Mobile TB X-ray Units: An Obsolete Technology Lingers

The mobile chest x-ray van, like the old-time patent medicine show, is an anchronism at least in the opinion of many medical authorities. There are, however, many such units still operating under the sponsorship of public groups, local tuberculosis associations, and private companies run for profit.

The persistence of such units is an example of how an obsolete technology can become institutionalized after the need for it is gone. Groups continue to run their units for a complex of reasons —economic, emotional, and humanitarian. Individuals, having been told for decades that they need an annual chest x-ray as a check for tuberculosis, continue to demand the service. States and counties require legal proof of the absence of tuberculosis in certain occupational groups.

Although the tuberculin skin test is now a preferred and less expensive method of screening for TB, teachers, food-handlers, and barbers are told in many areas that they can meet legal requirements only by having a chest x-ray.

One of the most influential voices that has been raised against the continuation of chest x-rays to detect TB in the general population is that of the National Tuberculosis and Respiratory Disease Association, long a promoter of the chest x-ray.

"Mass Chest X-ray Screening—An Idea Whose Time Has Gone" is the title on the cover of the National Association's October bulletin. A photograph of an x-ray van is crossed out with an emphatic "X."

In that issue of the bulletin, the National Association's Committee for the Guidance of the Tuberculosis Program recommends that local TB associations "should no longer conduct chest x-ray screening programs." The committee concluded that "community x-ray surveys using mobile or portable x-ray units among general population groups are not productive as a screening procedure for pulmonary disease and should be eliminated."

The committee stated that "in very special circumstances—such as in an apparent outbreak of tuberculosis or in a high incidence area which has no accessible walk-in facility—it may be appropriate to screen a selected population group with chest x-rays (along with tuberculin tests)," but cautioned that such x-ray programs "should not be started unless services are available for follow-up."

Federal, state, and county health officials that were interviewed agreed with the National Association's recommendations. Some of their reasons for opposing continuation of the mobile units are:

► These units find very few active cases of tuberculosis.

► They subject those least likely to have TB to needless radiation.

► Much of the photofluorographic x-ray equipment used on mobile units is old, exposing people to as much as ten times the radiation they would receive from a standard 14-inch by 17-inch x-ray.

► X-ray scattering can occur from such units, exposing people waiting in line and passing near the van to radiation.

Colorado Discontinues Units

The comments of Colorado and Denver health officials are representative of comments of officials in other areas. The Colorado Department of Health recently announced that its mobile chest x-ray unit would be discontinued because "no active tuberculosis case had been discovered within the past several years which can be attributed directly to the x-ray unit" and because people in the lower economic groups, which have the highest incidence of TB, rarely take advantage of the service. Health officials interviewed also mentioned unnecessary exposure to radiation as a factor in their decision.

The mobile unit that was operated by the city and county of Denver found only 15 active TB cases from the more than 100,000 chest x-rays taken between 1965 and 1970. The cost of finding each active case by that method was $8115, said John A. Sbarbaro, director of public health and medicine for the Denver Department of Health and Hospitals. The Denver mobile unit will be discontinued next year.

Although many local TB associations have stopped operating mobile units, groups in several cities, such as Chicago, Canton, Dallas, and El Paso, still run units, a National Association spokesman reports. Associations in St. Louis, Cincinnati, and Minnesota hire a private New York City firm to provide a mobile chest x-ray van.

The value of mass x-ray screening was unquestioned during its heyday 25 to 30 years ago. Indeed, the citizen was almost made to feel that it was his patriotic duty to have an x-ray. "The mass chest x-ray survey was an American phenomenon. It swept the country," a National Association pamphlet states.

In the last few years, budgetary pressures have forced public health departments throughout the country to reexamine whether their mobile units are as important now as they were a quarter of a century ago. For example, the Los Angeles County Health Department discontinued its two mobile x-ray units 6 months ago. Four privately owned, profit-making chest x-ray companies still operate in Southern California; some of these also travel to other parts of California and to other western states. The Bureau of Radiological Health of the California Public Health Department recently announced an intensive investigation of such units to determine if their certification should be revoked. "There is sufficient evidence that we should be doing something about these people," said Simon Kinsman, chief of the bureau. An incident that triggered this investigation was the discovery that one of these private companies was giving x-rays to elementary school children in the San Gabriel School District, with the cooperation of school district officials. Health authorities say that x-rays used to screen for TB should not be given routinely to children, especially those under 16, or to pregnant women.

Although the National Association issued its strongest statement against mass x-ray screening this autumn, it has been cautioning against the practice for several years. Why haven't all the local associations followed this lead from national headquarters?

"Frankly, the use of these mobile x-ray units is an advertising gimmick with some groups; it sells Christmas seals," said Larry Farer, assistant chief of the tuberculosis section of the U.S.

Public Health Service's Center for Disease Control in Atlanta. "The attitude of some people is, 'Who cares if we find any TB?'" Farer said that some organizations will spend $100,000 to find a couple of TB cases.

"Many people will feel, 'What good is my local tuberculosis association if I can't get a free chest x-ray? Why should I contribute anymore?'" said a health official in a western state.

