

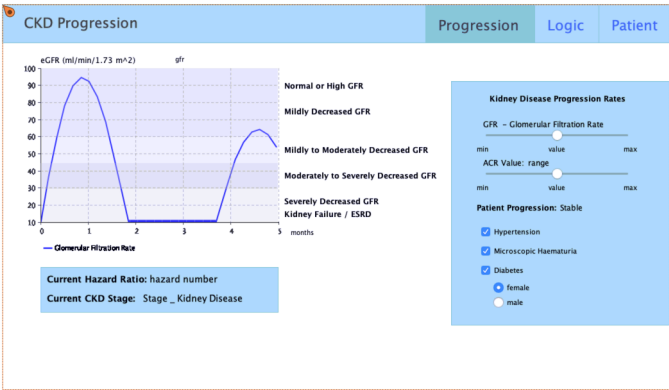
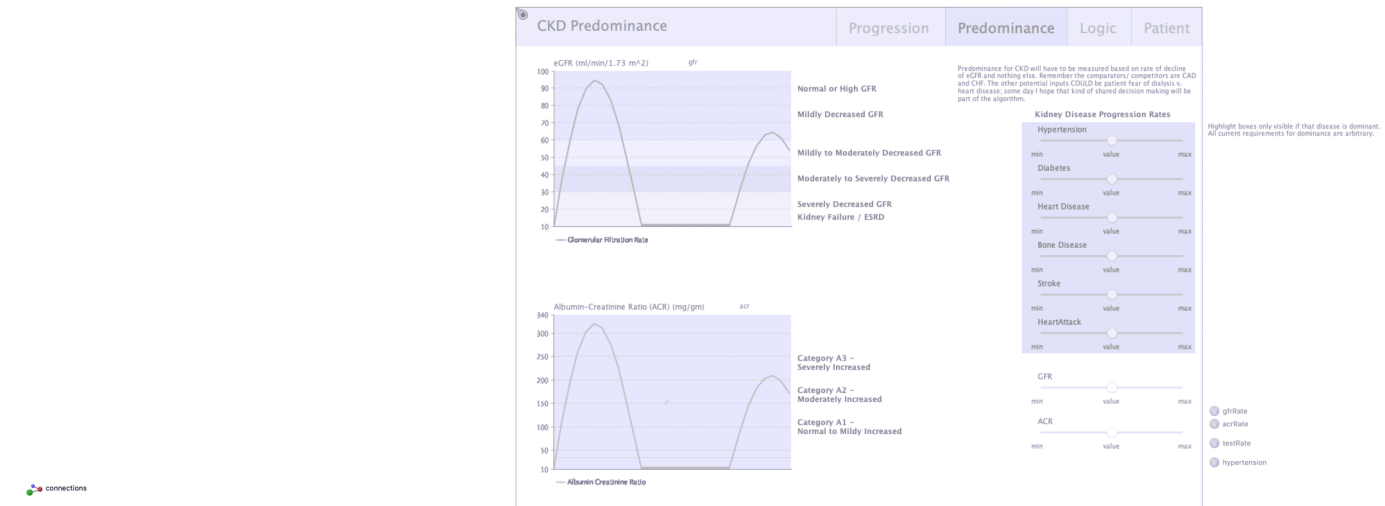
Model: CKD Model

Name	Value
General	
Model time units	months
System Dynamics solver	
Differentiation Equations Method	Euler
Algebraic Equations Method	Modified Newton
Mixed Equations Method	RK45+Newton
Absolute accuracy	1.0E-5
Time accuracy	1.0E-5
Relative accuracy	1.0E-5
Fixed time step	0.001
Advanced	
Java package name	ckd_model
File Name	/Users/hlawren8/Models/CKD Model/CKD Model.alp

