irradiation component for marrow, which for small marrow masses will be much more important than the marrow self-irradiation dose.

We chose to include only femoral marrow because it is the femoral marrow that is usually obtained and counted to determine the percentage injected dose per gram (%ID/g) and for correlating dose and effect. It may not be practical to obtain all %ID/g data for each marrow site and for every point in time.

Although Muthusawamy et al. provided a more detailed calculation for various marrow locations in the mouse, they then assumed that these different regions may be represented by a single average value. Although they applied S values for a 20-g human thyroid to estimate the total-body gamma contribution to marrow, they did not incorporate the important cross-organ β dose contributions (*4*).

In accordance with Fisher's Last Theorem, which states that "every dosimetry model may be improved on by someone else in the future," we recognize the importance of calculating dose to marrow in sites other than the femur. However, the prior mouse dosimetry model of Hui et al. (*2*) may have the advantage of being less complicated, more complete in terms of small organ dosimetry and more applicable to real animal experiments.

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REPLY: In their letter, Fisher and Hui point out that their work could have been described in a better manner. This is not contested. However, their work was correctly described in the context of our article.

Our model (*1*) makes it possible to compare the impacts of relative bone marrow dosimetry of various radionuclides. Specifically, we published these comparisons for ^{131}I, ^{186}Re and ^{90}Y radionuclides. Contrary to the claims of Fisher and Hui, no such comparisons were published by their group (*2,3*). In our model, average measured activity concentration can be input as a parameter.

The purpose of the marrow calculations presented by Hui et al. (*2*) was different from our purpose. Hui et al. limited their calculations to the bone marrow contributor that can be relatively easily verified within current experimental practice (the femur). Our purpose was to be more complete in incorporating the various marrow dose contributors (ribs, vertebrae, skull, etc.) to improve estimates of the correlation between dose calculation and organ function failure.

The work of Hui et al. (*2*) correctly calculated the dose to marrow using the known finite range of β particles resulting in a self-absorbed fraction of less than 1. The matrix of cross-organ absorbed fractions compiled for the mouse model by Hui et al. is reasonably extensive. Because of the assumptions made for their calculations, only the bone contributed as a source organ to the marrow dose. Nonetheless, in the simplest model of cross-organ dosimetry, as used by us, all nonmarrow organs are lumped together to represent the "rest of the body." We also discussed the meaningfulness of this approach compared to the approach used by Hui et al.

Both are, admittedly, only a part of the desired complete calculation, as pointed out by Fisher and Hui. A more complete calculation would include: (a) uptake in each marrow organ separately with properly registered heterogeneity of uptake and tissue density nonuniformity; (b) dose calculation including self-absorption and cross-organ dosimetry; and (c) dose response of each marrow dose contributor correlated with organ function as a whole. Attention to each piece of the puzzle may be of value as the pieces are assembled slowly.

We conclude that our discussion of the work of Hui et al. met the purpose of relating our results to their results while illustrating the effect of including a more representative bone marrow geometry and relative dosimetric impact of different radionuclides.

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