Case Study #2 Answer Key
PHA 5127-Fall 2004

1

a.) Systemic clearance = hepatic clearance for this drug.
1.14 L/hr/kg * 62 kg = **70.7 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 ml/min = 90 L/hr
$F_h = 1 – (70.7/90) = 1-0.785 =$ **0.215**

2.

For low E drug, $Cl_h = fu*Cl_i$
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 ahigh 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 L/hr**

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

c) $Cl_h = Q_h * E_h$
77.7 L/hr = 90 L/hr $*E_h$
E = 77.7/90 = **0.86**

d) $F_h = 1- E_h = 1-0.86 =$ **0.14**