
EDITORIAL

Standards for Assurance of Minimum Entry-Level Competence for the Diagnostic Ultrasound Professional

The document presented below is the result of a 14-month collaborative effort between the Society of Diagnostic Medical Sonography (SDMS) and the Society of Vascular Technology (SVT). During the drafting of this document, multiple persons were involved in the evolution of these standards including legal council, educators, clinical sonographers of all specialties, and vascular technologists. The purpose of the document is to establish the minimum entry-level educational and clinical standards to enter the field of diagnostic ultrasound for all subspecialties. This document will be used in tandem with the Scope of Practice for the Diagnostic Ultrasound Professional to reinforce the parameters of our profession with educational institutions, establishments of clinical practice, and legislative and regulatory agencies. It is anticipated this document will be periodically revised as our profession continues to change. The endorsement from other ultrasound organizations will be sought, as was done with the Scope of Practice.

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PREAMBLE

The purpose of this document is to define the qualifications necessary to become certified and practice as a Diagnostic Ultrasound Professional, which includes Diagnostic Cardiac Sonographers,

Diagnostic Medical Sonographers, and Vascular Technologists. It is expected that this document will change as the needs of the profession evolve in the future. The minimum standards established in this document are to be used in conjunction with the Scope of Practice for the Diagnostic Ultrasound Professional¹ and represent the entry-level threshold for persons to enter the field of diagnostic ultrasound. The Scope of Practice of the Diagnostic Ultrasound Professional includes those procedures, acts, and processes permitted by law for which the individual has received education and clinical experience and in which he or she has demonstrated competency. The field of diagnostic medical ultrasound includes the specialties of Vascular Technology, which encompasses vascular sonology and physiologic testing; Diagnostic Cardiac Sonology, with subspecialties in adult echocardiography and pediatric echocardiography; and Diagnostic Medical Sonology, with subspecialties in breast sonology, general medicine sonology, neurosonology, obstetrics and gynecology, and ophthalmology.

Standards, as described in the Scope of Practice, are designed to reflect behavior and performance levels expected in clinical practice. Clinical practice standards and personnel certification are paramount to ensure quality ultrasound examinations and maximum patient protection.

It is clear that a wide range of both academic and clinical training is prerequisite in order for individuals to meet these standards. The increasing sophistication of ultrasound technologies coupled with the current environment and the level of practice required of the Diagnostic Ultrasound Professional renders on-the-job training inadequate as an educational pathway. While no mechanism exists to unquestionably assure technical competence, national board certification is the standard of practice in ultrasound. The purpose of certification is to provide assurance to the public that persons practicing diagnostic ultrasound have completed specified didactic course work, clinical experience, and possess the knowledge, skills, and experience to deliver high-quality patient care.

DESCRIPTION OF THE PROFESSION

Diagnostic Ultrasound Professionals use a varied intellect that requires advanced education specific to the multiple specialties of diagnostic ultrasound. Individuals exercise independent judgment in the practice of diagnostic ultrasound, making the outcome

of the examination unique to each patient and not a routine process.

According to the Scope of Practice, Diagnostic Ultrasound Professionals

- perform patient assessments;
- acquire and analyze data obtained using ultrasound and related diagnostic technologies;
- provide a summary of findings to the physician to aid in patient diagnosis and management;
- use independent judgment and systematic problem-solving methods to produce high-quality diagnostic information and optimize patient care.

Competency in performing these critical patient care functions requires advanced education specific to the multiple specialties of diagnostic ultrasound.

Minimum Standards for the Profession

I. DIAGNOSTIC ULTRASOUND MINIMUM ACADEMIC STANDARDS²

These represent the minimum educational requirements identified as necessary for an individual to enter the Diagnostic Ultrasound Profession. The educational structure for the Diagnostic Ultrasound Professional has been evolving over the past 2 decades. It is anticipated that all persons will enter the field with a minimum of an associate degree in ultrasound, other allied health or life sciences and have, at a minimum, the clinical requirements outlined in Section II of this document by 2006; a bachelor of science degree in allied health or life sciences and have, at a minimum, the clinical requirements outlined in Section II of this document by 2008; and a bachelor of science degree in diagnostic ultrasound or one of its specialties by 2012.

