the People's Doctor
A MEDICAL NEWSLETTER FOR CONSUMERS by Robert S. Mendelsohn, MD

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IN THIS ISSUE:

Warning: X-rays are Hazardous to your Health

Dr. Robert Mendelsohn

J. Ernest Breed, M.D., a past president of the Illinois State Medical Society, has looked back on a time when x-rays were thought to be harmless: "Little was known of the dangers of radiation, and looking back, I recall many mistakes that people made. For example, often the radiologist, including myself, would not wear lead gloves, or the lead apron when doing fluoroscopy. Fortunately, I suffered no ill effects."

That isn't all that Dr. Breed has to say on the subject of the ignorance about the dangers of x-rays. In Chicago Medicine (February 21, 1983), Dr. Breed recalled: "Many shoe stores would have a small x-ray unit in which anyone could put his foot in a tube and look at a screen to see whether his foot fit the shoe well. This was considered a wonderful 'toy,' especially by children, but the potential for harmful affects was there.

"One young man in Tulsa was sent by his doctor to the University of Oklahoma in Oklahoma City for x-ray treatment of acne. The technician put the young man under the x-ray unit, went about some other business, and forgot about the young man, leaving him exposed to the x-rays for 20 minutes. The patient's face became violently inflamed, but eventually appeared to have cleared up. Twenty years later, he began to develop basal cell cancers of his face. I successfully treated a total of 64 cancers of his face and forehead with beta rays from radium.

"Two technicians who worked in the late '20s and '30s burned the fingers of their right hands as a result of holding strong applicators against intraoral tumors. Later, both women had to have their fingers removed.

"Around that time, I attended two technicians who worked for the Radium Service Corporation of Chicago. They had developed ulcerations of their fingers requiring skin grafts. I referred them to a hand surgeon at N.U. [Northwestern University] who removed the burned areas under the ulcerations of one of the technicians. He found a beginning squamous-cell cancer, directly caused by the radiation.

"Other radiology-related problems arose some years ago, when polio epidemics were common in Chicago. It was believed that those people who had their tonsils (surgically) removed during such an epidemic were more likely to contract polio. In one local hospital, an effort was made to shrink enlarged tonsils with x-rays. Many of those treated developed cancer of the thyroid in later years."

The experiences recounted by Dr. Breed did not occur in some dimly-remembered epoch of human history--they occurred within the lifetimes of most of you who are reading this Newsletter. I want no similar accounts ever to be written about our overuse and misuse of ultrasound, the CAT scan, food irradiation, and NMR while we were still unaware of their dangers.

Q Two months ago, I went to work for a large company. I passed their physical, as required, but I balked at taking an x-ray. I later was told that all medical insurance was in effect, but my job would be terminated at the end of the year unless I submitted to an x-ray before that time. My request to submit to alternative forms of "diagnosis" was turned down.

The sheets I'm attaching show that an x-ray was not specified in the physical exam and that I was accepted for employment. No one is saying that an x-ray is part of a physical exam.

Do I have any recourse in this matter?--D.O.

Mandatory X-rays

A When people have asked me this question in the past, I have suggested a number of approaches. First, I have told them to talk to the chief doctor in the plant, pointing out that routine x-rays are now frowned upon by practically every medical organization. When that has not worked, I have recommended that they have their own doctor speak to the plant doctor. When that approach has failed to work, I have recommended that people contact organizations which concern themselves with civil liberties. Since the ACLU (American Civil Liberties Union) has decided that patient rights are of low priority, I have had no recourse other than to advise the person to see a lawyer.

Q I am interested in the effects on adults who, as children, were "examined" by the x-ray machines in shoe stores. In the late 1930s and the 1940s, these fluoroscope machines were in many shoe stores across the country.

I can recall playing with the machines--looking at the bones in my feet in the viewing screen--while my parents talked to the salesman.

Do you know where I can get information as to the dosage of radiation inadvertently administered to the genitals by those machines? Do you know of any long-term studies regarding the fertility of adults who as children were irradiated by those machines?--M.K.

Did shoe x-ray machines cause harm?