Agent Type: Main

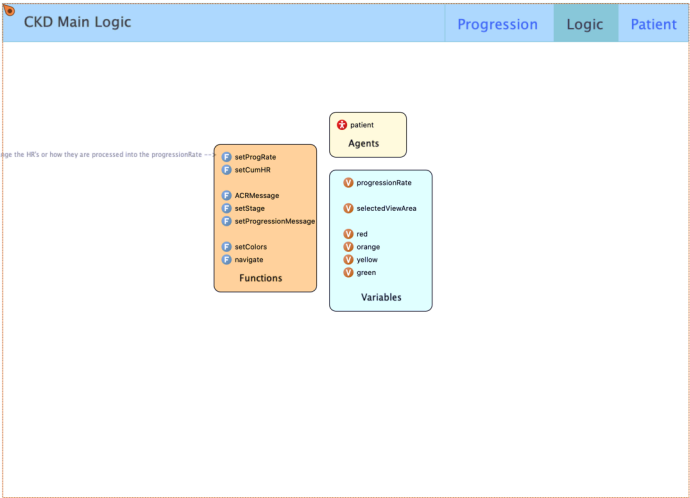
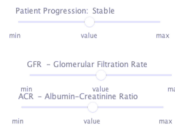
Name	Value
Agent in flowcharts	
Use in flowcharts as	Agent
Dimensions and movement	
Speed	(10 : MPS)
Rotate animation towards movement	true
Rotate vertically as well (along Z-axis)	false
Space and network	
Space Type	Continuous
Dynamic: Width	500
Dynamic: Height	500
Dynamic: z Height	0
Layout Type	User-defined
Layout Type Apply On Startup	true
Network type	User-defined
Network Type Apply On Startup	true
Enable steps	false
Advanced Java	
Generic	false
Advanced	
Logging	true
Auto-create datasets	true
AOC_DATASETS_UPDATE_TIME_PROPERTIES	- Recurring Event Properties
Limit the number of data samples	false

The CKD Predominance view. Not used due to switch to progression view.



Old Progression sliders.

talk to a kidney expert to get a sense of what progression looks like range-wise. This would not be something a person would pick, the algorithm would look at the eGFR values over the past 1-5 years, and plot the rate of progression which in turn would feed into a prediction for the rate at which the person is likely to progress to stage 4 and need renal replacement therapy, (or if ACR, to progress to >300 mg/g, and eventually nephrotic range proteinuria).



Scale: scale

Name	Value
General	
Unit	meters
Scale	10.0
Type	Defined graphically
Length, pixels	100.0
Show at runtime	false

Name	Value
Lock	false
Public	false
Position and size	
x	0.0
y	-150.0
Rotation	0.0

Function: navigate

Description: used to allow user to navigate between views. USED BY THE NAV BARS

Name	Value
General	
Return type:	Just action (returns nothing)
Show at runtime	true
Show name	true
Function body	
Body	<pre> selectedViewArea = viewArea; viewArea.navigateTo(); groupMainMenu.setPos(viewArea.getX(), viewArea.getY()); //if (viewArea == viewHome) { //groupControls.setY(viewArea.getY()); //} </pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	used to allow user to navigate between views. USED BY THE NAV BARS

Arguments:

Name	Type
viewArea	ViewArea

Function: setColors

Description: sets the colors based off of gfr and acr. Uses ranges from the acr gfr matrix in onenote

Name	Value
General	
Return type	Color
Return type:	Returns value
Show at runtime	true
Show name	true
Function body	
Body	<pre> if (ACRValSlider.value < 30) { // stage 1 if (patient.gfr >= 90 && patient.gfr < 110) return green; else if ((patient.gfr >= 45 && patient.gfr < 110) (patient.gfr < 115 && patient.gfr > 110)) return yellow; else if ((patient.gfr >= 30 && patient.gfr < 110) (patient.gfr < 130 && patient.gfr > 110)) return orange; else return red; } </pre>

Name	Value
	<pre> } else if (ACRValSlider.value < 300) { // stage 2 if ((patient.gfr >= 60 && patient.gfr < 110) (patient.gfr < 115 && patient.gfr > 110)) return yellow; else if ((patient.gfr >= 45 && patient.gfr < 110) (patient.gfr < 130 && patient.gfr > 110)) return orange; else return red; } else { // stage 3 if ((patient.gfr >= 60 && patient.gfr < 110) (patient.gfr < 130 && patient.gfr > 110)) return orange; else return red; } </pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	sets the colors based off of gfr and acr. Uses ranges from the acr gfr matrix in onenote

Function: setProgressionMessage

Description: displays a message based off of the the current rate of progression

Name	Value
General	
Return type	String
Return type:	Returns value
Show at runtime	true
Show name	true
Function body	
Body	<pre> double val = progressionRate; if (val < 1) return "Stable"; else if (val < 2) return "Slightly worsening"; else if (val < 3) return "Moderately deteriorating"; else return "Severely deteriorating"; </pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	displays a message based off of the the current rate of progression

Function: setProgRate

Description: function takes the average of the hazard ratios

Name	Value
General	
Return type:	Just action (returns nothing)
Show at runtime	true

