State of Alaska Epidemiology Bulletin

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HEALTH AND THE ENVIRONMENT - PCB EXPOSURES MAKE NEWS

Public scrutiny was drawn recently to a spill of PCB in Kake. Unknown quantities of PCB were spilled from obsolete electrical transformers in a dump. An alert resident's concerns about health and environmental risks from a pile of oily copper coils salvaged from the transformers led to joint investigation by the Alaska Department of Environmental Conservation (DEC), U.S. Coast Guard, Division of Public Health and U.S. Environmental Protection Agency (EPA).

During a visit to Kake on July 14, 1981, we identified, interviewed and drew blood from all the people who may have had significant contact with the PCB. The exposures appeared to be moderate or minimal and involved a limited number of people over a short period. No one was ill. Only two or three of the 18 tested were likely to have had more than a passing minor contact. Results of blood tests for PCB performed at the Centers for Disease Control, Atlanta, Georgia are not yet in. A better assessment of the degree of exposure will be available when the serum PCB levels become available.

PCB (polychlorinated biphenyls) make up a class of organic chemicals that have been used widely in the past, especially in electrical transformers and capacitors. Increasing concerns about their safety led in 1977 to much more stringent federal regulations and guidelines which have essentially banned manufacture and use of PCB in the United States. However, PCB containing equipment - some of it obsolete and in disuse - is still to be found in many communities across Alaska. Safe handling and disposal of such equipment will be a challenge for many years to come.

The health history of PCB dates from the 1930's when reports appeared of illness caused by high industrial exposures to PCB. Victims were found to have a peculiar rash called chloracne, liver damage, skin darkening and eye irritation. A small number of deaths led to increased precautions and to experiments to study the effects of PCB exposure.

PCB is of concern for several reasons. High doses in laboratory animals cause liver and kidney damage. Lesser doses cause cancers in animals, notably liver tumors. Genetic damage can be produced in the cells of rats and in bacteria by PCB and finally, birth defects in animals can be produced. PCB persists unchanged in the environment for thousands of years.

In 1968, about 1300 people in Japan were diagnosed with "yusho" from eating rice oil contaminated with PCB and lesser amounts of dibenzofurans and other chemicals. Several children born to yusho mothers in the subsequent 5 years were smaller than expected, had dark skin, and also had some minor anomalies, all of which resolved. Physical and mental development appeared normal.

Studies have shown unexpectedly high cancer rates in people with long-term industrial exposure to PCB. However, none of the studies contain sufficient numbers of people, or are able convincingly enough to rule out other possible explanations, to "prove" carcinogenicity in humans. Still, backed by laboratory evidence against PCB, there is sufficient reason to regard them as dangerous, even at fairly low levels, to make cautious handling of them mandatory and to justify the expense of preventing unnecessary long-term exposures to people.

The significance of the mishap in Kake lies in the fact that discovery of the problem has led to an extensive clean-up operation to prevent long-term human exposure, and to widespread publicity which may help prevent future episodes. Any questions about the use, handling or disposal of PCB should be directed to the appropriate regional office of the Department of Environmental Conservation. Questions about human exposure risks may be directed to Charles Ryan, M.D. or John Middaugh, M.D., at 272-7534.