A You aren't the only one who remembers those x-ray machines in the shoe stores. I, too, can remember putting my feet in that box while my mother and my two brothers and the neighbor's child and the shoe salesman and I all took a look. Then I tried on another pair of shoes and repeated the process.

Millions of Americans went through this senseless and dangerous ritual for many years. Did your doctor ever warn you about these machines? Mine didn't. Did you ever see a study conducted by either the government or any medical school on the long range effects of those x-rays? I haven't.

The x-ray machines simply disappeared--very quietly. Where they are buried, nobody knows.

But since you are asking the right questions, let me suggest that you pursue this important line of investigation. Call up a few radiologists (right out of the telephone book) and ask them the same questions you are asking me. Visit your local medical school and put those questions to the chairman of the radiology department. Correspond with some of the experts in the field, or write to your Congressman and Senators suggesting hearings be held to determine whether those x-ray machines are responsible, as you suggest, for, at least in part, the present epidemic of infertility which is now affecting 25 percent of all married couples in the U.S.

In addition to the possibility of physical and genetic damage, those x-ray machines left certain psychological problems in their wake, at least in my case. Even now, 40 years or more later, when I buy shoes without looking at them through an x-ray machine, I never can completely convince myself that the shoes really fit!

Doubtful value of hospital admission x-rays

For more than a decade, I have been recommending against the routine annual chest x-ray. Within the last few years, even such medical organizations as the American College of Radiology have opposed these routine x-rays. My own organization, the American Academy of Pediatrics finally

has gone on record as opposing the routine x-raying of children who enter hospitals.

Evidence has been gathered by the Department of Medicine, University of California, Irvine and Los Angeles (Clinical Research 1984) casting doubt on the value of routine hospital admission x-rays, even in patients known to have a high prevalence of disease affecting the lungs and the heart. Of 265 patients who were given these routine x-rays at the V.A. Medical Center, Long Beach, California, only four (1.5 percent) had their treatment changed; in only one of these four would appropriate treatment likely have been omitted if a chest x-ray had not been done.

The authors of the study, Dr. S. Greenfield and associates, conclude: "These studies strongly suggest that the routine admission chest x-ray is of so little value that it should not be ordered even in a population with high prevalence of cardiopulmonary disease."

What do we learn from this surprising study?

1) When doctors begin to realize how dangerous some procedures (in this case, x-rays) can be, they become motivated (even after half a century) to study those procedures.

2) Now that we have evidence that a once highly-valued diagnostic test (the routine admission chest x-ray) doesn't help even in high-risk cases (a population likely to harbour diseases of the lungs and heart), we should be very suspicious of other potentially dangerous diagnostic tests (e.g., ultrasound and amniocentesis which, if not used routinely, certainly are recommended by doctors for so-called "high risk" pregnancies). Will it take another 50 years before the public learns that these tests, already under considerable criticism, are not only dangerous but useless?

3) Most important, keep this column right next to your Blue Cross (or other health insurance) card so that if you ever (God forbid) have to be admitted to a hospital, you can show this information to any doctor who tries to order you to stand in front of that x-ray machine.

I am pregnant, and my doctor wants me to have a pelvic x-ray. Is this a dangerous thing to be doing to my baby?--U.M.

Pregnant women and x-rays

According to Dr. Ervin E. Nichols, spokesman for the American College of Obstetricians and Gynecologists, pelvic x-rays have long been "overrated and overused." The risk of childhood leukemia is increased from 1.3 to 1.8 times in children who are prenatally exposed to radiation during x-ray pelvimetry.

As a pregnant woman, you also should avoid the following x-rays:

1) Lower GI
2) Lumbar spine
3) Thoracic spine
4) Lumbopelvic
5) Intravenous pyelogram
6) Upper GI
7) Hip or upper thigh
8) Other x-ray examinations of the abdominal region
9) Hysterosalpingography (examination of the uterus and oviducts)
10) Placentography
11) Urethrocystography (examination of the kidneys, urinary tract, bladder and urethra)
12) Cystogram (examination of the bladder)
13) Abdominal aortography (examination of the main arteries in the abdominal region)
14) Celiac angiography (examination of the blood vessels in the abdominal cavity).

