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(4·9/44·2). This is because, in these circumstances of occupational lead exposure, the calcaneus lead concentration is roughly twice that in the tibia when concentrations are expressed with respect to mass of bone mineral.

Discussion

This small study, comprising repeated in vivo bone lead measurements, serves to highlight two points. The first is the reliability of the measurement technique, which was established by the fact that the variance in the difference between tibia lead measurements separated by about five years was all accounted for by the known measurement variance associated with counting statistics. This reliability was further substantiated by the similarity in the relation between calcaneus lead and tibia lead concentrations and that seen in a separate larger cross sectional survey.[6]

A second point of interest is the relation between tibia lead concentration and the cumulative blood lead index. This had previously been determined on the basis of cross sectional studies[4] so it is particularly encouraging to see that the ratio of changes in tibia lead concentration to cumulative blood lead index was consistent with the slopes of the relations, both those previously reported and those arising from the present data set (table). The limited longitudinal data thus far available preclude a very precise analysis of this relation as yet, but the results of this small scale study do serve both to confirm the robustness of these in vivo bone lead measurements and to underline their application as a biological monitor of cumulative exposure to lead.

We are grateful to members of the workforce of John Betts Refiners Ltd for their willing cooperation in this study, and particularly to Mr M S Boswell-Munday for helping us to organise the work.

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Requests for reprints to: Malcolm C Scott, Medical Physics Group, School of Physics and Space Research, University of Birmingham, Birmingham B15 2TT, UK.

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