Metronidazole (S = 1.0) follows a two-compartment pharmacokinetic model. After administering a single intravenous dose (1 g) in a female patient, the equation best describing metronidazole kinetics was:

\[ Cp = 95 \mu g/mL \ e^{-\frac{2.72}{t}} + 4.9 \mu g/mL \ e^{-\frac{0.257}{t}} \]

\[ C_0 = A + B = 99.9 \mu g/mL = 99.9 \text{ mg/L} \]

1. Calculate the elimination half-life for the drug above? (3 points).

\[ t_{\frac{1}{2}} = \frac{0.693}{\frac{0.257}{t}} = 0.693 \cdot \frac{0.257}{t} = 2.70 \text{ hr} \]

2. Calculate the area under the curve? (3 points).

\[ AUC = A + B = 95 \mu g/mL \cdot \frac{2.72}{2.72 \text{ hr}} + 4.9 \mu g/mL \cdot \frac{0.257}{0.257 \text{ hr}} \]

\[ 53.99 \mu g \cdot \text{hr} \text{ or } 53.99 \text{ mg} \cdot \text{hr} \]

3. Calculate the \( V_p \)? (3 points).

\[ V_p = \frac{F \cdot D_S}{A + B} = \frac{1000 \text{ mg}}{99.9 \text{ mg/L}} = 10.01 \text{ L} \]

4. Calculate the \( C_p \) at 15 minutes? (4 points).

\[ 15 \text{ min} \left( \frac{1 \text{ hr}}{60 \text{ min}} \right) = 0.25 \text{ hr} \]

\[ C_p = 95 \mu g/mL \ e^{-\frac{2.72}{(0.25 \text{ hr})}} + 4.9 \mu g/mL \ e^{-\frac{0.257}{(0.25 \text{ hr})}} \]

\[ = 48.13 \mu g/mL + 4.595 \mu g/mL = 52.73 \mu g/mL \text{ or } 52.73 \text{ mg/L} \]
Use the following information to answer the remaining questions.

Three people have had their serum creatinine measured. AJ, a male, has a serum creatinine of 1.0 mg%, is 5 feet 9 inches tall and is 38 years old. DR, a female, has a serum creatinine of 0.9 mg%, is 5 feet 4 inches tall and is 47 years old. Finally, MT is a 71 year old male, 6 feet 7 inches tall and has a serum creatinine of 1.0 mg%.

5. Rank in order which individual has the highest creatinine clearance to the individual with the lowest creatinine clearance (4 points)

   a. MT>DR>AJ
   b. AJ>DR>MT
   c. AJ>MT>DR
   d. DR>MT>AJ
   e. DR>AJ>MT

\[
C_{\text{Cl}} = \frac{(40-\text{age})(180)}{\text{Scr} \times 72}
\]

\[
\begin{align*}
AJ &= 100.2 \text{ mL/min} \\
DR &= 66.3 \text{ mL/min} \\
MT &= 89.8 \text{ mL/min}
\end{align*}
\]

6. What is the IBW of DR? (4 points)

   a. 93.7 kg
   b. 54.7 kg
   c. 70.7 kg
   d. 59.2 kg
   e. None of the above

\[
\text{IBW} = 45.5 + 2.3(4) = 54.7 \text{ kg}
\]

7. What is the IBW of MT? (4 points)

   a. 59.2 kg
   b. 93.7 kg
   c. 54.7 kg
   d. 70.7 kg
   e. None of the above

\[
\text{IBW} = 50 + 2.3(9) = 70.7 \text{ kg}
\]