Clinical implementation of the optimized dose regimen.

Assuming that the quadratic relation is valid for a specific setting, the new relation between FDG dose and body mass can easily be obtained following a simple procedure. The starting point is the dose regimen that is currently being used in the clinic. Assuming a fixed scan time per bed position and a linear relation between body mass (m, in kg) and FDG dose (A_{lin}, in MBq), this can be written as:

$$A_{lin} = c \cdot m \qquad \textit{(i)}$$

with *c* the FDG dose per kg. The new, quadratic dose regimen can be described by:

$$A_q = h \cdot m^2 \qquad \textit{(ii)}$$

with *h* the FDG dose per kg squared and A_q the FDG dose in MBq. A nuclear medicine expert has to determine up to which maximum body mass m_T the image quality is considered adequate in the old dose regimen. By requiring that for m_T the dose in the quadratic regimen is identical to the corresponding dose for the linear model A_T, equation (ii) can be solved directly to give:

$$A_q = h \cdot m^2 = \left(\frac{A_T}{m_T^2} \right) \cdot m^2 \qquad \textit{(iii)}$$

Note that, using equation (i) and the fact that $A_T = c \cdot m_T$, equation (iii) can also be rewritten to exemplify the relation between the linear dose and the quadratic dose as shown in equation (iv):

$$A_q = \left(\frac{A_T}{m_T^2} \right) \cdot m^2 = \left(\frac{m}{m_T} \right) \cdot A_{lin} \qquad \textit{(iv)}$$

Which equals equation (8) in the paper.

In the new dose regimen, a patient with a body mass equal to the threshold body mass m_T will receive the same FDG dose as in the old dose regimen. Patients with a body mass higher than m_T will receive a higher dose, while patients with a body mass lower than m_T will receive less FDG than in the old dose regimen.