

On July 1, 1964, legislation requiring the licensure of x-ray technicians became effective in New York State. The legislation set standards for eligibility and apparently has eliminated many untrained persons. As a result, the number of hospital-based schools for x-ray technicians has expanded and new community college courses have been developed, and further licensure was mandated in 1965 for x-ray therapy technicians and chest radiographers.

STATE LICENSURE OF X-RAY TECHNICIANS: THE EXPERIENCE OF NEW YORK STATE

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Background of Technician Licensing

RADIATION safety in the taking of medical x-rays requires both safe equipment and a safe operator. New York State, like many other states, has had public health regulations requiring the registration and periodic inspection of x-ray equipment for several years. In the course of these inspections, it became apparent that many instances of excessive exposure of patients or operators to radiation could be attributed to the poor training of operators rather than to faulty equipment. For example, inspectors found that cones or diaphragms to limit the x-ray beam, filters to absorb the soft x-rays, or shields to protect the gonads, were often unfamiliar to the operator and were either not used or used incorrectly. Because of poor tube angulation, selection of field size or centering of the beam, operators often exposed the gonads of patients to as much as 100 to 200 times the amount of radiation necessary from a purely medical point of view. Even in the tak-

ing of a simple wrist x-ray, the beam was often unnecessarily directed toward the gonadal region.

About 2,500 x-ray technicians in the state, who generally worked for private radiologists or in the radiology departments of better hospitals, in recent years have been registered with the American Registry of Radiologic Technologists. This is a voluntary national accrediting agency, jointly sponsored by the American College of Radiology and the American Society of Radiologic Technologists. A minimum of education and experience, plus the passing of a written examination for accreditation, are required. However, information gathered by the State Health Department in its registration of x-ray installations indicated that there were roughly from 12,000 to 14,000 persons, other than physicians, operating medical x-ray equipment in the state. This left a minimum of 9,500 persons taking x-rays without any controls or standards whatsoever. For the most part, they were nurses, secretaries, receptionists, and

others working in the offices of physicians, not radiologists, where about 85 per cent of the x-ray units not in hospitals were located. These persons, whose "training" was often limited to a few hours of instruction by a representative of the equipment manufacturer, were completely outside of any regulatory system.

Dependence upon a code which regulates the equipment, but not the operators applying the radiation, is akin to registering and inspecting motor vehicles without requiring the operators to demonstrate their ability to drive. When these facts were recognized, the State Health Department presented them to the State Society of X-ray Technicians who, at the department's urging, prepared a model x-ray technician-licensing law. Because x-ray technology is not a discipline requiring a college degree, the State Education Department was reluctant to sponsor its licensing. The State Health Department, with the approval of the State Education Department, therefore picked up the sponsorship of a licensing law as part of its responsibility for the control of ionizing radiation. Bills to license technicians were submitted to the Legislature in each year from 1960 through 1964. The final bill, revised from experience gained in earlier years, became law as Chapter 295 of the Laws of 1964, effective on July 1, 1964.

This law requires that, after October 1, 1965, only persons holding a state license can apply x-rays on human beings in the practice of x-ray technology. Physicians and other professional practitioners of the healing arts continue to be governed in their use of x-rays by the provisions of their own licensing laws. Furthermore, licensed x-ray technicians can only apply x-rays while under the supervision of a professional practitioner, and then only to those persons or parts of the human body specified in the law under which

the professional practitioner is licensed. Specific exemptions from the law are provided for students while attending approved schools in the health professions (including schools of x-ray technology), x-ray technicians employed by federal agencies, and dental assistants taking only intra-oral x-rays.

Short-term provision is made for examining and licensing presently practicing technicians. Standards are set for the licensing of future technicians based upon satisfactory completion of a two-year course of study approved by the State Health Department or State Education Department. The law specifies a minimum content of classroom work and clinical experience to be met by approved schools. Applicants are also required to meet standards of being at least 18 years of age, of good moral character, high school graduates, and able to pass a written licensing examination.

The law also provides for a biennial registration of licensed technicians, for suspension or revocation of licenses, and for criminal prosecution in certain cases of violation of the law's provisions. Finally, the law establishes an X-Ray Technician Board of Examiners, composed of two radiologists, two x-ray technicians, a health physicist, a hospital administrator, and a general practitioner of medicine, to advise the department in its administration of the licensing program.

Particular stress is given in the law to the problem of radiation protection. The law states: "It is declared to be the policy of the State of New York that the health and safety of the people of the State must be protected against the harmful effects of excessive and improper exposure to ionizing radiation." One of the most important goals of licensing, therefore, is to see that adequate attention is given to radiation protection. This is reflected in the curriculum requirement for the teaching of

radiation protection at approved schools, and in the stress given to this subject in the written examination.