Standard: Educational Program Accreditation

- All established ultrasound educational programs in the United States must be accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP)^{3,4} by 2006.
- All newly established ultrasound educational programs in the United States must be accredited by the CAAHEP within 5 years of initiation.

- Standards for the accreditation of an educational program for the Diagnostic Ultrasound Professional should be in conjunction with Section I (Requirements for Accreditation) and III (Maintaining and Administering Accreditation) of the CAAHEP Standards and Guidelines for an Accredited Educational Program.^{5,6}
- Multispecialty programs must ensure that all requisite standards for each specialty are met. In the case of diverse specialties, this may require an additional year of didactic training.

Standard: Prerequisite Education per CAAHEP Standards Section IC1 (Admission Policies and Procedures)

Standard: Curriculum per CAAHEP Standards Section IIB

The entry-level curriculum for diagnostic ultrasound provides the foundation of knowledge that will be used before a student enters into clinical training.

Standard: Required Competencies Common to Each Learning Concentration (Section IIC).

- Curriculum should be reviewed to ensure currency of content every 2 years.
- Competencies should be outcomes based.
- Code of Ethics as created by the Sonography Coalition should be adopted.
- Code of Professional Conduct should be established.
- Professional society participation should be promoted.

A. Cardiac Sonology Learning Concentration^{5,6}

- Competencies specific to the cardiac sonology learning concentration (Section IIE)

B. Vascular Technology Learning Concentration^{5,7}

Competencies specific to the vascular technology learning concentration (Section IIF)

C. General Medicine Sonology Learning Concentration⁵

- Competencies specific to the general medicine learning concentration (Sections IID1-3 and 8)

D. Obstetrics and Gynecology Learning Concentration⁵

- Competencies specific to obstetrics and gynecology learning concentration (Sections IID4-8)

E. Neurosonology Learning Concentration⁸

F. Breast Sonology Learning Concentration

G. Ophthalmology Learning Concentration

II. DIAGNOSTIC ULTRASOUND CLINICAL EDUCATION STANDARDS

Clinical education should be an adjunct to didactic education. The cognitive and psychomotor skills necessary to competently perform any ultrasound specialty require extensive clinical experience. A significant component of any ultrasound educational program is clinical practice. Exposure to a high volume and variance of sonographic procedures is necessary, which permits exposure to a variety of pathologic conditions. Clinical education should be specific for each specialty practiced. Clinical education must be accomplished under the direct supervision of a certified Diagnostic Medical Sonographer, Diagnostic Cardiac Sonographer, or Vascular Technologist experienced in the specialty of clinical focus. The cardiac concentration requires a minimum of 800 procedures annually in the lab of clinical internship. The vascular concentration requires a minimum of 1000 procedures annually in the lab of clinical internship, including both sonographic and indirect physiologic procedures. Multispecialty programs require a minimum of 1500 clinical procedures annually in the lab of clinical internship.⁹ This allows for overlap of skill development in clinical education that occurs in the first 4 to 6 months for any single learning concentration.

III. DIAGNOSTIC ULTRASOUND MINIMUM CERTIFICATION STANDARDS

Definition of Certification: Successful completion of a national objective written certification examination that has been independently validated and meets the standards of the National Commission for Certifying Agencies (see Appendix, Part III)

Standard: National Board Certification Is Mandatory to Ensure

- Public protection
- Quality of care

The purpose of certification is to provide assurance to the public that the Diagnostic Ultrasound Professional has completed specified didactic courses, and clinical experience, and possesses the knowledge, skills, and experience to deliver high-quality patient care. Additionally, the provider is able to appropriately evaluate normal and abnormal anatomy with ultrasound images or related technologies, assess patient clinical history, optimize established examination procedures, and communicate findings with physicians.

