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TCDD (Dioxin) Content of Human Fat: Progress Report

The VA has undertaken a study to determine whether there is a method that can detect minute amounts (in parts per trillion) of 2, 3, 7, 8 tetrachlorodibenzo-para-dioxin (TCDD or dioxin) in the body fat of persons claiming exposure to Herbicide Orange and those with no known exposure. Samples of fat were obtained by biopsy from 20 veterans who believe they were exposed to the herbicide in Vietnam and 3 Air Force officers with known close and more recent exposure. Ten veterans who denied exposure had fat biopsies during operations for other disorders. (An eleventh name was entered in the latter group but no biopsy specimen was submitted.)

The gas chromatography = high resolution mass spectrometry used at a university laboratory for the sensitive assay proved difficult with the low concentrations encountered but the comparatively large biopsy samples have allowed repeated assays. Duplicate extracts and biopsy samples from 10 veterans were sent to the EPA laboratory which uses a more discriminating gas chromatograph but a lower resolution mass spectrometer. Both laboratories assayed "blinded" samples; both experienced difficulties with the new and delicate techniques. Replication and equipment problems have delayed results.

At present, the assay problems have been resolved except for two samples extracted and assayed by EPA scientists. These two gave concentrations that far exceeded any other determinations, results

thought to be due to contamination. Both laboratories are attempting to resolve the discrepancy.

Simultaneously, the exposures to Herbicide Orange reported by the 20 Vietnam veterans are being evaluated to see whether they can be assigned a relative value for the extent of contact. This will allow a comparison of assay results with exposure within the group.

The symptoms and signs of the Vietnam veterans have been reviewed and the findings of their clinical chemistries are being tabulated. Correlation of these with the assay results and the exposure evaluations will then be sought.

The results to date can be tentatively interpreted as showing that a method does exist to detect minute amounts of TCDD in body fat but it requires samples so large that open biopsy is used and the technique is still too difficult and slow for routine use. The method remains at present a research tool for use with small groups.

TCDD has been detected both in individuals claiming exposure to Herbicide Orange and in those with no known exposure. Some individuals in both groups have no TCDD in the fat using methods that can measure as little as one or two parts per trillion. No value to date has been so great as one part per billion even in the two samples with questionably large concentrations.