Initiation of Licensing Program

During the first 18 months of the licensing law in New York State, the State Health Department processed over 6,000 applications for licenses. Of these, about 2,500 were licensed on the basis of their certification by the American Registry of Radiologic Technologists. This left over 3,500 to whom "present practitioner" examinations were given under the law; of these, about 2,000, with over five years of experience before the law went into effect, were given practical examinations. Another 1,000 or so, with over one year of experience but less than five years, were given special written and oral examinations. Finally, about 500 were given the first regular written examination on the basis of having recently completed a course in x-ray technology. For the practical and oral examinations, over 100 highly experienced x-ray technicians were recruited to examine patients at more than 35 hospitals which volunteered the use of their x-ray facilities.

Two points about the "present practitioner" examinations should be emphasized: first, the examinations were intended to be of a *qualifying* nature only, since the department knew that it could not sharply cut into the supply of practicing technicians without injuring medical practice in the state. The examinations therefore disqualified only those manifestly unqualified to practice. This was especially so in the practical examination for people with over five years already invested in the field. In this connection, it should be kept in mind that many new licensing laws automatically "blanket in" all "grandfathers" without any examination. However, in the case of x-ray technicians, it was felt that, since radiation poses a

hazard, some scrutiny should be made of all practitioners before licensure.

The second brief point which should be noted about the "present practitioner" examinations is that, throughout the process of conducting these examinations, the department closely consulted with its X-ray Technician Board of Examiners. A radiologist and a chief x-ray technician on the board personally reexamined all who initially failed the practical examination.

Since the termination of the "grandfather" provision on July 1, 1966, all applicants, including those holding certificates from the American Registry, must have some formal schooling. After October 1, 1966, they must be graduates of two-year approved schools.

Examinations

While the law required the holding of "present practitioner" examinations, the main concern of the State Health Department has been in the development of a high quality, ongoing written examination for new graduates of schools of x-ray technology. For this purpose, on the advice of the board, a Written Examination Advisory Committee was formed, composed of the director of x-ray technology who is an x-ray technician, the assistant director who is an examiner, another examiner from the State Department of Civil Service, another prominent x-ray technician, and a noted radiologist. The committee prepared a general outline for the test and determined the weight to be given to each subject. The committee meets as a whole, and members give individual consultation in reviewing the material for each test form. After each test, the committee reviews statistical material, analyzes the results, and recommends standards for setting final marks.

School graduates, who take the examination for the first time, are issued temporary permits to practice until the

rating of their papers is completed. Technicians who come into the state can also obtain temporary permits. At present, examinations are regularly scheduled, semiannually.

Under an agreement with the State Civil Service Department, the state-licensing examination is also used to establish eligibility lists to fill positions with the state and with some local governments. To protect nongovernmental employers, only applicants for a license who specifically express an interest are placed on the Civil Service lists.

Promotion of Training

High among priorities in the administration of the licensing program is the promotion of new schools of x-ray technology. In 1964, there were about 30 two-year hospital schools in New York State. As of the end of 1965, the State Health Department had received commitments from 67 hospitals running schools or planning to begin schools in the near future. Many of these schools may eventually establish affiliations with community colleges under the program described below.

The State Health Department is working with the State Education Department and State University to promote community college courses that offer associate degrees in x-ray technology. One experimental pilot program began at Broome Technical Community College (Binghamton, N. Y.) in September, 1965. Groundwork has been prepared for several others to start in 1966-7. The long-range goal is about 20 courses strategically located throughout the state. An obstacle to be overcome is the shortage of qualified teaching technicians to act as program directors. Plans are underway to recruit such people and hold seminars in educational methods to prepare them for their new roles.

A limited number of baccalaureate

degree programs to fill administrative and teaching positions is also planned. To encourage more of the bright high school graduates to enter the field, the State Health Department prepared a brochure directed to students, entitled "Your Career as an X-ray Technician." Copies are available for distribution to high school guidance counsellors for use in career-day programs.

1965 Changes in the Law

There were five amendments to the licensing law in 1965. This is of interest in itself, since it shows that a licensing law is not inflexible and can be changed to meet newer advances in the field. Two amendments corrected technical deficiencies in the original law by providing for temporary permits pending examination and for refunds of fees to unqualified applicants.

A third amendment admitted to examination persons enrolled in shorter courses in x-ray technology, prior to July 1964, when the law became effective. These students, in good faith and not knowing about the law, spent money and time taking such courses. This amendment, which involved only about 250 students, did not automatically license them; it only admitted them to the examination. It was *not* open-ended; they had to apply by October 1, 1966.

