



UNIVERSITY OF MASSACHUSETTS
AT AMHERST

Arnold House • Morrill Science Center
Amherst, MA 01003

School of Public Health

MEMORANDUM

To: Robert Gilligan, M.D.
From: Kenneth A. Mundt, Ph.D. *KAM*
Date: March 9, 1990
Subject: Enclosed summary on health effects of Vinyl Chloride Monomer

Enclosed is a summary statement on the most recent and pertinent epidemiological literature on Vinyl Chloride Monomer (VCM). One critical report - from IARC - is forthcoming, and I have requested of Dr. Saracci that we be included on the earliest distribution list.

I am currently preparing a related statement which might be useful in addressing employee concerns over possible health effects associated with VCM exposure.

I would be happy to address any additional questions or comments concerning the epidemiology of VCM, or to supply copies of the key publications in this area. I can be reached at (413) 545-2861.

cc: J. Coburn
H. Pastides
R. Tardiff

RECEIVED
APR 25 1990
J.W. LESSIG

OCC 1282

SUMMARY OF HEALTH EFFECTS
ASSOCIATED WITH OCCUPATIONAL EXPOSURES
TO VINYL CHLORIDE MONOMER (VCM)

Kenneth A. Mundt, Ph.D.

Vinyl Chloride Monomer (VCM) is one of 36 chemicals classified by the International Agency for Research on Cancer (IARC) as Group I carcinogens, for which there is sufficient evidence of human carcinogenicity. Various epidemiological studies of persons occupationally exposed to VCM have suggested that there may be associations between VCM exposures and increased incidence of cancer of the liver, brain, breast, skin, thyroid, lymphatic, or hematopoietic tissues. Presently, however, there is insufficient evidence to establish a causal relationship between VCM exposure and any of these *except* angiosarcoma of the liver (ASL), an extremely rare cancer.

The following facts pertain to ASL related to VCM exposure:

- A worldwide registry of occupational VCM-related cases of ASL identified 120 cases diagnosed and histologically confirmed between 1974 and 1986. Additional cases have accrued at rate of about five per year since.
- Most registered cases were detected between 15 and 30 years after first VCM exposure.
- Nearly half of the registered cases were among those employed as reactor cleaners, who sustained VCM exposures much greater than those found today. (In the early 1960's the TLV for VCM was 500 ppm; today it is 1ppm with a 5ppm ceiling).
- No cases have been found among persons exposed only since 1974; however, this might reflect an inadequate follow-up period to detect new cases of ASL.

IARC is scheduled to release a report on VCM-related cancers in summer, 1990. Advance word (personal communication with Dr. Saracci, Director for Epidemiology, IARC, March 29, 1990) suggests that there is no additional evidence for an association between VCM and any of the other cancers listed above. This supports Sir Richard Doll's 1988 conclusion that "No positive evidence of a hazard of any non-malignant disease or any type of cancer other than angiosarcoma of the liver has been found except possibly for a small hazard of lung cancer when exposure was heavy."

- VCM has been shown to be a mutagen, therefore, theoretically, it could act as a teratogen, leading to congenital malformations in offspring of women exposed during pregnancy.
- Because of its central nervous system (anesthetic) effects, VCM might be neurotoxic.
- A controversy exists concerning whether or not the carcinogenic effects of VCM in the liver are limited to AASL or might include primary liver tumors as well.

Again, the available evidence is inadequate, and further investigation into these areas is needed.