In recent years, the incidence of TB has steadily declined, and drugs that are of great assistance in combating it have been developed. In 1970, there were only 37,137 new cases reported in the United States, Farer noted, and 5560 persons died from TB. Because of new drugs, people with TB-like symptoms who seek medical attention needn't worry that, if they have the disease, it will be fatal, Farer said. "It is a disease that no one should die from anymore."

People who have operated mobile x-ray units have often justified them on the grounds that the x-rays reveal physical abnormalities other than TB. Health officials interviewed said that, in most cases, such findings are not medically useful to the patient. The medical committee advising the National Association dismissed the "other findings" argument: "Community chest x-ray surveys cannot be justified on the basis of 'other findings,' since this procedure is not the recommended method for identifying persons with non-tuberculous chest conditions."

Tuberculosis is now most common in low-income areas, such as inner-city ghettos. But in the judgment of several of those interviewed, including William W. Lewis, head of Cleveland's TB association, even mobile x-ray units centered in the ghettos no longer represent a useful expenditure. Although Cleveland's two mobile units spent most of the summer of 1969 in a ghetto area, only seven of the 123 new, active TB cases found there were discovered by means of the mobile units.

The National Association's bulletin echoes Lewis' findings: "Almost everywhere, even industrial, rural, and skid row chest x-ray screening, traditionally considered rich sources of new active cases, have been found to be unproductive and too costly."

"As we looked at the diminishing results, we had in the back of our minds that we were giving people radiation exposure, even at the low levels at which these units operate, with little compensating medical benefit," Lewis said.

The decline in concern about tuberculosis has coincided with an increase in concern about needlessly exposing persons to radiation. The valuable diagnostic tool of the medical x-ray is the largest single source in this country of human exposure to man-made radiation. The U.S. Surgeon General has written about "the widely accepted axiom that [x-ray] exposure should be given only when the potential benefit clearly outweighs the potential hazard, that all unnecessary exposure should be avoided." The Public Health Service–issued booklet, *X-ray Examinations . . . A Guide to Good Practice,** warns that, because of possible genetic effects, "no amount of gonadal exposure is so small as to be dismissed as harmless," tells of the special consideration needed for pregnant women in regard to such radiation, and states that only those x-ray screening programs "that result in significant case-finding are defensible."

More Radiation

Most mobile chest x-ray units use the smaller photofluorographic x-ray, which, though more economical, exposes the subject to considerably more radiation than does the standard 14-inch by 17-inch chest x-ray. The standard x-ray unit often produces about 0.05 roentgen per exposure. (If an abnormality is found, the subject is usually x-rayed again, this time with the standard unit, which provides a better picture for the physician than the photofluorographic equipment does.) Many health departments also use stationary photofluorographic units because they are cheaper to operate than the more useful 14-inch by 17-inch units.

Robert England, senior health physicist of the Bureau of Radiological Health for the California Public Health Department, said that he has examined a photofluorographic unit which produces 4 to 5 roentgens per exposure.

Many of the photofluorographic units used in this country are antiquated, and many average 0.5 to 0.7 roentgen per exposure, more than ten times that of a standard chest x-ray, England said. Newer photofluorographic units average 0.1 to 0.2 roentgen per exposure. Exposure also varies by individual. England explained that, on a photofluorographic unit, a large-bosomed woman or a heavy man would absorb twice the radiation that a thin person would.

Illinois has regulations limiting radiation from such photofluorographic equipment to an average of 0.1 roentgen per exposure. Other states, including California, have no legal limits on the amount of radiation permissible per exposure, England said.

Operators of mobile chest x-ray units say that many people get x-rays because they are worried about air pollution or smoking and want evidence that their lungs are surviving without damage. Sbarbaro said that he believes his Denver health department and others throughout the country will have to offer free x-rays at stationary units for years to come.

"Through our education programs, we've created a fantastic need for x-rays in middle-class America. We have to ease them through a gradual withdrawal period; this need for x-rays is truly like an addiction," Sbarbaro said.

Health authorities say that there will have to be a massive campaign to re-educate the citizenry that the skin test is a preferred method for initial TB screening and that the x-ray does not necessarily certify that a person's chest is free from other complications.

There is, however, no rush to begin such an educational campaign. "It's a hot iron; no one has the guts to touch it," said one health official who thinks the topic too controversial to permit his being identified. The reasons for this reluctance seem to be a fear of contradicting past instructions, economic self-interest, a suspicion that people will relax their vigilance on TB, and a worry that the minority who should have chest x-rays will no longer have them if authorities downplay their utility for the majority.

The chest x-ray to detect TB was useful in previous decades; it may take decades before the average citizen realizes that its day is past. "People have gotten used to the idea of having a chest x-ray every year," said A. Lloyd Andersen, director of screening services for the TB association of Los Angeles County. "We have promoted that idea in the past and now that promotion is backfiring."—BRYCE NELSON

Bryce Nelson, formerly a writer for the News and Comment staff, now lives in Chicago and is a national correspondent for the Los Angeles Times.

* This booklet, prepared by the American College of Radiology's Commission on Radiologic Units, Standards, and Protection, is available for 35 cents from the U.S. Government Printing Office, Washington, D.C. 20402. The booklet's stock number is 5505-0003.