Glucose and Lactate Concentrations in Plasma, Cerebrospinal Fluid and Brain Parenchyma Following Aneurysmal Subarachnoid Hemorrhage: A Cross-Compartmental Correlation Study

Supplemental material

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Sections 3, 4, and 5 present trajectories as well as scatterplots for individual patients. Within each (sub-)chapter, the first plot corresponds to the data of a single patient, the second plot to a different patient, and so forth.

1.Secondary hypothesis- exploration of the relationship between the concentrations

Only two hypoglycemic values occurred in the data and they could not be assigned to any brain parenchyma glucose value, so no hypoglycemia could be evaluated in the model. Therefore this group is missing.

Table 1B: Fixed effect, standard deviation of the random effects and residuals estimates derived by a mixed model regressing brain parenchyma glucose on plasma glucose with a slope break ((180/18.02) mmol/L) in plasma glucose.

	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	-0.3841	-0.6014	-0.1689	0.0011
Glucose Serum	0.1972	0.1647	0.2298	<0.001
Serum_Hyper	0.0003	-0.0501	0.0505	0.9898
2. Random Effects and Residuals				
sd residuals	0.3612	0.3515	0.3713	
sd intercept	0.5808	0.4221	0.7736	
sd Glucose Serum	0.0916	0.0695	0.1189	

Table 2B: Fixed effect, standard deviation of the random effects and residuals estimates derived by a mixed model regressing brain parenchyma lactate on plasma lactate with a slope break ((180/18.02) mmol/L) in plasma glucose.

	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	4.2677	3.1627	5.3798	<0.001
Laktat Serum	-0.0653	-1.2204	1.0788	0.9109
Serum_Hyper	0.0750	-0.0644	0.2142	0.2914
2. Random Effects and Residuals				
sd residuals	1.0731	1.0440	1.1031	
sd intercept	3.4381	2.7061	4.3621	
sd Laktat Serum	3.5267	2.7430	4.5079	

2. Results of sensitivity analysis

To assess the sensitivity of the models to outliers that were determined with the help of box plots, outlying glucose (plasma glucose ≥ 11.5 mmol/l, CSF glucose ≥ 6 mmol/l) and lactate (plasma lactate ≥ 2mmol/l, CSF lactate ≥ 6 mmol/l) data were removed and the new data set was used to estimate the regression parameters.

Table 3B: Fixed effect, standard deviation and correlation estimates derived by a univariable mixed model
regressing brain parenchyma glucose on CSF glucose excluding outliers (outlier: CSF glucose ≥ 6).

	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	0.0966	-0.3285	0.5428	0.6599
Glucose CSF	0.2390	0.1209	0.3522	<0.001
2. Random Effects and Residuals				
sd residuals	0.3716	0.3335	0.4169	
sd intercept	0.5696	0	1.1458	
sd Glucose CSF	0.1938	0.0293	0.3344	

Table 4B: Fixed effect, standard deviation and correlation estimates derived by a univariable mixed model
regressing brain parenchyma glucose on plasma glucose excluding outliers (outlier: plasma glucose ≥ 11.5).

	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	-0.4173	-0.6427	-0.1950	<0.001
Glucose Plasma	0.2018	0.1668	0.2370	<0.001
2. Random Effects and Residuals				
sd residuals	0.3568	0.3471	0.3669	
sd intercept	0.6145	0.4479	0.8169	
sd Glucose Plasma	0.1011	0.0767	0.1312	

Table 5B: Fixed effect, standard deviation and correlation estimates derived by a univariable mixed model regressing brain parenchyma lactate on CSF lactate excluding outliers (outlier: CSF lactate ≥ 6).

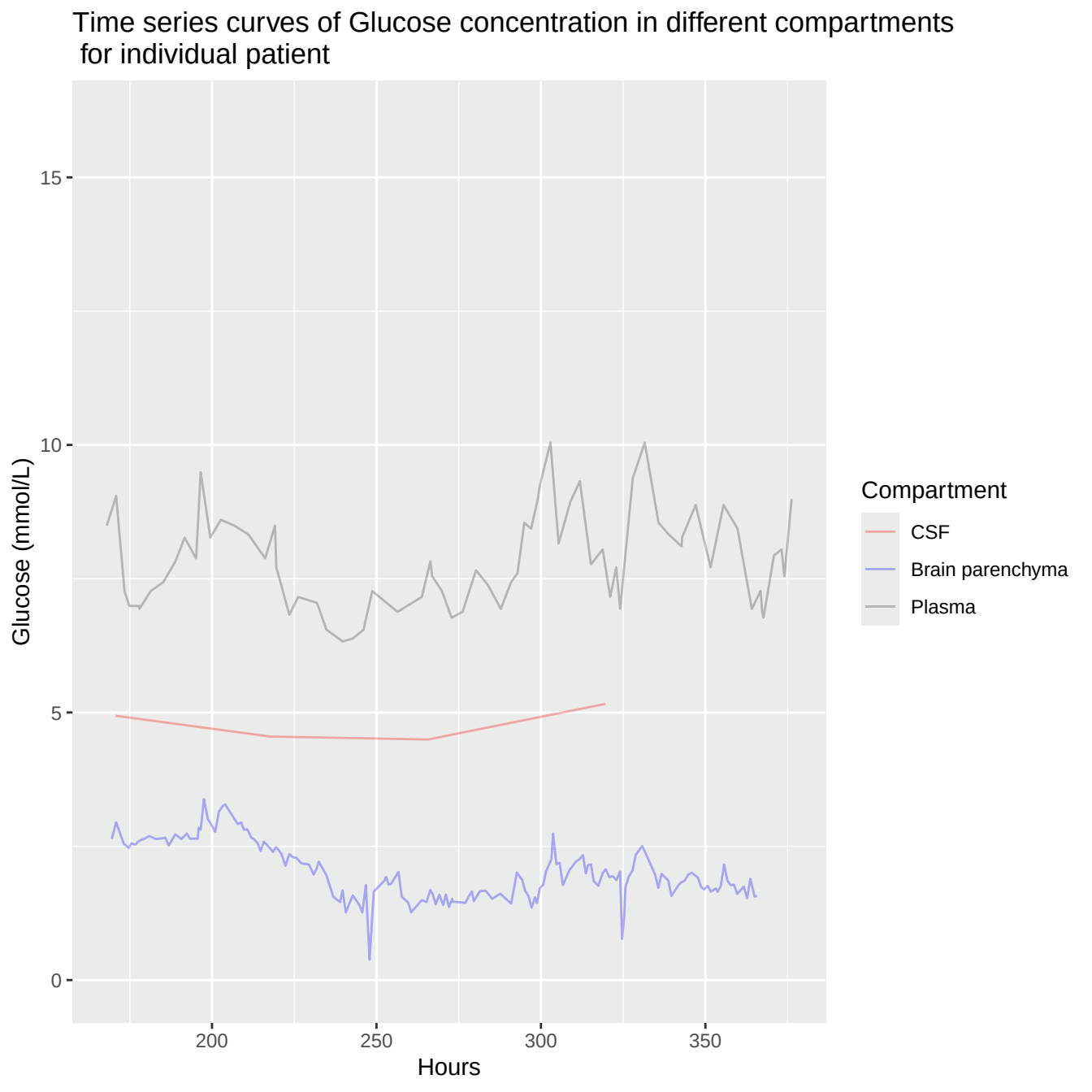
	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	2.7488	1.4226	4.0550	<0.001
Lactate CSF	0.3982	-0.0001	0.7877	0.0549
2. Random Effects and Residuals				
sd residuals	1.1120	0.9937	1.2579	
sd intercept	3.1114	1.4544	4.6669	
sd Lactate CSF	0.8894	0.4265	1.3213	

Table 6B: Fixed effect, standard deviation and correlation estimates derived by a univariable mixed model regressing brain parenchyma glucose on plasma lactate excluding outliers (outlier: plasma lactate ≥ 2).

	Estimates	**CI 2.5%**	**CI 97.5%**	**p-value**
1. Fixed Effects				
Intercept	4.1875	3.0602	5.3214	<0.001
Lactate Plasma	0.0236	-1.1502	1.1859	0.9682
2. Random Effects and Residuals				
sd residuals	1.0700	1.0406	1.1009	
sd intercept	3.5012	2.7571	4.4411	
sd Lactate Plasma	3.5799	2.7890	4.5724	

The sensitivity analyses support the main results. Only the connection between CSF and brain parenchyma lactate is slightly not significant anymore although the effect is slightly higher. This is due to the smaller sample size and still supports the results.