Name	Value
Show name	true
Function body	
Body	<pre> int num = 0; double val = 0; // num selected boxes // && total val if (ACRValSlider.value > 300) { num++; val += 3.06; } else if (ACRValSlider.value < 300 && ACRValSlider.value >= 30) { num++; val += 1.99; } if (HypertensionBox.isSelected()) { if (patient.gfr >= 60) { num++; val += 1.06; //first listed hr in onenote } else { num++; val += 1.28; // second listed hr in onenote } } if (MicroscopicHaematuriaBox.isSelected()) { num++; val += 2.07; } if (DiabetesBox.isSelected()) { if (DiabetesRadio.getValue() == 0) { num++; val += 3.34; } else { num++; val += 2.84; } } //take into acct gfr if (patient.gfr < 60 && patient.gfr > 44) { //45-60 num++; val += 2.02; } else if (patient.gfr < 45 && patient.gfr > 30) { //44-30 num++; val += 2.99; } else if (patient.gfr < 30) { num++; val += 6.84; } // val / num if (num != 0) progressionRate = val/num; </pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	function takes the average of the hazard ratios

Function: ACRMessage

Description: displays the name for the acr range.

normal <30

microalb. <300

macroalb. >300

Name	Value
General	
Return type	String
Return type:	Returns value
Show at runtime	true
Show name	true
Function body	
Body	<pre>if (ACRValSlider.value < 30) return "Normal Range"; else if (ACRValSlider.value < 300) return "Microalbuminuria"; else return "Macroalbuminuria";</pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	<p>displays the name for the acr range.</p> <p>normal <30 microalb. <300 macroalb. >300</p>

Function: setStage

Description: displays which stage of kidney disease the patient is in based off of gfr range.

Name	Value
General	
Return type	String
Return type:	Returns value
Show at runtime	true
Show name	true
Function body	
Body	<pre>if (patient.gfr >= 90) return "Stage 1 Kidney Disease"; else if (patient.gfr >= 60) return "Stage 2 Kidney Disease"; else if (patient.gfr >= 45) return "Stage 3a Kidney Disease"; else if (patient.gfr >= 30) return "Stage 3b Kidney Disease"; else if (patient.gfr >= 15) return "Stage 4 Kidney Disease"; else return "Stage 5 Kidney Disease";</pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	displays which stage of kidney disease the patient is in based off of gfr range.

Function: setCumHR

Description: a function to combine the hazard ratios by multiplying them, since that is how to combine hr's per: <https://stats.stackexchange.com/questions/194270/are-hazard-ratios-additive>

Name	Value
General	

Name	Value
Return type	double
Return type:	Returns value
Show at runtime	true
Show name	true
Function body	
Body	<pre>double val = 1; // if none are selected return 0 if (ACRValSlider.value < 30 && HypertensionBox.isSelected() == false && MicroscopicHaematuriaBox.isSelected() == false && DiabetesBox.isSelected() == false && patient.gfr >= 60) return 0; // num selected boxes // && total val if (ACRValSlider.value > 300) { val *= 3.06; } else if (ACRValSlider.value < 300 && ACRValSlider.value >= 30) { val *= 1.99; } if (HypertensionBox.isSelected()) { val *= 1.06; } if (MicroscopicHaematuriaBox.isSelected()) { val *= 2.07; } if (DiabetesBox.isSelected()) { if (DiabetesRadio.getValue() == 0) { val *= 3.34; } else { val *= 2.84; } } //take into acct gfr if (patient.gfr < 60 && patient.gfr > 44) { //45-60 val *= 2.02; } else if (patient.gfr < 45 && patient.gfr > 30) { //44-30 val *= 2.99; } else if (patient.gfr < 30) { val *= 6.84; } return val;</pre>
Advanced	
Access type	default
System dynamics units	false
Description	
Description	<p>a function to combine the hazard ratios by multiplying them, since that is how to combine hr's per: https://stats.stackexchange.com/questions/194270/are-hazard-ratios-additive</p>

Variable: selectedViewArea

Description: used to set the current view area in the simulation. CALLED BY THE MENU BARS

Name	Value
General	
Initial value	viewProg

Name	Value
Type	ViewArea
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	used to set the current view area in the simulation. CALLED BY THE MENU BARS

Variable: red

Description: custom transparent red color

Name	Value
General	
Initial value	new Color(255, 0, 0, 58)
Type	Color
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	custom transparent red color

Variable: yellow

Description: custom transparent yellow color

Name	Value
General	
Initial value	new Color(255, 255, 0, 64)
Type	Color
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	custom transparent yellow color

Variable: green

Description: custom transparent green color

Name	Value
General	
Initial value	new Color(154, 205, 50, 100)
Type	Color
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	custom transparent green color

Variable: orange

Description: custom transparent orange color

Name	Value
General	
Initial value	new Color(255, 165, 0, 123)
Type	Color
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	custom transparent orange color

