



STATE OF NEBRASKA

DEPARTMENT OF HEALTH

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GOVERNOR

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DIRECTOR

MEMORANDUM

TO: Senator Don Wesely
Chairman, Health & Human Services Committee

FROM: Gregg F. Wright, M.D., M.Ed.
Director of Health

DATE: March 6, 1987

SUBJECT: Recommendations Regarding Credentialing of Radiologic Technologists

To complete the final report on the credentialing of radiologic technologists, the Department has reviewed the application material, the information presented at the public hearing, the reports from both the technical committee and the Board of Health, the Department's current regulatory authority and capability, and background material on radiation safety.

RECOMMENDATION

In their proposal, the Nebraska Society of Radiologic Technologists sought a two-tiered system of licensure for all persons doing radiographic work on patients. The technical committee recommended that this system of licensure be granted to radiologic technology. However, the Board of Health recommended against the credentialing of this occupation at this time. While the Board recognized the potential dangers of unregulated practice, they felt that licensure of the operators was not the most appropriate or cost-effective remedy to the problem.

The Department recommends that credentialing legislation for radiologic technologists not be enacted at this time but recommend instead that serious attempts be made to strengthen the enforcement of current statutes pertaining to the inspection of x-ray machines and minimum standards for x-ray operators.

DISCUSSION

My comments will be organized around a series of questions that must be addressed.

Is there a potential danger from x-rays in Nebraska?

Yes, the potential danger to the public from x-rays is clear. This was also the finding of both the technical committee and the Board of Health. There is no safe level of x-ray exposure and unnecessary radiation exposure has the potential of causing both genetic damage and cancer.

However, as stated in the Comptroller General's Report to Congress for 1981, "The present understanding of how radiation causes cancer is insufficient to predict exactly the effects of low-level radiation. Furthermore, with present techniques, there is no way to distinguish between the cells of human cancers induced by radiation and the cells of cancers induced by other causes." There is no smoking gun. No evidence was presented of direct harm to a patient, and while the proponents presented a number of examples of unnecessary radiation, it cannot be determined if these anecdotes are indicative of a widespread problem.

Where is this potential danger greatest?

There are many reasons for suspecting that x-rays taken in a hospital or large clinic are less likely to result in unnecessary radiation exposure. X-rays in these sites are likely to be read by a radiologist who has the highest level of expertise in monitoring for unnecessary exposure. These sites are likely to already employ a certified x-ray technologist. Other licensing and certification requirements impose controls, and because many x-rays are taken, the financial incentive to reduce retakes and unnecessary film use is great. In addition, the equipment is more likely to be up-to-date in such settings. The anecdotal evidence of unnecessary exposure that was presented did not appear to come from these sites. If additional regulation is needed, it would most likely be in the smaller clinics and individual offices with part-time operators where there is a greater chance of finding older equipment. The limited scope licensure in the proposal was intended to address these settings.

Is this potential danger from bad machines or from poor operators?

Both. Unnecessary radiation exposure can result from either the condition of the machines or the techniques of the operator. The machine must produce x-rays in the proper direction and of the proper strength and duration. Older machines are less likely to perform appropriately. The director of the Division of Radiological Health estimates that up to 30% of the machines may need repair or adjustment. There is no way that the operator or the supervising professional can ensure that the machine is causing unnecessary exposure.

The operator must protect the patient by collimating the x-ray beam properly and by shielding the patient's susceptible tissue. The operator must also be able to position the patient and set the machine to produce a diagnostic film with minimal retakes. The supervising professional can monitor some (but not all) of the efforts to protect the patient because some of the unnecessary exposure shows up on the film, and the supervising professional is likely to be aware of the unnecessary retakes because of the costs and poor quality of films involved.

Would licensing of operators alone reduce this danger?

No. The potential harm from machines in need of adjustment or repair would still exist. Although all x-ray machines are regulated by the Department of Health under the Radiation Control Act, there is evidence that the current regulatory structures have not been adequate to maintain standards needed to protect the public. Of the approximately 3,000 machines in Nebraska, the Department has only enough staff to inspect about 400 per year. The Department estimates that a \$163,000 increase in funds would be necessary to fully implement the goals of the Radiation Control Act concerning equipment safety. Attempts are in progress to allow the Department to charge fees to increase the funds available for this task by charging the person wishing to operate an x-ray machine.

