THE RECENT SITUATION AND FUTURE PERSPECTIVES OF THE CERTIFICATION OF TOXICOLOGISTS

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Toxicology is the science which studies adverse chemical effects on living organisms and assesses the probability of their occurrence. A toxicologist is one who applies expert knowledge to the study of these adverse effects and to risk assessment of the probability of occurrence.

Dedicated professionals have always tried to keep current with new developments in their chosen fields. The purpose of certification is to set standards for and recognize exceptional expertise in these professional and scientific disciplines. To assure that such certified individuals successfully maintain their expertise, a necessity for periodic re-examination has been widely recognized and incorporated into the certification process. Such a process can provide a reliable measure of competence to be recognized by other professionals and is also reassuring to the public utilizing the services of toxicologists and relying on their judgement for health and safety evaluations.

To ensure continuing competence in toxicology and to support public confidence in the evaluations of toxicologists, national standards of training, professional skills and continuing education were established and published. Toxicology Certification was first offered through professional organizations beginning in the late 1940's through the establishment of the American Board of Clinical Chemistry (in Toxicological Chemistry, and subsequently by the American Board of Forensic Toxicology, the American Board of Industrial Hygiene, the American Board of Medical Toxicology, and the American Board of Veterinary Toxicology.

Then, in the mid-1970's, the Society of Toxicology in the United States examined concerns related to the rapidly expanding knowledge in toxicology and the proliferation of self-acclaimed expertise in disciplines of this specialty. It appointed a Task Force to study this situation with the intent to upgrade the science of toxicology.

A Subcommittee specifically addressed the certification of professionals in toxicology. It examined the qualifications necessary for professional personnel working with toxicology and especially those involved in laboratories performing toxicologic studies. Standards, guidelines and recommendations on how the expertise and capabilities of these personnel should be evaluated, and the type of certification and examination mechanisms necessary to ensure that individuals making judgements on toxicologic matters are appropriately qualified, were all considered. The requirements for certification, specific areas of competency, and the method and type of possible examinations to achieve and maintain the certification status were reviewed.

The fact that there are many sub-specialties in toxicology exemplified the diversity and background of training and experience necessary for competence in toxicology. The organization of such a certifying board requires that the public interest remain supreme. Therefore it was suggested to be organized as a not-for-profit corporation that met pertinent governmental criteria. Competent legal council, professional accounting advice, and appropriate insurance coverage were considered essential.

Operation of such a Board was recognized to be expensive and financial underwriting of these costs by the Society of Toxicology was necessary for several years until the Board became financially self-sustaining.

The need to establish such a certification program by professional toxicologists was not readily apparent to all members of the profession, but the Subcommittee clearly and convincingly provided a blueprint for toxicology training programs, a system of maintaining competency through continuing education efforts, and the coordination of certification and education to provide opportunities for periodic re-examinations to continue demonstrating professional competence.
Training programs should include biology, chemistry, biochemistry, physiology, pharmacology, pathology, biostatistics, and specialty courses in areas of toxicology specialty such as analytical methods, biochemical mechanisms of toxicity, environmental toxicology, mutagenesis and teratogenesis, carcinogenesis, and behavioral or industrial toxicology. Such intensive specialization requires the development of graduate programs and post-graduate specialty training at academic institutions.

Continuing education must be available to permit continuing upgrading and expansion of the professional's knowledge. Such efforts include programs given by teaching institutes and universities through attendance at specific workshops, symposia and conferences, and national meetings, self-education through study of publications and video materials, and sabbatical studies at appropriate research institutes and laboratories. The communication of upcoming workshops, symposia, short courses and other educational efforts must be coordinated through an organizational effort of the sponsoring Society.

Periodic re-certification is a vital part of professional certification. The profession and the public must be assured that continuing competency in the recognized discipline is maintained, and the certifying body must maintain mechanisms to assure that each professional demonstrates continuing and updated knowledge. Individuals not meeting the re-certification standards must not be continued on the certified roster, for in no other way can the public be assured of competence in its scientists nor can the profession maintain its credibility.

The Task Force's Report in 1977 emphasized the importance of establishing and maintaining training and continuing education criteria for the certification program. In addition, it laid out the organizational structure for a certifying body by providing Articles of Organization (charter, certificate of incorporation, name, location, purposes and objectives, finances, initial directors, corporate meetings and sponsors), Officers and Staff (titles, qualifications, terms of office, compensation), Trustees or Directors (number, qualifications, terms of office, source of nominations, vacancies), and Bylaws and General Provisions (officers, membership of corporation, elections, meetings and voting, committees, amendments, indemnifications and seal). (Oehme, FW: Report of the Society of Toxicology Council's Committee on Accreditation, Certification and Good Laboratory Practices in Toxicology. Society of Toxicology, Reston, Virginia, USA, 18 Oct 1977, 93 pp.)

The Report recommendations were widely discussed throughout North America, and in 1979 the Society of Toxicology formally established and financially supported the American Board of Toxicology as a certifying body to recognize special expertise in General Toxicology. The office was located in Washington DC, and a select group of internationally recognized toxicologists were asked to serve as the first Board of Directors to develop specific eligibility criteria and the first examination. The initial group of candidates for certification were considered in early 1980, and the first examination was given that fall. Professionals that met the eligibility requirements for examination were given a full-day written examination covering the various specialties within the scope of General Toxicology.

Since then the examination has been given once yearly in at least 2 cities in the United States and also usually at 1 international location.

The initial group of toxicologists giving the first examinations withdrew from the organization as individuals receiving certification by examination were identified. Within 3 years, all members of the Board of Directors that judged eligibility criteria and established examination criteria and evaluated candidates were certified by examination. Most of the original Board members then took the written examination so that within a few years all Diplomates of American Board of Toxicology were appropriately examined and certified by the written examination procedures. Since the initial examination was given, 1,585 Diplomates have been certified by the American Board of Toxicology as having special expertise, and the number of individuals successfully passing the examination has been maintained stable each year.

Once certified, individuals must re-certify themselves every 5 years by reevaluation of credentials and re-examination. Well over 90% of the Diplomates successfully complete the re-certification process each year, thus demonstrating continuing expertise and competence in toxicology.

The American Board of Toxicology certifying procedure has been widely accepted by industry, academia, government and regulatory authorities, and the public sector. Employment opportunities and professional advancement are enhanced for Diplomates of the Board. Recognized expertise in medico-legal matters requiring toxicology judgement is enhanced by Board toxicologists having certification credentials. The continuing national and international recog-
nition of the certifying process is evidence of the importance given to it by scientists and the general public.

As toxicology expands its horizons and the depths and intensity of scientific expertise applied to risk assessments and safety evaluations becomes more specialized, individual toxicologists will become equally focused and maintaining detailed expertise in all areas of toxicology will become increasingly difficult. It is therefore likely that future certification efforts in toxicology will recognize the unique expertise in such rapidly developing sub-disciplines as molecular biology, neurotoxicology, immunotoxicology, veterinary toxicology, reproductive and developmental toxicology, carcinogenesis, inhalation toxicology, mechanisms of toxic action, heavy metal toxicology, in vitro toxicology, food safety, regulatory and safety evaluation, and risk assessment.

Throughout this entire process, however, the emphasis on establishing and maintaining standards of professional excellence in toxicology will ensure scientific and public recognition of the exceptional expertise demonstrated by a scientist achieving and maintaining certification in toxicology.