Variable: progressionRate

Description: measures the rate at which the gfr declines. Changed by the hazard ratios

Name	Value
General	
Initial value	0
Type	double
Show at runtime	true
Show name	true
Advanced	
Access type	public
Constant	false
Save in snapshot	true
System dynamics units	false
Description	
Description	measures the rate at which the gfr declines. Changed by the hazard ratios

Rectangle: rectangle

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	60.0
Width	370.0
y	410.0
Height	70.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Rectangle: rectangle1

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	700.0
Width	340.0
y	120.0
Height	380.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Text: text2

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	Kidney Disease Progression Rates
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	760.0
y	140.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text30

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	Functions
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	370.0
y	1140.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Rounded Rectangle: roundRectangle1

Name	Value
General	
Show at runtime	true
Lock	false

Name	Value
Embedded icon	false
Public	true
Appearance	
Fill color	lemonChiffon
Line color	black
Line width	1.0
Line style	SOLID
Position and size	
x	510.0
Width	120.0
y	890.0
Height	70.0
Rotation	0.0
Radius	10.0
Advanced	
Show name	false

Rounded Rectangle: roundRectangle2

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Appearance	
Fill color	new Color(255, 209, 132)
Line color	black
Line width	1.0
Line style	SOLID
Position and size	
x	330.0
Width	160.0
y	940.0
Height	230.0
Rotation	0.0
Radius	10.0
Advanced	
Show name	false

Text: text35

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	

Name	Value
Text	Functions
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	370.0
y	1140.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Rounded Rectangle: roundRectangle5

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Appearance	
Fill color	lightCyan
Line color	black
Line width	1.0
Line style	SOLID
Position and size	
x	510.0
Width	160.0
y	980.0
Height	220.0
Rotation	0.0
Radius	10.0
Advanced	
Show name	false

Text: text33

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	Agents
Appearance	
Color	black
Alignment	LEFT

Name	Value
Position and size	
x	540.0
y	930.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text34

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	Variables
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	560.0
y	1170.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text3

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	months
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	450.0
y	350.0
z	0.0
Rotation	0.0

Name	Value
Advanced	
Show in	2D only
Show name	false

Text: ACRRangeText

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	range
Dynamic: Text	ACRMessage()
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	820.0
y	240.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text102

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	The CKD Predominance view. Not used due to switch to progression view.
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	800.0
y	-840.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text103

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	Old Progression sliders.
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	1140.0
y	100.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Group: GFRGraphGroup

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	320.0
y	160.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Time Plot: patientGFR

Name	Value
General	
Lock	false
Public	true
Data update	
Analysis auto update	true
ANALYSIS_UPDATE_TIME_PROPERTIES	- Recurring Event Properties
Dataset Samples To Keep	300

Name	Value
Scale	
Time window	5
Time	years
Vertical scale	Fixed
Chart Vertical Scale: From	10
Chart Vertical Scale: To	100
Appearance	
Labels horizontal position	DEFAULT
Labels vertical position	DEFAULT
Label format	Model time units
Labels Text Color	darkGray
Chart Area Grid Color	darkGray
Draw line	true
Fill area under line	false
Interpolation	Linear
Position and size	
x	-310.0
Width	450.009
y	-90.0
Height	330.0
Legend	
Show legend	true
Legend size	30.0
Legend text color	black
Chart area	
Chart Area: X Offset	50.0
Chart Area: Width	370.0
Chart Area: Y Offset	30.0
Chart Area: Height	240.0
Chart Area: Background Color	white
Chart area border color	black
Advanced	
Time window moves	Continuously
Show name	false
Logging	true

Plot Items:

Title	Type	Dataset / Value	Point Style	Color	Line	Width	Interpolation
Glomerular Filtration Rate	value	patient.gfr	NONE	blue	true	2.0	LINEAR

Text: text97

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	

Name	Value
Text	eGFR (ml/min/1.73 m ²)
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-260.0
y	-80.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Rectangle: rectangle32

Name	Value
General	
Dynamic: Visible	patient.gfr >= 60
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(192, 192, 192, 100)
Dynamic: Fill Color	setColors()
Line width	1.0
Line style	SOLID
Position and size	
x	-260.0
Width	370.0
y	-60.0
Height	107.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Rectangle: rectangle35

Name	Value
General	
Dynamic: Visible	patient.gfr >= 45 && patient.gfr < 60
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(192, 192, 192, 64)