"The X-Ray Information Book" by Priscilla Laws and the Public Citizen Health Research Group (Farrar, Straus, 1983), states that each of the above x-ray examinations of a pregnant woman may expose her unborn child to more than 4,000 mrds (or mrems) of radiation.

Q My daughter, who is now an adult, was x-rayed just prior to birth and when she had an accident at the age of three. I later became aware of a survey which linked x-ray just before birth with increased incidence of bone cancer and leukemia in children. When she was 11, she developed thrombocytopenic purpura which the doctors first feared was leukemia. However, a bone marrow test revealed this other disease which they wished to treat by removing her spleen. We learned that some doctors delayed surgery for several years with good success, and we opted for that route. She had a remission and no further problems. However, during the time of the illness, she suffered severe stomach pain, and the doctor ordered x-rays. She was x-rayed once again after a fall.

My daughter has given birth to two healthy children, but her third has been diagnosed as suffering from Down's syndrome. The doctors tell us one type of Down's syndrome is hereditary, but this is not that type. I recall reading your opinion that x-rays can be the cause. We went to the university medical library and found that the connection between x-rays and leukemia, bone cancer and Down's syndrome is known. When we spoke to the team of university doctors, they were not aware of any connection, but they were very willing to consider it. If these doctors were totally unaware of these relationships, despite literature describing them in their own university library, are any others in medicine aware?--Mrs. T.V.

A *X-rays and Down's Syndrome*

Your letter should serve as a model for every medical consumer: When you needed information on the dangers of x-rays that you couldn't get from your own doctors, you went right to a medical library. In case you didn't find his name in your Canadian library, the best U.S. authority on the risks of x-rays is John Gofman, M.D., Ph.D., of the University of California at Berkeley. (A review of his most recent book appears elsewhere in this Newsletter.)

While you have every right to be disappointed at the ignorance of the physicians you consulted, I am pleased that they were willing to consider the documented risk of x-rays. While their education may have been deficient, it is encouraging that their minds are open.

Q I have read what you have to say about the incidence of mongoloidism for births in older women being related to the amount of previous radiation. Could you be more specific--just what is the dangerous level?

As a healthy, food-conscious, six-mile-a-day runner, and 36-year-old woman who plans to have her first child, I am concerned about this matter. As a result of an illegal abortion many years ago, I received quite a few diagnostic x-rays to my pelvic region.--J.G.

A Because doctors are too busy trying to reassure patients that x-ray is safe, precious little work has been done by medical researchers in determining dangerous levels of x-rays. But the Veterans Administration is not as sure as it used to be about the safety of radiation, as evidenced by their acknowledgment that one army corporal's cancer was caused by his involvement in six nuclear tests during the 1950's.

Your first step is to contact the doctors who x-rayed you all those years ago to determine how many exposures you had, what brand of machine was used, whether the machine had been periodically inspected, and what kind of dose its beam emitted. You also may wish to consult Dr. John Gofman's book, "Radiation and Human Health."

Armed with this information, you might communicate directly with Johns Hopkins Hospital where the original studies were done which linked an excess incidence of mongolism (Down's syndrome) to a history of maternal exposure to medical and dental x-rays (throughout a woman's life) to see whether they can give you more quantitative information.

In addition to such a retrospective analysis, you should consult with some of those in the healing arts outside orthodox medicine (e.g., macrobiotics) for their evidence that some of the damaging effects of previous radiation can be overcome through significant changes in diet and lifestyle.

Conflicts over dental x-rays

Has your dentist told you that dental x-rays are absolutely necessary in order to determine whether you need root canal therapy? If so, ask him if he has read the 1983 study published in the Scandinavian Journal of Dental Research which shows that the accuracy in interpreting dental x-rays is just about as low as in interpreting medical x-rays. In this study, six endodontists (dentists who work on the inside of the enamel, as in the root canal) evaluated the x-rays of 119 endodontically-treated roots. A total of 37 bony defects were diagnosed, but there was agreement on only 10 of those defects. Forty of the 119 examined roots were designated as having "destruction of bone definitely present" by at least one observer. In only six cases (15 percent) did the opinions of all observers coincide. There were also plenty of cases of over-reading, i.e., reporting healthy conditions as disease. In a previous study cited, six endodontists agreed in only 27 percent of cases.