3. Trajectories of the glucose concentration in different compartments for individual patients


Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
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Hours
Compartment
CSF
Brain parenchyma
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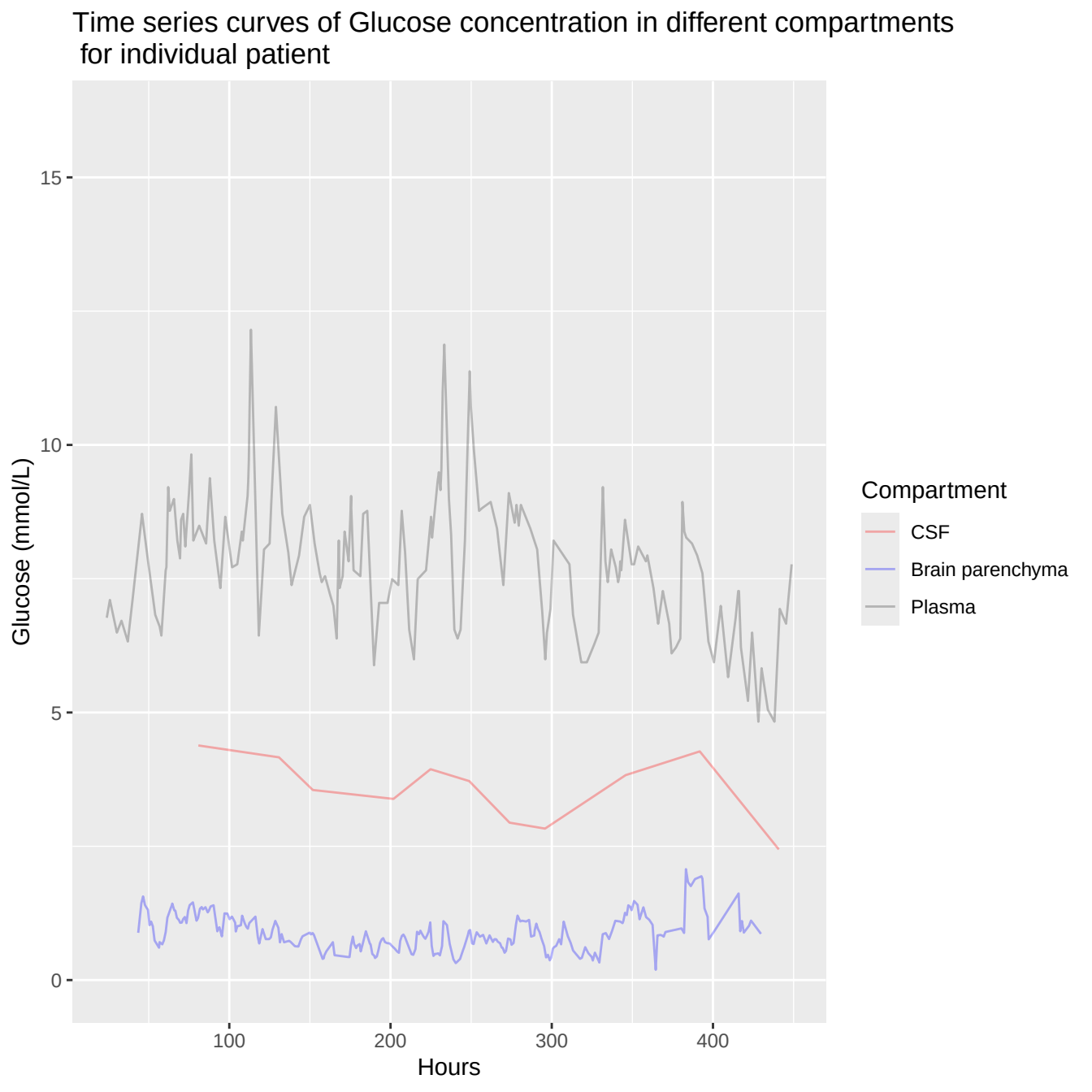
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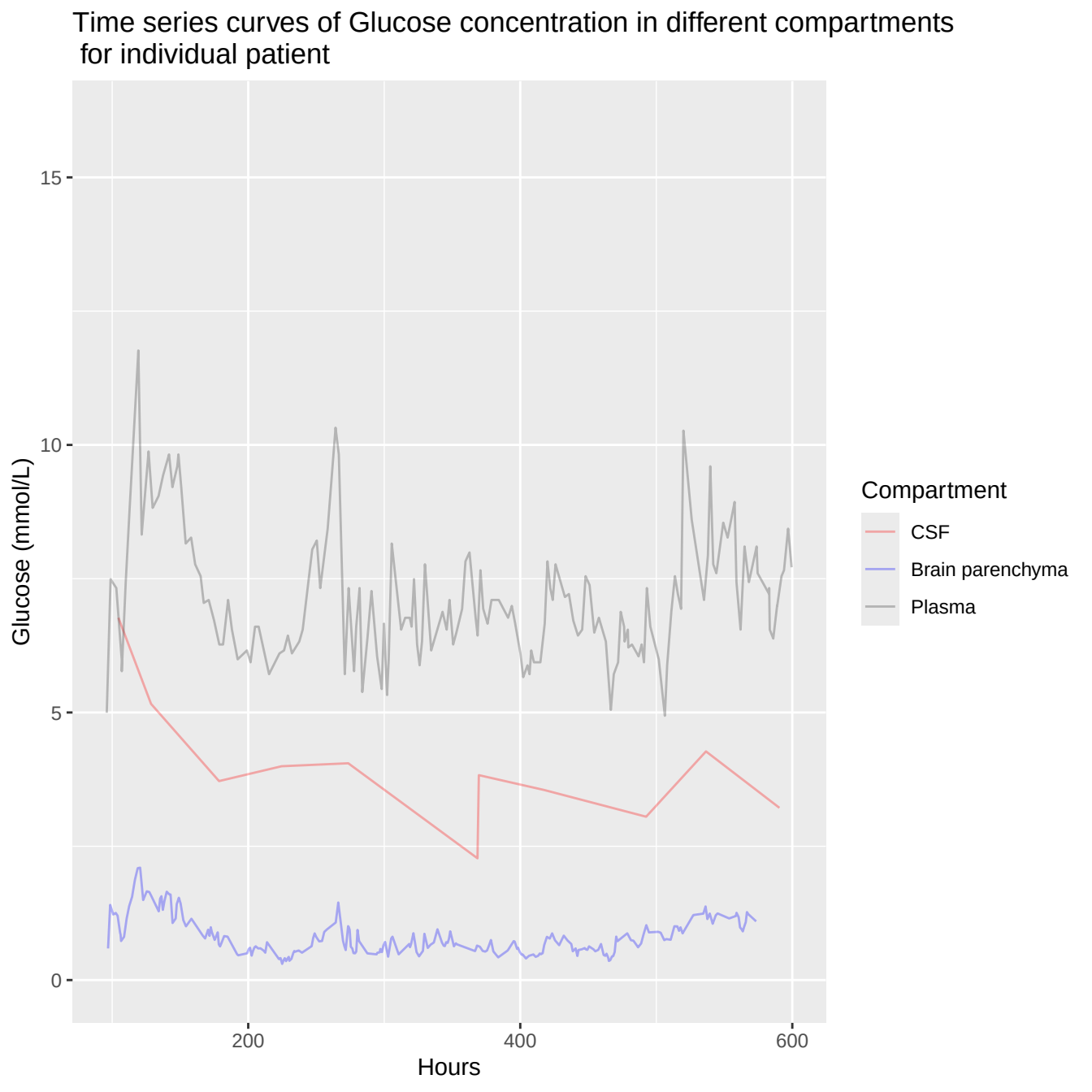
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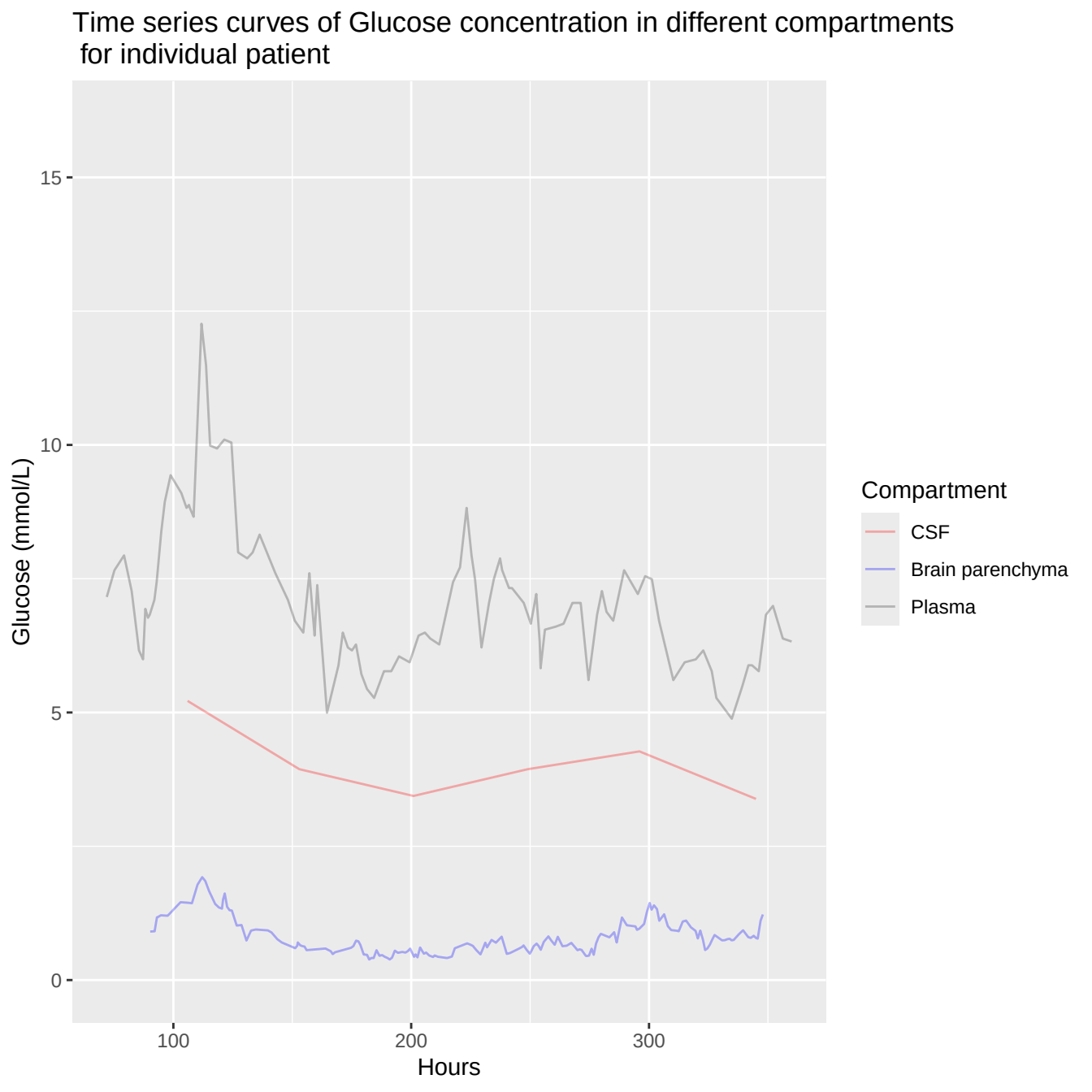
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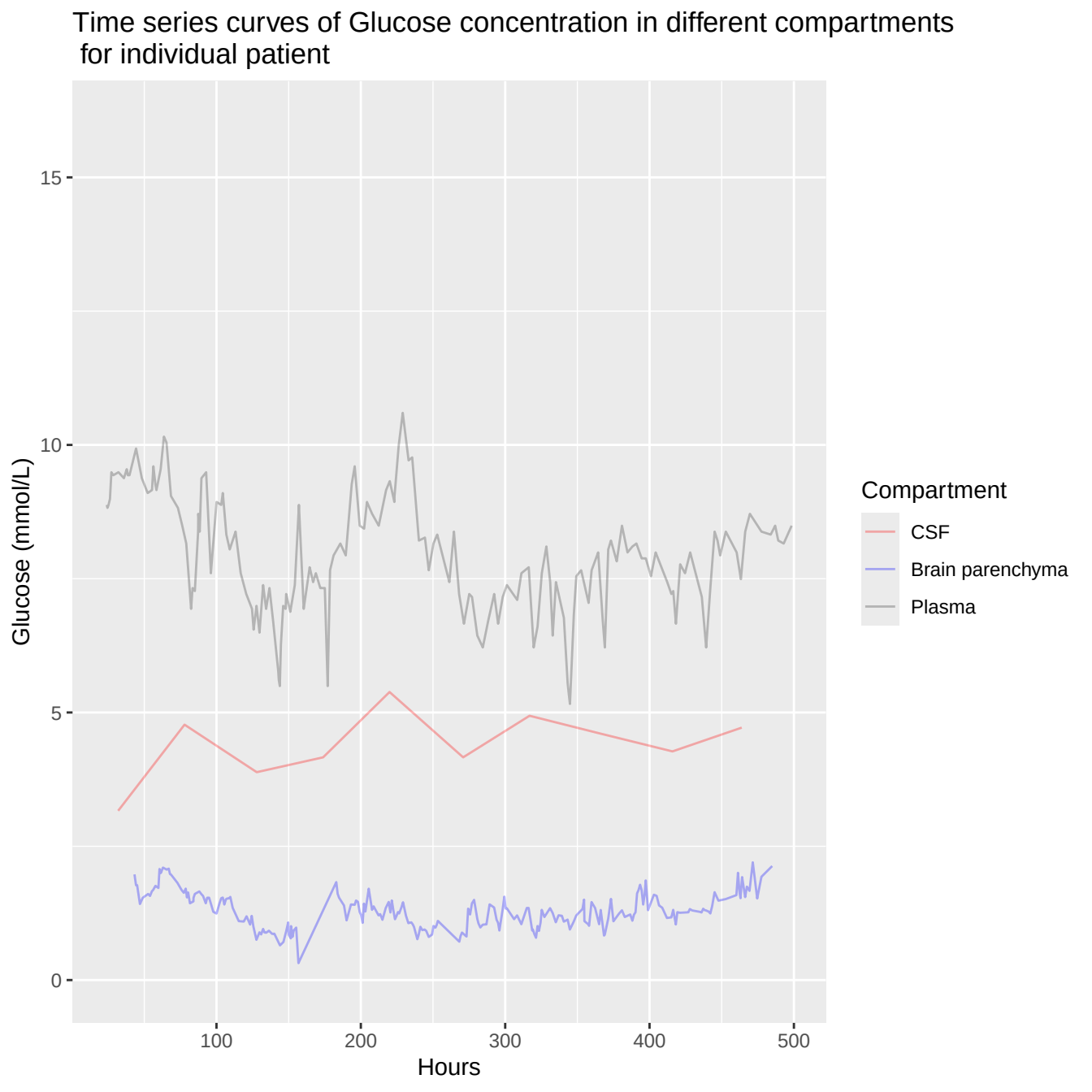
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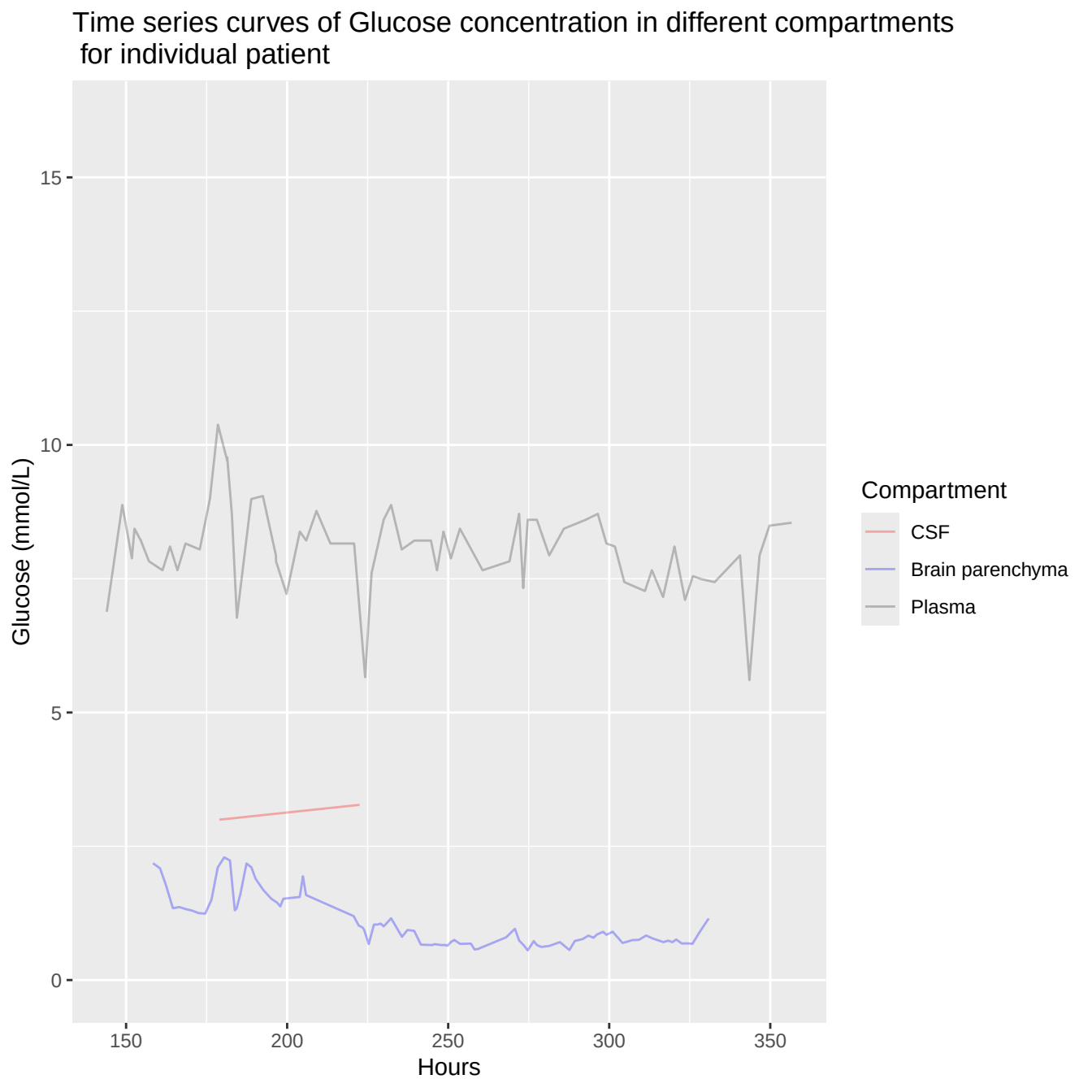
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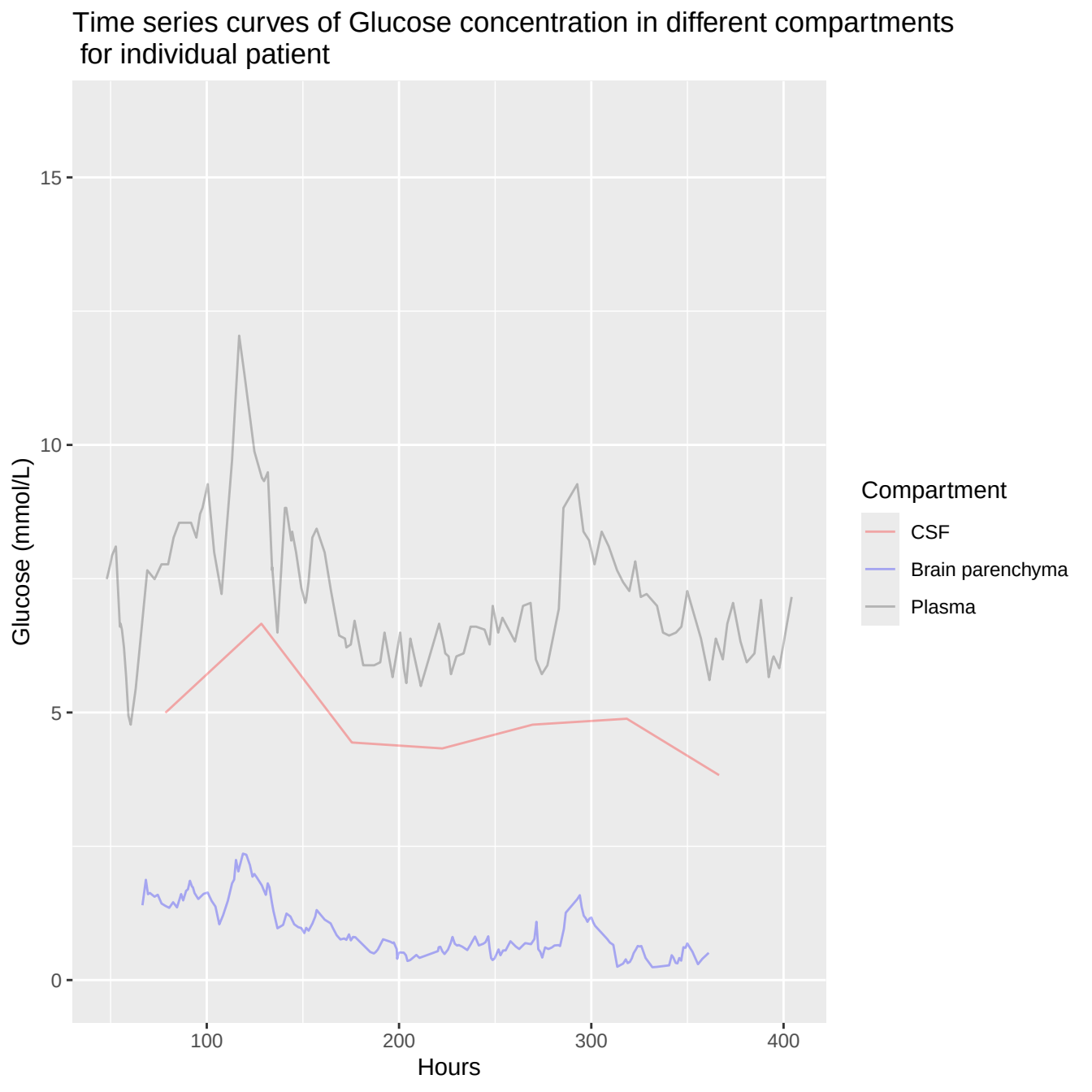
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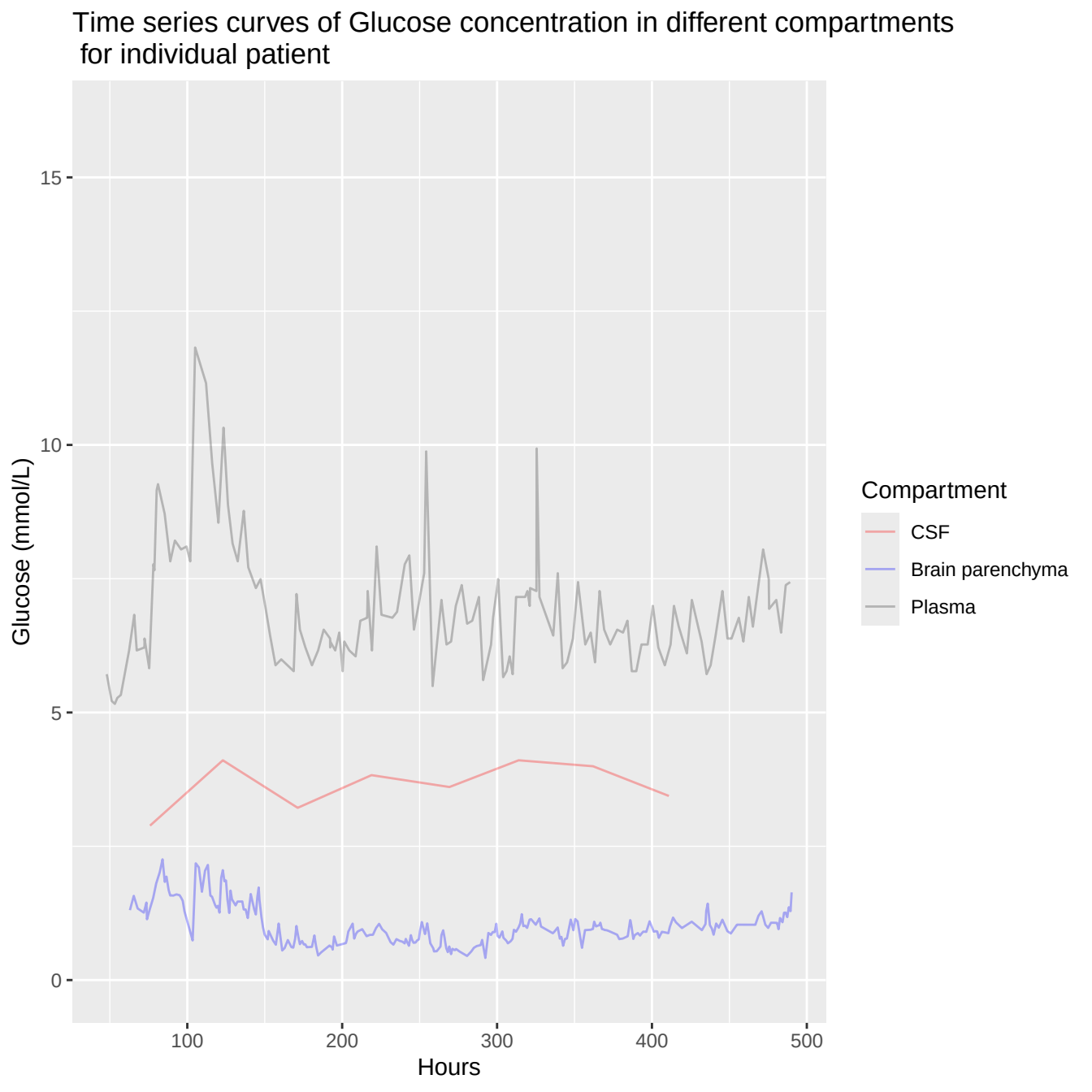
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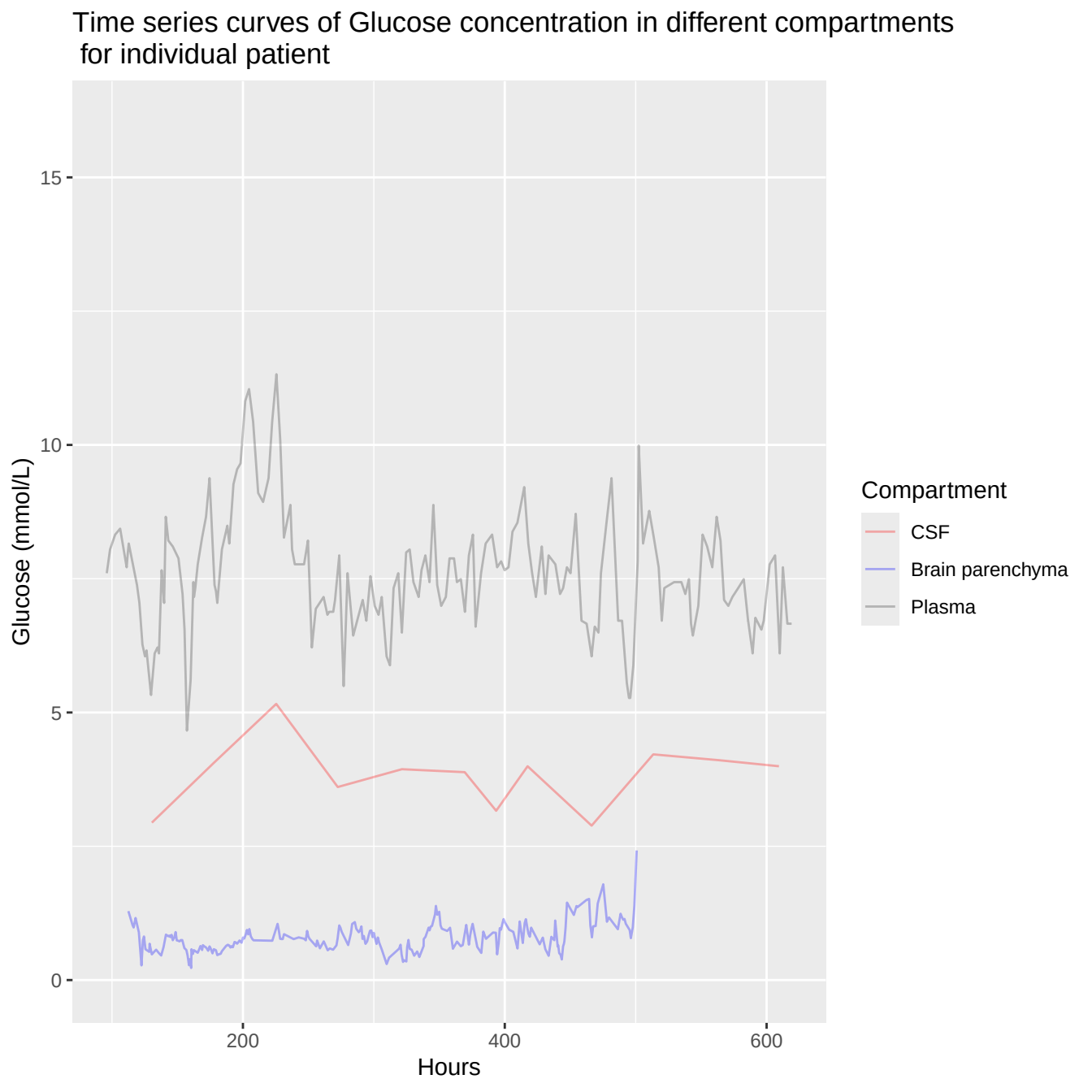
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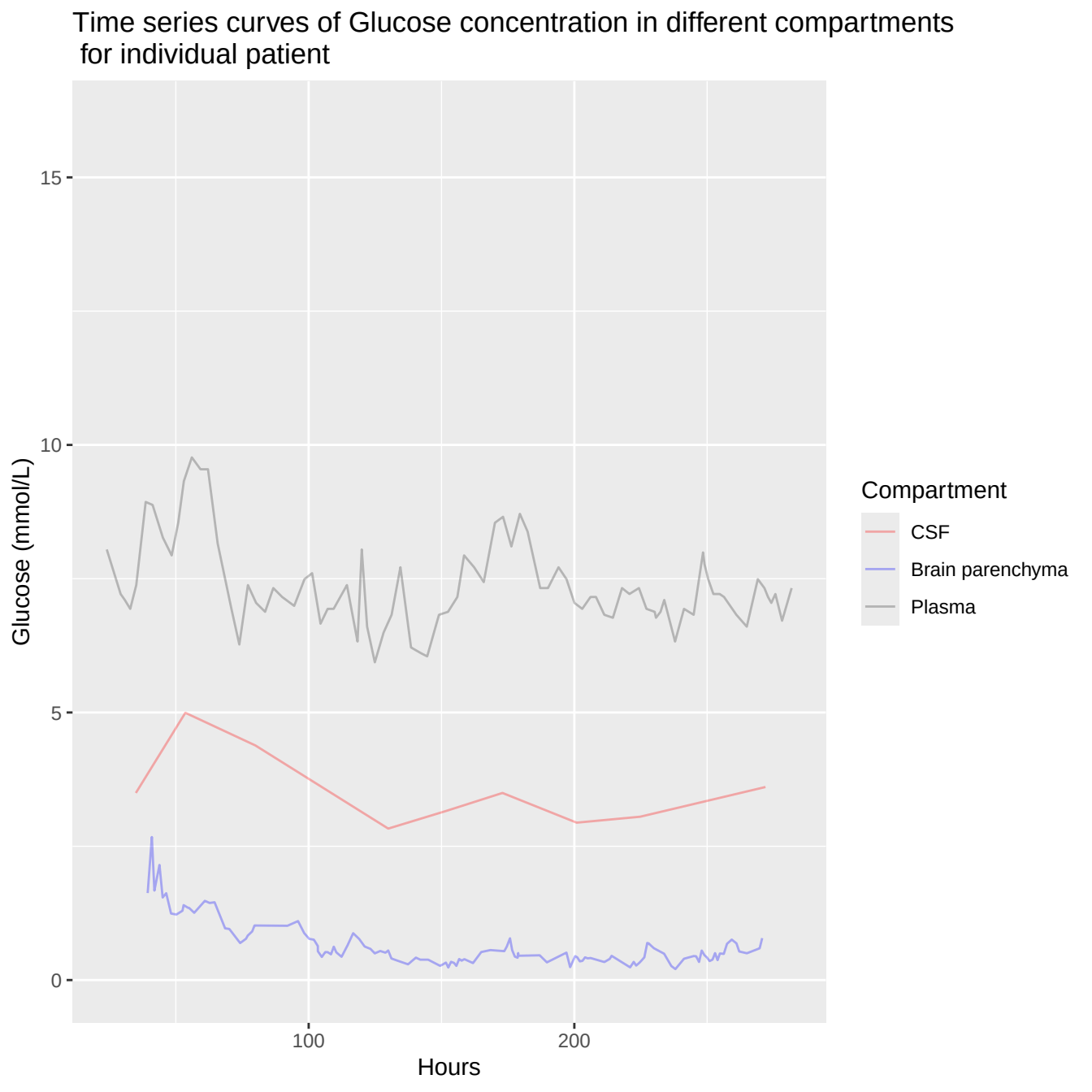
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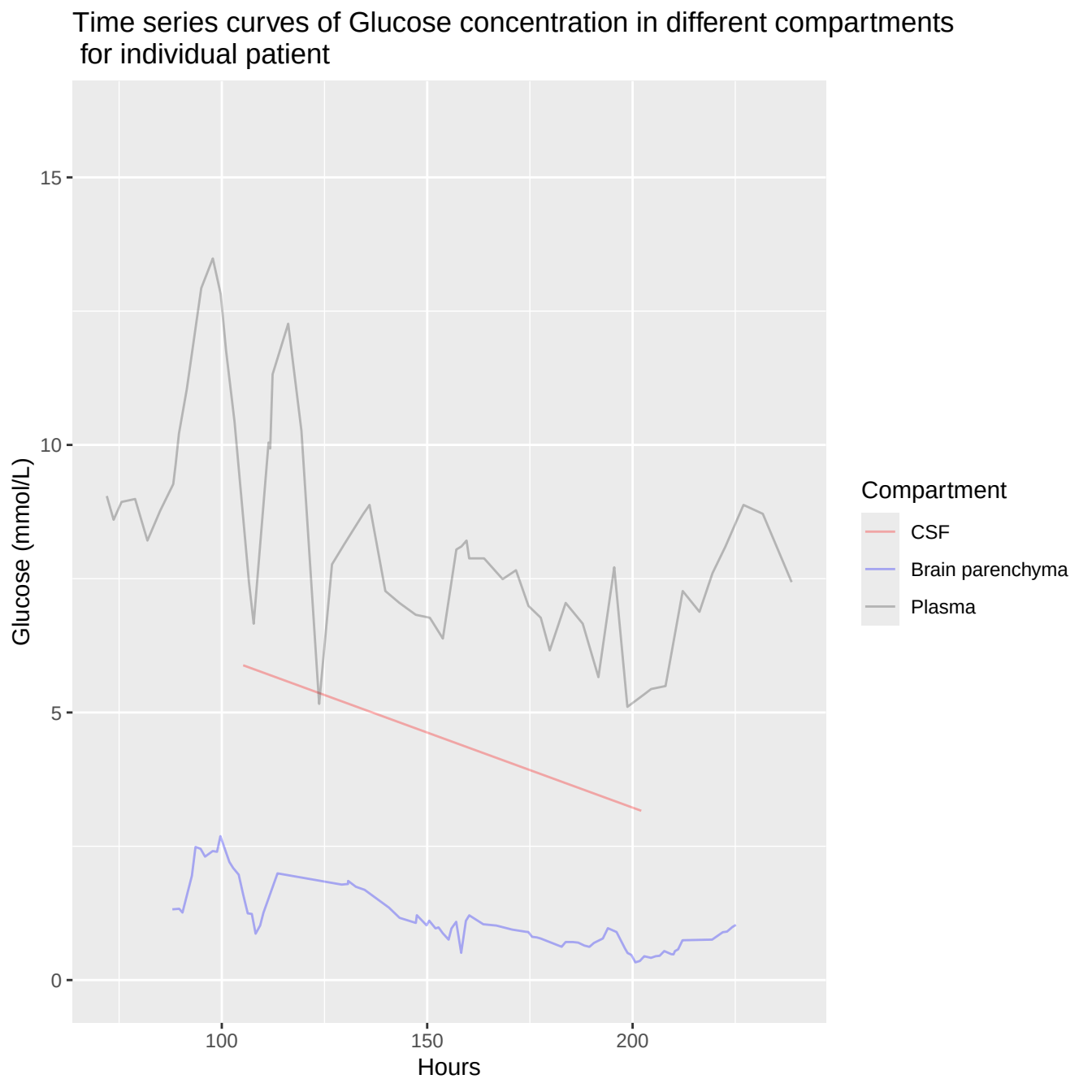