The Department also has in place regulations that require the operator of any x-ray machine to take a 16 hour course in radiation safety and the safe operation of x-ray machines. Although it is in regulations, this minimum standard has not been put in effect, because educational institutions have been slow to develop such courses. One factor contributing to these delays may have been the uncertainty about whether a more extensive credentialing would be needed, which is what has been proposed by this credentialing application.

The Legislature is currently considering two bills, LB 390 and LB 653, which would strengthen the legislative basis for requiring minimum training for operators. If this were done, it would give the Department firmer authority to require such training, and would clarify to the educational institutions that it is a necessary course.

One comment about this sixteen hour requirement is in order. Sixteen hours is clearly a minimal amount of training. It may not be possible to cover all of the topics listed in the current bill in sixteen hours, and consideration should be given to reducing the expectations for the course or increasing the hours. However, even if the expectations for the course were reduced, it would appear that one of the most important topics to cover in such a minimal course would be the protection of the patient by proper collimation and shielding. These two skills are relatively unmonitorable by the supervising professional. Other skills needed to produce a quality x-ray can be monitored by the supervising professional. The current course expectations do not specifically include the protection of the patient by proper collimation and shielding and this should be added.

Is the supervising professional able to prevent this danger?

Yes, in most respects. The arguments against specific licensing of x-ray operators rely on the fact that currently x-ray operators work under the direction of a licensed professional who is ultimately responsible for the patient's safety. This includes physicians, chiropractors,

podiatrists, and dentists. As we discussed above, the supervising professional can monitor many hazards associated with x-rays by periodic observation of the x-ray operators and especially by seeing the end product film and the amount of film used. There are two exceptions. Because difficulties with the machine are not likely to be within the expertise of the supervising professional, a program of inspection of x-ray equipment is important. And because some types of unnecessary tissue exposure do not show up on the film it is difficult for the supervising professional to monitor this completely, and some minimum standards are necessary.

This ultimate professional responsibility should not be taken lightly. It means that if a patient is exposed to unnecessary radiation it reflects upon the supervising professional's competence or conduct. Consideration should be given to making this type of action a specific grounds for discipline against the supervising professional's license. If this were done, complaints against a professional who was not supervising properly could result in limiting the professional's use of such equipment. A stronger approach would be to require a specific certification before a professional could supervise the operation of an x-ray machine. While this is in effect in California and Vermont, evidence was not presented that such a step is needed. Because it would constitute a limitation of scope of practice of the supervision professionals, it would likely require a separate credentialing review.

Is there potential harm from the licensing proposal?

Yes. Licensing will create additional costs, and will reduce the access of Nebraskans to x-ray procedures. Limited scope operators, as envisioned by the applicants, would be limited to x-rays of chests and extremities. The availability of emergency x-rays of other parts of the body, most importantly abdominal films and skull films, would be restricted to those sites that could afford to employ a fully-licensed technologist. This is important concern. In addition, anyone taking x-rays for more than chest and extremity films would incur the additional costs necessary to have fully-licensed operators covering all shifts. The financial costs and the access problems would be passed on to the patients. If the need could be demonstrated and if restrictive credentialing were the only solution, then these would be necessary costs. This application does not appear to have demonstrated this need.

The bill (LB 534) to provide licensure to radiologic technologists does not restrict limited radiographers to the chest and extremities. However, this bill does require that these practitioners work only under the supervision of a fully-licensed radiologic technologist. This restriction would affect small rural facilities in the same way as the limitation on body parts, and would hinder the provision of emergency trauma care in the same way.

SUMMARY

This report can be summarized by the following six comments and recommendations:

- 1) Although the applicants have not shown direct evidence that patients are being harmed by the current situation, the potential for harm clearly exists.
- 2) An improved system of regulating x-ray machines is a necessary condition for reducing this potential for harm. An improved system of fees is likely to provide the resources for this improvement.
- 3) Some minimum standards should be imposed upon operators, because of the potential for exposing patients in ways that are difficult for the supervising professional to detect. These standards should stress the protection of the patient by shielding and proper collimation of the x-ray beam.
- 4) Current regulations require a course of training before operating an x-ray machine. This requirement should be put in statute in a way that will facilitate its enforcement.
- 5) Consideration should be given to adding the exposure of patients to unnecessary radiation exposure to the list of things for which licensed professional's license may be disciplined.
- 6) If the need for additional regulation is evident even after these steps, then a more restrictive form of regulation including operator licensing should be considered.

