

Base Run:

Name of Stock	Initial Value
Injection Site	96000000
NA in Blood	0
NE in Blood	0
NA in Bladder	0
NE in Bladder	0
Gastrointestinal Tract	0
Finasteride in Blood	0
Reductase Enzymes	100
Occupied Enzymes by Finasteride	0
Recovery Phase I	0
Recovery Phase II	0

Name of Flow	Equation
Absorption and NA Conversion	(Injection_Site*NA_Ratio)/Absorption_Time
Absoption and NE Conversion	(Injection_Site*NE_Ratio)/Absorption_Time
Others' Conversion	(Injection_Site*Others'_Ratio)/Absorption_Time
Metabolism Rate of NA	NA_in_Blood/Metabolism_Time_of_NA
Metabolism Rate of NE	NE_in_Blood/Metabolism_Time_of_NE
Urine Rate of NA	IF(MOD (TIME*(1/DT) ,((1/DT)/8))=0) THEN NA_in_Bladder*(1/DT) ELSE 0
Urine Rate of NE	IF(MOD (TIME*(1/DT) ,((1/DT)/8))=0) THEN NE_in_Bladder*(1/DT) ELSE 0
Intake Rate	0
Metabolism Rate of Finasteride	Gastrointestinal_Tract/Metabolism_Time_of_Finasteride
Elimination Rate	Finastieride_in_Blood/Elimination_Time
Occupation Rate by Finasteride	Occupation_Ratio*Reductase_Enyzmes
Recovery Rate I	Occupied_Enzymes_by_Finasteride/Recovery_Time
Recovery Rate II	Recovery_Phase_I/Recovery_Time
Recovery Rate III	Recovery_Phase_II/Recovery_Time

Name of Converter	Equation
Injection Site Ratio for Ratios	Injection_Site/Base_Injection_Site_for_Ratios
Effect of Injection Site on Ratios	f(Injection_Site_Ratio_for_Ratios) - Graphical
NA Ratio	Base_NA_Ratio*Effect_of_Reductase_Enyzmes*Effect_of_Injection_Site_on_Ratios
Injection Site Ratio for Time	Injection_Site/Base_Injection_Site_for_Time
Effect of Injection Site on Time	f(Injection_Site_Ratio_for_Time) - Graphical
Absorption Time	Base_Absorption_Time*Effect_of_Injection_Site_on_Time
Concentration of NA	NA_in_Bladder/Urine_Volume
Concentration of NE	NE_in_Bladder/Urine_Volume
NA NE Ratio	IF (TIME>0.01) THEN Concentration_of_NA/Concentration_of_NE ELSE 0
Reductase Enzymes' Ratio	Reductase_Enyzmes/Base_Reductase_Enzymes
Effect of Reductase Enyzmes	f(Reductase_Enzymes'_Ratio) - Graphical
Finasteride Ratio	Finastieride_in_Blood/Base_Finasteride_in_Blood
Effect of Finasteride	f(Finasteride_Ratio) - Graphical
Occupation Ratio	Base_Occupation_Ratio*Effect_of_Finasteride

Name of Converter	Average Value	Calculation	Reference Number
Metabolism Time of NA	2.86	taken from reference + trials	9
Metabolism Time of NE	2.5	taken from reference + trials	9
Urine Volume	250	taken from reference	8
Recovery Time	3	taken from reference + trials	11
Base Occupation Ratio	3.6	by trial and error	
Base Finasteride in Blood	650000	by trial and error	
Metabolism Time of Finasteride	0.535/24	taken from reference	6
Elimination Time	5.65/24	taken from reference	6
NE Ratio	0.72-NA_Ratio	Approximating from real data given in the reference	9
Base Reductase Enzymes	100	by trial and error	
Base Absorption Time	16.667	taken from reference	9
Others' Ratio	0.28	Approximating from real data given in the reference	9
Base Injection Site for Time	7500000	by trial and error	
Base NA Ratio	0.57	Approximating from real data given in the reference	9
Base Injection Site for Ratios	2500000	by trial and error	

Scenario Analysis:

Only the variables differing from base run are given here.

Day 52 without Finasteride:

Name of Stock	Initial Value
Injection Site	3110609.37
NA in Blood	125430.01
NE in Blood	28396.74
NA in Bladder	5495.14
NE in Bladder	1423.16

Name of Converter	Equation
NA NE Ratio	Concentration_of_NA/Concentration_of_NE

Day 52 with One Pill of Finasteride:

Name of Stock	Initial Value
Injection Site	3110609.37
NA in Blood	125430.01
NE in Blood	28396.74
NA in Bladder	5495.14
NE in Bladder	1423.16
Gastrointestinal Tract	5000000*0.65

Name of Converter	Equation
NA NE Ratio	Concentration_of_NA/Concentration_of_NE

Day 52 – Repeated Usage of Finasteride:

Name of Stock	Initial Value
Injection Site	3110609.37
NA in Blood	125430.01
NE in Blood	28396.74
NA in Bladder	5495.14
NE in Bladder	1423.16

<i>Name of Flow</i>	<i>Equation</i>
Intake Rate	IF (TIME<10) THEN (IF (MOD(TIME,1)=0) THEN 5000000*0.65*(1/DT) ELSE 0) ELSE 0

<i>Name of Converter</i>	<i>Equation</i>
NA NE Ratio	Concentration_of_NA/Concentration_of_NE

Day 124 without Finasteride:

<i>Name of Stock</i>	<i>Initial Value</i>
Injection Site	809054.18
NA in Blood	19359.09
NE in Blood	9937.39
NA in Bladder	847.40
NE in Bladder	497.23

<i>Name of Converter</i>	<i>Equation</i>
NA NE Ratio	Concentration_of_NA/Concentration_of_NE

Day 124 with One Pill of Finasteride:

<i>Name of Stock</i>	<i>Initial Value</i>
Injection Site	809054.18
NA in Blood	19359.09
NE in Blood	9937.39
NA in Bladder	847.40
NE in Bladder	497.23
Gastrointestinal Tract	5000000*0.65

<i>Name of Converter</i>	<i>Equation</i>
NA NE Ratio	Concentration_of_NA/Concentration_of_NE