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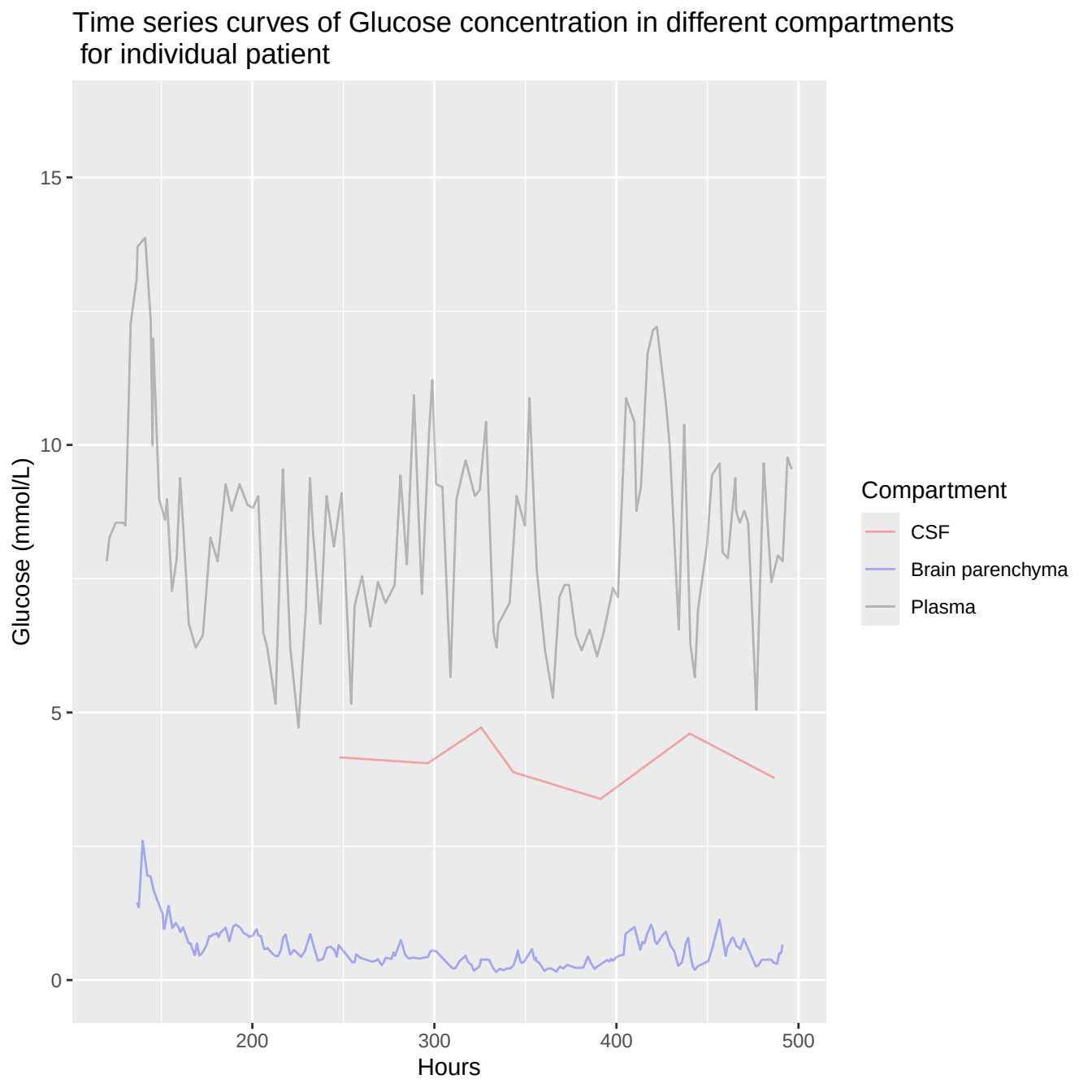
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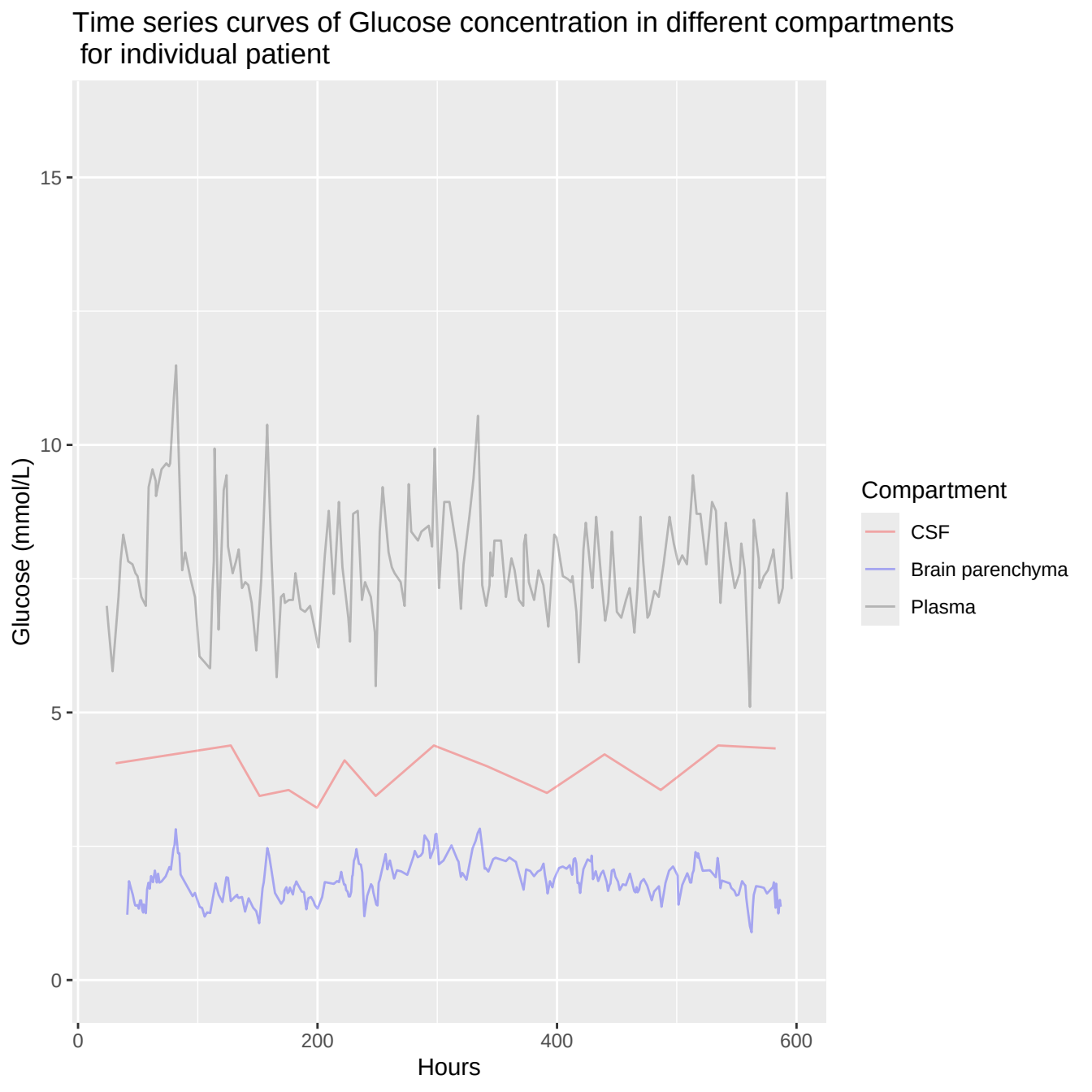
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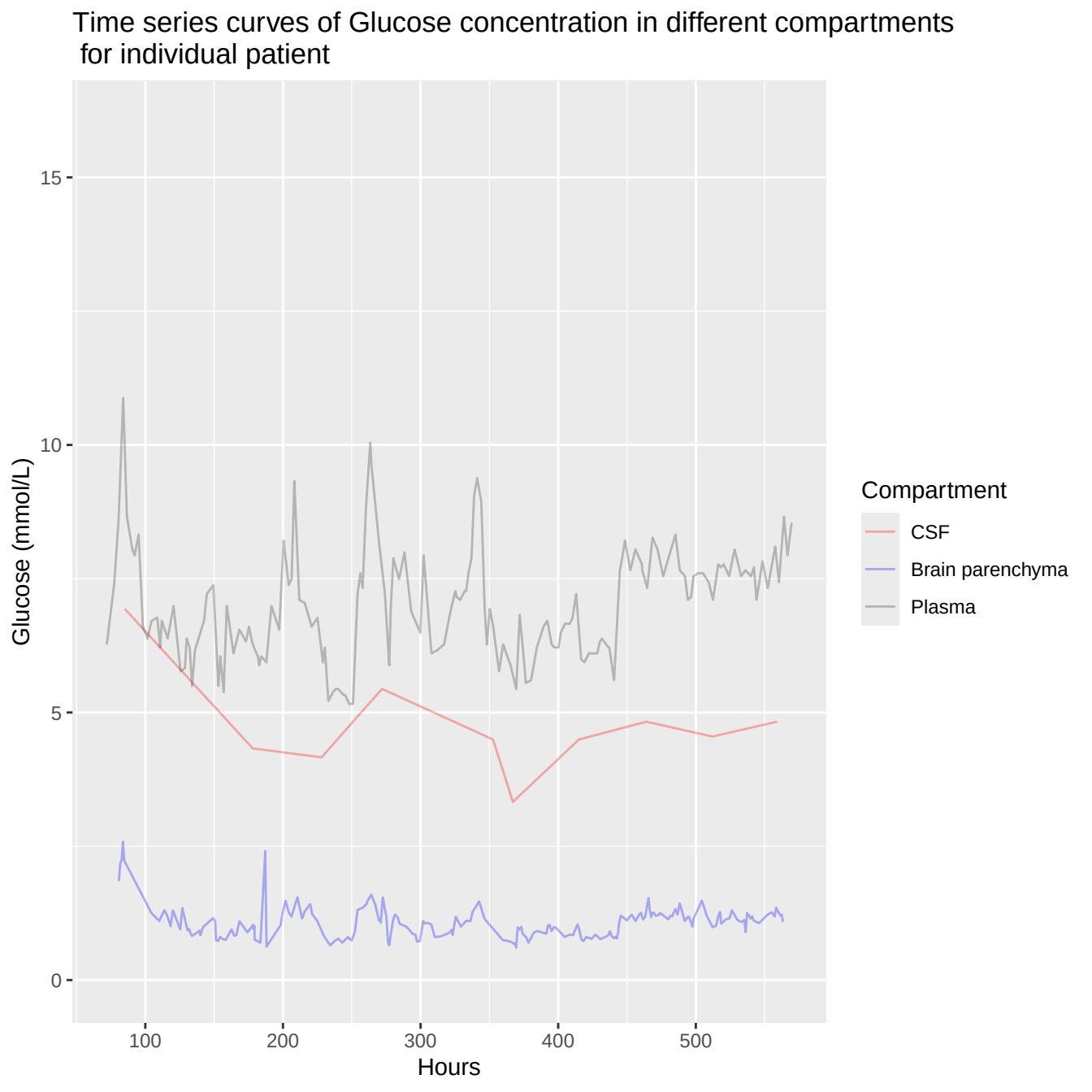
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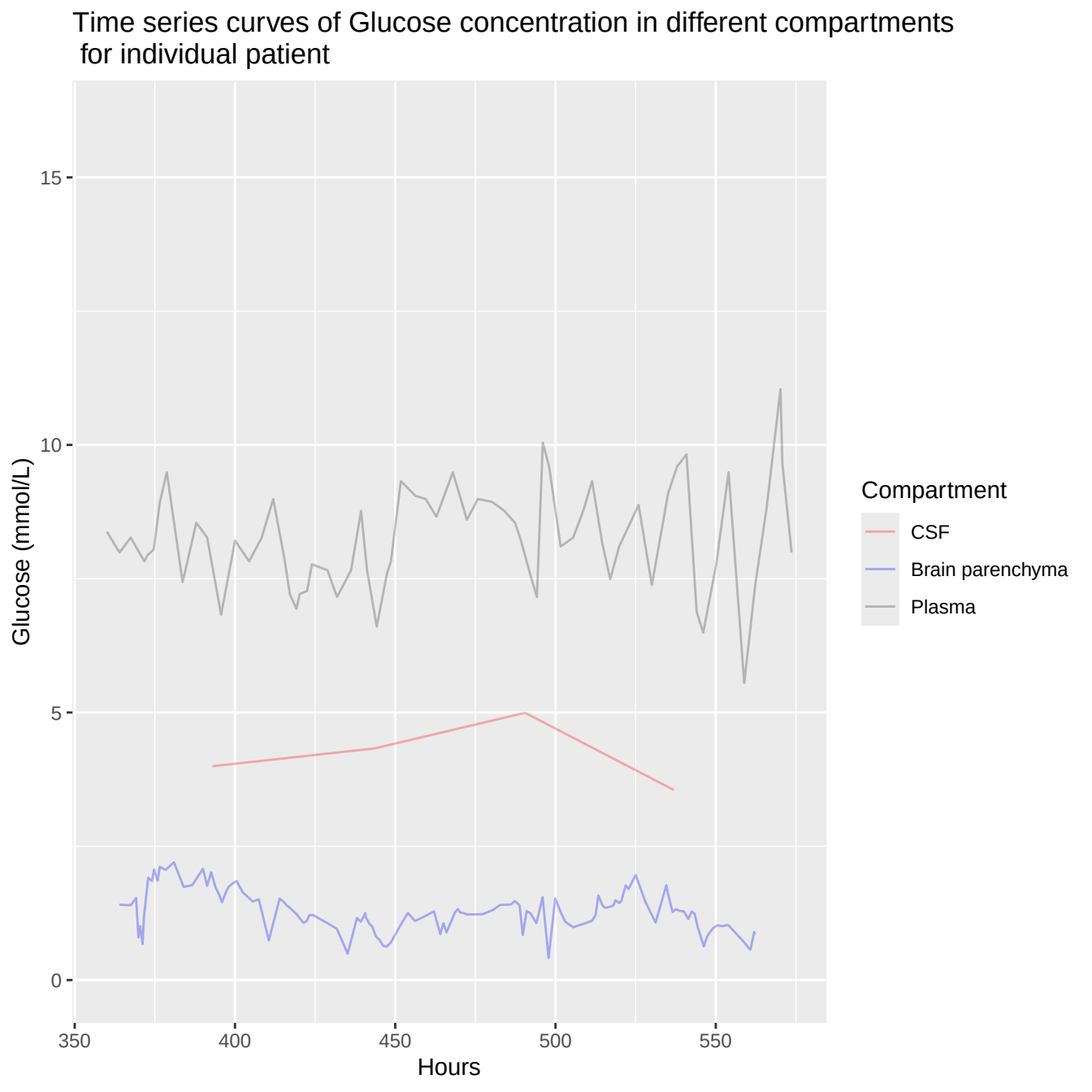
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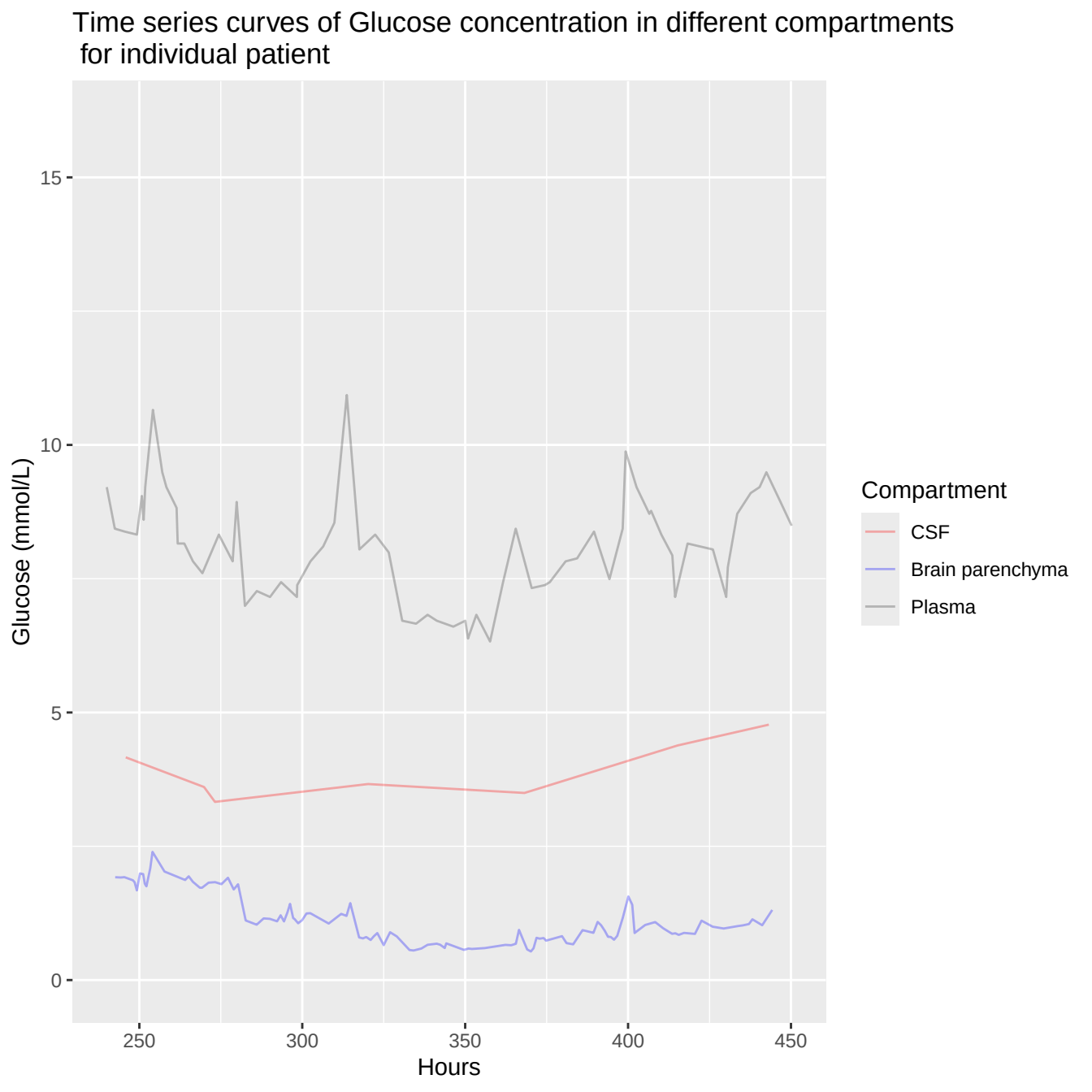
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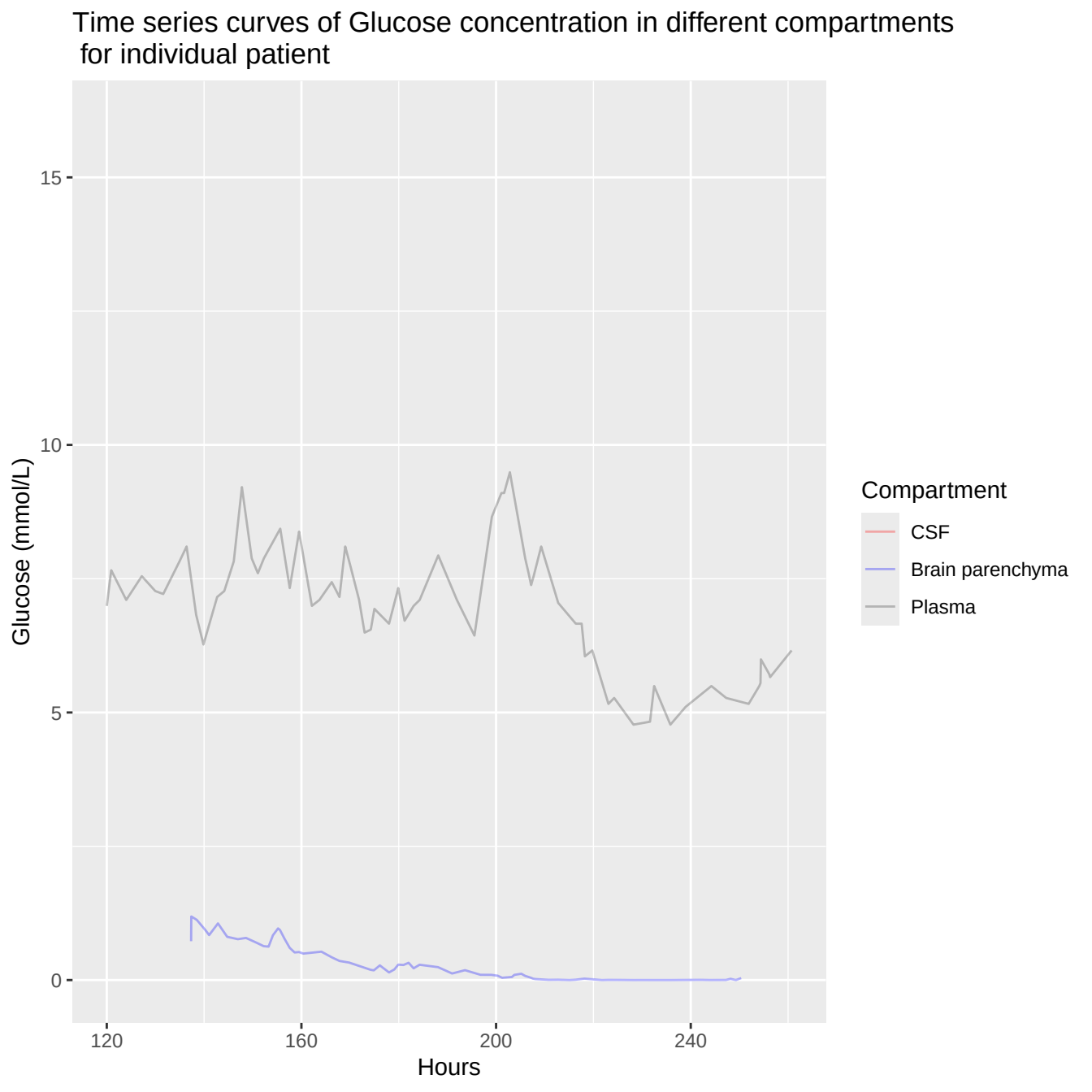
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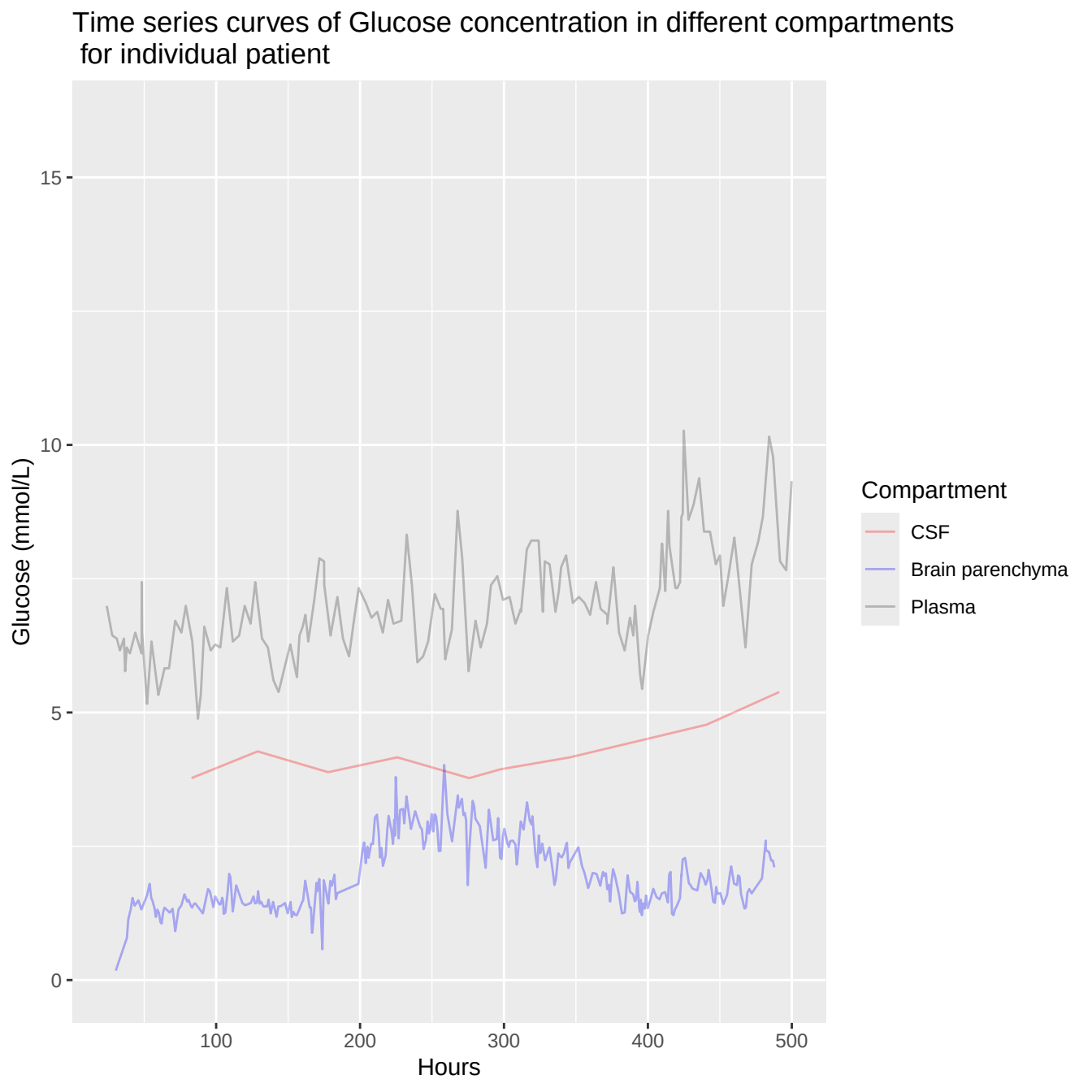
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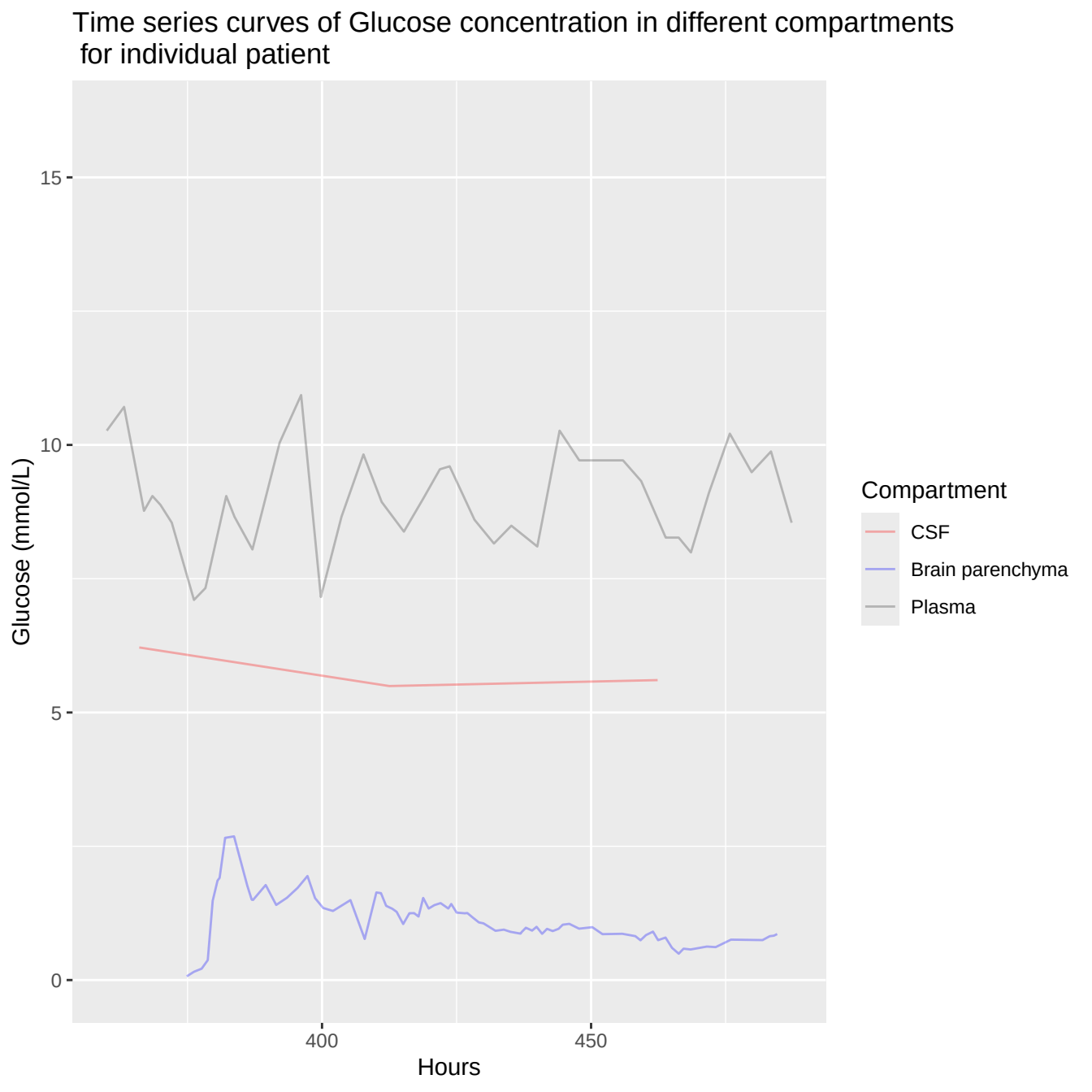
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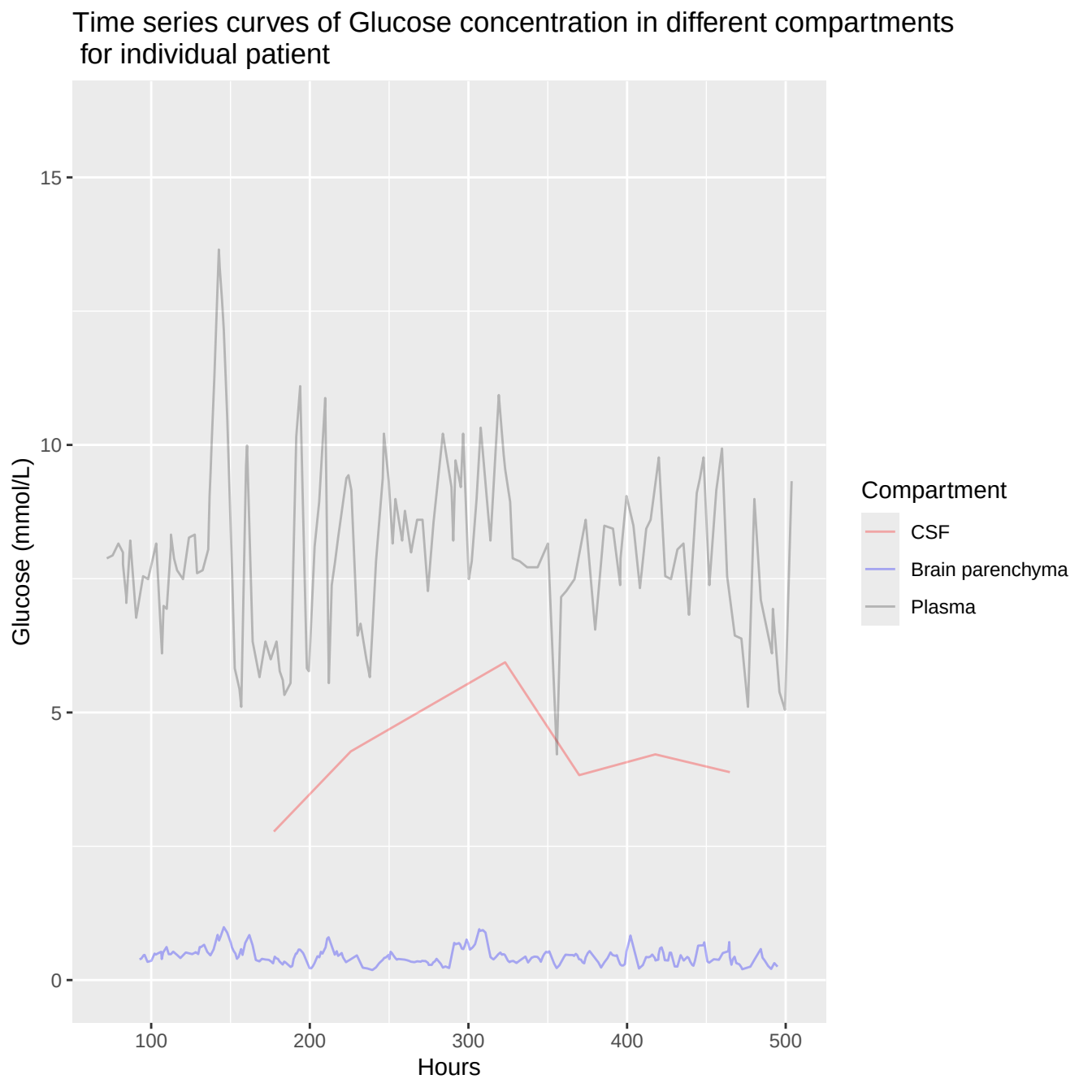
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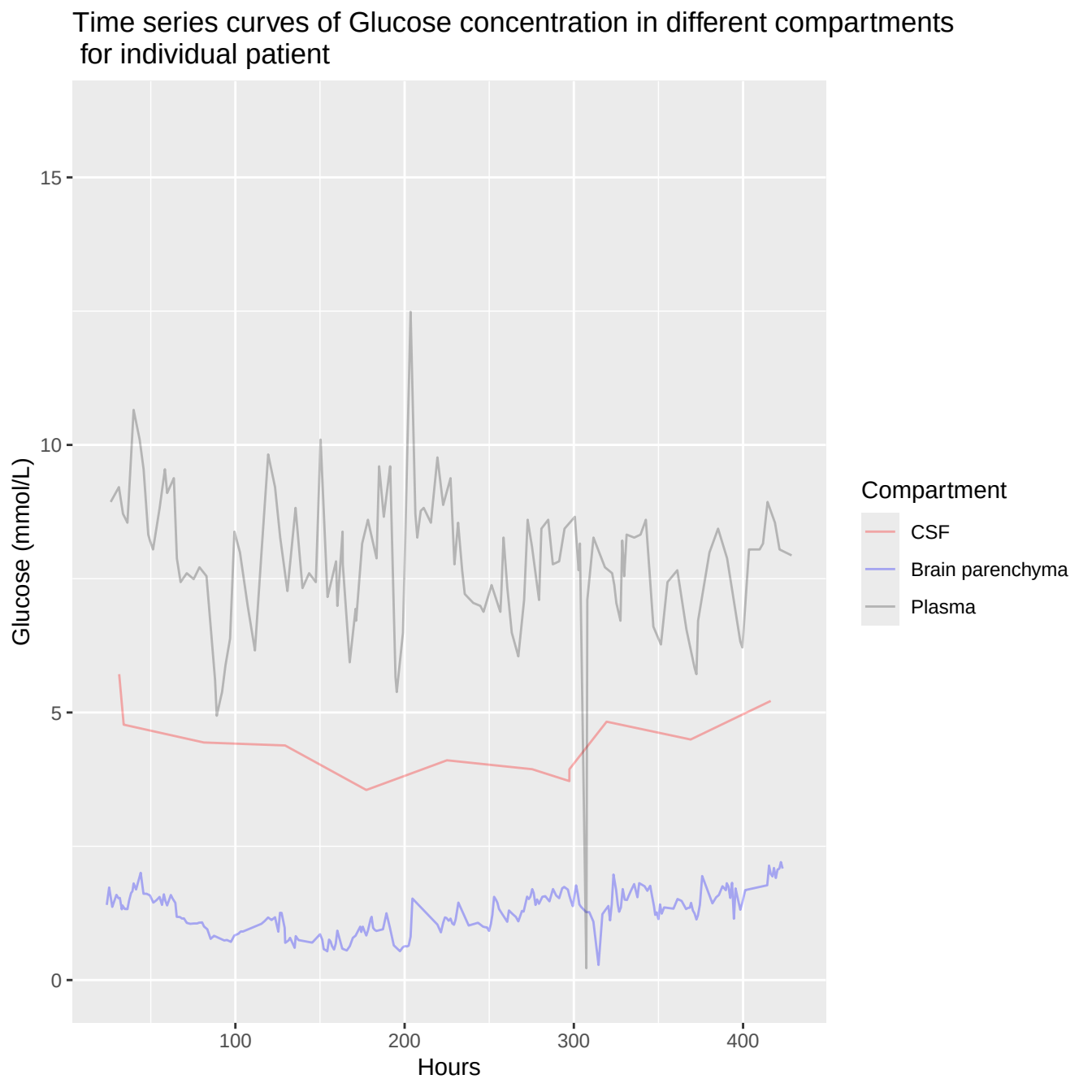
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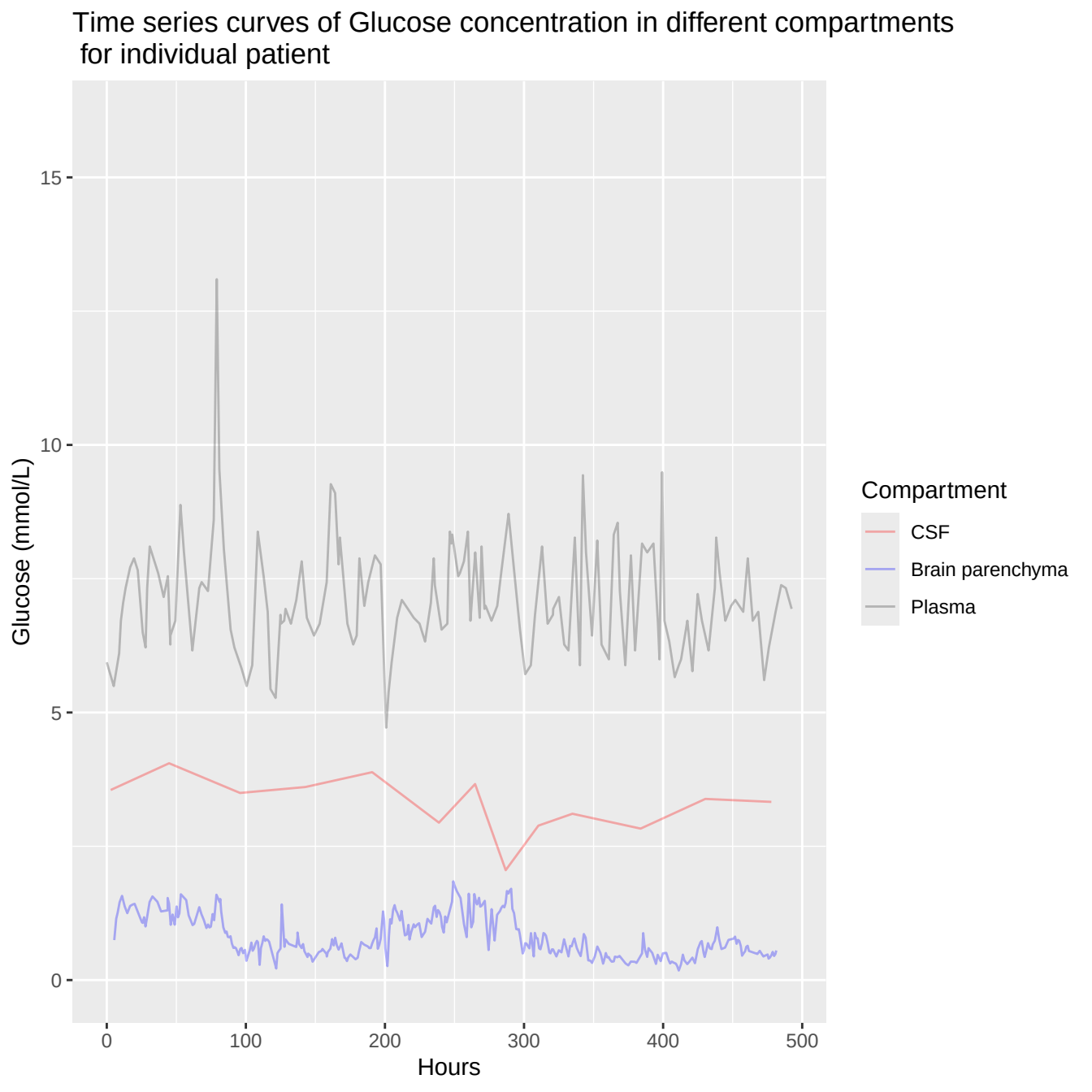
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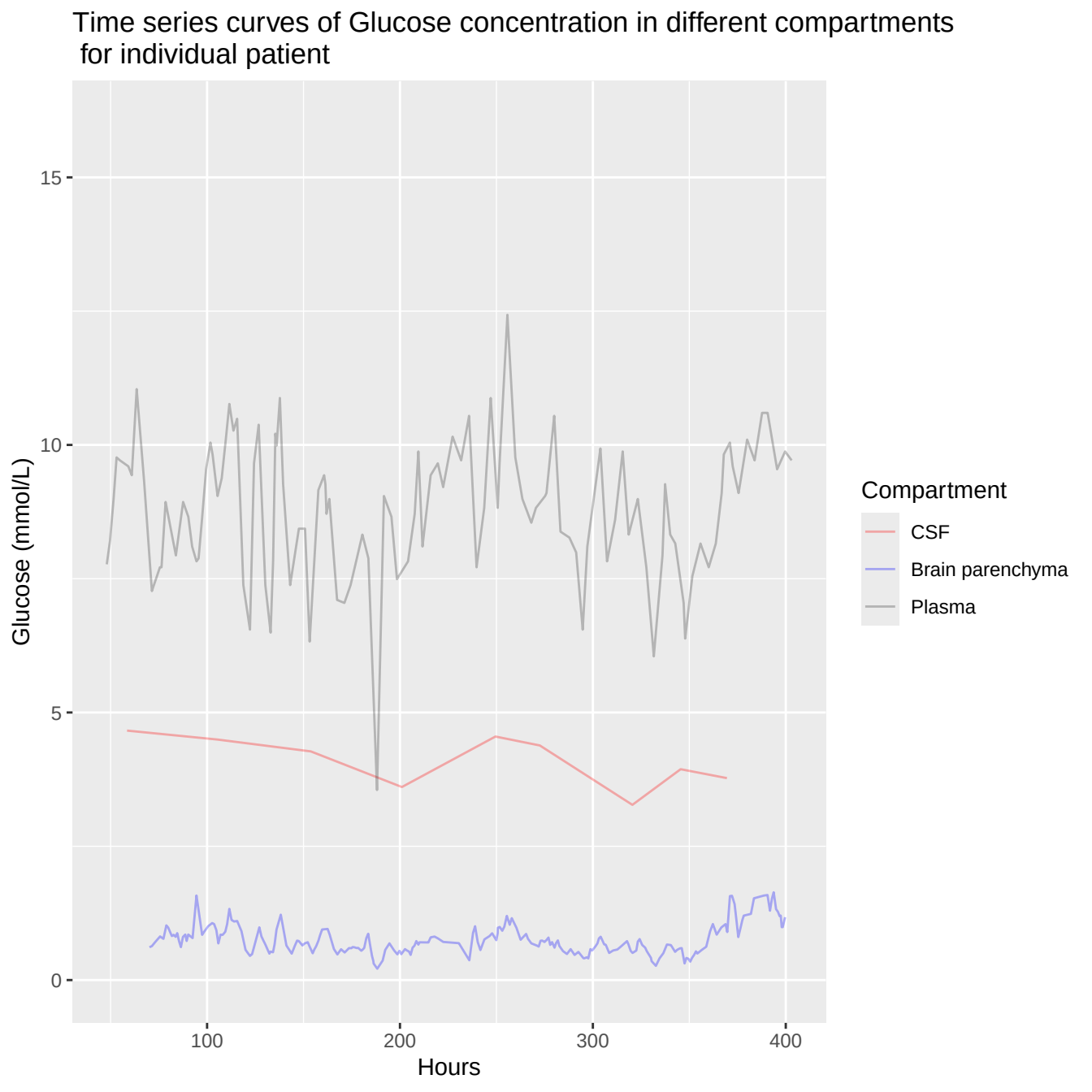