Name	Value
Dynamic: Fill Color	setColors()
Line width	1.0
Line style	SOLID
Position and size	
x	-260.0
Width	370.0
y	47.0
Height	41.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Rectangle: rectangle38

Name	Value
General	
Dynamic: Visible	patient.gfr >= 30 && patient.gfr < 45
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(192, 192, 192, 123)
Dynamic: Fill Color	setColors()
Line width	1.0
Line style	SOLID
Position and size	
x	-260.0
Width	370.0
y	88.0
Height	40.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Rectangle: rectangle33

Name	Value
General	
Dynamic: Visible	patient.gfr < 30
Show at runtime	true
Lock	false
Public	true

Name	Value
Appearance	
Fill color	new Color(192, 192, 192, 58)
Dynamic: Fill Color	setColors()
Line width	1.0
Line style	SOLID
Position and size	
x	-260.0
Width	370.0
y	128.0
Height	54.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false

Text: text117

Name	Value
General	
Dynamic: Visible	patient.gfr > 90 && patient.gfr < 95
Show at runtime	true
Lock	false
Public	true
Text	
Text	Normal or High GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	120.0
y	-40.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text118

Name	Value
General	
Dynamic: Visible	patient.gfr < 60 && patient.gfr > 44
Show at runtime	true
Lock	false
Public	true
Text	

Name	Value
Text	Mildly to Moderately Decreased GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	120.0
y	60.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text120

Name	Value
General	
Dynamic: Visible	patient.gfr < 45 && patient.gfr > 29
Show at runtime	true
Lock	false
Public	true
Text	
Text	Moderately to Severely Decreased GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	120.0
y	100.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text121

Name	Value
General	
Dynamic: Visible	patient.gfr < 30 && patient.gfr > 14
Show at runtime	true
Lock	false
Public	true
Text	
Text	Severely Decreased GFR
Appearance	
Color	black
Alignment	LEFT

Name	Value
Position and size	
x	120.0
y	140.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text122

Name	Value
General	
Dynamic: Visible	patient.gfr < 90 && patient.gfr > 59
Show at runtime	true
Lock	false
Public	true
Text	
Text	Mildly Decreased GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	120.0
y	0.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text123

Name	Value
General	
Dynamic: Visible	patient.gfr < 15
Show at runtime	true
Lock	false
Public	true
Text	
Text	Kidney Failure / ESRD
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	120.0
y	160.0
z	0.0

Name	Value
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text29

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	gfr
Dynamic: Text	Math.round(patient.gfr) + " ml/min/1.73^2"
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-50.0
y	-80.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Group: GFRRateSliderGroup

Description: changes the current GFR

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	870.0
y	210.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false
Description	
Description	changes the current GFR

Text: text51

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	min
Dynamic: Text	RateSlider.getMin()
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-130.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text52

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	max
Dynamic: Text	RateSlider.getMax()
Appearance	
Color	black
Alignment	RIGHT
Position and size	
x	120.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text53

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	

Name	Value
Text	value
Dynamic: Text	RateSlider.getValue()
Appearance	
Color	black
Alignment	CENTER
Position and size	
x	-5.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: GFR1

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-120.0
y	-30.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
On click	if(GlomerularFiltrationRate1.isVisible()) GlomerularFiltrationRate1.setVisible(false); else GlomerularFiltrationRate1.setVisible(true);
Show name	false

Text: GlomerularFiltrationRate1

Name	Value
General	
Show at runtime	false
Lock	false
Public	true
Text	
Text	- Glomerular Filtration Rate
Appearance	
Color	black
Alignment	LEFT

Name	Value
Position and size	
x	-90.0
y	-30.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Slider: RateSlider

Name	Value
General	
Enabled	true
Default value	95
Step	1
Maximum value	100
Minimum value	10
Link to	false
Orientation	Horizontal
Lock	false
Public	true
Action	
Action	patient.gfr = value; setProgRate();
Position and size	
x	-130.0
Width	250.0
y	-20.0
Height	30.0
Advanced	
Show name	false

Group: groupLogicMenu

Description: allows user to change view in simulation. buttons are coded on click

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	0.0
y	720.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only

Name	Value
Show name	false
Description	
Description	allows user to change view in simulation. buttons are coded on click

Rectangle: rectangle48

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	690.0
Width	170.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	navigate(viewProg);
Show name	false

Rectangle: rectangle50

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(136, 199, 217)
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	860.0
Width	100.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0

Name	Value
Advanced	
On click	navigate(viewLogic);
Show name	false

Rectangle: rectangle51

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	0.0
Width	690.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show name	false

Text: text86

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Progression
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	710.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text88

