Use of X-rays in Dental Studies and Investigations of Caries Preventive Agents

Two statements relating to the use of X-rays in dental studies recently were issued by the Public Health Service. One, by the Surgeon General, lists general guidelines. The other, issued jointly by the Division of Radiological Health and the Division of Dental Health, concerns the use of X-rays in field investigations of caries preventive agents. The statements were developed in response to requests for policy guidance on this matter.

Use of X-rays for Dental Studies

The use of X-rays in the detection, measurement, and management of dental diseases is recognized as being both effective and valuable. X-rays are used not only for diagnostic purposes in individual patients, but also for data useful in clinical and field dental studies in which etiological and developmental factors and therapeutic or preventive agents or techniques are being evaluated in population groups. Current concepts of radiation protection indicate that X-rays should be used with maximum efficiency in terms of the benefit to be derived for the amount of exposure given. This is particularly relevant in dental studies, since these frequently involve younger age groups in which the biological effects of radiation are of greatest concern. The following guidelines have been developed for dental studies in which decisions to use X-rays are made on the basis of criteria applied to population groups. Three elements should be considered: (*a*) whether X-rays are necessary to the study, (*b*) the design of the study in terms of the size of the study group and the frequency and numbers of X-rays taken, and (*c*) the equipment and techniques used.

In the planning of a dental study careful thought should be given to whether or not the use of X-rays is necessary and will add materially to the findings of the study. Evaluation of radiation risk is especially important when large numbers of people are involved, particularly where decisions to take X-rays are made according to group category rather than individual patient bases. The benefit to the public to be derived from the study must clearly outweigh the risk in the use of X-rays.

In group studies, benefits generally accrue to the public at large and not necessarily to individuals participating in the study. However, it is desirable that whenever possible, individuals participating should receive a direct benefit from the X-ray information obtained such as through referral for dental care where indicated or through making a duplicate film available to the individual's dentist.

Careful consideration should be given to the size of the study group and the frequency and number of X-ray examinations necessary to the study. Population samples should not exceed the minimum number of subjects required for reasonable statistical significance. The frequency of X-ray examinations and the number of films per examination should be kept to the absolute minimum necessary to provide the needed information.

The equipment and techniques used in the study should be such as to insure that the smallest amount of radiation is used to provide the optimum amount of necessary diagnostic information. Guidance on equipment and tech-

niques may be obtained from recommendations of the Radiation Protection Committee of the American Academy of Oral Roentgenology, the National Council on Radiation Protection and Measurements, and the Public Health Service.—*Statement by the Surgeon General, Public Health Service.*

X-rays in Field Investigations of Caries Preventive Agents

The Public Health Service statement on the use of X-rays in dental studies indicates there are three elements which should be considered: (*a*) whether X-rays are necessary to the study, (*b*) the study design in terms of the size of the study group and the frequency and number of X-rays taken, and (*c*) the equipment and technique used. Those responsible for field investigations of caries preventive agents must give careful thought as to whether the use of X-rays will materially aid the analysis and interpretation of the data. In a field investigation, routinely augmenting clinical examinations with radiographic findings is unwarranted. In many studies the magnitude of difference to be anticipated between the experimental and controlled groups is sufficiently large to be demonstrated satisfactorily by clinical examination alone. Furthermore, while X-ray examinations may be expected to yield a higher total score, they do not necessarily reduce examiner error or improve the reliability of the findings. It is possible to detect interproximal dental caries with a thorough clinical examination employing a mirror and explorer, a good source of light, and compressed air. In longitudinal studies of cariostatic agents the detection of a difference of interproximal decay experience between groups may be enhanced by selecting an age group with a high susceptibility for developing interproximal caries and by conducting the studies for a minimum of 2 years.

If the use of X-ray examinations is considered essential in a study of caries preventive agents, careful consideration should be given to the other elements in the study design referred to above. Every effort should be made to ensure that individuals participating in the study receive a direct benefit from the X-ray examination by referral for dental care where indicated or making a duplicate film available to the individual's dentist.—*Joint statement of the Division of Radiological Health and the Division of Dental Health, Public Health Service.*

Medical Care for Needy Children

Dr. Ellen Winston, U.S. Commissioner of Welfare, Department of Health, Education, and Welfare, has urged State and local leaders to make prompt use of provisions in the 1965 amendments to the Social Security Act which cover health and medical care for needy children.

"Several provisions of the new legislation which relate to children are particularly important in helping to remove sickness and disability as causes of life-long poverty," Dr. Winston said. The health provisions for children will be of benefit only when State and local agencies elect to use them.

The legislation authorizes special project grants paying 75 percent of the cost of comprehensive health programs for school and preschool children in low-income areas. This would include screening to identify remediable health defects, full diagnosis for those with positive findings, and treatment and followup for all children who need care but whose families cannot afford it. States also can obtain Federal aid to set up medical assistance programs to cover all persons receiving public assistance.