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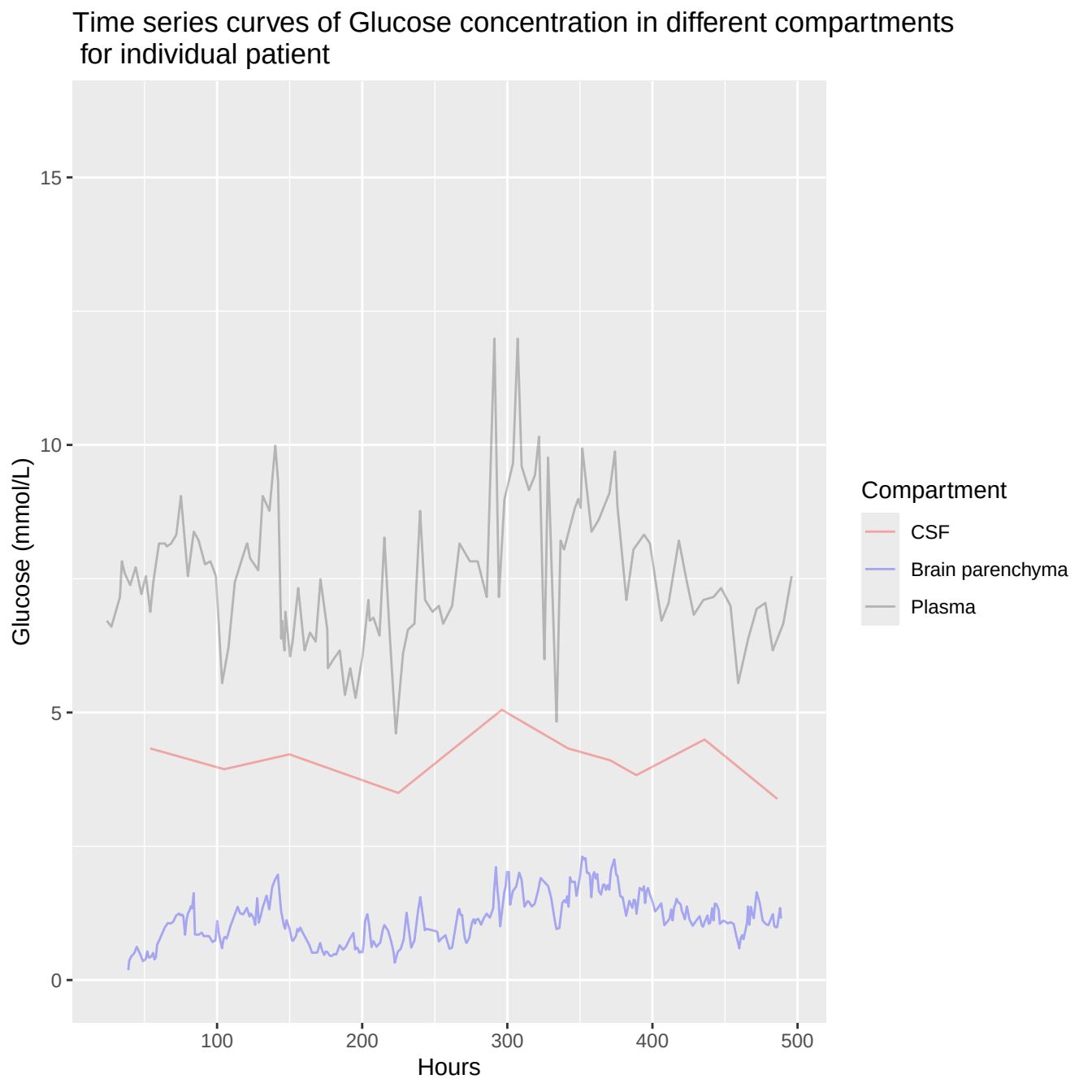
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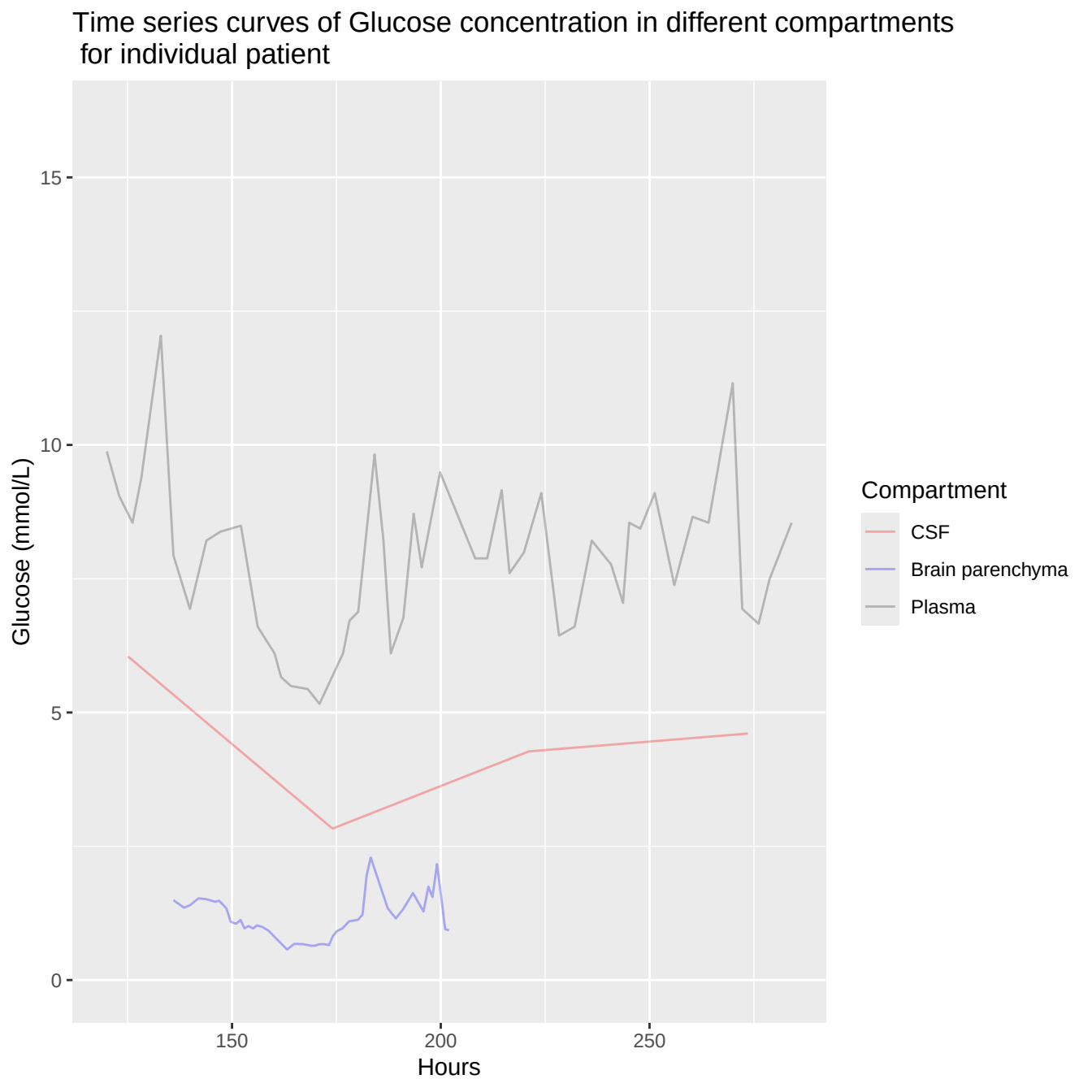
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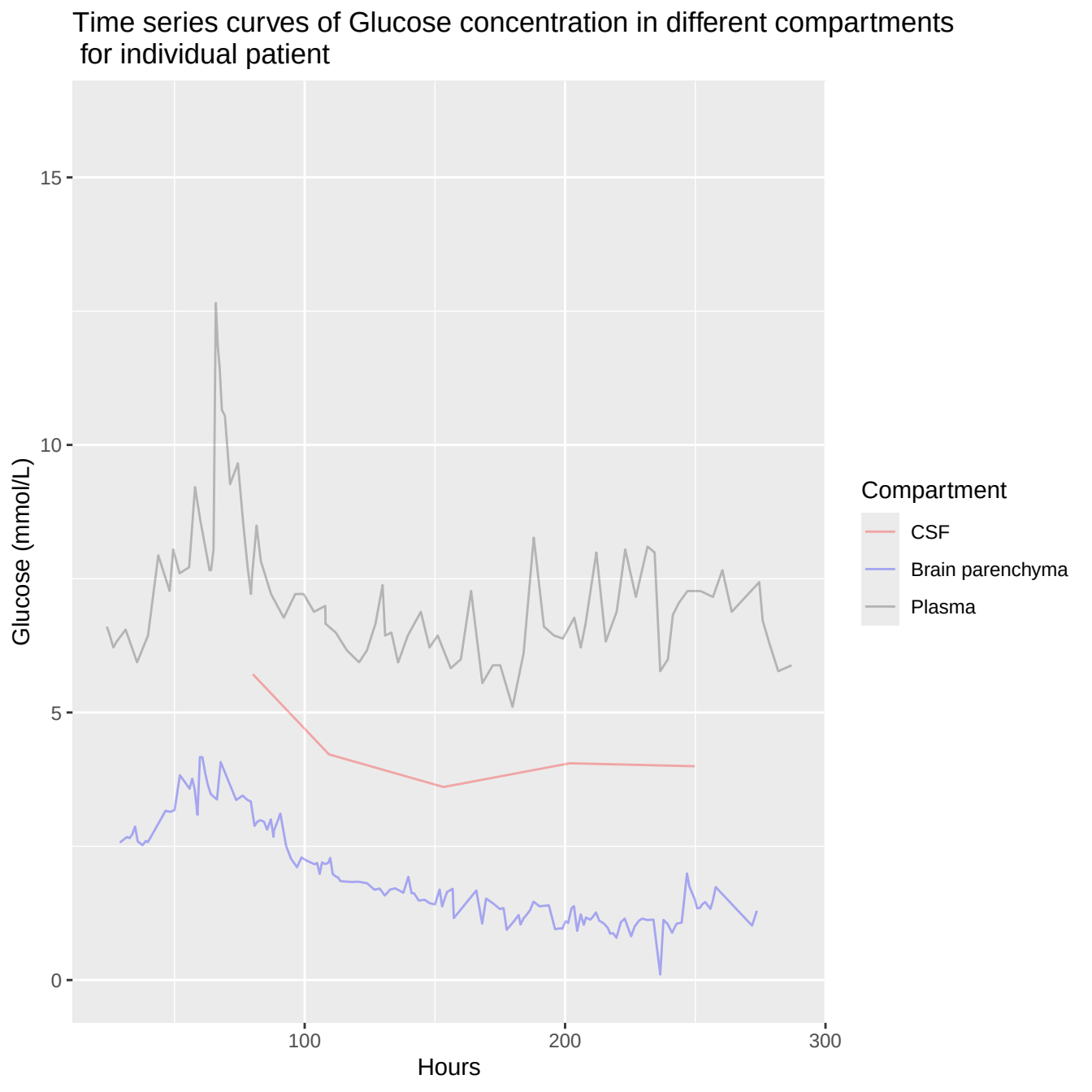
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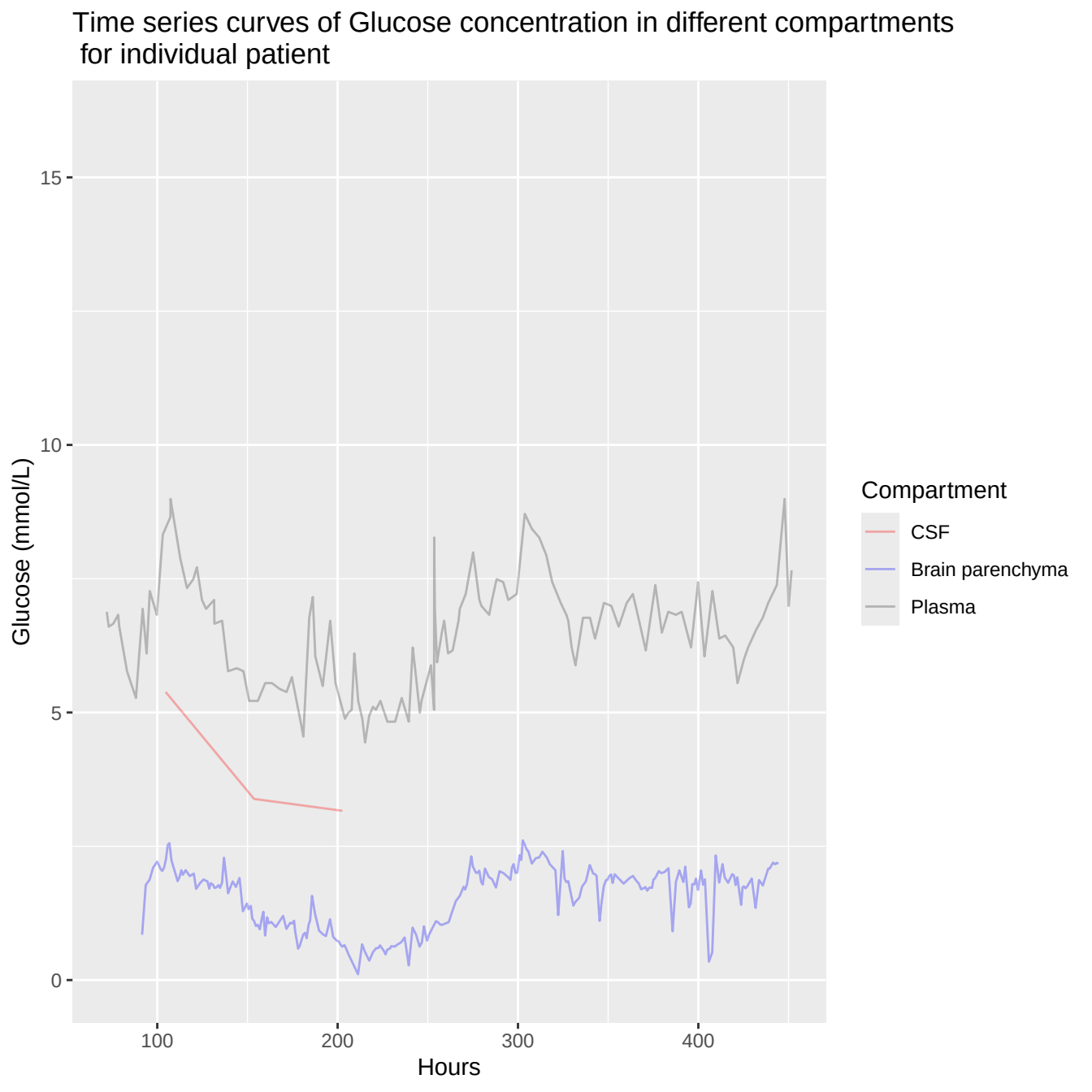
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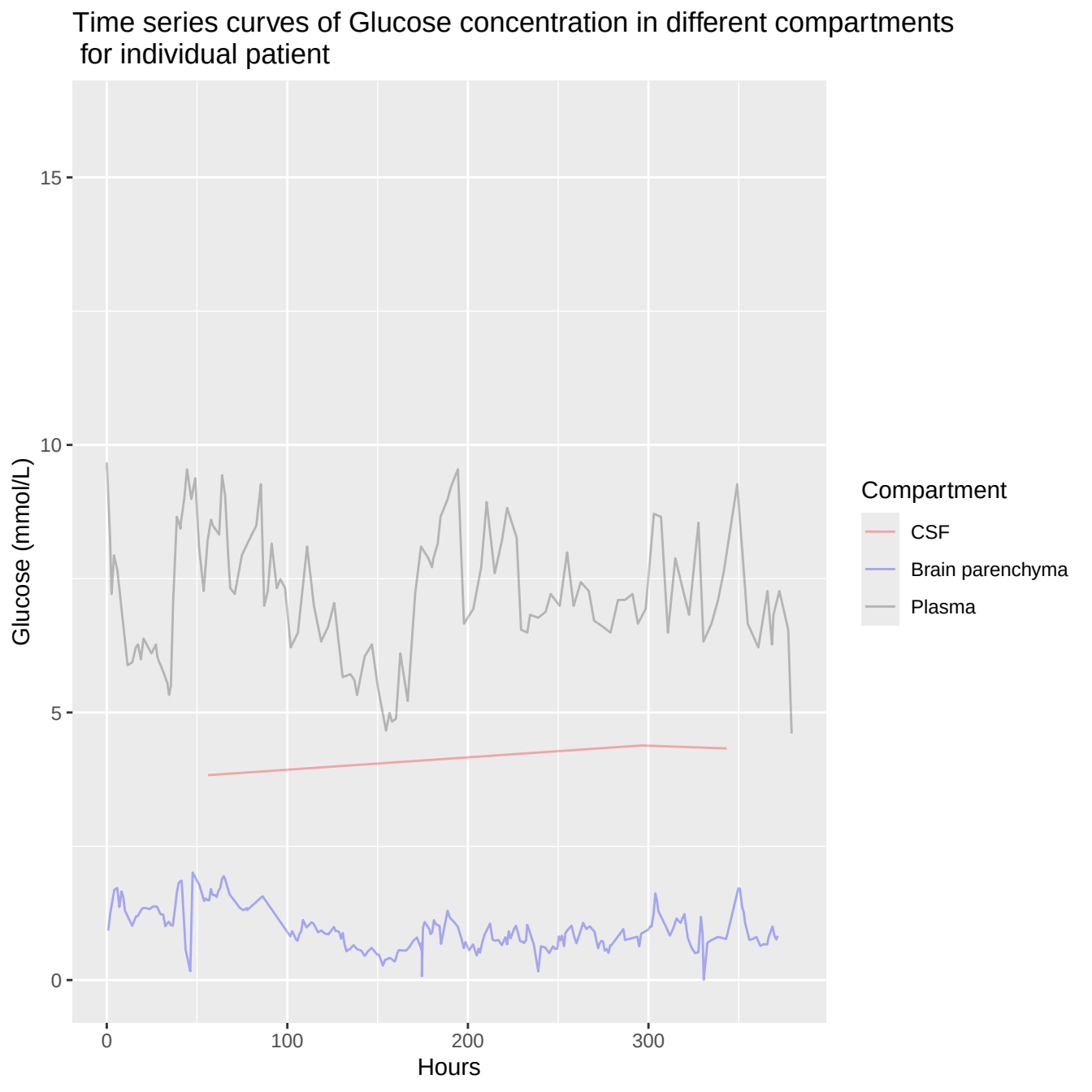
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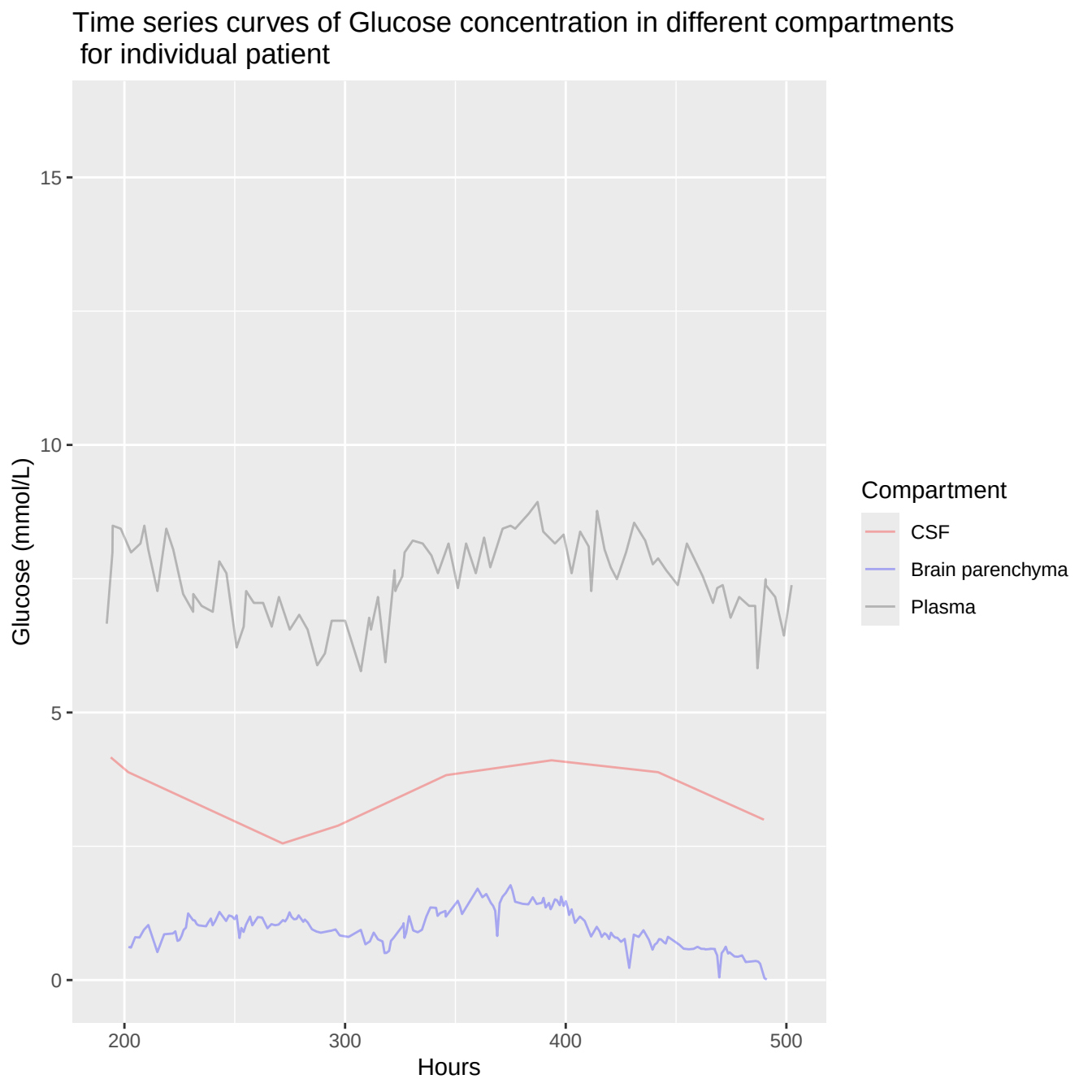
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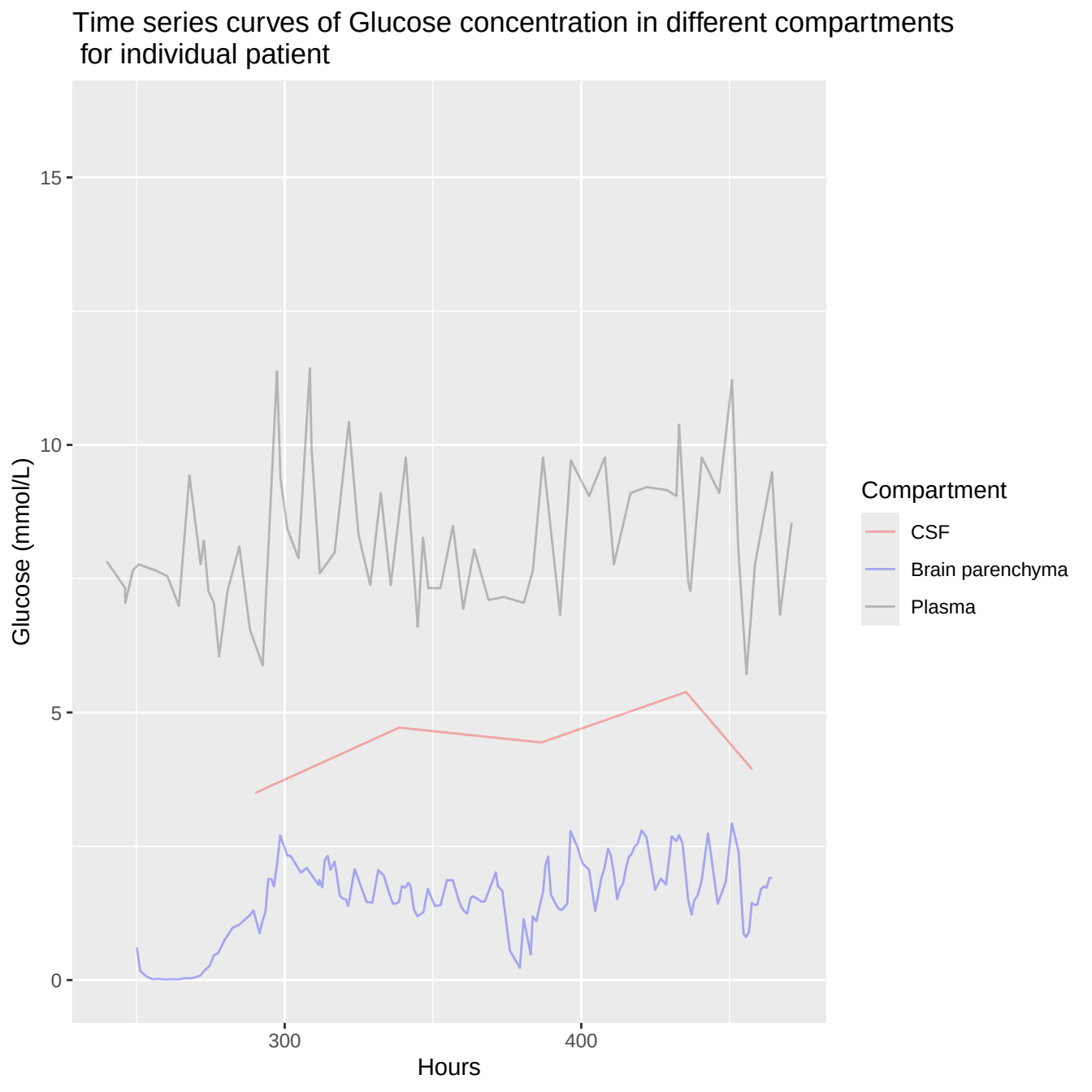
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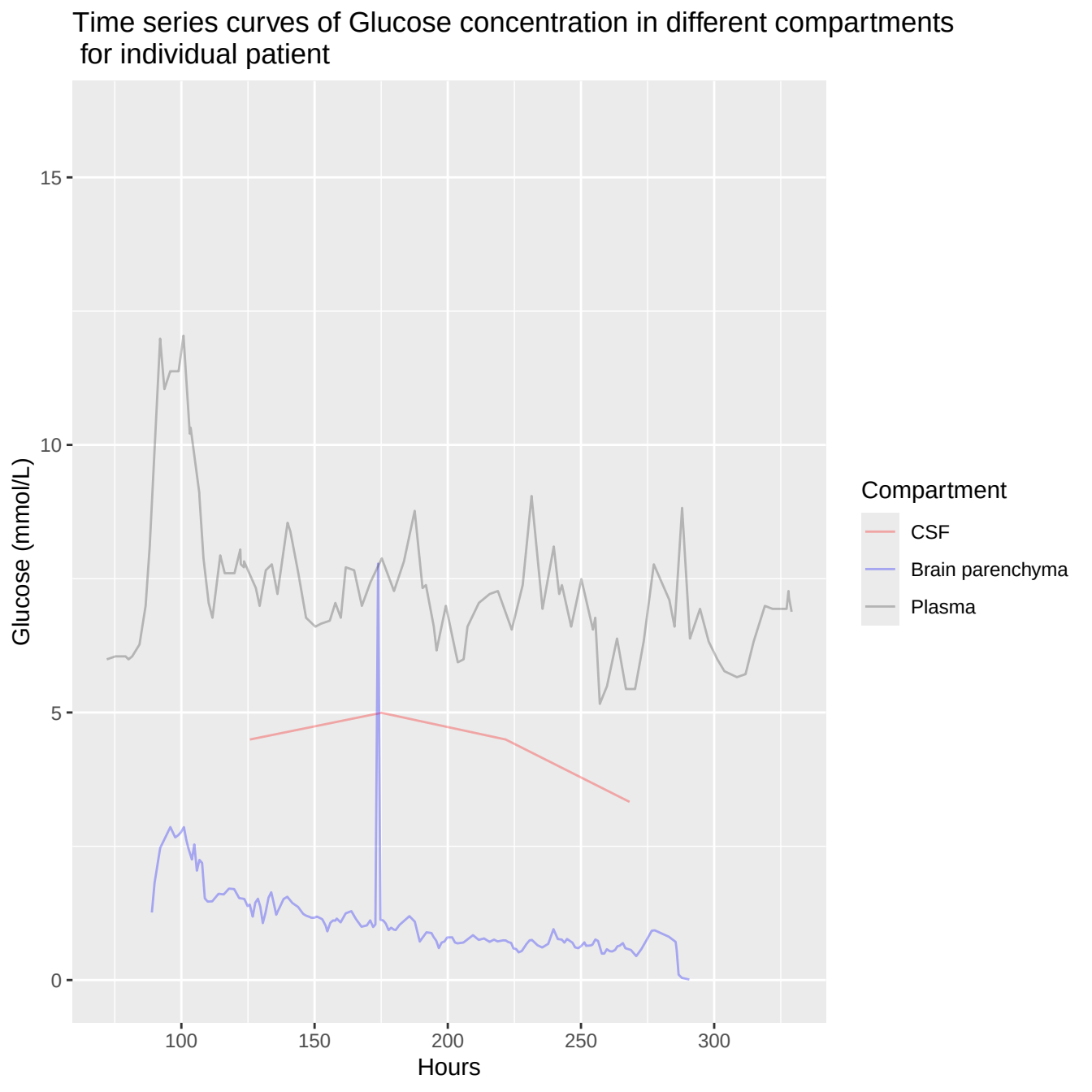
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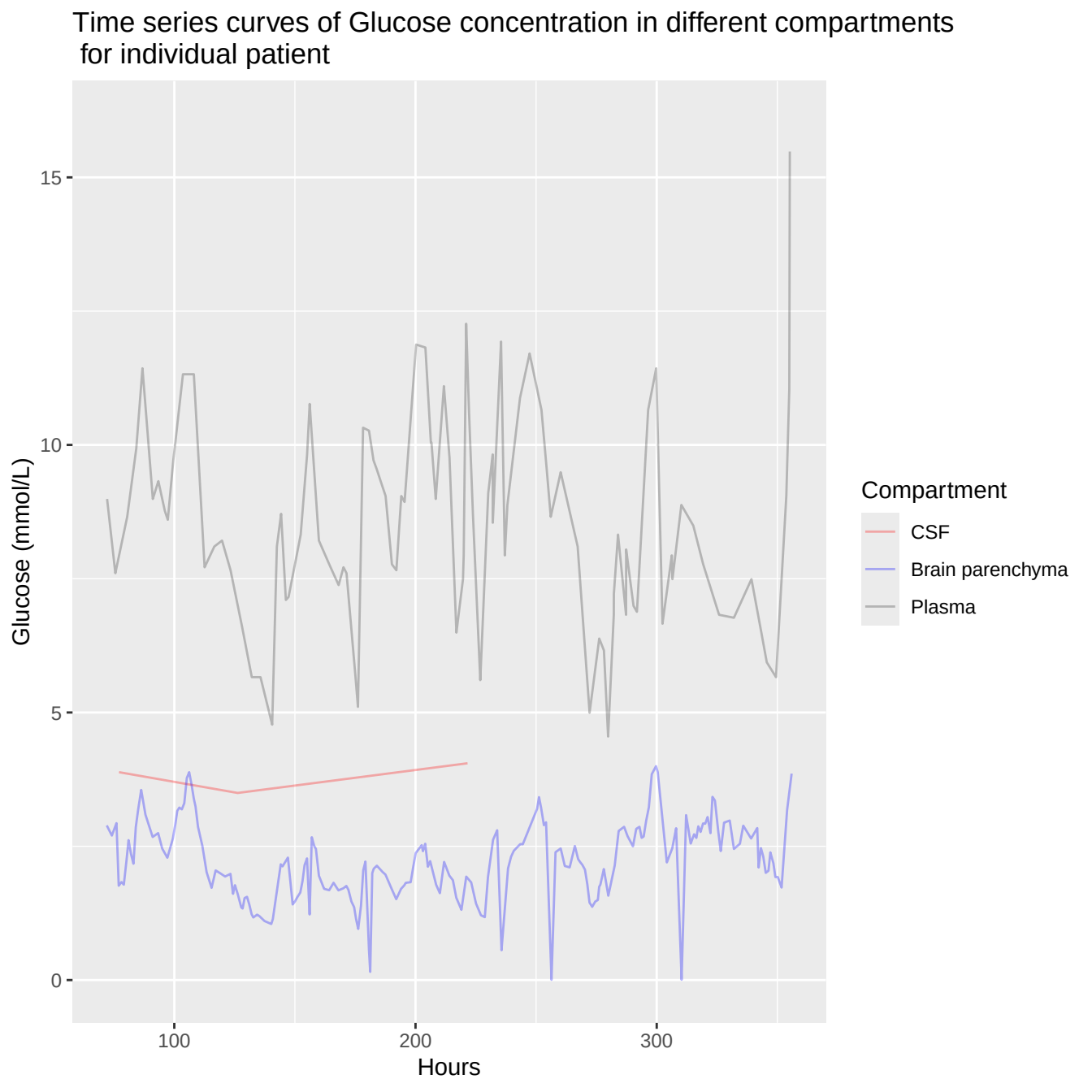
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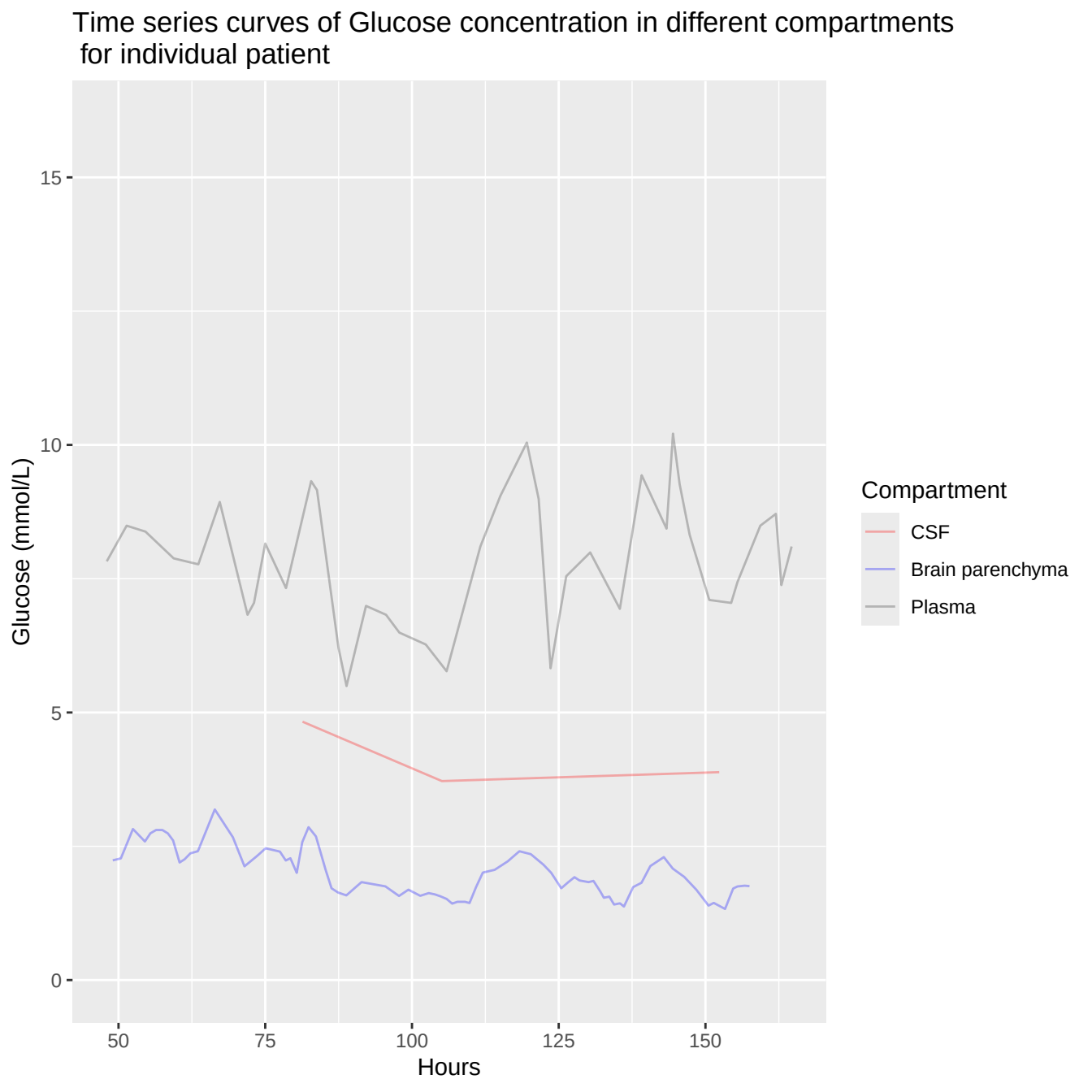
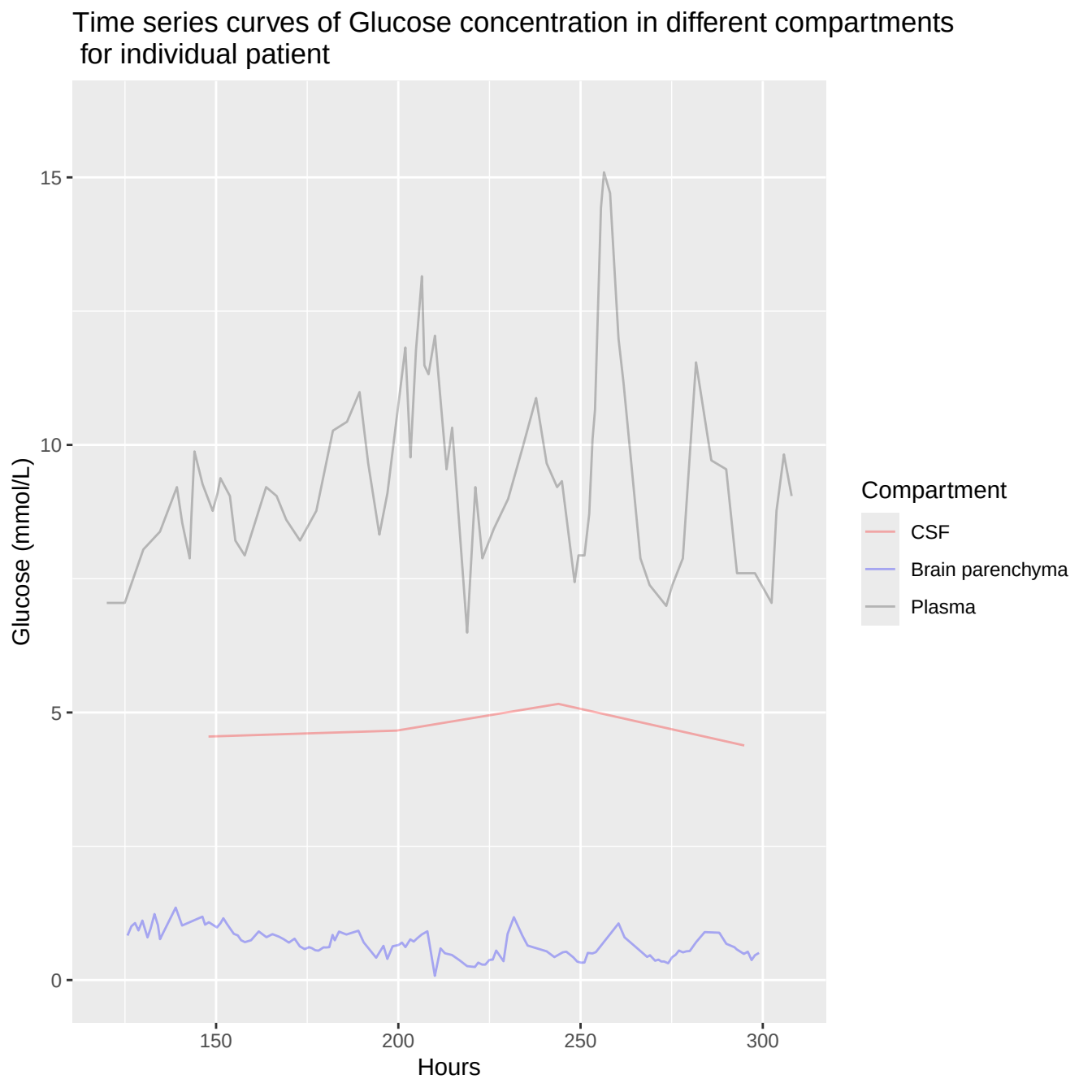
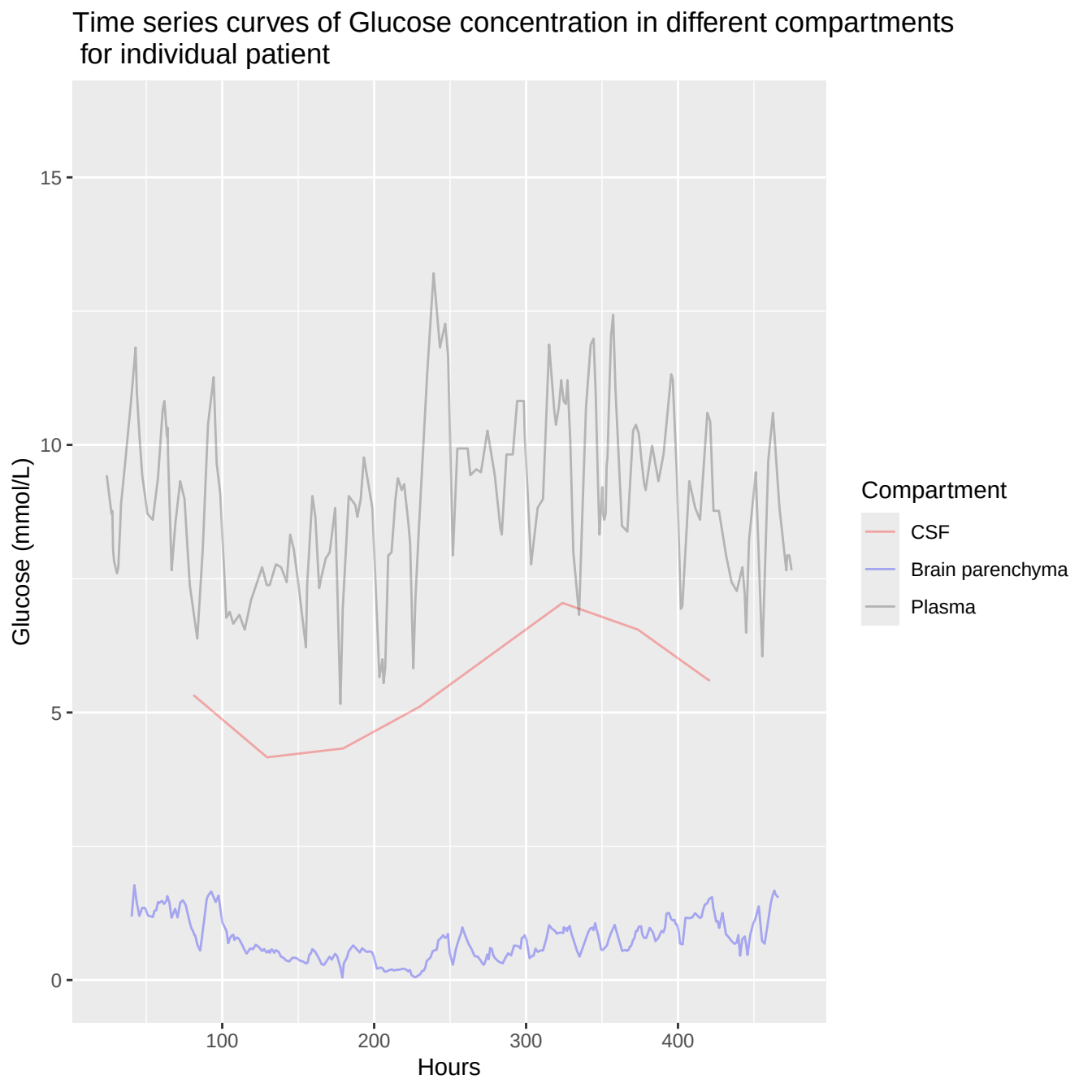
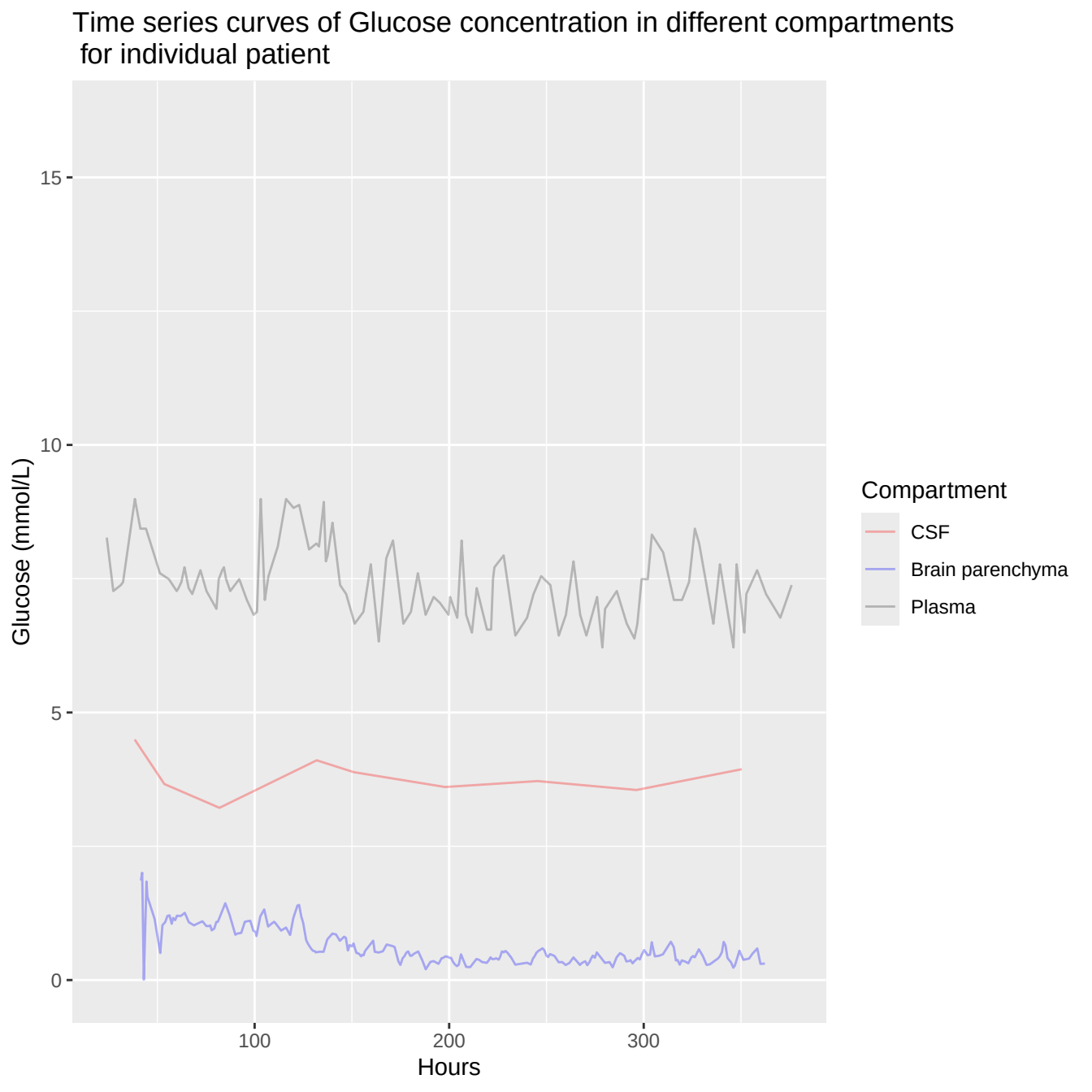
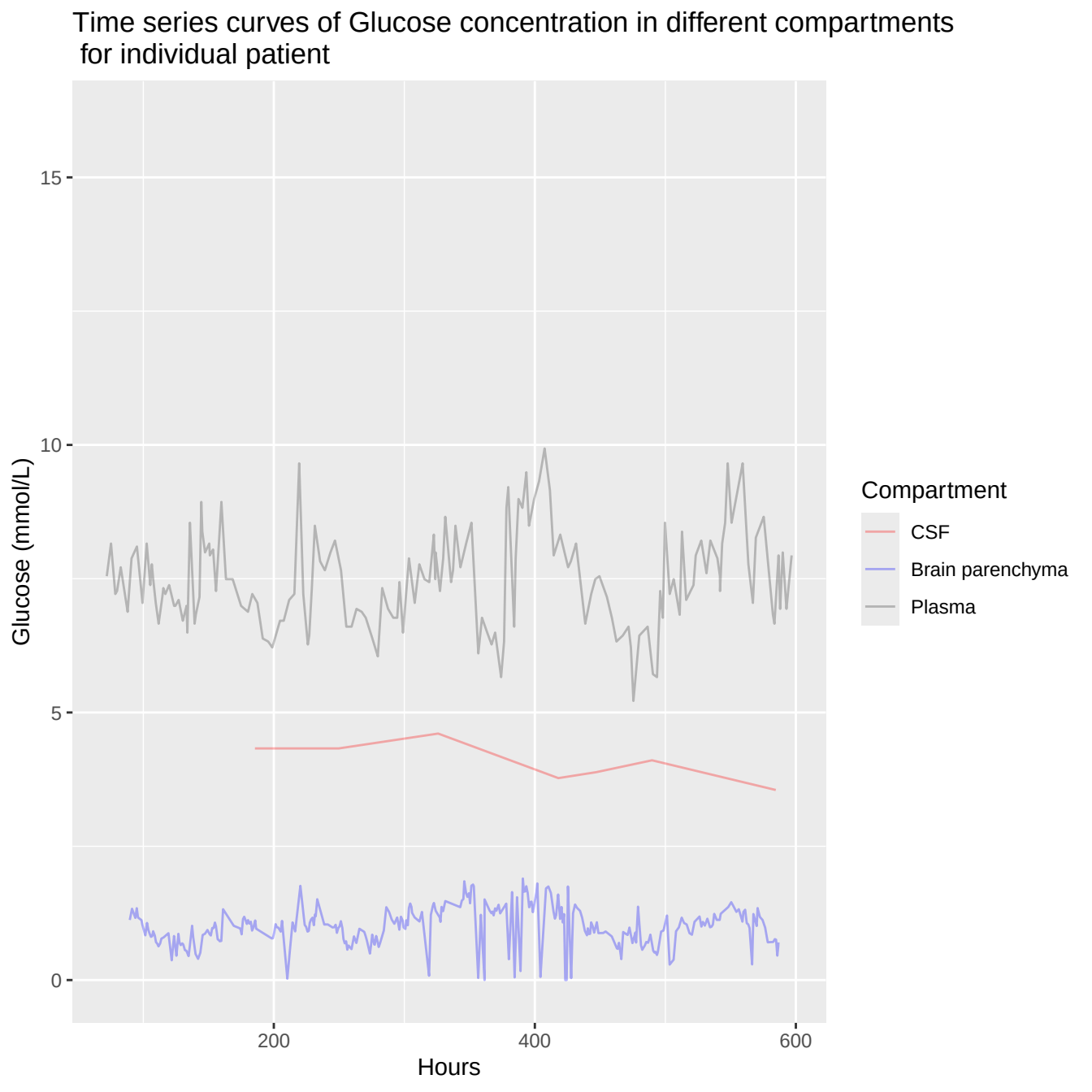
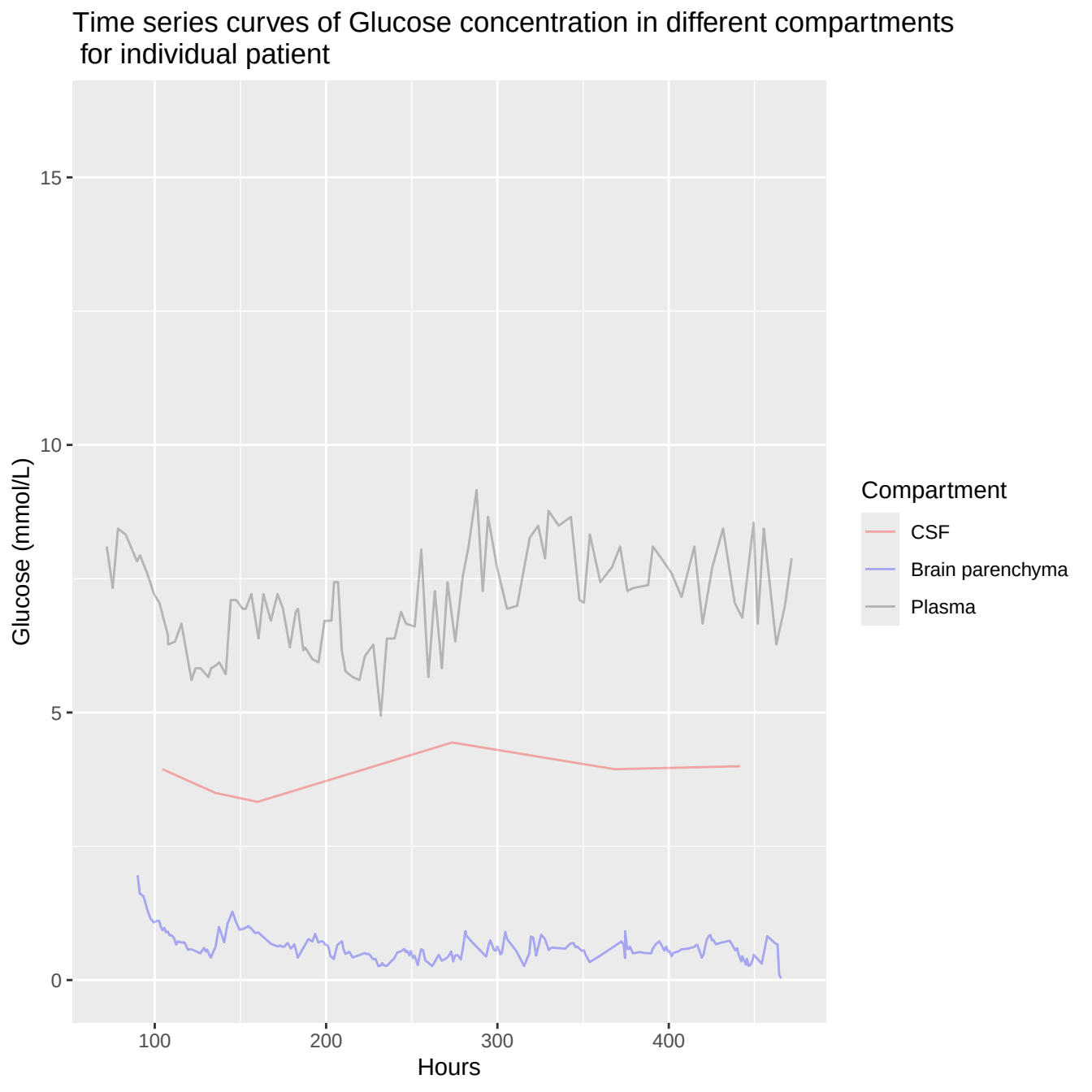

Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
50
75
100
125
150
Hours
Compartment
CSF
Brain parenchyma
Plasma

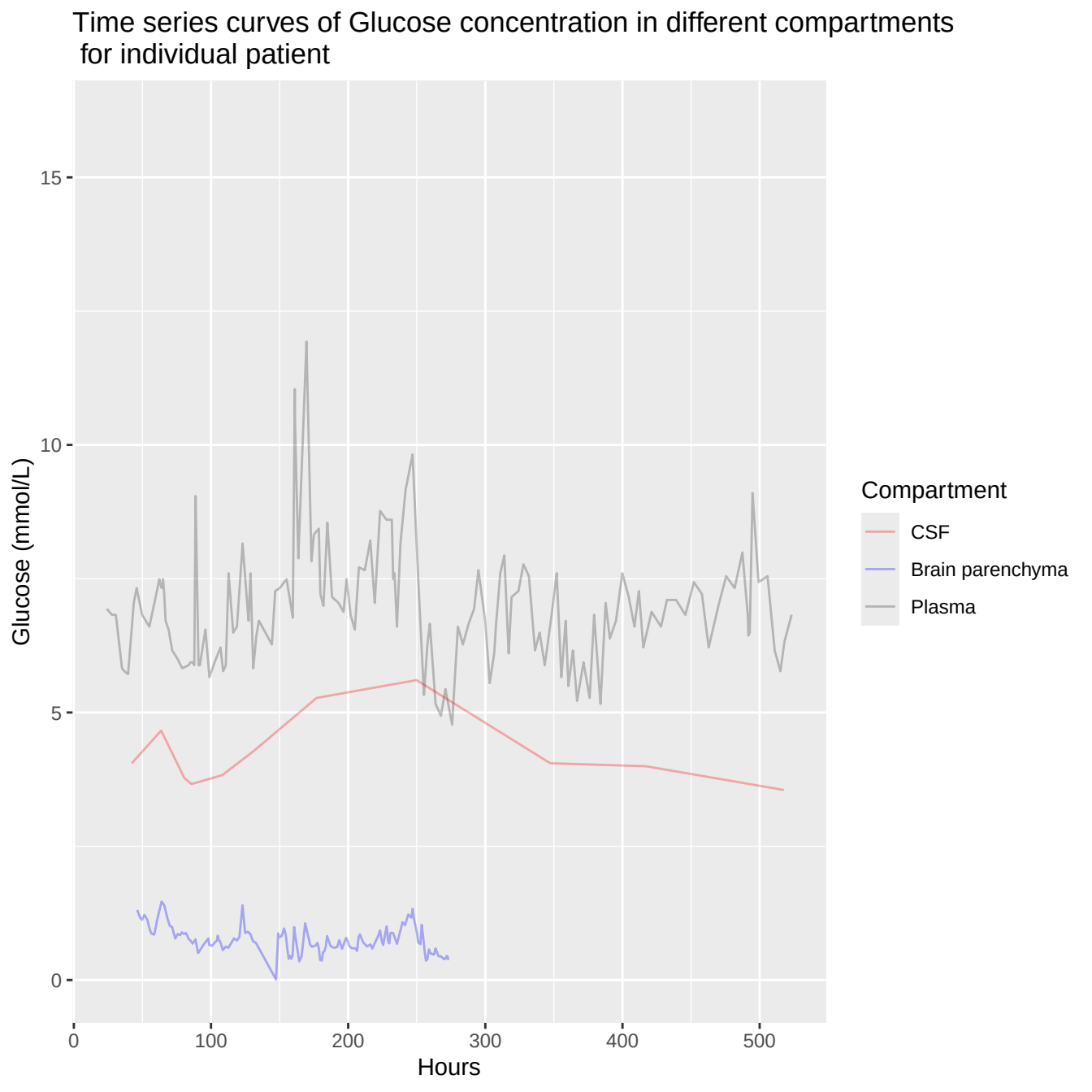

Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
150
200
250
300
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

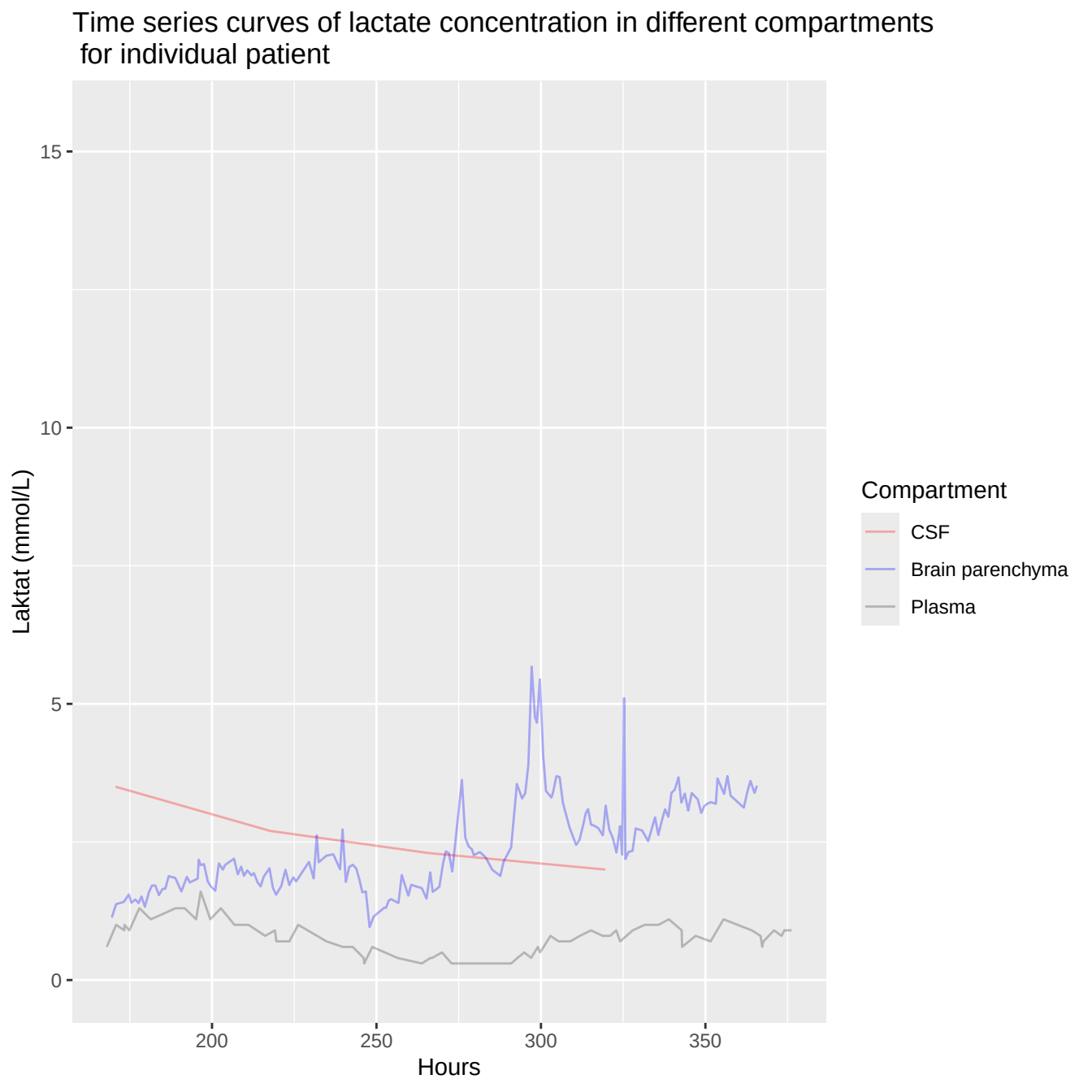

Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
200
400
600
Hours
Compartment
CSF
Brain parenchyma
Plasma

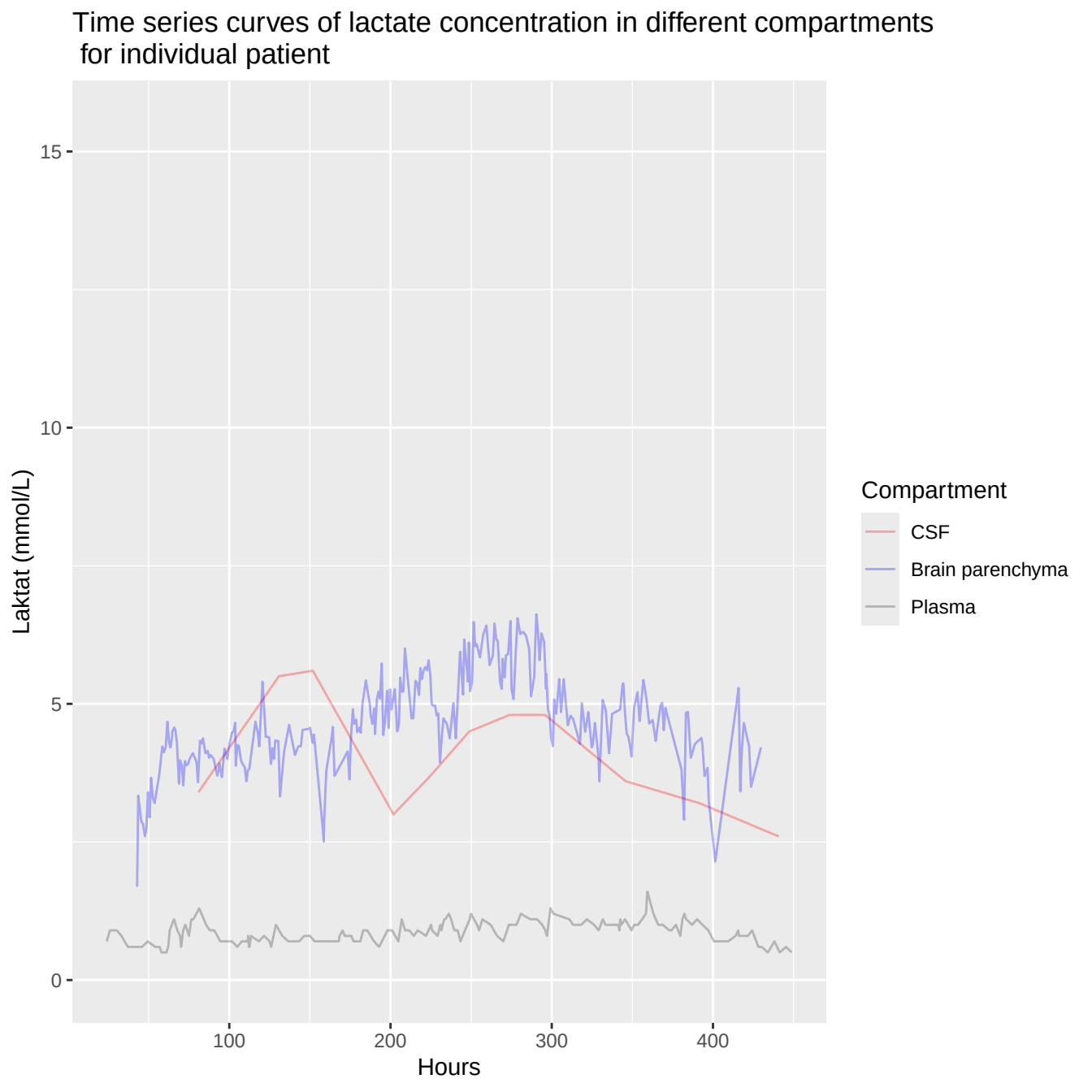

Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

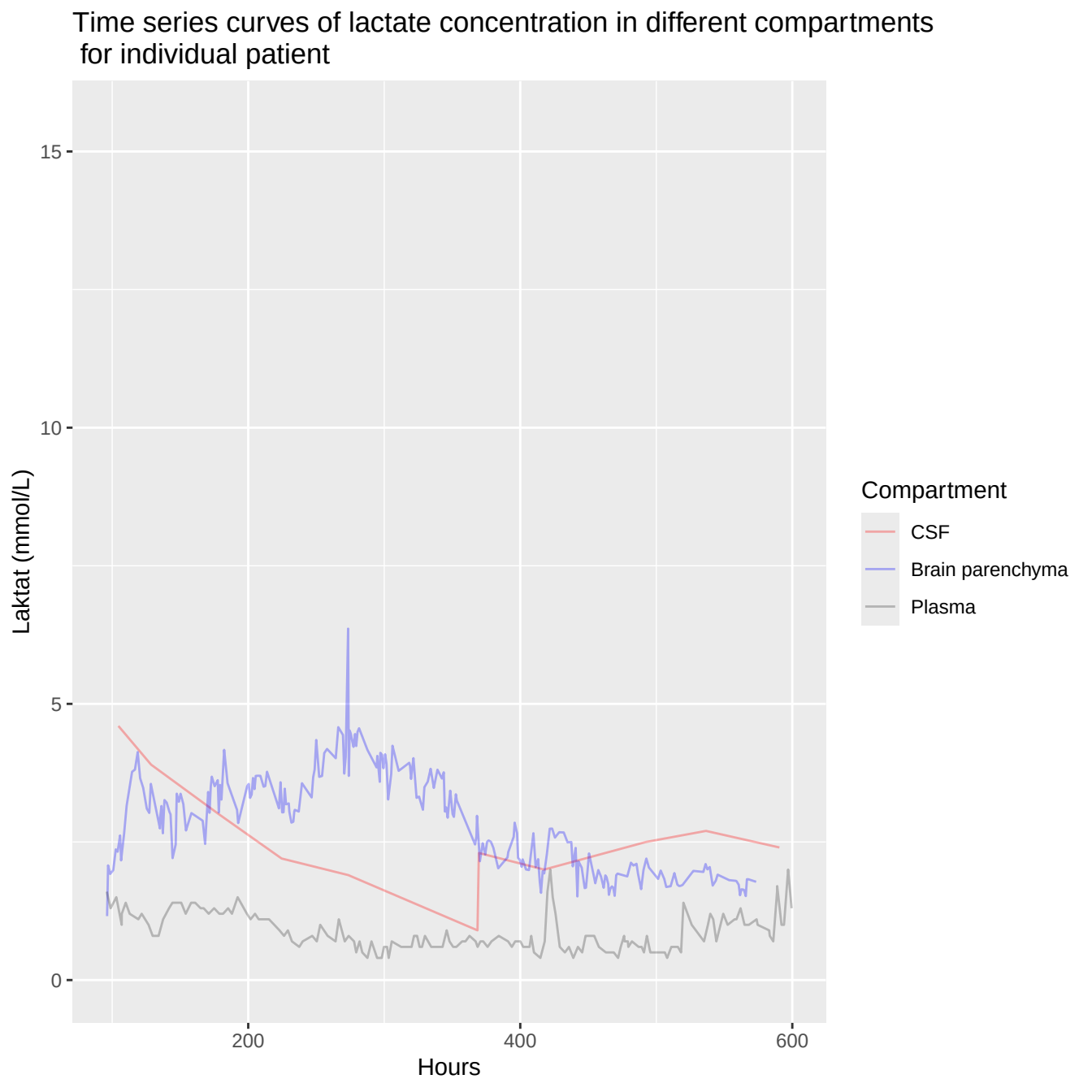

Time series curves of Glucose concentration in different compartments for individual patient
Glucose (mmol/L)
15
10
5
0
0
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

