

HAND DISEASE SUMMARY

Hand Disease

This is a status report for the physicians of those plants of The B.F. Goodrich Company, where cases of "hand disease" among polyvinyl chloride manufacturing personnel have occurred. This information should be regarded as confidential and is not to be disseminated or discussed except to B.F. Goodrich Management personnel.

CLINICAL CASES

The basic characteristics of this disease have been described in an article by Wilson, McCormick, Creach and Tatum in the August 21, 1967 JAMA, a copy of which is attached. The major portion of the cases that have occurred exhibit osteolysis of the distal phalanges of the fingers and Raynaud's symptoms. We have observed a few cases with acroosteolysis and asymptomatic, and some with symptoms but without acroosteolysis. A few cases have shown suggestive lytic changes in other bones of the body. Currently, the best method of determining the presence of the disease is by x-ray. The B.F. Goodrich Company has been performing hand x-rays on all polyvinyl chloride personnel every six months. The recognition of early acroosteolysis from the x-ray requires the use of proper technique in producing the film, and expertise by the roentgenologist making the interpretation. Any Raynaud's symptoms that occur among polyvinyl chloride manufacturing personnel should be regarded as suspicious. Cases have been seen progressing from Raynaud's symptoms into marked acroosteolysis.

B.F. Goodrich Company

Positive and questionable cases exist at three B.F.G. plants: Avon Lake, Louisville and Niagara Falls. Some of the cases at these plants are asymptomatic and not too definite.

At three plants - Calvert City, Henry and Welland - the single cases reported are questionable. Including all positive and questionable cases, the totals are:

Avon Lake	18
Louisville	23
Niagara Falls	5
Calvert City	1
Henry	1
Welland	1

Acroosteolysis exists in one of the B.F. Goodrich's foreign affiliates.

Other Companies

Acroosteolysis has occurred in other polyvinyl chloride manufacturing companies in the United States and Europe. We believe that up to twelve other companies in the United States and Canada are involved, and at least three in Europe.

EPIDEMIOLOGICAL AND RESEARCH STUDIES

In the Fall of 1966 the B.F. Goodrich Company advised the U.S.A. and Canadian polyvinyl chloride producing companies holding membership within the Manufacturing Chemists' Association of the "hand problem". As a result, a research grant was made



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to the School of Public Health at the University of Michigan by M.C.A. to conduct an epidemiological study. Nineteen companies agreed to participate by making hand x-rays and completing detailed work histories of their manufacturing personnel. This study is in the final stages of completion. The results should indicate the incidence of the disease in the Industry, and perhaps its possible causes.

The B.F. Goodrich Company has been pursuing the cause of the disease through its own research efforts. It has employed the services of the Kettering Laboratory, Cincinnati, Ohio, for both clinical studies and animal experimentation. Recently, this laboratory has reported that it has reproduced the disease in hamsters.

The B.F. Goodrich Company has sponsored research at the Brooklyn Polytechnic Institute on the effects of various chemicals on collagen tissue. These studies have not yielded any information as to the cause of the disease.

ETIOLOGY

The cause of acroosteolysis remains unknown. It probably is related to a chemical insult arising out of polyvinyl chloride polymerization. Any of the monomers or intermediate compounds produced could be the cause. In addition to the chemical insult, probably a physical insult and a personal idiosyncrasy are necessary for the occurrence of the disease. Because of the low incidence of the disease even among polycleaners performing the same type of work and using the same chemicals, it is probable that the personal factor plays a very definite part. Individuals should not be used as polycleaners who have abnormal responses to temperature stress. The cold insult hand test introduced into our plants about a year ago, should be done prior to the assignment of any individual to polycleaning.

When the reports of hand x-rays are received by the plant physician from the Akron B.F.G. Medical Center, it is his responsibility to evaluate the case, discuss it with the affected employee, and decide on the necessity of reporting it to the proper state health authorities. However, no reporting to the state should be done without prior consultation with The B.F. Goodrich Company Medical Director,

Rex H. Wilson, M.D.
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mj
6/24/68
cc: Mr. John Nelson
Mr. J.W. Miller, Jr.

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