The authors conclude that "In radiologic diagnosis, it has been shown that variations within and between examiners are substantial." They point out that this range of disagreement could at least partly explain the great discrepancies among various investigations on the results of endodontic therapy.

Our second child was born last June with spina bifida and myelomeningocele of the lower lumbar area. The latter was repaired by a neurosurgeon within 24 hours after birth, and a shunt was successfully implanted when our son was one month old.

During his hospitalization, it seemed as though every test was performed on him--various x-rays, ultrasound, CAT scans, IVP, to name a few. At that time, his kidneys and bladder were found to be functioning normally. Although leg movement was less than normal, it was present.

To date, our beautiful, alert son is a picture of health; his little legs kick with vigor and strength. The physiotherapist we see monthly notices some weakness in the baby's ankles, but he says everything looks encouraging for his normal development. Our son enjoys his weekly swimming lessons. His plumbing works like that of any other four-month-old. As far as future control is concerned, we understand no-one can predict that with any accuracy, but the doctors feel it might not be complete.

Our problem is: How do we know which tests are necessary to insure our child's health? Spina bifida children are recommended to have intravenous pyelograms yearly, more frequently for young children. Can such frequent testing result in damage of healthy organisms? The doctors here say no, but I tend to distrust them, preferring to take a preventive approach. I take herbs which are known to improve bladder function, and I take other dietary supplements which reach my son through my breastmilk. I intend to breastfeed him until he can take these supplements himself.

Are there any doctors in our area who share your views? You are an inspiration to countless mothers like me.--Mrs. D.M.

Dangers of kidney x-rays

I am happy that your son is doing so well after undergoing this serious form of corrective surgery.

You are right in questioning the annual kidney x-rays which involve the injection of potentially risky dyes as well as the hazards of x-ray itself. Ask your child's doctors several further questions:

1) Why must these x-rays be taken annually? Why not every six months? Why not every two years or every five years? Or why not take x-rays only after symptoms manifest themselves? Is there a rational, documented reason for taking this kind of x-ray annually, or is there something magical about a 365-day interval?

2) What dose of radiation will your child receive from his x-ray?

3) Can the doctors refer you to reading material which proves such an x-ray dose is safe?

4) What are the specific risks (including sensitivity reactions that may even lead to death) of the dyes used in this kidney x-ray?

5) What is the percentage of accuracy of the x-ray pictures?

6) Are the doctors familiar with Dr. Edward R. Pinckney's statement: "Pyelography [IVP] is not considered very accurate in evaluating urinary tract infections"? ("The Patient's Guide to Medical Tests," Facts on File, $7.95)

7) Are the doctors taking x-rays in order to find such an infection, or are the x-rays being taken to find kidney stones? Dr. Pinckney states that unless the pathology is obvious, it is all too easy for the radiologist viewing a pyelogram to miss seeing kidney stones.

8) Might this x-ray, taken to detect kidney conditions, produce kidney conditions? Dr. Pinckney says that the dye used in intravenous pyelography has been known to lead to kidney failure.

9) When was the last time the doctor's x-ray machine was checked to make sure it is not giving off too much radiation?

Continue your search for second, third and fourth opinions. You are not far from an excellent medical school in Hamilton, Ontario. Listen to what their doctors have to say. Then, compare their advice to that of a good general practitioner, such as John McCulloch, M.D., of Toronto (the doctor for my children and grandchildren).

My son is one of the shortest children in his classroom, and my doctor wants to send him for x-rays to see if he is growing properly. Can x-rays really tell me that?--U.M.

Can x-rays determine bone growth?

X-raying the bones of children in an attempt to predict their ultimate height and to detect certain diseases is a common practice in pediatrics. If the pediatrician tells the parents that these x-rays for bone age show a lack of compatibility with the child's chronological age, he next may recommend hormonal and other forms of treatment.

Many people today are aware of the dangers of medical treatment; perhaps even more recognize the dangers of x-rays. But very few people--and comparatively few doctors--have any idea of the inaccuracy of x-rays for bone age, even though this information has been available for decades in medical books.