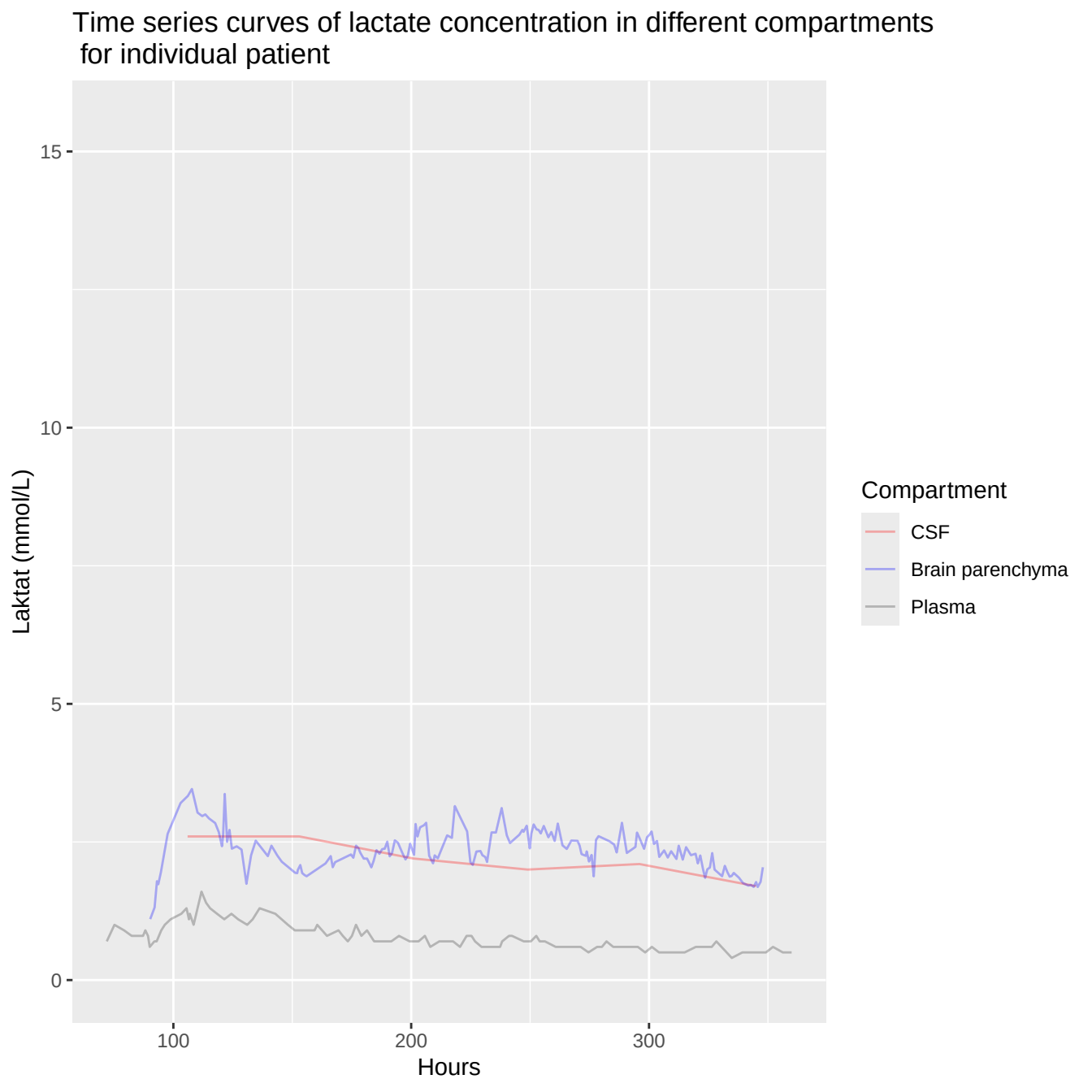
4. Trajectories of the Lactate Concentration in Different Compartments for Individual Patients

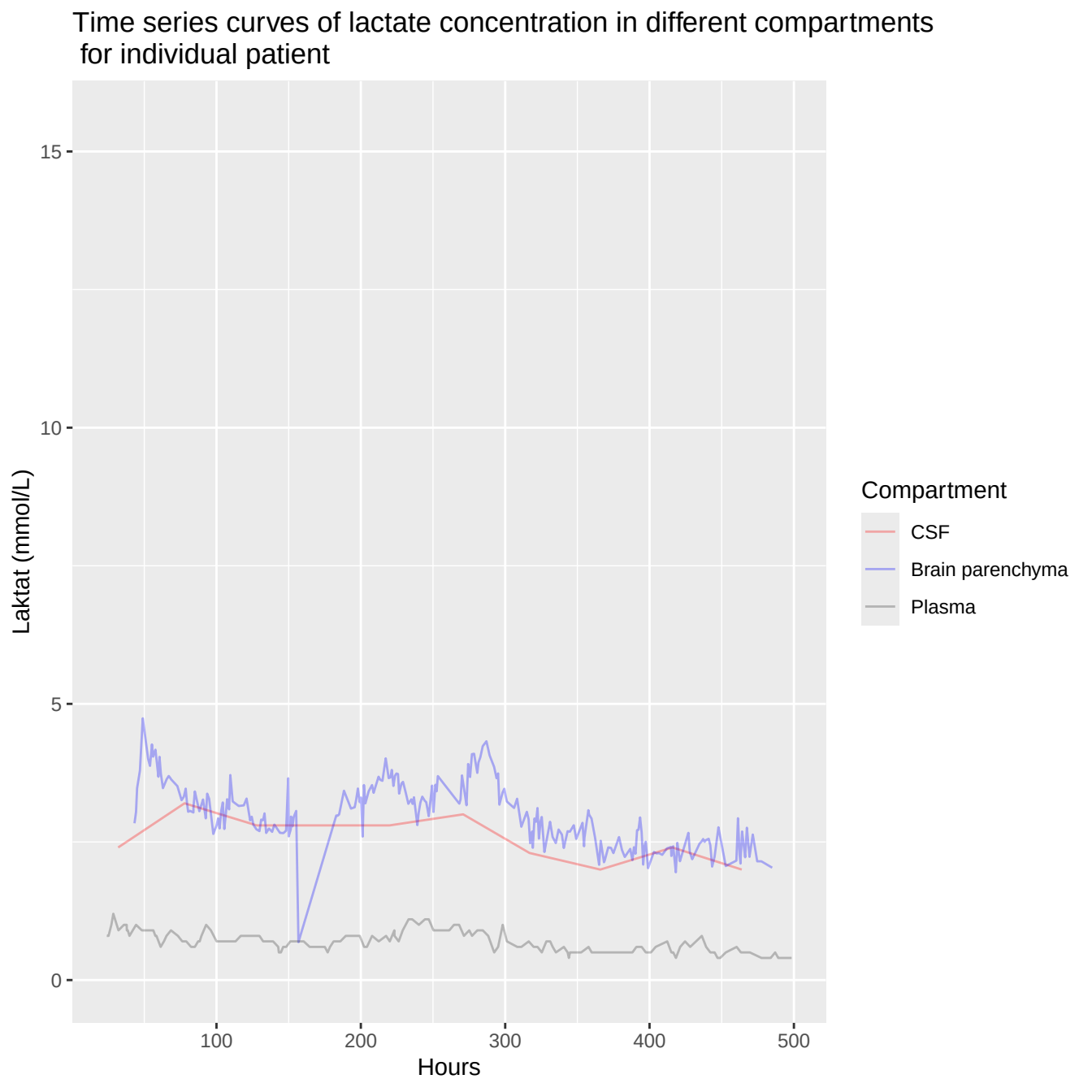
Values above 15mmol/L where cut off at 15 mmol/L in the following plots.

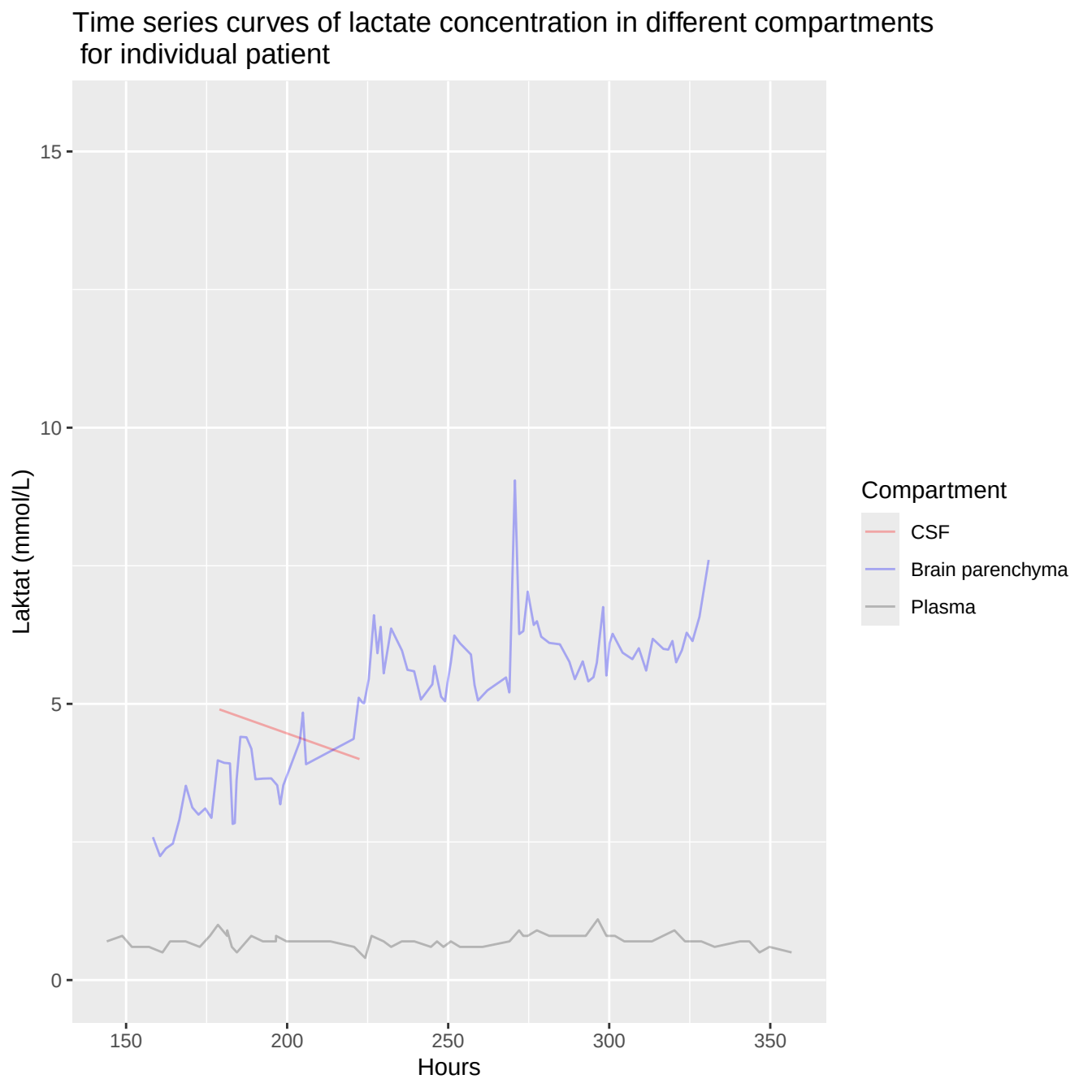

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
250
300
350
Hours
Compartment
CSF
Brain parenchyma
Plasma

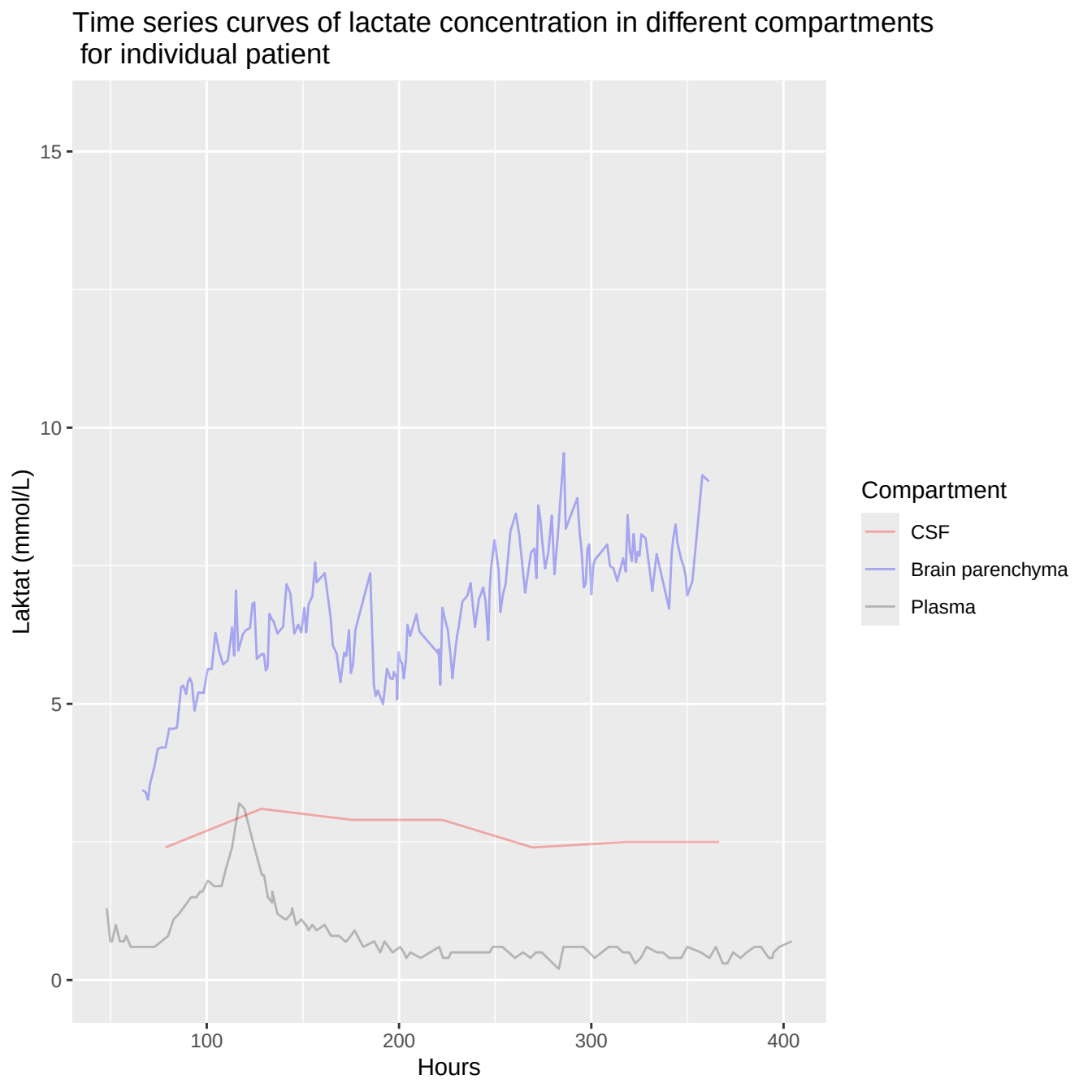

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

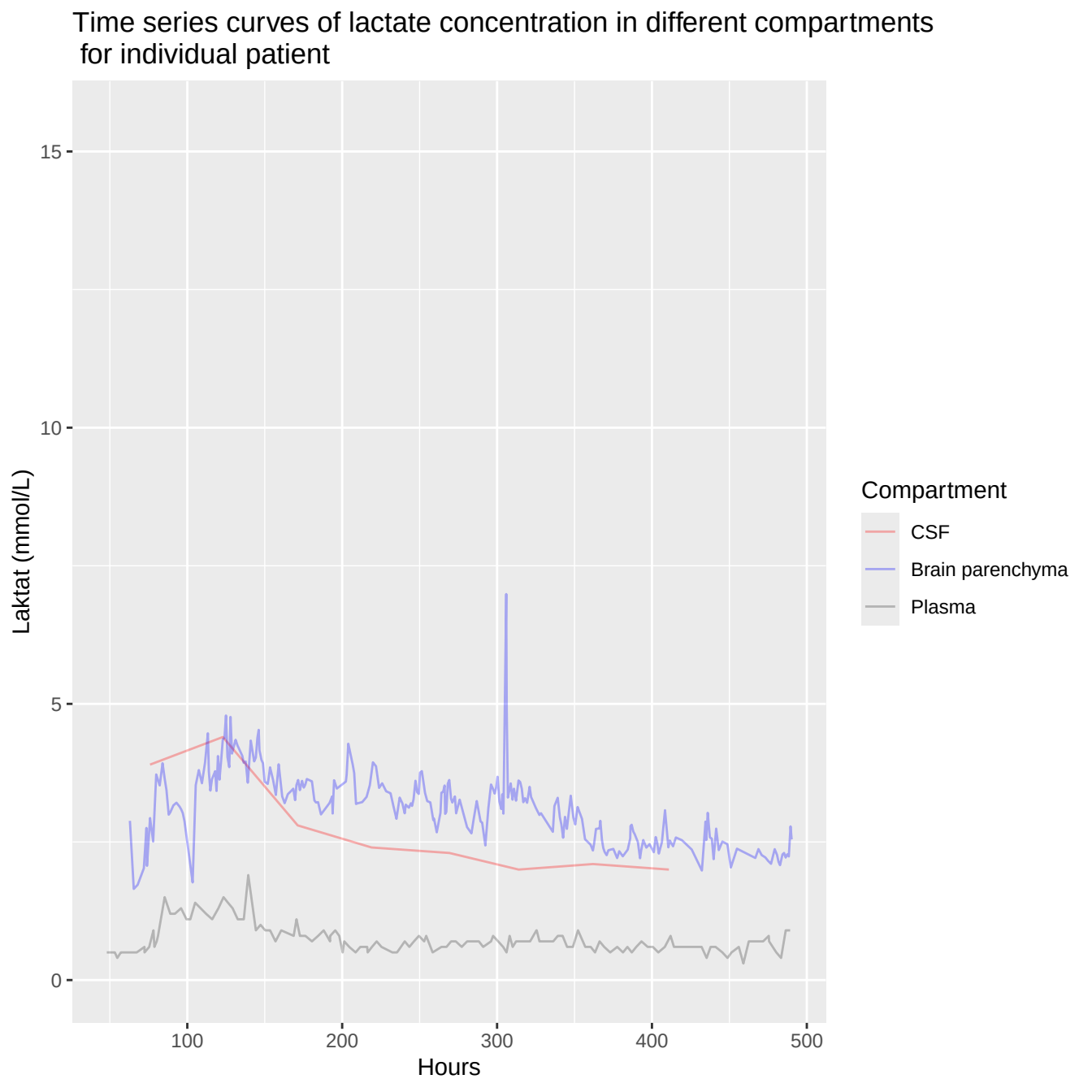

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
400
600
Hours
Compartment
CSF
Brain parenchyma
Plasma

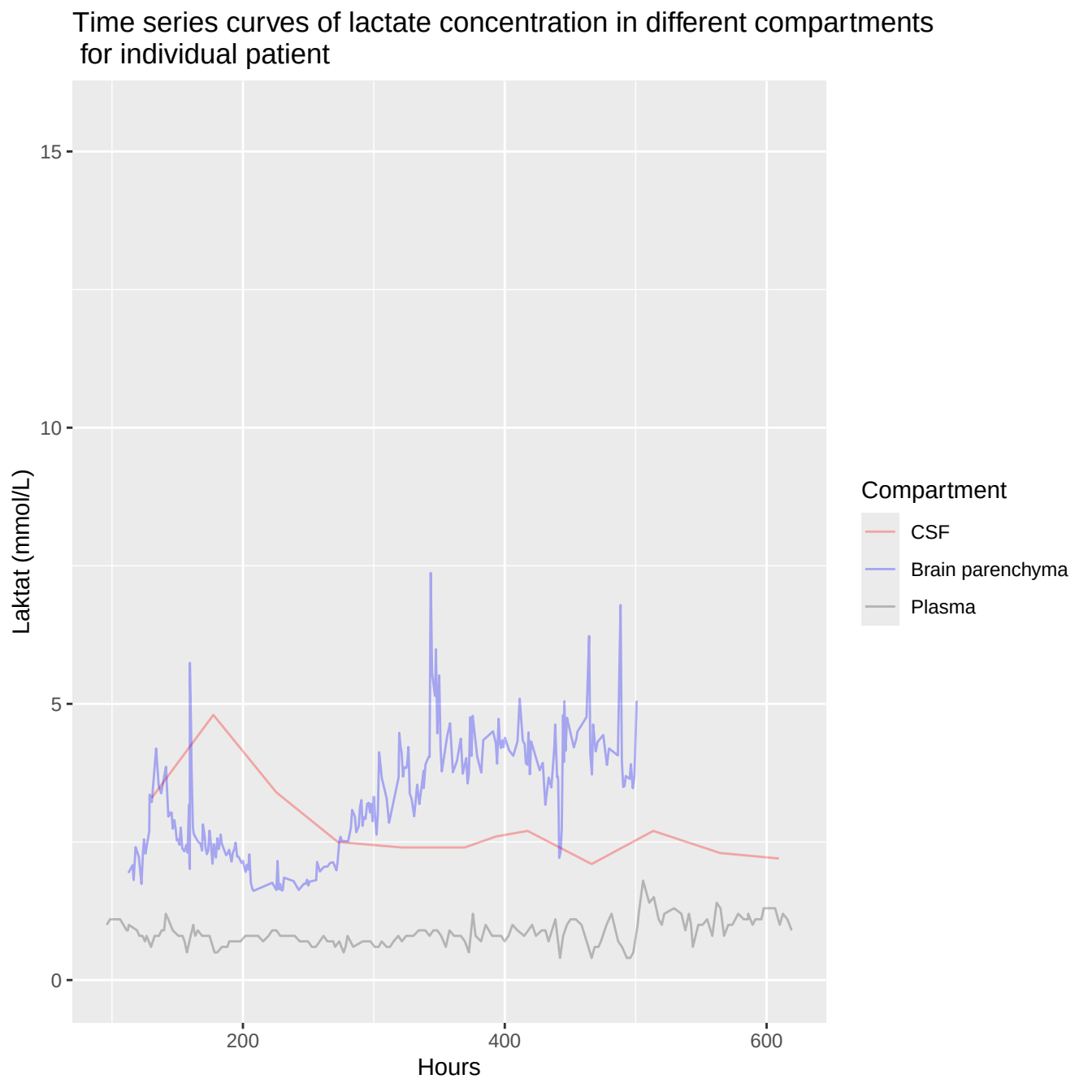

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

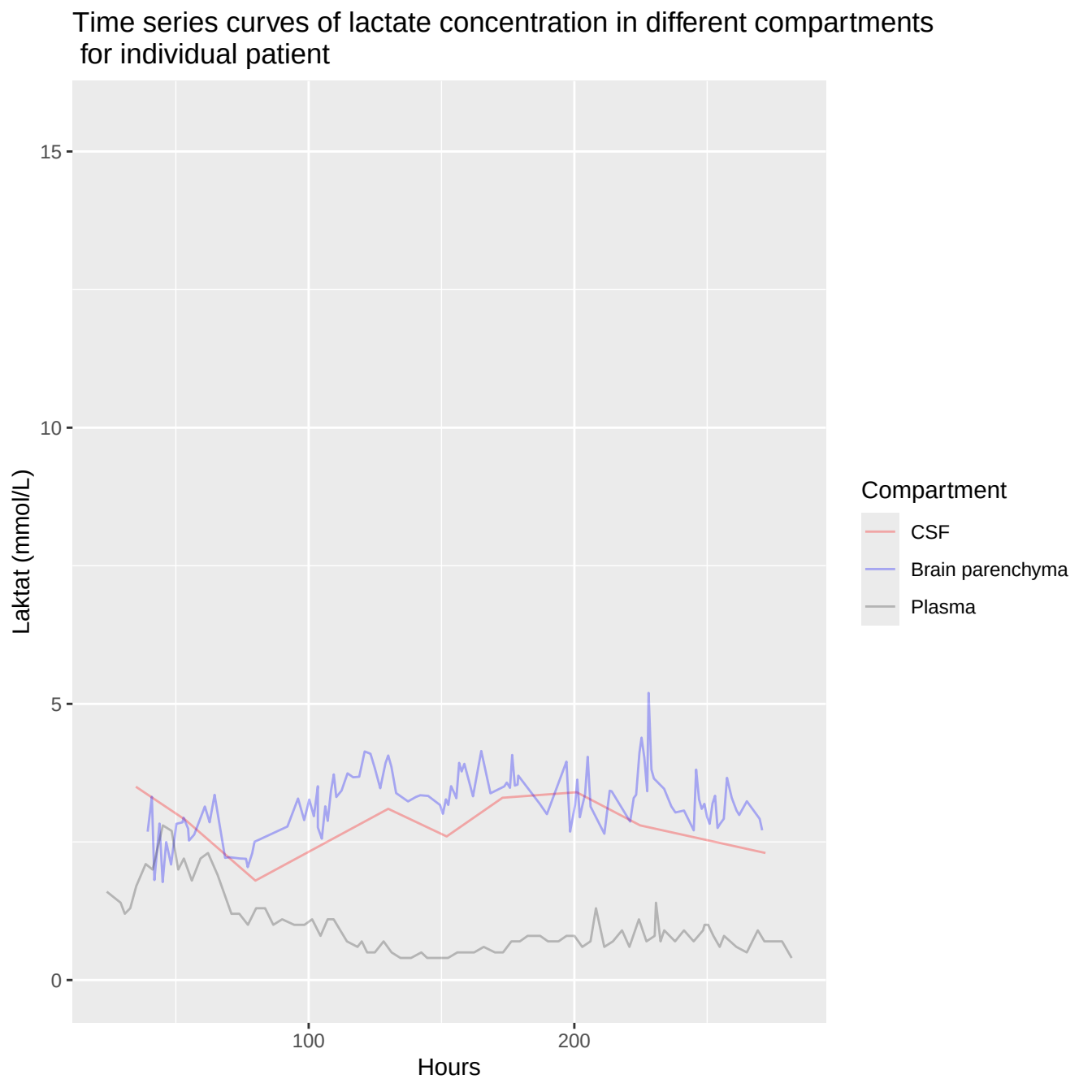

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

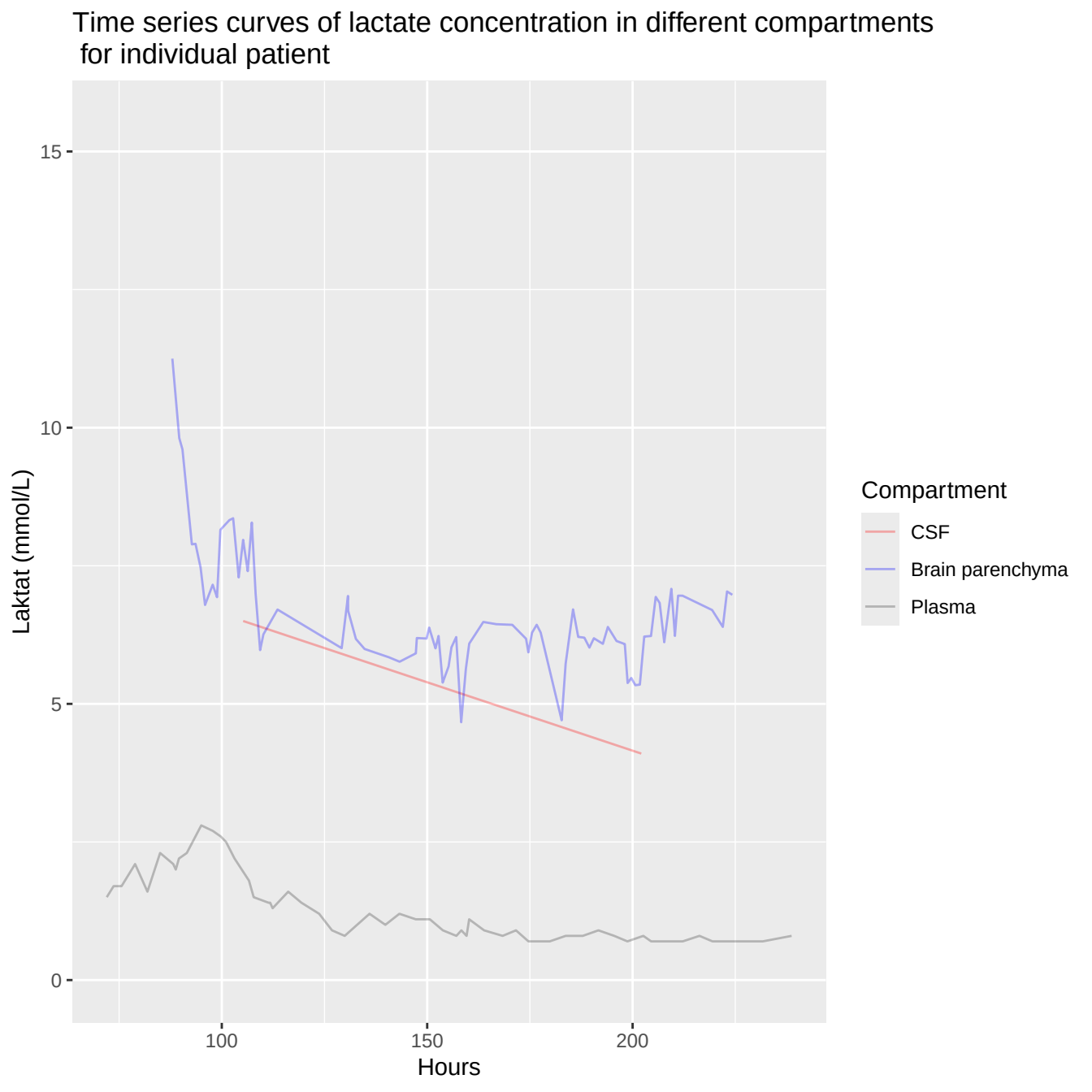

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
150
200
250
300
350
Hours
Compartment
CSF
Brain parenchyma
Plasma