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	CKD Main Logic
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	34.114
y	16.224
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text89

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Logic
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	880.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Rectangle: rectangle52

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Dynamic: Fill Color	selectedViewArea == patient.viewPatient ? new Color(136, 199, 217) : lightBlue
Line color	new Color(136, 199, 217)

Name	Value
Line width	1.0
Line style	SOLID
Position and size	
x	960.0
Width	109.774
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	navigate(patient.viewPatient);
Show name	false

Text: text90

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Patient
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	980.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Group: groupMainMenu

Description: allows user to change view in simulation. 'buttons' are coded onClick to call navigate

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	0.0
y	0.0
z	0.0
Rotation	0.0
Advanced	

Name	Value
Show in	2D only
Show name	false
Description	
Description	allows user to change view in simulation. 'buttons' are coded onClick to call navigate

Rectangle: rectangle58

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(136, 199, 217)
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	660.0
Width	170.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	navigate(viewProg);
Show name	false

Rectangle: rectangle59

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	830.0
Width	100.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0

Name	Value
Rotation	0.0
Advanced	
On click	navigate(viewLogic);
Show name	false

Rectangle: rectangle60

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	0.0
Width	660.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show name	false

Text: text96

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Progression
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	680.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text99

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	CKD Progression
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	34.114
y	16.224
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text100

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Logic
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	850.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Rectangle: rectangle61

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Dynamic: Fill Color	selectedViewArea == patient.viewPatient ? new Color(136, 199, 217) : lightBlue
Line color	new Color(136, 199, 217)

Name	Value
Line width	1.0
Line style	SOLID
Position and size	
x	930.0
Width	109.774
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	navigate(patient.viewPatient);
Show name	false

Text: text101

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Patient
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	950.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Group: ACRValSliderGroup

Description: changes acr and induces hrs for macro. and microalbuminuria

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	870.0
y	270.0
z	0.0
Rotation	0.0
Advanced	

Name	Value
Show in	2D and 3D
Show name	false
Description	
Description	changes acr and induces hrs for macro. and microalbuminuria

Text: GFRRate2

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	ACR Value:
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-120.0
y	-30.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text69

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	min
Dynamic: Text	ACRValSlider.getMin()
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-130.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text70

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	max
Dynamic: Text	ACRValSlider.getMax()
Appearance	
Color	black
Alignment	RIGHT
Position and size	
x	120.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Text: text71

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	value
Dynamic: Text	ACRValSlider.getValue()
Appearance	
Color	black
Alignment	CENTER
Position and size	
x	-5.0
y	10.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Slider: ACRValSlider

Name	Value
General	
Enabled	true
Default value	0
Step	2

Name	Value
Maximum value	310
Minimum value	0
Link to	false
Orientation	Horizontal
Lock	false
Public	true
Action	
Action	setProgRate();
Position and size	
x	-130.0
Width	250.0
y	-20.0
Height	30.0
Advanced	
Show name	false

Group: CKDStageGroup

Description: displays currentckd stage (1-5). Based off of patient.gfr

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	220.0
y	460.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false
Description	
Description	displays currentckd stage (1-5). Based off of patient.gfr

Text: text28

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Current CKD Stage:
Appearance	
Color	black
Alignment	LEFT

Name	Value
Position and size	
x	-150.0
y	-10.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text32

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Stage _ Kidney Disease
Dynamic: Text	setStage()
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	0.0
y	-10.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Group: HazardRatioGroup

Description: Displays the average of all the current active hazard ratios

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	200.0
y	420.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false
Description	
Description	Displays the average of all the current active hazard ratios

Text: text15

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Current Hazard Ratio:
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-130.0
y	0.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text16

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	hazard number
Dynamic: Text	progressionRate //setCumHR() // multiplies the hrs
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	30.0
y	0.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Group: ProgressMessGroup

Description: displays a message based off of how severe the progressionRate is

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false

Name	Value
Public	true
Position and size	
x	820.0
y	320.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false
Description	
Description	displays a message based off of how severe the progressionRate is

Text: PatientProg1

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Patient Progression:
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	-80.0
y	-10.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: progression1

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Stable
Dynamic: Text	setProgressionMessage()
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	50.0
y	-10.0

Name	Value
z	0.0
Rotation	0.0
Advanced	
Show name	false

Group: DiabetesGroup

Description: hr 3.34

Diabetes was the strongest predictor of incident CKD (hazard ratio, 1.96; 95% confidence interval, 1.84 to 2.09) and was associated with the greatest rate of decline in eGFR (-2.2 ml/min per 1.73 m(2) per year)

