

SUPPLEMENTAL DATA

a. Plasma based RM dosimetry

The total RM dose consists of a self dose (patient mass-independent) and a cross dose (patient mass-dependent) term:

$$D_{RM}^{Total} = \tilde{A}_{RM} \times S(RM \leftarrow RM) + (\tilde{A}_{WB} - \tilde{A}_{RM}) \times S(RM \leftarrow RB) \quad \text{Supplemental Eq. 1}$$

The dose conversion (S) factors for both RM and remainder-of-body contribution should be mass adjusted, as follows:

$$S(RM \leftarrow RM) = S(RM \leftarrow RM)_{MIRDOSE3} \times \left(\frac{m_{RM-MIRDOSE3}}{m_{RM-patient}} \right) \quad \text{Supplemental Eq. 2}$$

$$S(RM \leftarrow RB) = \left(\begin{array}{l} S(RM \leftarrow WB)_{MIRDOSE3} \times \left(\frac{m_{WB-MIRDOSE3}}{m_{RB-MIRDOSE3}} \right) - \\ - S(RM \leftarrow RM)_{MIRDOSE3} \times \left(\frac{m_{RM-MIRDOSE3}}{m_{RB-MIRDOSE3}} \right) \end{array} \right) \times \frac{m_{RM-MIRDOSE3}}{m_{RM-patient}}$$

$$= \left(\begin{array}{l} S(RM \leftarrow WB)_{MIRDOSE3} \times \left(\frac{m_{WB-MIRDOSE3}}{m_{WB-MIRDOSE3} - m_{RM-MIRDOSE3}} \right) - \\ - S(RM \leftarrow RM)_{MIRDOSE3} \times \left(\frac{m_{RM-MIRDOSE3}}{m_{WB-MIRDOSE3} - m_{RM-MIRDOSE3}} \right) \end{array} \right) \times \frac{m_{RM-MIRDOSE3}}{m_{RM-patient}}$$

Supplemental Eq. 3

Final expressions for both self dose and cross dose to RM are obtained by substituting Equations 2 and 3 and Supplemental Equations 2 and 3 into Supplemental Equation 1:

$$D_{RM}^{Self} = RMECFF \times [\tilde{A}_{PL}] \times m_{RM-MIRDOSE3} \times S(RM \leftarrow RM)_{MIRDOSE3} \quad \text{Supplemental Eq. 4}$$

$$D_{RM}^{Cross} = \left\{ \tilde{A}_{WB} - [\tilde{A}_{PL}] \times RMECFF \times \frac{m_{RM-MIRDOSE3}}{m_{WB-MIRDOSE3}} \times m_{WB-patient} \right\} \times$$

$$\times \left\{ \begin{array}{l} S(RM \leftarrow WB)_{MIRDOSE3} \times \left(\frac{m_{WB-patient}}{m_{WB-patient} - m_{RM-patient}} \right) - \\ - S(RM \leftarrow RM)_{MIRDOSE3} \times \left(\frac{m_{RM-patient}}{m_{WB-patient} - m_{RM-patient}} \right) \end{array} \right\} \times \frac{m_{WB-MIRDOSE3}}{m_{WB-patient}}$$

Supplemental Eq. 5

b. Image based RM dosimetry

Here, the average activity concentration in the lumbar vertebrae is used to calculate the self and cross RM dose. Supplemental Equations 4 and 5 can be rewritten as follows:

$$D_{RM}^{Self} = [\tilde{A}_{RM}] \times m_{RM-MIRDOSE3} \times S(RM \leftarrow RM)_{MIRDOSE3} \quad \text{Supplemental Eq. 6}$$

$$D_{RM}^{Cross} = \left\{ \tilde{A}_{WB} - [\tilde{A}_{RM}] \times \frac{m_{RM-MIRDOSE3}}{m_{WB-MIRDOSE3}} \times m_{WB-patient} \right\} \times$$

$$\times \left\{ \begin{array}{l} S(RM \leftarrow WB)_{MIRDOSE3} \times \left(\frac{m_{WB-patient}}{m_{WB-patient} - m_{RM-patient}} \right) - \\ - S(RM \leftarrow RM)_{MIRDOSE3} \times \left(\frac{m_{RM-patient}}{m_{WB-patient} - m_{RM-patient}} \right) \end{array} \right\} \times \frac{m_{WB-MIRDOSE3}}{m_{WB-patient}}$$

Supplemental Eq. 7