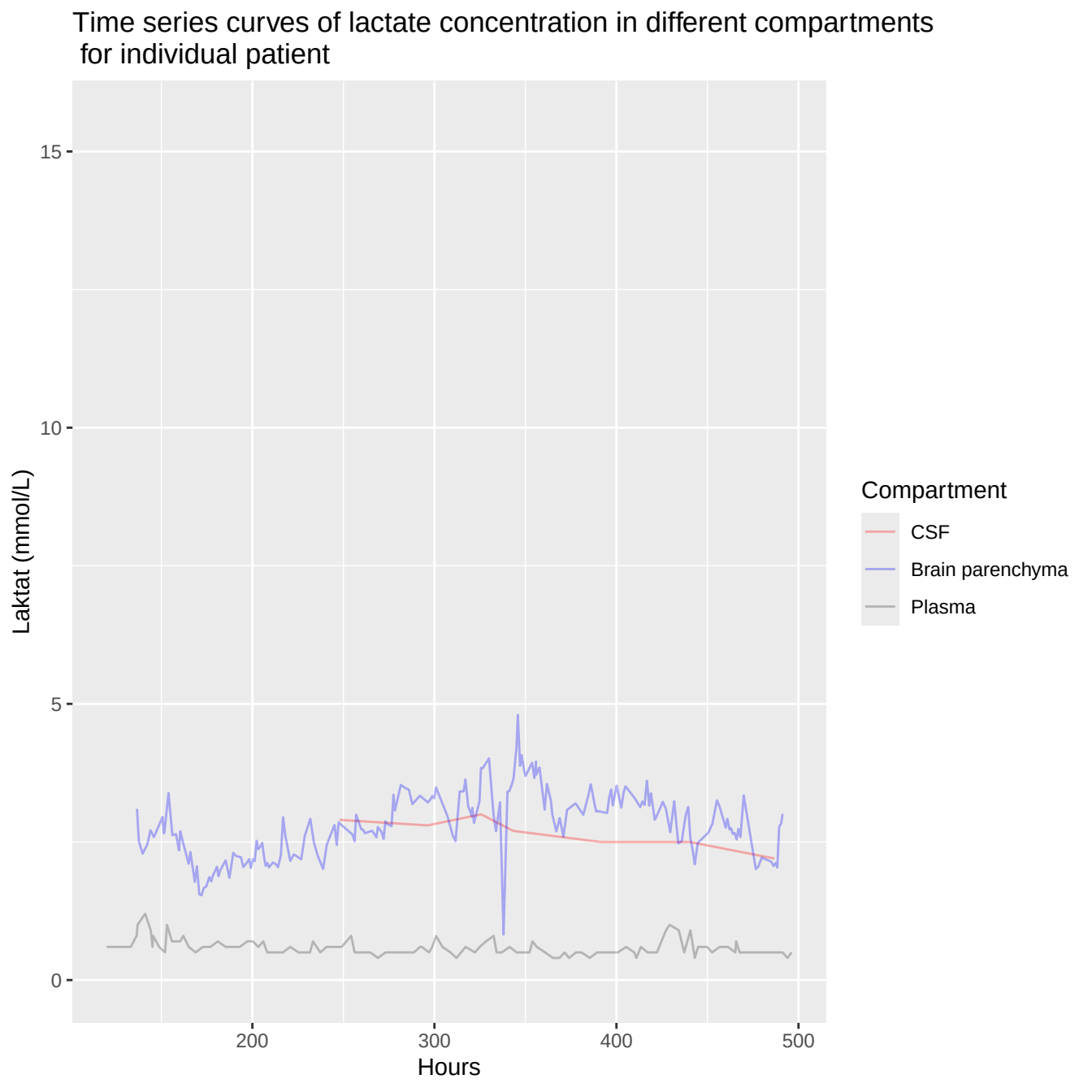

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

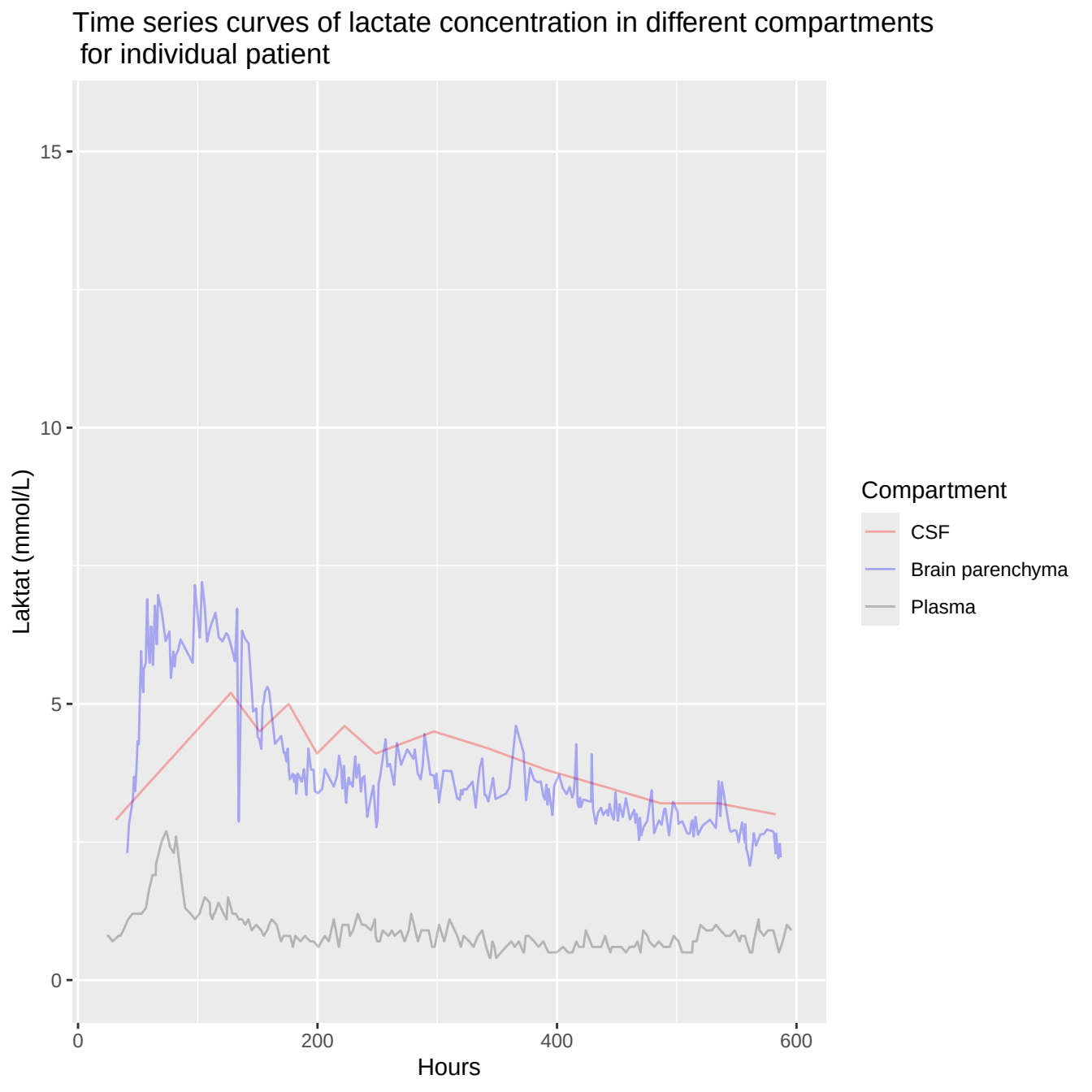

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

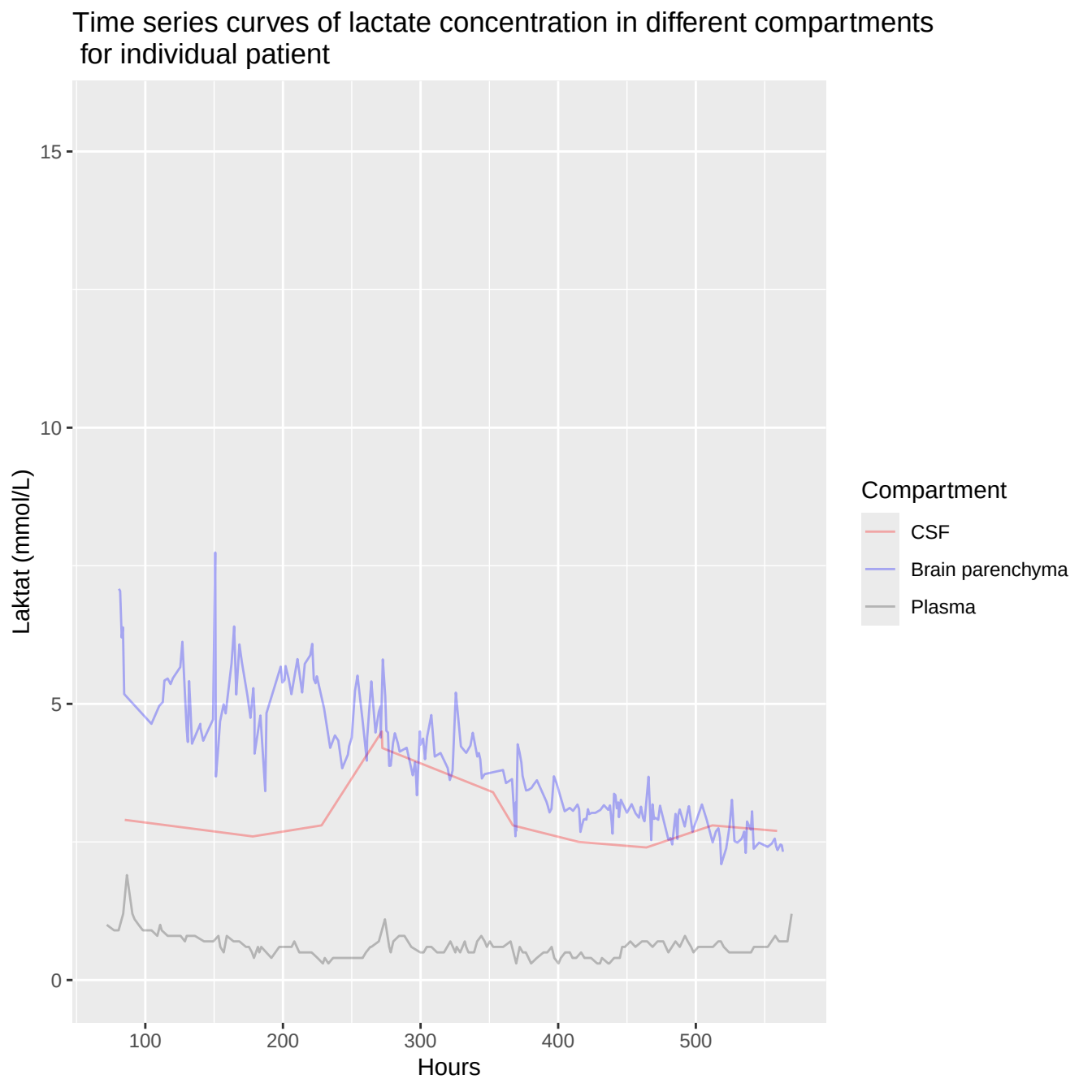

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
400
600
Hours
Compartment
CSF
Brain parenchyma
Plasma

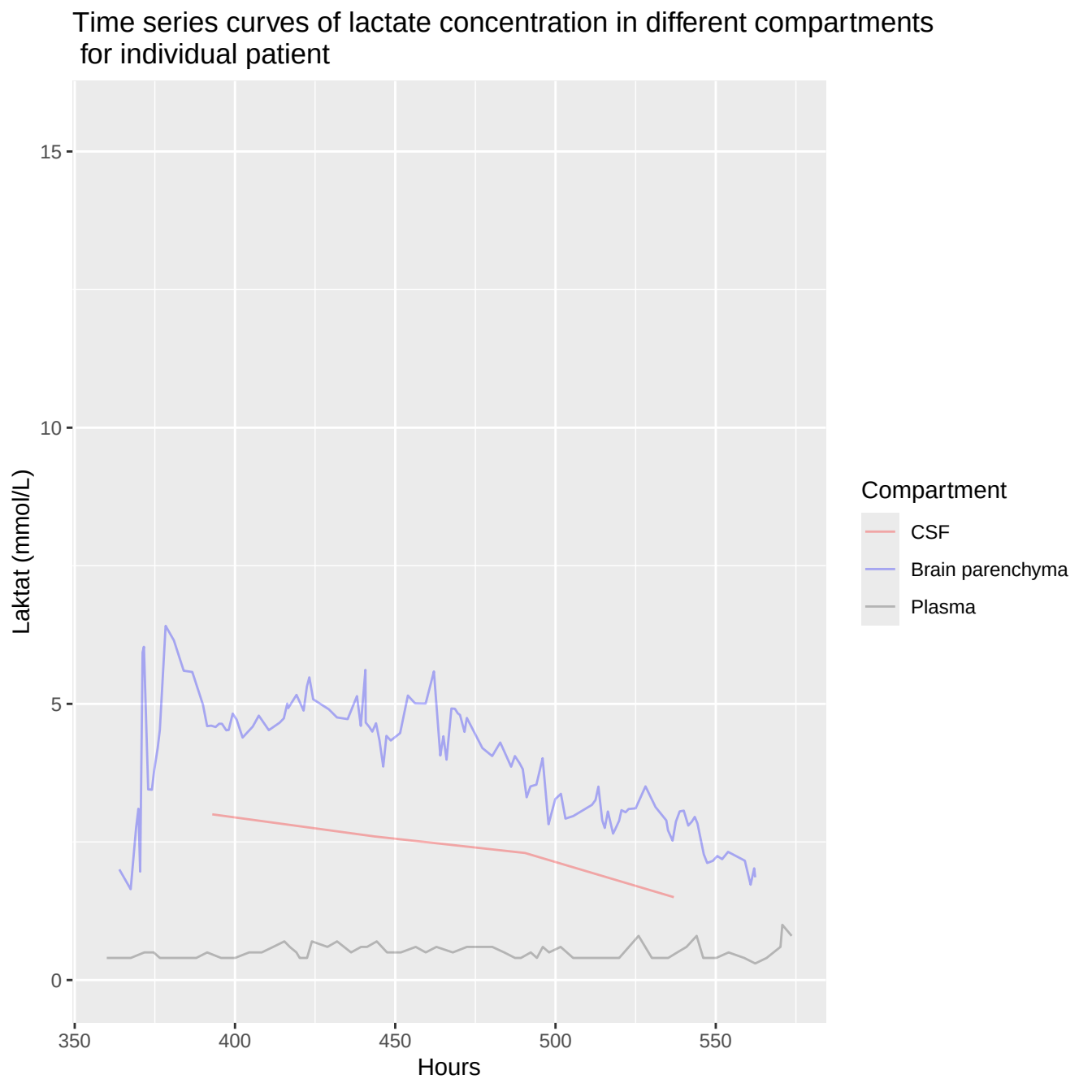

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
Hours
Compartment
CSF
Brain parenchyma
Plasma

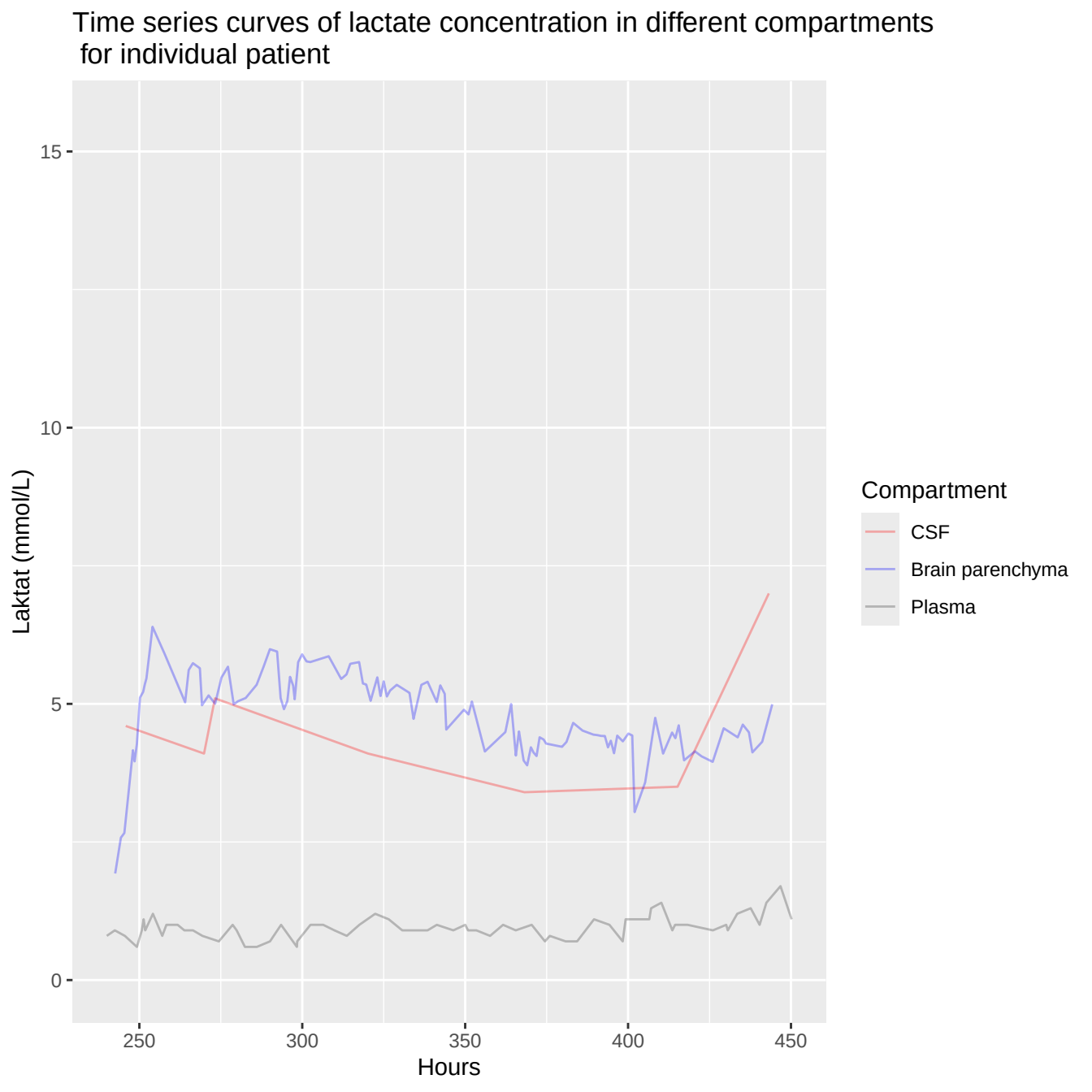

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
150
200
Hours
Compartment
CSF
Brain parenchyma
Plasma

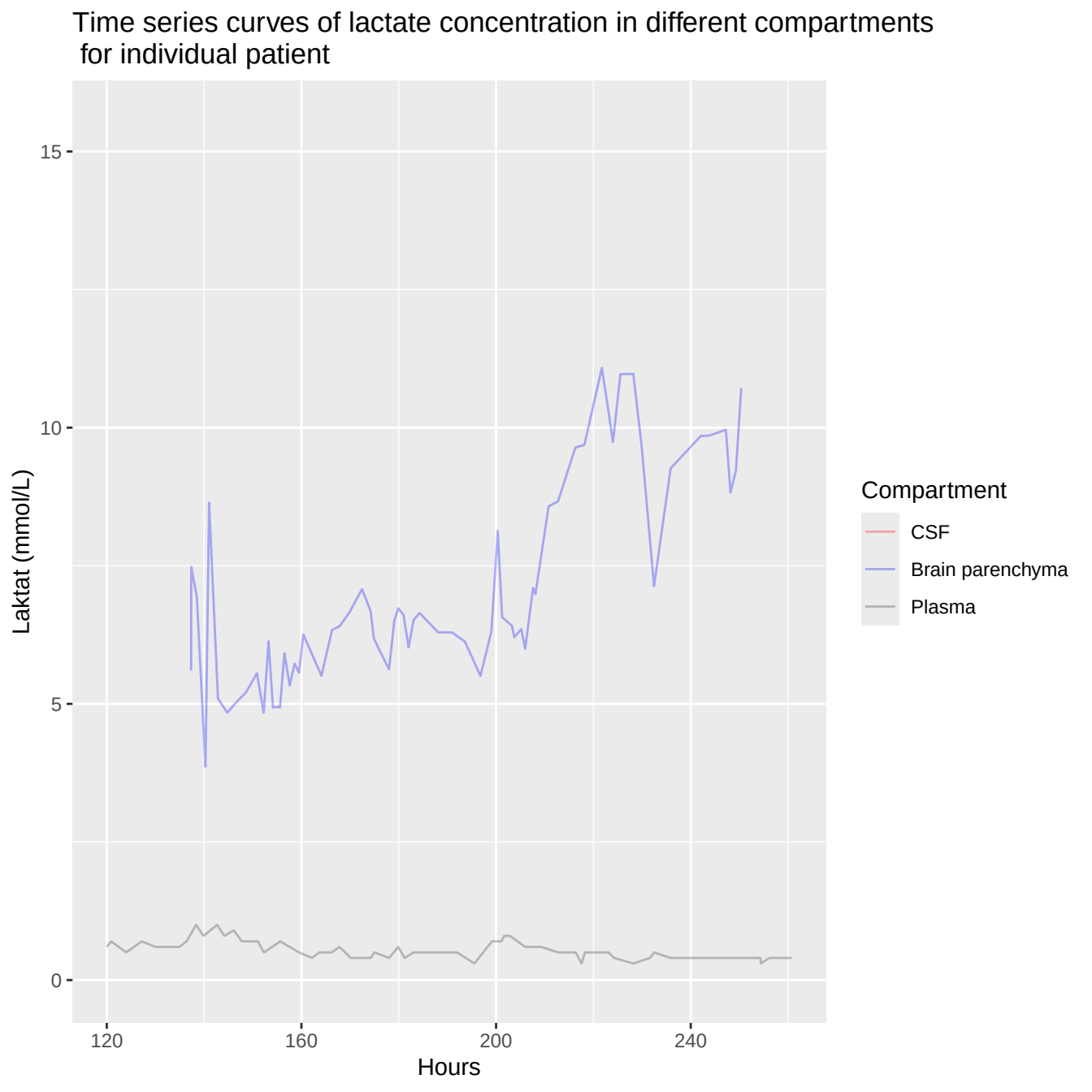

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

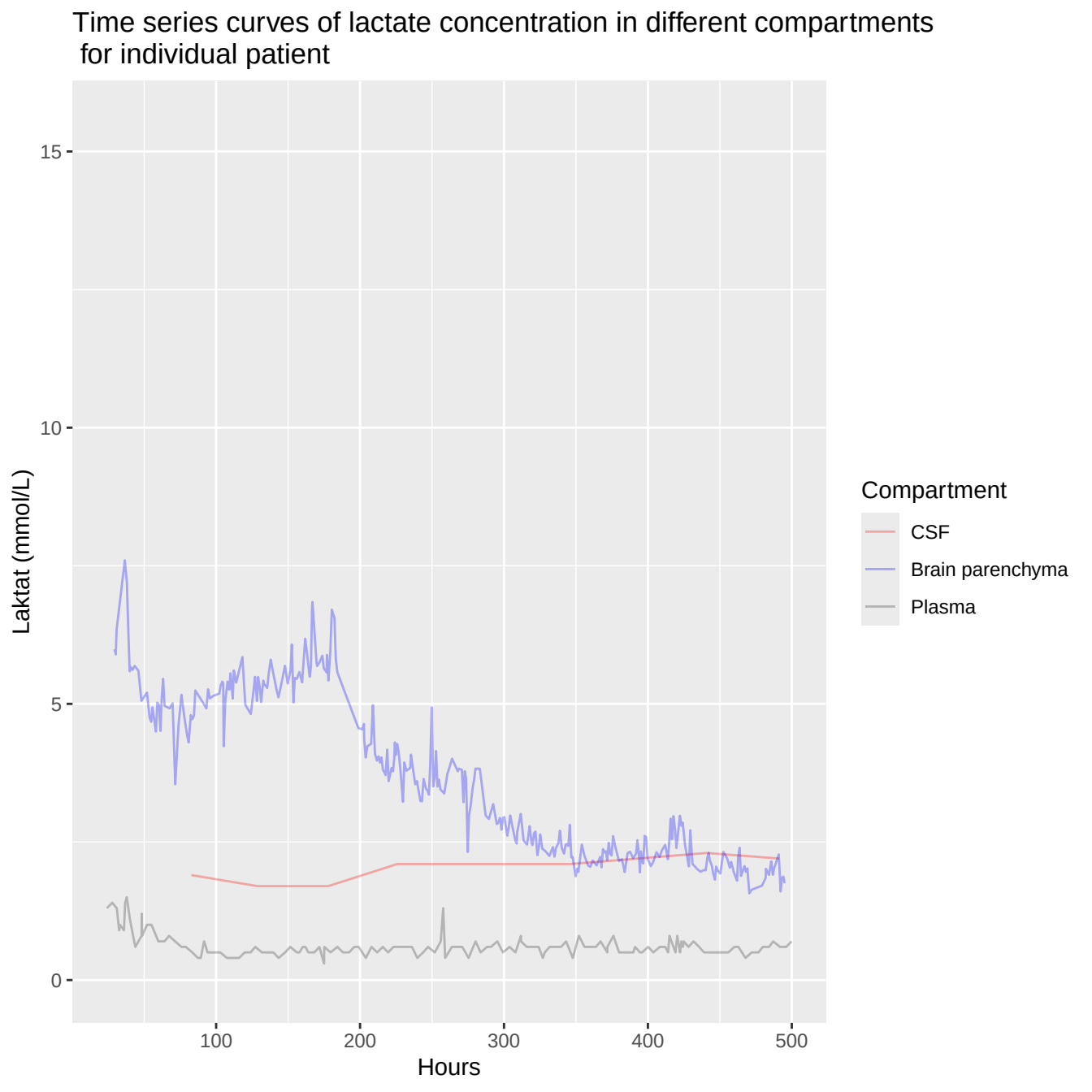

Time series curves of lactate concentration in different compartments for individual patient
Laktat (mmol/L)
15
10
5
0
0
200
400
600
Hours
Compartment
CSF
Brain parenchyma
Plasma

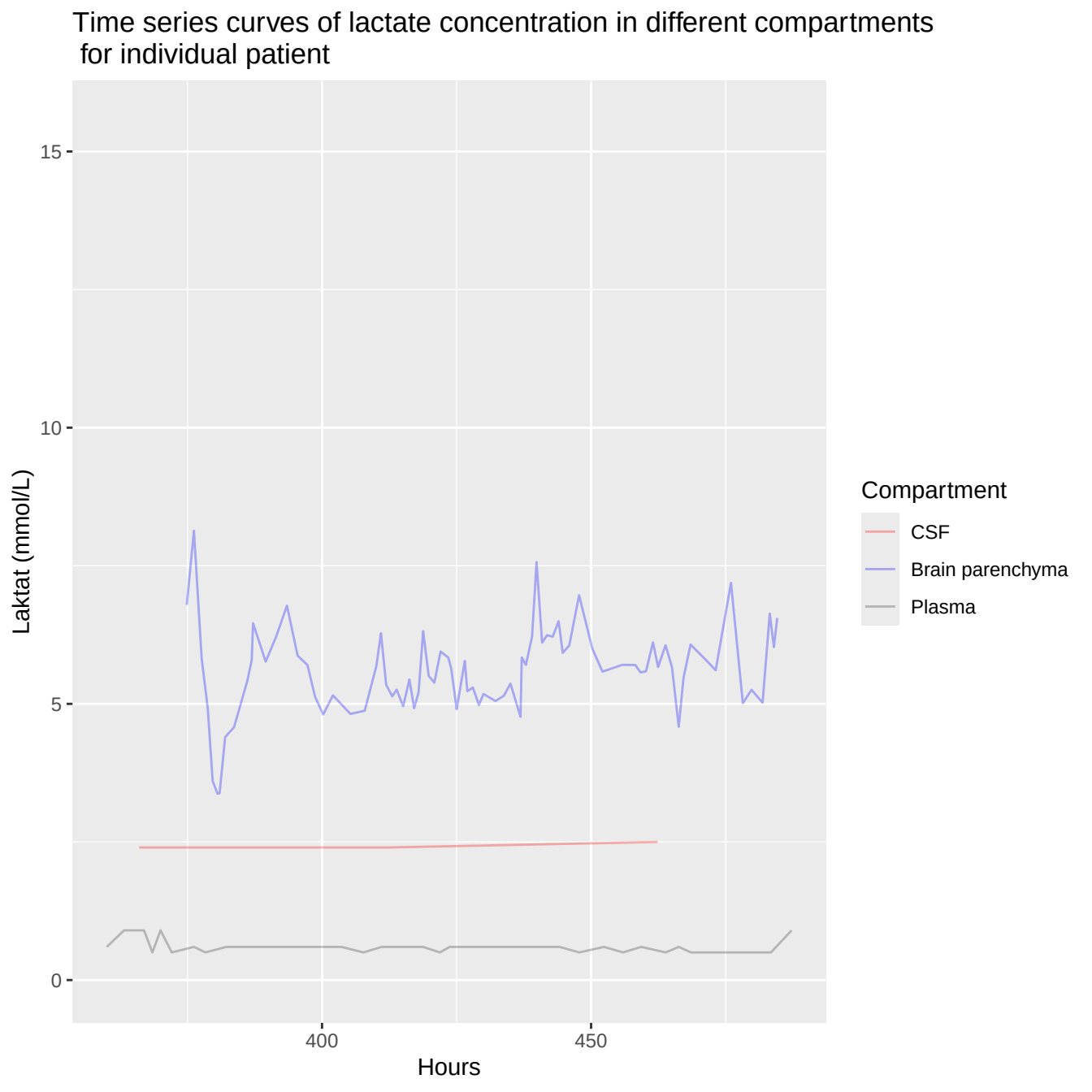

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

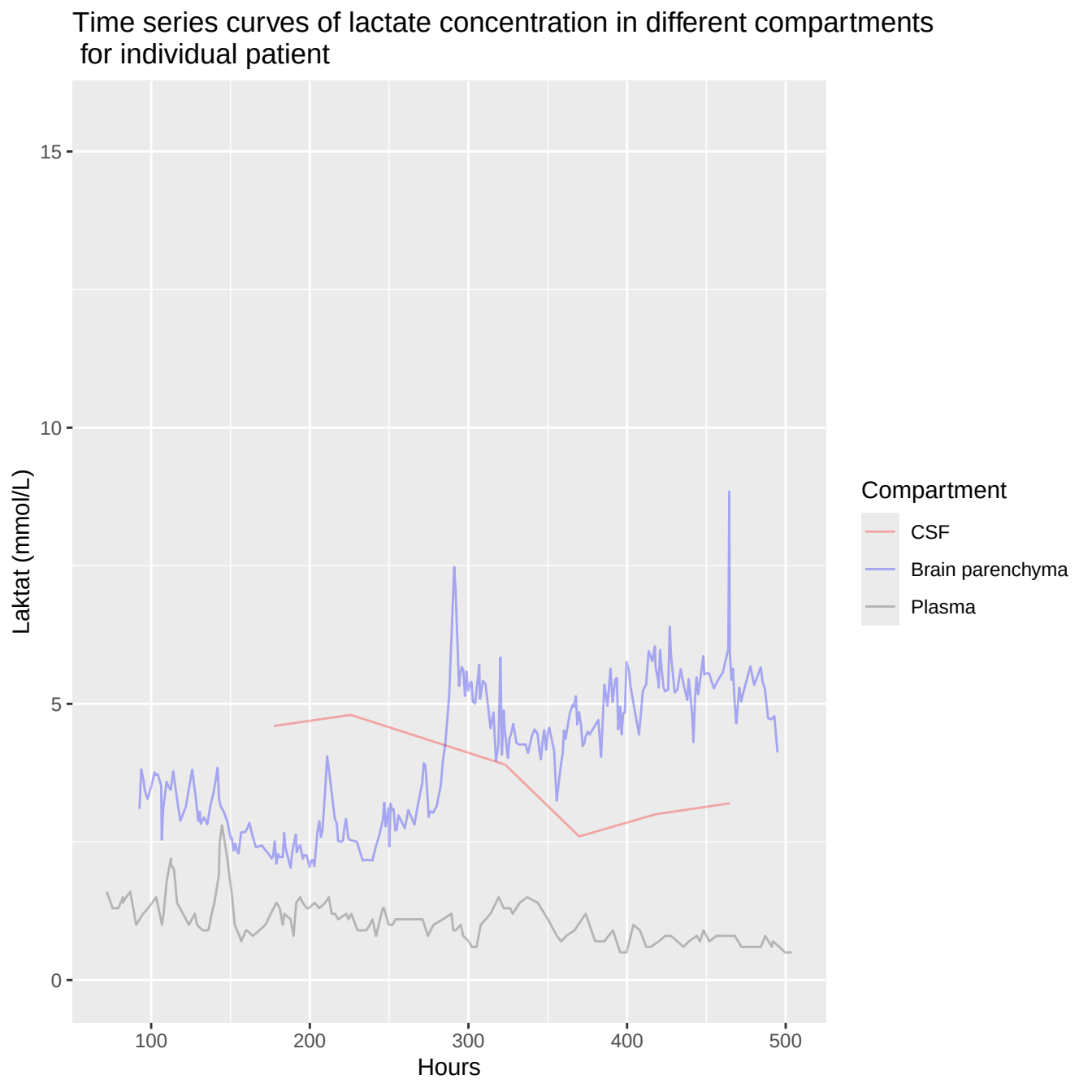

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
350
400
450
500
550
Hours
Compartment
CSF
Brain parenchyma
Plasma