Competence in one specialty can not, and should not, be construed as competence in any other. Certification in each area of clinical work is required.

Standard: Postcertification Continuing Education

Diagnostic Ultrasound Professionals must adhere to the specific continuing education and/or recertification guidelines as mandated by the organization from which the certification is obtained. Due to rapid advancement in ultrasound practice, the need for continually staying abreast of evolving standards, techniques, and technology is imperative. Without continuing education and exposure to knowledge beyond the undergraduate experience, no professional can stay current in information and skills necessary to provide high-quality care to patients. Ongoing certification is based on a standard that includes successful attainment of continuing professional education and experience with new technologies and modalities. In order to remain current with the development of the field, persons who have passed their certification examinations for ultrasound must demonstrate completion of at least 30 hours of qualified CME every 3 years and a minimum of 15 hours in each specialty in which they are certified.

Standard: Types of Continuing Education

Standards of practice will continue to evolve as technology advances and new procedures and tech-

niques are developed. Ongoing education of current practice is necessary to remain abreast of these changes. Participation in research, scientific publication, and completion of advanced degrees may also be a means of staying current with the profession and/or contributing to continuing professional development.

Standard: Institutional Orientation

Current practice dictates persons practicing diagnostic medical ultrasound assume significant responsibility for obtaining a complete and accurate examination, pertinent to each patient's condition. Institutional and laboratory-specific protocols and procedures cannot be taught prior to being employed at an institution. Every employer of ultrasound professionals must provide comprehensive institutional orientation about its philosophy, standards and methods of practice, the range of patients to be encountered, and all protocols and procedures. The length of this orientation will vary depending on many factors, including the size of the institution, but would generally be a minimum of 6 months.

Standard: Continuing Professional Development

Participation in research, scientific publication, and completion of advanced degrees in order to stay current with the profession is strongly encouraged and supported by the field. However, clinically relevant continuing education is still mandatory.

Appendix

- I. **Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Education Program for the Diagnostic Medical Sonographer*, www.caahep.org/standards/dms-st.htm**
- II. **CAAHEP, *Standards and Guidelines for an Accredited Program for the Cardiovascular Technologist*, www.caahep.org/standards/cvt-st.htm**
- III. ***National Organization for Competency Assurance Standards for National Commission for Certifying Agencies Accreditation*, www.noca.org**

Notes

1. "Scope of Practice for the Diagnostic Ultrasound Professional" (*Journal of Diagnostic Medical Sonography* 2000;16:206–211, *Journal of Vascular Technology* 2000;24:151–156).
2. The minimum educational and clinical standards within this document are supported by the precedent set in the U.S. district court for the eastern district of Pennsylvania (Civil Action No. 98-CV-4076).
3. Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Education Program for the Diagnostic Medical Sonographer*, www.caahep.org/standards/dms-st.htm.
4. Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Program for the Cardiovascular Technologist*, www.caahep.org/standards/cvt-st.htm.
5. Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Education Program for the Diagnostic Medical Sonographer*, www.caahep.org/standards/dms-st.htm.
6. Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Program for the Cardiovascular Technologist*, www.caahep.org/standards/cvt-st.htm.
7. *SVT Guidelines for Educational Programs in Vascular Technology*.
8. Because the standards for the learning concentrations related to neurosonology, breast sonology, and ophthalmology have not been created by the CAAHEP, the SDMS and SVT will jointly approach the CAAHEP to request creation of these standards. The SDMS and SVT seek endorsement from the American Society of Ophthalmology.
9. Commission on Accreditation of Allied Health Education Programs (CAAHEP), *Standards and Guidelines for an Accredited Education Program for the Diagnostic Medical Sonographer*, www.caahep.org/standards/dms-st.htm.