The text I used during my medical training, "Pediatric X-Ray Diagnosis" (copyright 1945, revised 1956), by John Caffey, M.D., Professor of Radiology at Columbia University College of Physicians and Surgeons, stated: "Although bone maturation can be used successfully in the measurement of the general development of large groups of infants and children, it may be highly misleading in estimating the general development of single individuals in these same groups." In other words, those x-rays for bone age may have some value in the study of large populations to determine statistical averages, but they can't really help you with your own child.

In order to determine your child's bone age, the doctor may want to take an x-ray of his wrist or his ankle or another bony center. Dr. Caffey

warned that such segmental x-rays may not be representative of the entire skeleton. He wrote, "Ideally, films of the entire skeleton should be studied before the skeletal age is estimated." But he also pointed out, "In daily clinical practice, the time-consuming, expensive, roentgen examination of all the bones cannot be carried out except in special cases." When segmental x-rays are done, "It should be borne in mind that there is a potential error in this practice...the velocity of ossification may not be uniform in different regions of the skeleton of a single healthy child. ...Two sides of the same skeleton may show considerable differences in development, and there may even be discrepancies in the maturational levels of different bones in a small structure such as the hand.

Since x-rays of the hand are commonly taken to determine bone age, you should be aware that, according to Dr. Caffey's text, "In the small bones of the wrists and ankles, there is a great variability in the time of appearance and the order of appearance of the primary (bone) centers. ...These discrepancies sometimes make it difficult or impossible to appraise the skeletal age...." Referring to tables commonly used, the author tells us that the younger the subject, the greater the error of prediction. However, the developers of these tables found that in young adolescents, "they could predict the mature height within one inch in approximately two-thirds of cases." Obviously, this means they were wrong in one-third the cases. Although Dr. Caffey mentioned the expense of multiple x-rays, he did not include the danger of radiation, today's CAT scan included.

Since my experience in pediatric practice over the past 30 years indicates that the accuracy of bone age x-rays is no greater today than it was all those years ago, you must question your doctor very closely if he should try to convince you that these x-rays can give you a safe, objective, and reliable index. Just as I have given you first-hand quotes from the textbooks written by Dr. Caffey, one of the giants in the field, to prove my case, your doctor should let you read from any of his own textbooks on pediatric radiology if he wishes to disprove my case.

How safe is NMR?

As doctors probe ever more deeply into the human body, they frequently come up with new devices, and they constantly assure us of their safety.

The first such instrument to be applied to large populations was the x-ray machine. It took 50 years before people began to reject that form of ionizing radiation. Then came CAT scanners, a number of which had to be recalled from the market because of excessive radiation. The next device was diagnostic ultrasound, already highly controversial in terms of its safety. (See my Newsletter V.7, N.11.) Recently, nuclear magnetic resonance (also known as magnetic resonance imaging) has come into vogue. In this procedure, patients are placed inside a big magnet and are exposed in a strong magnetic field to radiofrequency radiation. While these latter devices do not use ionizing radiation, they do expose patients to electromagnetic radiation.

When the FDA approved marketing by three manufacturers of NMR devices, the agency took the position that low-level electromagnetic radiation "appears relatively safe on the basis of current knowledge." High-level static and time-varying magnetic fields, also used in NMR, "seems justified in view of apparent benefits, but current knowledge of long-term risks of high magnetic fields is very limited" (FDA Drug Bulletin, V.14, N.2).

In 1984, researchers at the University of Texas Health Center at San Antonio stated that exposure to electromagnetic fields may not be totally harmless (Chicago Tribune, May 13, 1984). Microbiologist Wendell Winter and colleagues subjected living things to a range of electromagnetic fields and found that they stimulated the growth rate of human cancer cells. Winter

called these laboratory studies "the first step in identifying a chain reaction of events which ultimately may affect cellular growth and functions in both humans and animals."

Will the FDA be able to counter Dr. Winters' linking of electomagnetic fields to cancer? Ask that question of any doctor who wants to expose you to this latest highly publicized "medical breakthrough." (See also my Newsletter V.9, N.2.)

What do you think about irradiation of food? What do doctors in general think about this subject? Do we have to resort to growing our own food to be safe from this dangerous newly FDA-sanctioned practice of preserving food by subjecting it to nuclear radiation?--J.Z.