A fourth amendment provided a special license for therapy technicians and was sponsored by the Therapeutic Club of Radiologists, a group of board radiologists. About ten hospitals in the state use pure therapy technicians in highly developed therapy departments. These technicians are trained almost to the level of health physicists. Without a therapy license, therapy schools could not be approved, since they do not teach radiographic technics or darkroom chemistry. Holders of these licenses are limited to therapy and are not permitted to do diagnostic x-raying. The Amer-

ican Registry has a similar provision in its program.

A fifth amendment provided a limited license for chest radiographers. It had the endorsement of many organizations running mass-screening programs. They pointed out that mass screening, as employed by voluntary health agencies, hospital admissions programs, county chest clinics, and pre-employment and periodic examination programs in industry, detects many cases of tuberculosis and other respiratory diseases. These agencies cannot recruit x-ray technicians who are willing to do this limited type of work. Often they must also be able to drive mobile units. The license limits the holder to x-ray of the chest area, using only special equipment in which the tube and the cassette or hood are interlocked and beam-limiting devices, filters, and gonadal shielding of a permanent type are built into the equipment. Furthermore, the chest radiographer may use this equipment only when employed by an agency engaged in a public health program; he *may not* be employed in a private physician's office.

Enforcement of the Law

The State Health Department, as the public agency responsible for licensing x-ray technicians, plays a key role in promoting and enforcing high standards of professional behavior. The licensing law requires that x-ray technicians must be "of good moral character." Under the law, licenses may be denied or revoked because of conviction of a felony or engagement in unethical conduct.

The State Health Department is taking immediate steps to enforce the licensing law to insure that only duly licensed persons take x-rays. Local health department inspectors, who already inspect x-ray installations, are determining that technicians operating the installations must be licensed. Local

x-ray societies are setting up "watch-dog" committees to police their areas from unlicensed practice. A list of x-ray technicians with registered licenses is being distributed, so that technicians on this list can report anyone practicing who is not listed. Lastly the cooperation of insurance companies, which issue malpractice insurance, and the State Education Department, which licenses physicians, will be sought if action is necessary against those who willfully employ unlicensed technicians. An attempt will also be made to create among the general public an awareness of the licensing requirement.

Effect of Licensing on Practice

Inasmuch as some 6,000 technicians have been licensed, a logical question is: "What happened to the other thousands of people who were taking x-rays—the nurses, secretaries, laboratory technicians, and receptionists in the private physicians' offices?" It appears that many of these persons have eliminated themselves from the field by not applying. Apparently, they felt that, with limited experience and no formal training in x-ray, they did not wish to risk twenty dollars on taking the examination. Furthermore, their jobs usually did not depend upon taking x-rays, since they only took a few x-rays per week and the bulk of their work involved either nursing or clerical duties. The "present practitioner" examinations therefore served a purpose that was not originally obvious in that they discouraged many clerks, typists, receptionists, and so on, from applying for a license and thus removed them from the field of x-ray technology. Removal of these ill-trained people should be beneficial to the general public, as well as to the professional status of the x-ray technician. It will also have an impact on the practice of medicine, since many general practitioners now will either re-

fer their x-ray cases to radiologists or take the x-rays themselves.

Almost all applicants with substantial x-raying experience (employees of radiologists and hospital x-ray departments) qualified on the "present practitioner" examinations and were licensed. For this reason, the larger number of those x-ray installations experienced a smooth transition on October 1, 1965, the date after which only licensed practice was permitted under the law.

Summary

Pioneer legislation mandating licensure of x-ray technicians became effective

in New York State on July 1, 1964. The legislation sets standards for eligibility for licensure for present and future practitioners. It has apparently eliminated from the x-ray field many untrained persons who took only occasional x-rays. The program has encouraged the development of many new hospital-based x-ray technology schools, and it should lead to the development of a state-wide system of associate degree courses in two-year colleges. Experience has called for legislation, which was enacted in 1965, for special licensure of x-ray therapy technicians and chest radiographers.

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Internships in Rehabilitation Counseling

Applications are now available for graduate internships in rehabilitation counseling, predoctoral internships and postdoctoral fellowships in counseling psychology offered at the Pennsylvania branch of The Devereux Schools, a group of residential treatment, special education and rehabilitation centers, located in suburban Philadelphia. The program covers a full-time, 12-month period of training and experience with mentally retarded and emotionally disturbed children, adolescents, and young adults presenting problems of learning and of personal adjustment. Stipends ranging from \$2,800 to \$7,000 are available to qualified candidates who are United States citizens.

Information is available from Dr. Henry Platt, Director, Devereux Foundation Institute for Research and Training, Devon, Pa. 19333.