

**Case Study #2 Answer Key**  
**PHA 5127-Fall 2004**

1

a.) Systemic clearance = hepatic clearance for this drug.

$$1.14 \text{ L/hr/kg} * 62 \text{ kg} = 70.7 \text{ L/hr}$$

b.)  $F_h = 1 - E_h$

$$Cl_h = Q_h * E_h$$

$$F_h = 1 - (Cl_h / Q_h) = 1 - (70.7 \text{ L/hr} / 1500 \text{ ml/min})$$

$$1500 \text{ ml/min} = 90 \text{ L/hr}$$

$$F_h = 1 - (70.7/90) = 1 - 0.785 = \mathbf{0.215}$$

2.

For low E drug,  $Cl_h = f_u * Cl_i$

For high E drug,  $Cl_h = Q_h$

Parameter	Direction of change	effect on $Cl_h$ for a low E drug	effect on $Cl_h$ for a high E drug
$f_u$	decrease	decrease	no change
$Cl_i$	increase	increase	no change
$Q_h$	decrease	no change	decrease

3.

a) Systemic clearance = hepatic clearance for this drug

$$Cl = k_e * V_d$$

$$k_e = 0.693 / 15.6 \text{ hours} = 0.044 \text{ hr}^{-1}$$

$$V_d = 25 \text{ L/kg} * 70 \text{ kg} = 1750 \text{ L}$$

$$Cl = 0.044 \text{ hr}^{-1} * 1750 \text{ L} = 77.7 \text{ L/hr}$$

b) **High clearance because it is close to liver blood flow.**

c)  $Cl_h = Q_h * E_h$

$$77.7 \text{ L/hr} = 90 \text{ L/hr} * E_h$$

$$E = 77.7/90 = \mathbf{0.86}$$

d)  $F_h = 1 - E_h = 1 - 0.86 = \mathbf{0.14}$