Risks of food irradiation

As the national controversy over irradiation of food escalates, doctors, who comprise one of the most influential groups in our society, have been strangely silent. Yet, doctors have plenty of reasons to be scared of x-rays. Not too many decades ago, quite a few doctors lost their fingers from exposure to "safe" fluoroscopy machines. Later, thousands of their patients developed thyroid cancer from "safe" x-rays directed at the face, head, neck, and tonsils. Still later, "safe" mammography turned out to cause more breast cancer than it detected in some age groups.

So, one would think that doctors, knowing the history of x-rays, would be very conservative about assurances that these beams are "safe" for food. Why are doctors so quiet? Maybe they just haven't been asked. Maybe they're a little shy about speaking up.

Why don't you act on this hypothesis and approach your own doctor? Point out to him the tremendous influence which doctors have on the political process. If he is as scared about irradiation of food as you and I are, ask him to speak up and to write some letters to his legislators and to the newspapers. Ask him to contact some of his doctor friends who share his feelings. If your doctor happens to be a delegate to the AMA, maybe he can swing that entire organization into opposing food irradiation. Or at least that organization can sponsor a labeling requirement.

Perhaps you should contact Dr. Bernard Lown who received the Nobel Peace Prize for his M.D.-group's opposition to nuclear weapons. That group of doctors certainly knows the dangers of radiation. Maybe Dr. Lown will speak out just as vigorously on the subject of radiation damage to the foods we eat as he speaks out against radiation damage from the bombs we build.

Book quantifies x-ray risks

A new book, "X-Rays: Health Effects of Common Exams," by John F. Gofman, M.D., Ph.D. (Sierra Club Books, $25) describes in quantitative terms exactly the risk a patient faces from the x-rays his doctor orders. (Dr. Gofman is professor emeritus of medical physics at the University of California at Berkeley and author of the groundbreaking book, "Radiation and Human Health.") If your doctor tells you that you need a chest x-ray or a dental x-ray or a knee x-ray or an angiogram or a swallow of barium, you now can determine the risk of cancer from each of these examinations, thanks to Dr. Gofman.

As a pediatrician, I take particular interest in Dr. Gofman's finding that the most serious x-ray examinations are those which are performed on newborn infants in intensive care units. According to one study, each such infant receives about 40 x-rays. Furthermore, a child at the age of five is about five times more likely to suffer from radiation-induced cancer than is an adult who is given the same radiation dose at age 35.

If your doctor should order a barium enema, I hope he shares with you the information that perforation of the colon occurs once in every 12,000 of these examinations. You then can participate in evaluating whether this risk is worth the potential benefit. Or, if the doctor orders a gall bladder x-ray, I hope he tells you that when certain dyes are injected, the death rate for that x-ray is one per 5,000. If he doesn't, then look to Professor Gofman's new book for a much-needed second opinion.

Q Five years ago, my 17-year-old cousin was working at Boston Children's Hospital in the leukemia ward. She contracted leukemia and died one month later. The memory of that, coupled with your writings about medical x-rays as a cause of cancer, makes me very concerned about my godchild, the sister of the young woman who died of leukemia. This 18-year-old girl has just graduated from high school and has decided to become an x-ray technician, starting school last September. Can you tell me whether this might be harmful to her health?--B.L.

Is career in x-ray lab dangerous?

A Ask your godchild how much of an investigation she carried out before deciding to spend a large part of her life in an area well-known for its occupational hazards. The time has long passed (if indeed there ever was such a time) when an x-ray department could be considered safe until proven dangerous. Therefore, your godchild should ask the director of her school for evidence proving that x-ray departments are safe for the people who work in them. She should ask for published long-range studies on women who were employed as x-ray technicians so that she can learn how many developed leukemia, lymphoma and other forms of cancer in later life. How many suffered repeated miscarriages or delivered premature babies? How many have given birth to babies with Down's syndrome or other congenital malformations? How many are infertile?

Until these questions are answered satisfactorily, I hope every woman who is contemplating this career has a godmother who cares the way you do.