Induces Diabetes in the patient

Attached select bubbles only visible when checkbox is selected

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	810.0
y	440.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D and 3D
Show name	false
Description	
Description	<p>hr 3.34</p> <p>Diabetes was the strongest predictor of incident CKD (hazard ratio, 1.96; 95% confidence interval, 1.84 to 2.09) and was associated with the greatest rate of decline in eGFR (-2.2 ml/min per 1.73 m(2) per year)</p> <p>Induces Diabetes in the patient</p> <p>Attached select bubbles only visible when checkbox is selected</p>

Check Box: DiabetesBox

Name	Value
General	
Enabled	true
Link to	false
Label text	Diabetes
Lock	false
Public	true
Position and size	
x	-70.0
Width	100.0
y	-40.0
Height	30.0
Advanced	
Show name	false

Radio Buttons: DiabetesRadio

Description: female 3.34
male 2.84

Name	Value
General	
Enabled	true
Link to	false
String values	female, male
Orientation	Vertical
Lock	false
Public	true
Action	
Action	setProgRate()
Position and size	
x	-50.0
Width	110.0
y	-10.0
Height	50.0
Advanced	
Dynamic: Visible	DiabetesBox.isSelected()
Show name	false
Description	
Description	female 3.34 male 2.84

View Area: viewLogic

Name	Value
General	
Show name	false
Position and size	
x	0.0
Width	1070.0
y	720.0
Height	770.0

View Area: viewProg

Name	Value
General	
Show name	false
Position and size	
x	0.0
Width	1040.0
y	0.0
Height	600.0

Check Box: MicroscopicHaematuriaBox

Description: hr 2.07

red blood cells in your urine.
Induces MH in the patient

Name	Value
General	
Enabled	true
Link to	false
Label text	Microscopic Haematuria
Lock	false
Public	true
Action	
Action	setProgRate()
Position and size	
x	740.0
Width	190.0
y	370.0
Height	30.0
Advanced	
Show name	false
Embedded icon	false
Description	
Description	hr 2.07 red blood cells in your urine. Induces MH in the patient

Check Box: HypertensionBox

Description: induces hypertension HR in the patient

Name	Value
General	
Enabled	true
Link to	false
Label text	Hypertension
Lock	false
Public	true
Action	
Action	setProgRate()
Position and size	
x	740.0
Width	190.0
y	340.0
Height	30.0
Advanced	
Show name	false
Embedded icon	false
Description	
Description	induces hypertension HR in the patient

Link to agents: connections

Name	Value
General	

Name	Value
Show at runtime	true
Show name	true
Communication	
Message type	Object
Animation	
Draw line	false

Agent Type: Patient

Name	Value
Agent in flowcharts	
Use in flowcharts as	Agent
Dimensions and movement	
Speed	(10 : MPS)
Rotate animation towards movement	true
Rotate vertically as well (along Z-axis)	false
Space and network	
Space Type	Continuous
Advanced Java	
Generic	false
Advanced	
Logging	true
Auto-create datasets	true
AOC_DATASETS_UPDATE_TIME_PROPERTIES	- Recurring Event Properties
Limit the number of data samples	false

 main

 connections

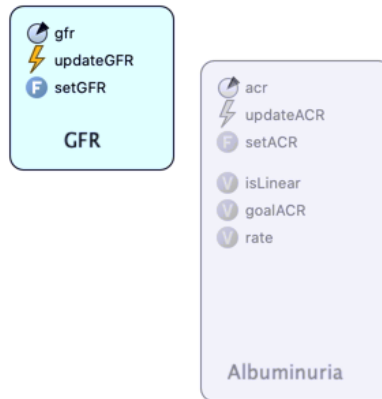
Predominance

CKD Patient Logic

Progression

Logic

Patient



Scale: scale

Name	Value
General	
Unit	meters
Scale	10.0
Type	Defined graphically
Length, pixels	100.0
Show at runtime	false
Lock	false
Public	false
Position and size	
x	0.0
y	-150.0
Rotation	0.0

Parameter: gfr

Description: descriptions for ef variables from
<https://my.clevelandclinic.org/health/articles/16950-ejection-fraction>

Name	Value
General	
Array	false

Name	Value
Default value	94
Type	double
Show at runtime	true
Show name	true
Value editor	
Editor control	Text
Advanced	
System dynamics units	false
Save in snapshot	true
Description	
Description	descriptions for ef variables from https://my.clevelandclinic.org/health/articles/16950-ejection-fraction

