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## CORRESPONDENCE

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### Employment in pulp mills as a possible risk factor for soft tissue sarcoma: a case report

Sir,—A 60 year old man was admitted to our department in 1989 with a soft tissue sarcoma (malignancy grade III) of the neurofibrosarcoma type located in the heart. He had been employed in sulphate pulp mills since 1951 and since 1970 he supervised the drainage of the sludge from the whole mill. He was thus in skin contact with both the sludge and the drainage water. The mill used chlorine bleaching.

In four case-control studies we have associated soft tissue sarcoma with exposure to chlorinated phenols,<sup>1-4</sup> a finding also reported in other studies as discussed in our latest report.<sup>4</sup> We have recently attributed the increased risk to dioxin contaminated phenoxyacetic acids or chlorophenols.<sup>4</sup> Furthermore dioxins are carcinogenic in animal experiments.<sup>5,6</sup> In several studies it has been clearly shown that dioxins are produced in the chlorine bleaching process of the pulp, and that the concentrations are directly related to the amount of chlorine used in the bleaching process.<sup>7</sup> Dioxins appear to be concentrated in pulp mill sludges and in sediments outside pulp mills creating a long term exposure situation for affected areas.<sup>7</sup> This might be a source of exposure to dioxin for employees in the pulp industry and thus of aetiological significance for our patient described above. We are currently investigating this possible association further.

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- 3 Hardell L, Eriksson M. The association between soft tissue sarcomas and exposure to phenoxyacetic acids. A new case-referent study. *Cancer* 1988; 62:652-6.

- 4 Eriksson M, Hardell L, Adami H-O. Exposure to dioxins as a risk factor for soft tissue sarcoma: a population-based case-control study. *J Natl Cancer Inst* 1990;82:486-90.
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- 6 National Toxicology Program, National Cancer Institute. *NIH bioassay of a mixture of 1,2,3,6,7,8 and 1,2,3,7,8,9-hexachloro dibenzo-p-dioxins for carcinogenicity (gavage study)*. Research Triangle Park, NC: DHHS, 1980. (NTP tech rep ser No 198; DHHS publ No (NIH) 80-198.)
- 7 Swanson SE. *Dioxins in the bleach plant*. Umeå, Sweden: Umeå University 1988. (Dissertation.)

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## NOTICE

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### Fourth Summer Institute in Environmental Health Studies, Baltimore MD, 3-14 June 1991.

The Fourth Summer Institute in Environmental Health Studies will present courses during a two week period for academic credit or for continuing education credit. It will be possible to register for more than one course. The Summer Institute is designed for the following groups: (1) people unable to take the traditional four quarters of graduate study leading to a degree, (2) practising health professionals—that is, physicians, nurses, industrial hygienists, toxicologists, and safety engineers, (3) men and women with responsibility for health, safety, and environmental matters in either government service or the corporate world, (4) public health practitioners. Subjects will include: principles of toxicology, risk communication of environmental hazards, fundamentals of occupational health, physical agents in environmental health sciences, contemporary problems in radiation health sciences, risk assessment and risk management, and case studies and principles of industrial hygiene. For further information contact Dr Jacqueline Corn, Director, Continuing Education Program or Catherine Walsh, Course Coordinator, Depart-

### Correction

**Biological effect monitoring of occupational exposure to 1,3-dichloropropane: effects on liver and renal function and on glutathione conjugation** (1991;48 (March):167-72).

In the fourth line of the second column of the abstract "... creatinine excretion" should read "... creatinine concentration."