Medical News

Chicken pox vaccine may not give lifelong immunity

Doctors are gearing up to give our nation's children the new chicken pox vaccine. One doctor, Victor Troll, M.D., of Peabody, Massachusetts, has pointed out the hazards that might be associated with widespread use of this vaccine (Pediatric News, May, 1986)

Dr. Troll notes that, if a large number of children are inoculated, those who do not receive the vaccine will have less opportunity to catch the disease and thus acquire lifelong natural immunity while they are quite young. These unprotected children will remain at risk for serious varicella (the medical word for chicken pox) infection during their entire lives.

As for those who do receive the vaccine, no one knows whether the immunity profuced by the vaccine will be lifelong. By contrast, we know that the natural chicken pox disease confers future lifelong immunity. Thus, if we vaccinate young children, they might develop devastating chicken pox infections when they become senior citizens. While chicken pox is generally harmless to young children, it is extremely dangerous to adults.

Another View

by Marian Tompson

While the People's Doctor long has served as an early warning system on the dangers of x-rays, it was a surprise to find confirmation of those concerns in a study directed by John S. Evans, M.D., of the Harvard School of Public Health that appeared in the New England Journal of Medicine. As reported by Associated Press, Dr. Evans estimates that x-rays cause 788 breast cancer cases a year and 370 breast cancer deaths. X-rays also are held responsible for an estimated 267 leukemia cases and 250 leukemia deaths annually. The researchers point out that doctors should be sure that the benefits outweigh the risks before using x-rays.

But when you start reading some of the many books that speak of the hazards of x-rays, you will find the problem is even more complicated. In 1981, a Chicago survey revealed that many of the x-ray machines in clinics and doctors' offices had not been inspected for almost 20 years and that 99 percent of the inspected facilities had received citations for one or more violations.

Illinois is one of 36 states that require no licensing or special education for x-ray technicians. In 1982, seven out of every 10 Americans received at least one medical or dental x-ray, with as many as 10 percent of medical x-rays having to be repeated because of poor technique. Too often, x-rays are taken to see what's there, rather than to confirm or eliminate a suspected condition.

When ionizing radiation (such as an x-ray) passes through a cell, it may damage the cell. This damage can destroy the cell, impair its ability to reproduce, or cause it to reproduce with incorrect genetic information. With high levels of radiation, more cells are damaged and destroyed than at lower doses. But in either case, the number of damaged cells is roughly proportional to the amount of radiant energy absorbed, no matter how small it is.

The younger you are, the more hazardous the effects of radiation. For example, it takes 300 times less radiation to cause cancer in a newborn than in a 55-year-old. It is difficult to assess the risk of a particular x-ray without taking into account that person's age, sex and accumulated risk from exams taken at younger ages. However, figures are available on a person's lifetime chance of getting cancer as the result of having just one x-ray exam. For example, the risk is 1/900 for a 35-year-old female who has mammography (two shots of each breast) by the Xeroradiographic method. For a 10-year-old boy who has one full-mouth dental exam (16 films), the risk is 1/600. And speaking of dental exams, are you as surprised as I was to learn that the American Dental Association has stated that dental x-ray examinations should not be performed routinely and that the decision to x-ray should be made only AFTER a visual examination of the mouth and a patient history are obtained?

Today, many schools are requiring that students be screened for scoliosis. The FDA has become concerned about the effects of these x-rays of the spine on pre-adolescent and adolescent girls, since developing breast tissue is especially sensitive to the carcinogenic effects of radiation. If you are facing this situation, you may wish to look up the research of Gray, Hoffman and Peterson at the Mayo Clinic. This team reported a 69-fold reduction in breast x-ray dosage when patients were x-rayed for scoliosis after certain precautions were taken, including a posterior-anterior beam direction, specially designed leaded acrylic filters, a high-speed screen-film system, a breast shield and additional filtration in the x-ray tube collimator.

For more insights on this subject I highly recommend the following books, which were used in preparing this column: "Medical Overkill," by Ralph C. Greene, M.D.; "The X-Ray Information Book and X-Rays: More Harm Than Good," by Priscilla Laws, Ph.D.; "Medical Mayhem," by David T. Nash, M.D.; and "X-Rays, Health Effects of Common Exams," by John Forman, M.D., Ph.D., and Egan O'Connor.

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Robert S. Mendelsohn, MD, Editor
Vera Chatz, Managing Editor