Qualifications of the Physician in the Vascular Diagnostic Laboratory

Michael A. Ricci and Robert B. Rutherford

The vascular diagnostic laboratory (VDL) is of increasing importance in the care of patients with vascular disease\(^1\) while coming under greater governmental scrutiny and economic pressures.\(^4\) In view of these challenges, the qualifications and credentials of physicians who interpret noninvasive diagnostic studies have taken on additional importance. The InterSocietal Commission for the Accreditation of Vascular Laboratories (ICA VL) has established overall standards for vascular laboratories, including credentials for interpreting physicians. Several professional societies\(^5\)–\(^10\) have published guidelines for credentials for physicians interpreting noninvasive vascular studies but, as yet, there is no universally accepted standard. Physicians from different specialty backgrounds and with different training and clinical diagnostic experience may all read and direct vascular laboratories.\(^7\),\(^11\),\(^12\) Can these diverse backgrounds and training be accommodated in a single set of standards that qualifies physicians for working in the VDL in these capacities? This chapter will examine the desired attributes in regard to formal education and necessary skills, as well as special qualifications required for physicians interpreting noninvasive vascular diagnostic studies.

Educational Background

Although the first vascular laboratories were developed by vascular surgeons,\(^13\) today a variety of other physician specialties are involved in the interpretation of noninvasive vascular studies. These include radiology, cardiology, neurology, and neurosurgery, as well as vascular medicine specialists.\(^3\) However, each of these specialties has, stereotypically, certain deficiencies in their usual training experiences when it comes to understanding and interpreting vascular diagnostic laboratory tests. Neurologists and neurosurgeons have clinical knowledge regarding cerebral vascular disease, particularly stroke, but are less frequently provided the opportunity to acquire significant experience in the VDL evaluation of patients with those conditions. In addition, cerebrovascular diagnosis is only a limited segment of the broad scope of today’s VDL. Radiologists often are well-grounded in the principles of ultrasound and have experience interpreting and performing duplex ultrasound examinations, but generally lack knowledge of the principles that govern physiologic vascular testing and the clinical aspects of vascular disease. Training in cardiology includes a focus on the pathogenesis of arterial disease, particularly atherosclerosis, and the clinical aspects of some other peripheral vascular diseases, such as venous thromboembolism, but it infrequently includes adequate exposure to noninvasive vascular diagnosis or nonarterial vascular disease, such as chronic venous insufficiency. Vascular surgeons and vascular internists have broad educational exposure to the hemodynamic principles, the pathogenesis, and clinical aspects of a broad spectrum of vascular disease and how they apply to diagnosis. However, they are less often exposed to the principles and instrumentation of ultrasound and often are not given the opportunity to actually perform duplex ultrasound examinations.

While training requirements in each of these fields has evolved considerably in the past several years, no one specialty characteristically provides adequate exposure to all the educational components of vascular diagnosis that have been recommended\(^7\),\(^12\),\(^14\) to qualify physicians to interpret noninvasive vascular tests. These educational components, listed in Table 2–1, require a multispecialty approach to the education of residents or fellows in the vascular diagnostic laboratory. The table lists all the areas in which knowledge and skills should be acquired. These components provide a framework for noninvasive vascular diagnosis training within standard specialty training so that individuals can work effectively in the VDL.

Although residency and fellowship training may vary between specialties, and between different programs
within those specialties, individuals interpreting vascular laboratory studies should have acquired a certain set of basic skills (Table 2–2). A thorough understanding of diseases that affect the vascular system is an absolute requirement. This should include an understanding of the epidemiology and pathophysiology of vascular disorders as well as their clinical signs and symptoms, prognosis, and treatment options. This fundamental knowledge is necessary because noninvasive VDL tests are based upon both normal and abnormal vascular physiology. By the same token, since noninvasive testing is an adjunct to caring for patients with vascular disease, physicians interpreting noninvasive vascular tests should have a thorough understanding of appropriate indications for the performance of these tests. It is incumbent upon the interpreting physician to understand these indications to ensure appropriate clinical conclusions are reached and wasteful or excess testing is avoided. This, of course, includes an understanding of the false-positive and false-negative rates of VDL studies.

It should also be understood that not every laboratory will be able to produce an equivalent experience for every individual in each listed area, nor is it absolutely necessary (i.e., there is little need for residents in neurology to learn venous testing). Areas of expertise and emphasis can and should be designated by each specialty, although individuals who hope to direct a VDL should seek an educational experience that covers all the components listed in Tables 2–1 and 2–2. Additionally, it is desirable that individuals learn how to utilize instruments by actually performing clinical studies, although this may be more difficult to achieve in some specialty areas. As a minimum, in our opinion, a basic knowledge of the instrumentation and testing is desirable—if not essential. Experience actually performing the various examinations is necessary in order to adequately assist technologists with difficult examinations and, for the surgeon, to perform intraoperative duplex scanning.

Qualifications

The qualifications for physicians interpreting vascular noninvasive studies have been outlined previously. They consist of the following: (1) understand instrumentation (and be able to troubleshoot technical problems); (2) be able to perform and instruct others in performing noninvasive tests; (3) have a thorough knowledge of vascular diseases studied in the VDL; (4) understand the meaning, accuracy, and limitations of test results in light of other tests and the clinical setting; (5) either be completely supported by the VDL or have other activities that do not interfere with the ability to be accessible for the VDL; and (6) have no conflicts of interest between acting as both diagnostican and clinician. The individual should have a valid medical license and be in good standing in the medical community. Some professional organizations have suggested minimum numbers of examinations to qualify interpreting physicians in the VDL, but no consensus exists. In many situations, no single individual will meet those criteria and more than one individual (physician, engineer, or technologist) may need to share these qualifications.

Credentialing

ICAVL encourages all technologists to seek certification as Registered Vascular Technologists (RVT) and considers such certification by physicians suitable evidence.