Function: setGFR

Name	Value
General	
Return type:	Just action (returns nothing)
Show at runtime	true
Show name	true
Function body	
Body	<pre>// based off of the value of the gfr slider, // change the gfr to be a val in the middle of // that GFR category if (n <= 1) // 0 and 1 normal at >= 90 gfr = 94; else if (n < 3) // 2 Mildly decreased at 60-89 gfr = 80; else if (n < 4) // 3a mild-mod dec at 45-59 gfr = 50; else if (n < 5) // 3b mod-sev dec at 30-44 gfr = 38; else if (n < 6) // 4 sev dec at 15-29 gfr = 20; else //6 // 5 esrd/ kidney failure at <15 gfr = 12;</pre>
Advanced	
Access type	default
System dynamics units	false

Arguments:

Name	Type
n	double

Event: updateGFR

Name	Value
General	
Logging	true
EVENT_TIMEOUT_PROPERTIES	- Recurring Event Properties

Name	Value
Mode	Cyclic
Trigger type	Timeout
Show at runtime	true
Show name	true
Action	
Action	//gfr -= main.gfrRate; gfr -= main.progressionRate; main.setProgRate();

Rounded Rectangle: roundRectangle1

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Appearance	
Fill color	lightCyan
Line color	black
Line width	1.0
Line style	SOLID
Position and size	
x	390.0
Width	120.0
y	160.0
Height	120.0
Rotation	0.0
Radius	10.0
Advanced	
Show name	false

Text: text37

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Text	
Text	GFR
Appearance	
Color	black
Alignment	LEFT
Position and size	
x	430.0
y	250.0

Name	Value
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false

Group: groupLogicMenu

Description: allows user to change view in simulation. buttons are coded on click

Name	Value
General	
Show at runtime	true
Lock	false
Embedded icon	false
Public	true
Position and size	
x	0.0
y	0.0
z	0.0
Rotation	0.0
Advanced	
Show in	2D only
Show name	false
Description	
Description	allows user to change view in simulation. buttons are coded on click

Rectangle: rectangle48

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	660.0
Width	170.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	main.navigate(main.viewProg);

Name	Value
Show name	false

Rectangle: rectangle50

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	new Color(136, 199, 217)
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	830.0
Width	100.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	main.navigate(main.viewLogic);
Show name	false

Rectangle: rectangle51

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	0.0
Width	660.0
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
Show name	false

Text: text86

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Progression
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	680.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text88

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	CKD Patient Logic
Appearance	
Color	darkGray
Alignment	LEFT
Position and size	
x	34.114
y	16.224
z	0.0
Rotation	0.0
Advanced	
Show name	false

Text: text89

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Logic
Appearance	

Name	Value
Color	darkGray
Alignment	LEFT
Position and size	
x	850.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

Rectangle: rectangle52

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Appearance	
Fill color	lightBlue
Dynamic: Fill Color	main.selectedViewArea == viewPatient ? new Color(136, 199, 217) : lightBlue
Line color	new Color(136, 199, 217)
Line width	1.0
Line style	SOLID
Position and size	
x	930.0
Width	109.774
y	0.0
Height	60.0
z	0.0
Z-Height	10.0
Rotation	0.0
Advanced	
On click	main.navigate(viewPatient);
Show name	false

Text: text90

Name	Value
General	
Show at runtime	true
Lock	false
Public	true
Text	
Text	Patient
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	

Name	Value
x	950.0
y	20.0
z	0.0
Rotation	0.0
Advanced	
Show name	false

View Area: viewPatient

Name	Value
General	
Show name	false
Position and size	
x	0.0
Width	1040.0
y	0.0
Height	600.0

Link to agents: connections

Name	Value
General	
Show at runtime	true
Show name	true
Communication	
Message type	Object
Animation	
Draw line	false

Simulation Experiment: Simulation

Name	Value
General	
Bypass Initial Simulation Screen	true
Maximum available memory	512
Agent type	Main
Model time	
Execution mode	Real time with scale
Real time scale	1.0
Stop option	Never
Initial time	0.0
Initial date	Tue Jul 20 00:00:00 GMT 2021
Randomness	
Random Number Generation Type	Fixed seed (reproducible simulation runs)
Seed value	1
Window	
Title	CKD Model : Simulation
Enable zoom and panning	false
Enable developer panel	true

Name	Value
Show developer panel on start	false
Advanced	
Load root from snapshot	false

CKD Model

Text: text

Name	Value
General	
Show at runtime	true
Lock	false
Text	
Text	CKD Model
Appearance	
Color	royalBlue
Alignment	LEFT
Position and size	
x	50.0
y	30.0
z	0.0
Rotation	0.0
Advanced	
Show name	false