User Supplement for CARESTREAM PACS

PET/CT Standard Uptake Value Formulas

Carestream HEALTH

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Purpose
This document describes the formulas used to calculate the Standard Uptake Values (SUV) available in the PET/CT application.

Intended Audience
This document is intended for use by physicians, clinicians, and qualified users of the CARESTREAM PACS Client software.

PET/CT Standard Uptake Value (SUV)

Formulas

There are three common formulas for calculating SUV. These formulas are based on:

- Body weight (the most commonly used method)
- An approximation of the body surface area
- Lean body mass, according to the patient's gender

SUV Formula – Body Weight

\[
SUV_{\omega} (g/ml) = \frac{\text{average activity in ROI (Bq/ml)}}{\text{injected dose (Bq)} \times \text{patient body weight (g)}}
\]

SUV Formula – Body Surface Area

\[
SUV_{BSA} (cm^2 / ml) = \frac{\text{average activity in ROI (Bq/ml)}}{\text{injected dose (Bq)} \times BSA (cm^2)}
\]

Where BSA (Body Surface Area) is calculated by the following formula:

\[
BSA (cm^2) = \left[ \frac{\text{patient weight (kg)}}{100} \right]^{0.425} \times \left[ \frac{\text{patient height (cm)}}{100} \right]^{0.725} \times 71.84
\]

SUV Formula – Lean Body Mass

\[
SUV_{LBM} (g/ml) = \frac{\text{average activity in ROI (Bq/ml)}}{\text{injected dose (Bq)}} \times \text{LBM (g)}
\]

Where LBM (Lean Body Mass) is calculated by the following formula:

\[
\text{LBM}_{\text{MALE}} (kg) = 1.10 \times \left[ \frac{\text{patient weight (kg)}}{\text{patient height (cm)}} \right] - 128 \times \left[ \frac{\text{patient weight (kg)}}{\text{patient height (cm)}} \right]^2
\]

\[
\text{LBM}_{\text{FEMALE}} (kg) = 1.07 \times \left[ \frac{\text{patient weight (kg)}}{\text{patient height (cm)}} \right] - 148 \times \left[ \frac{\text{patient weight (kg)}}{\text{patient height (cm)}} \right]^2
\]

Note: LBM should be divided / multiplied by 1000 to get the result in Kg / g.