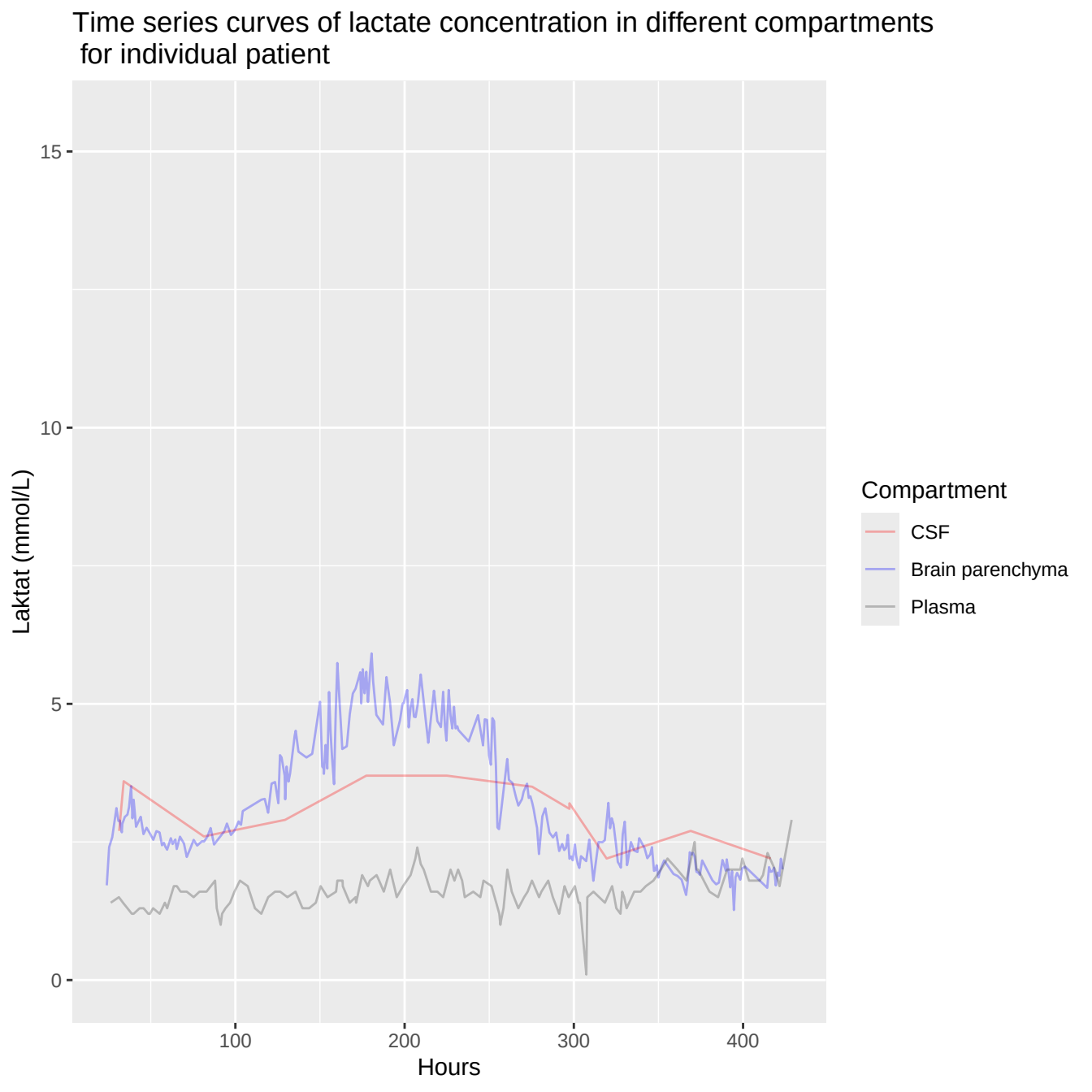

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
250
300
350
400
450
Hours
Compartment
CSF
Brain parenchyma
Plasma

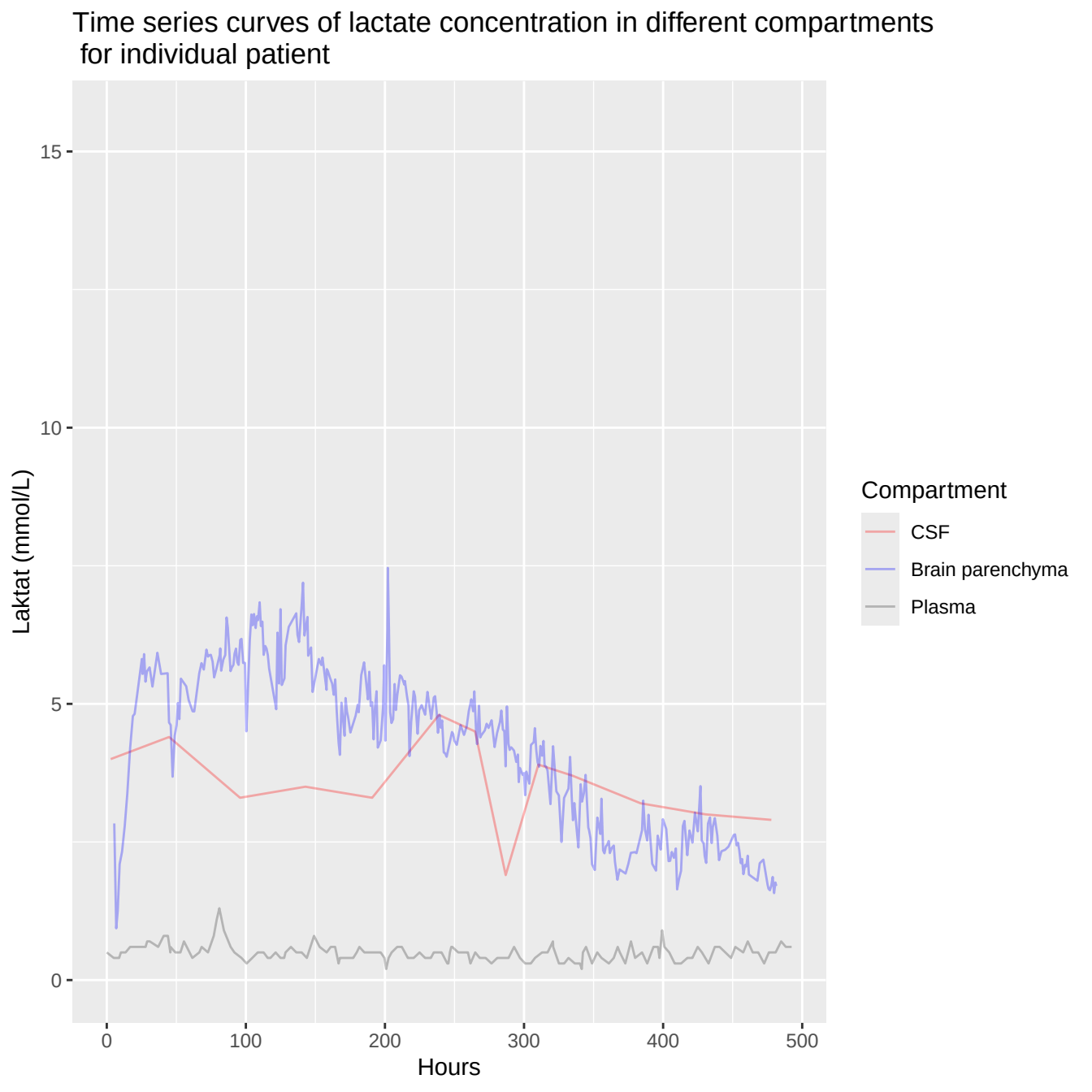

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
120
160
200
240
Hours
Compartment
CSF
Brain parenchyma
Plasma

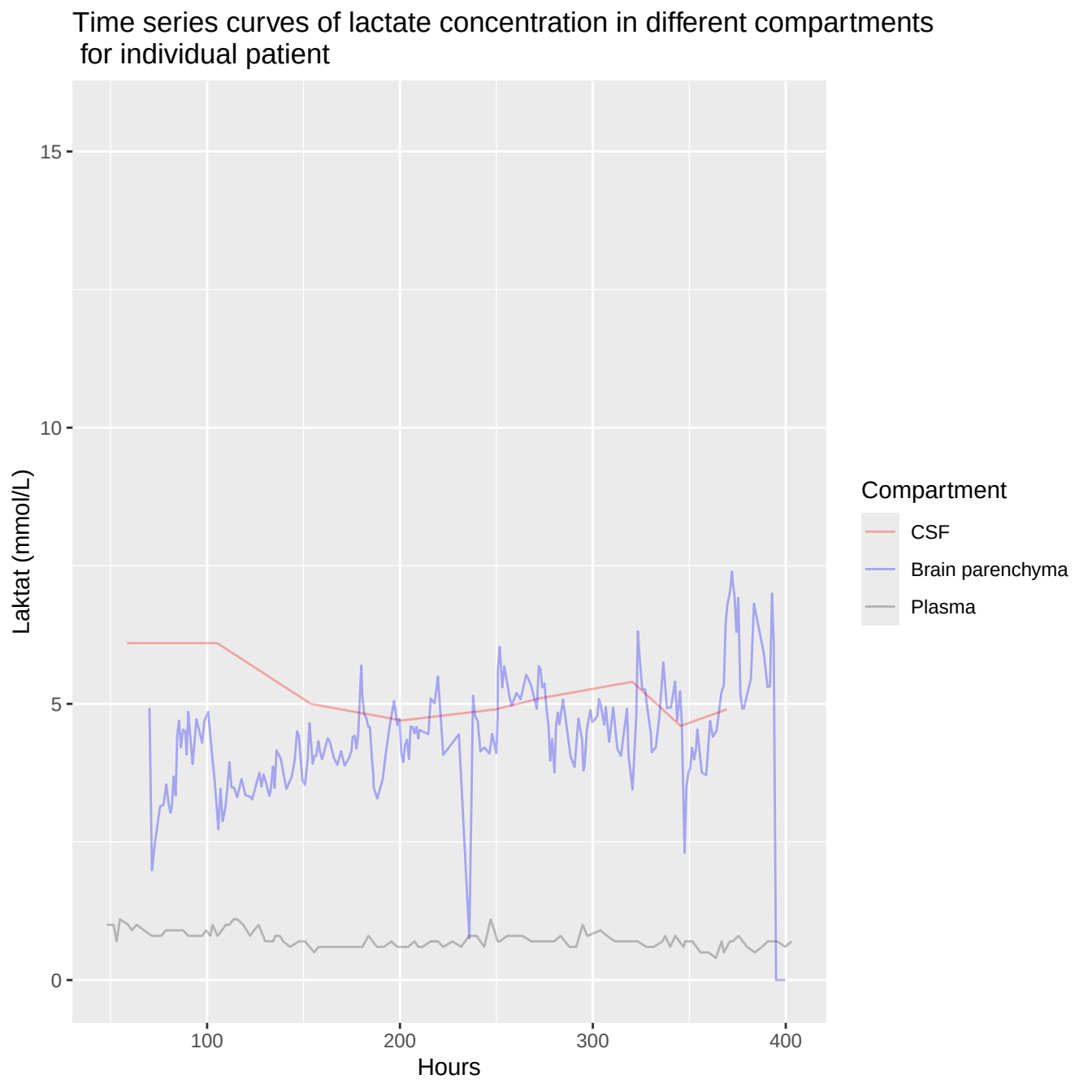

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

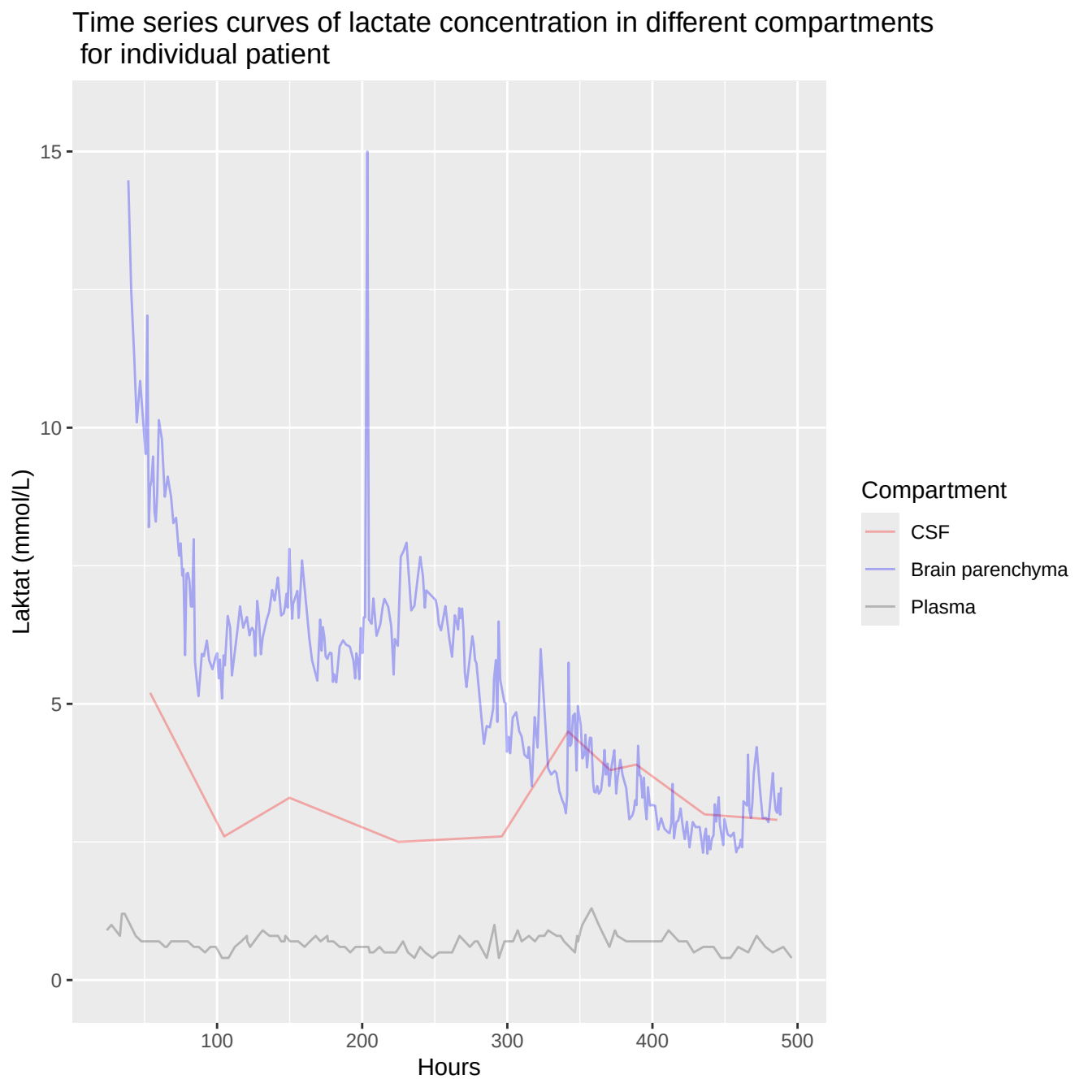

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
400
450
Hours
Compartment
CSF
Brain parenchyma
Plasma

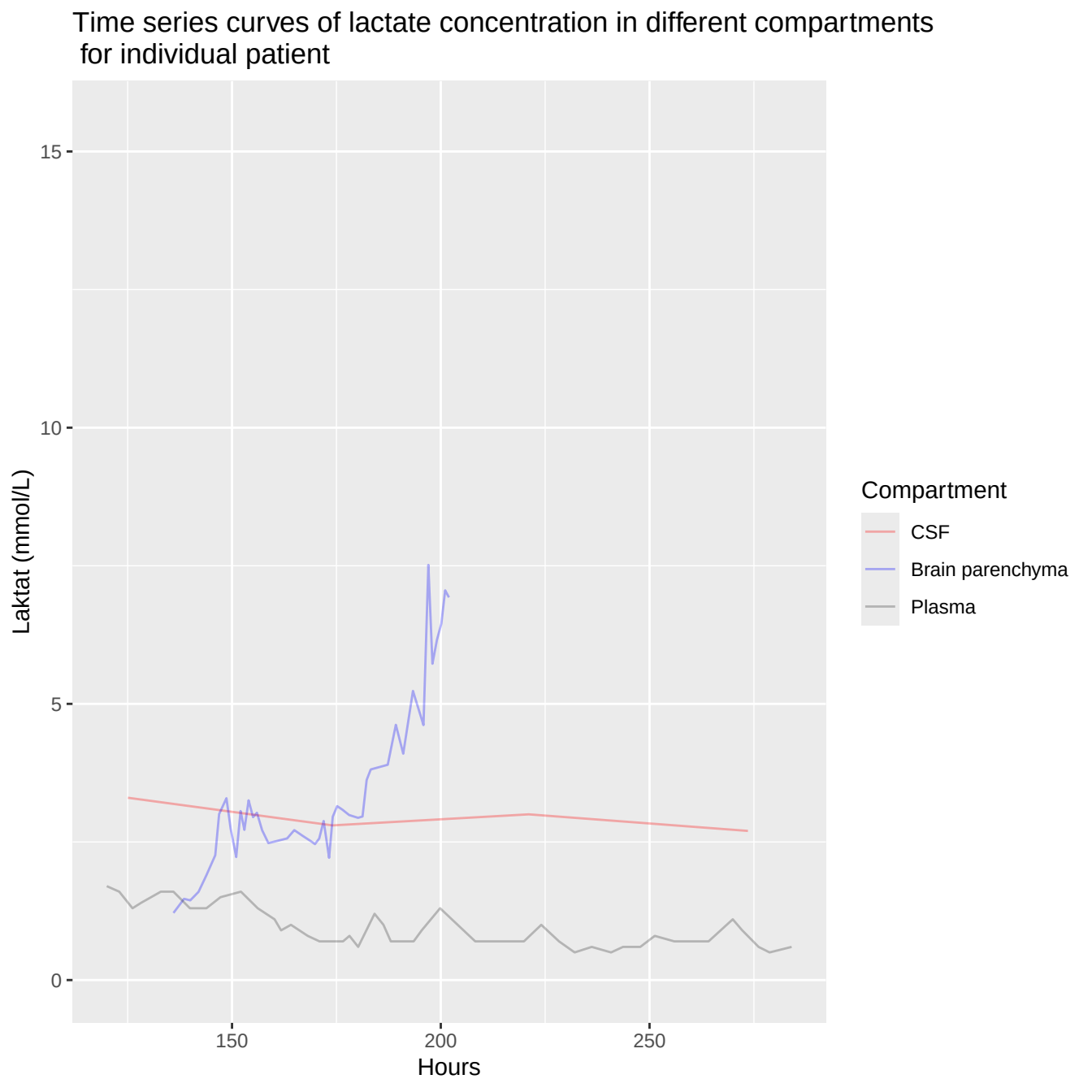

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

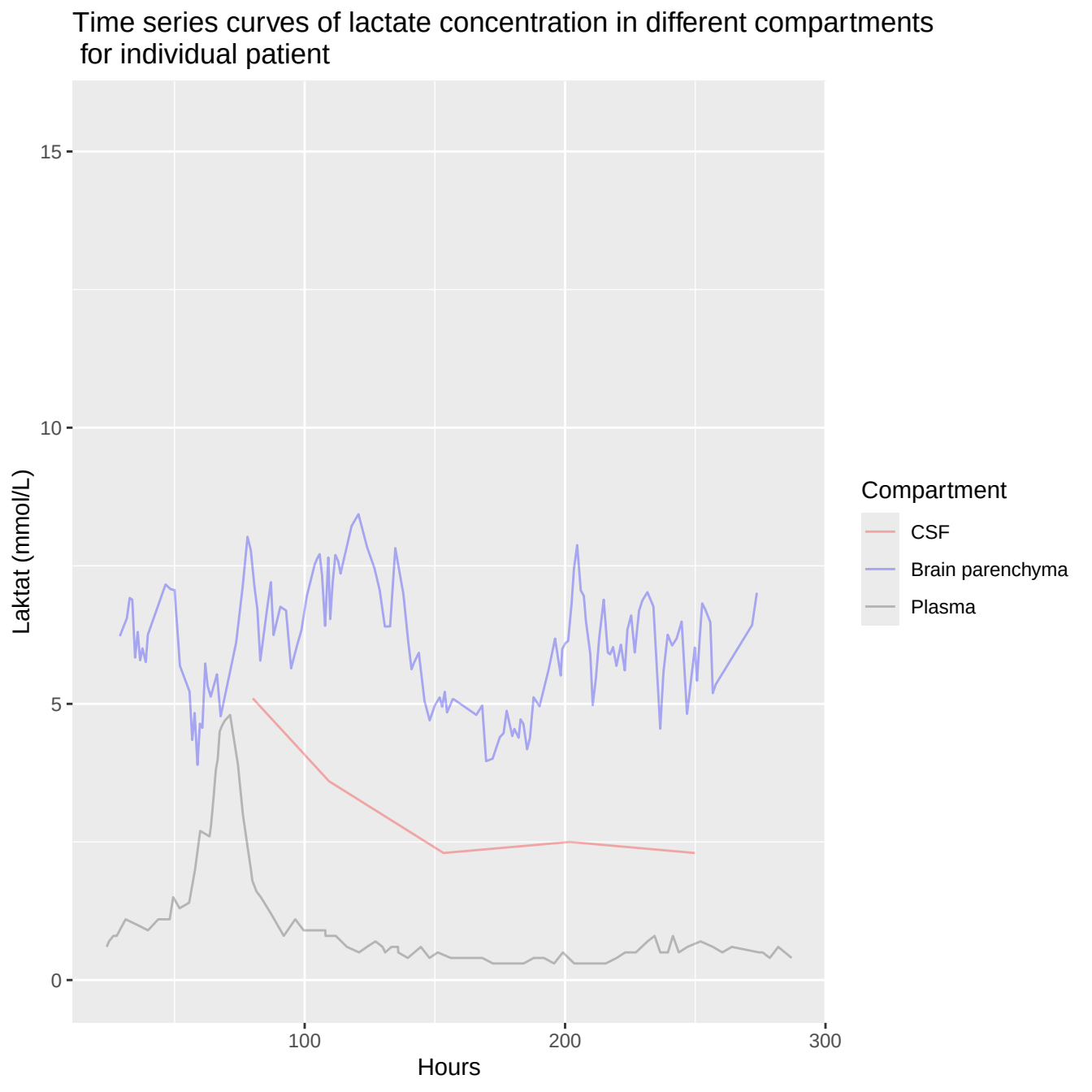

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

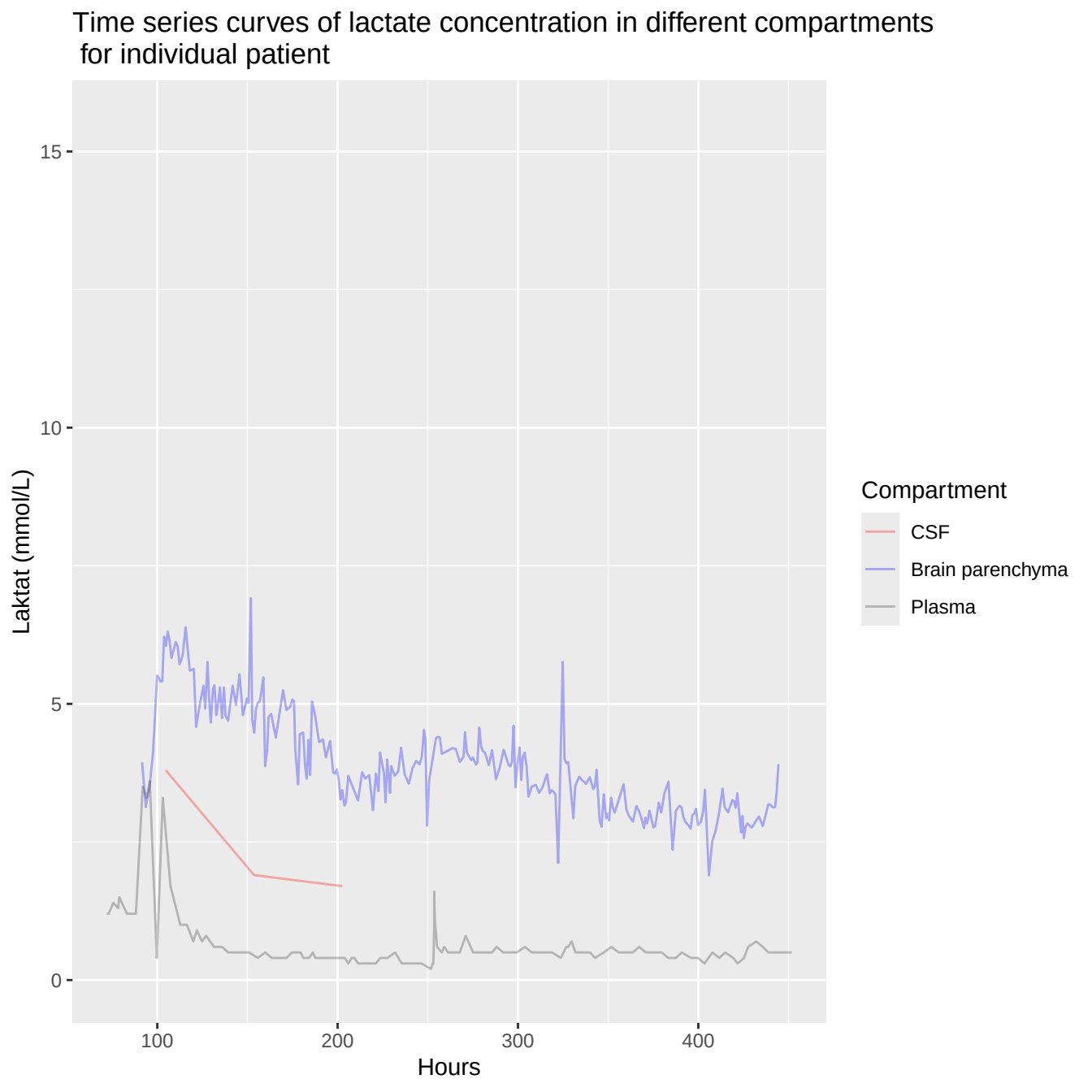

Time series curves of lactate concentration in different compartments for individual patient
Laktat (mmol/L)
15
10
5
0
0
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

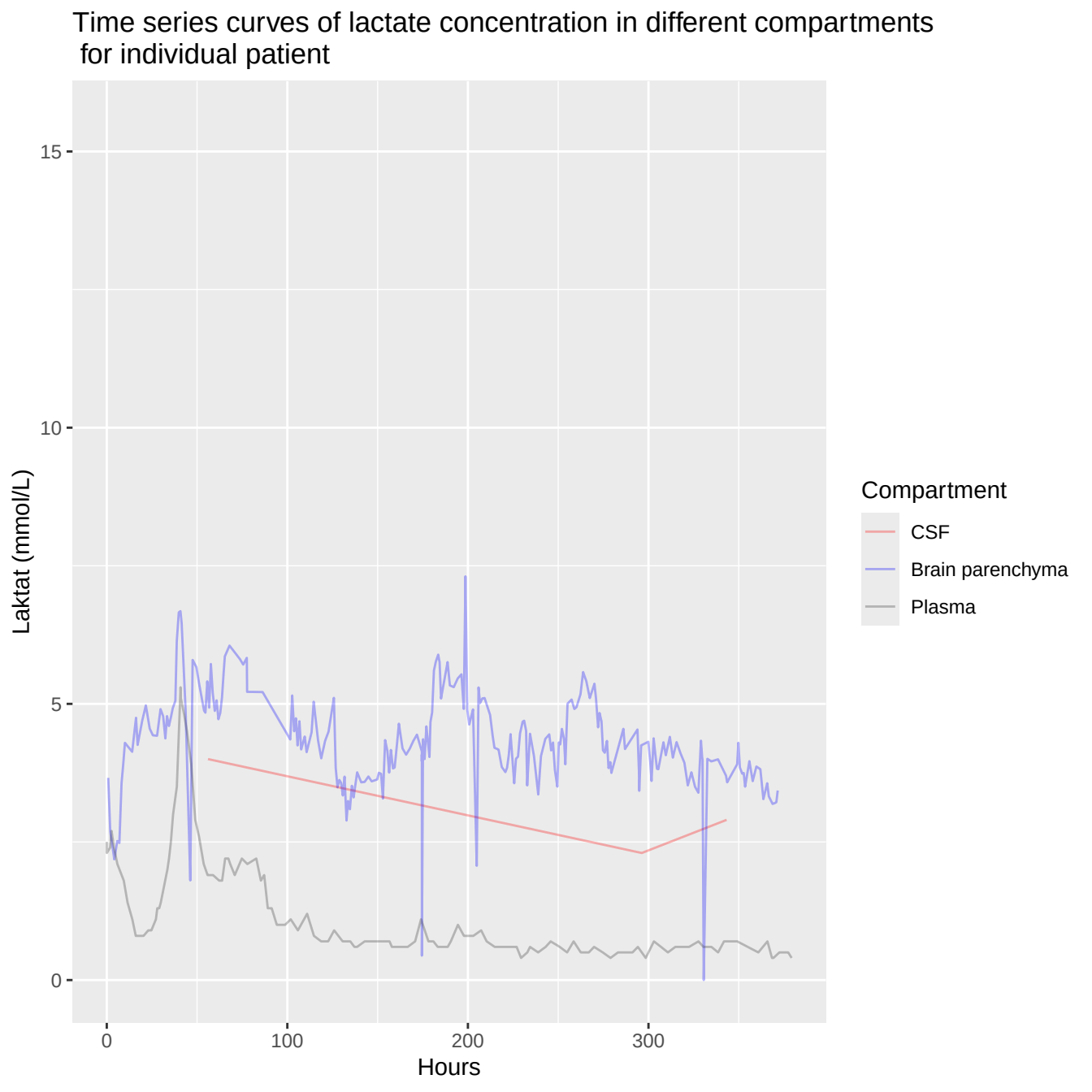

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

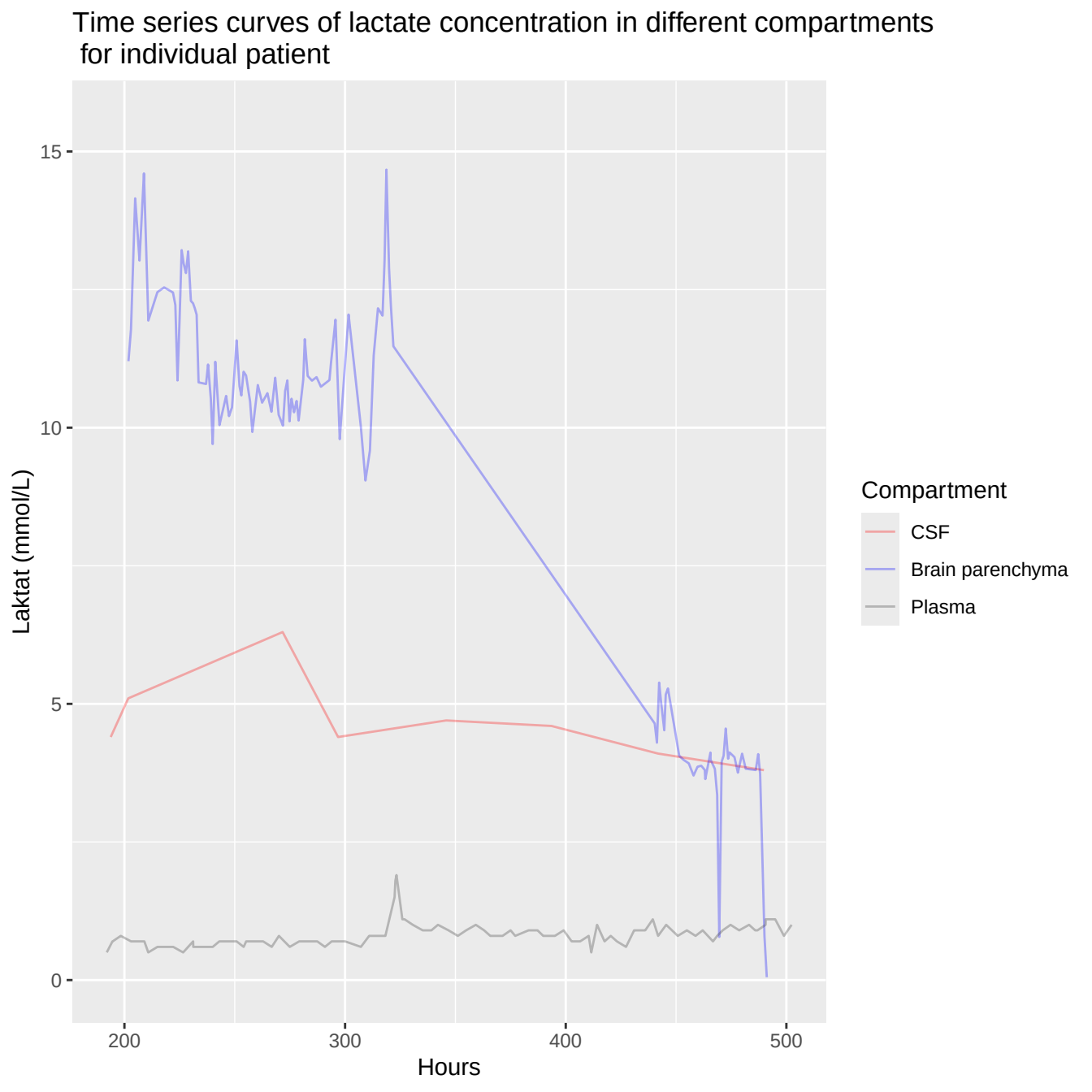

Time series curves of lactate concentration in different compartments for individual patient
Laktat (mmol/L)
15
10
5
0
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

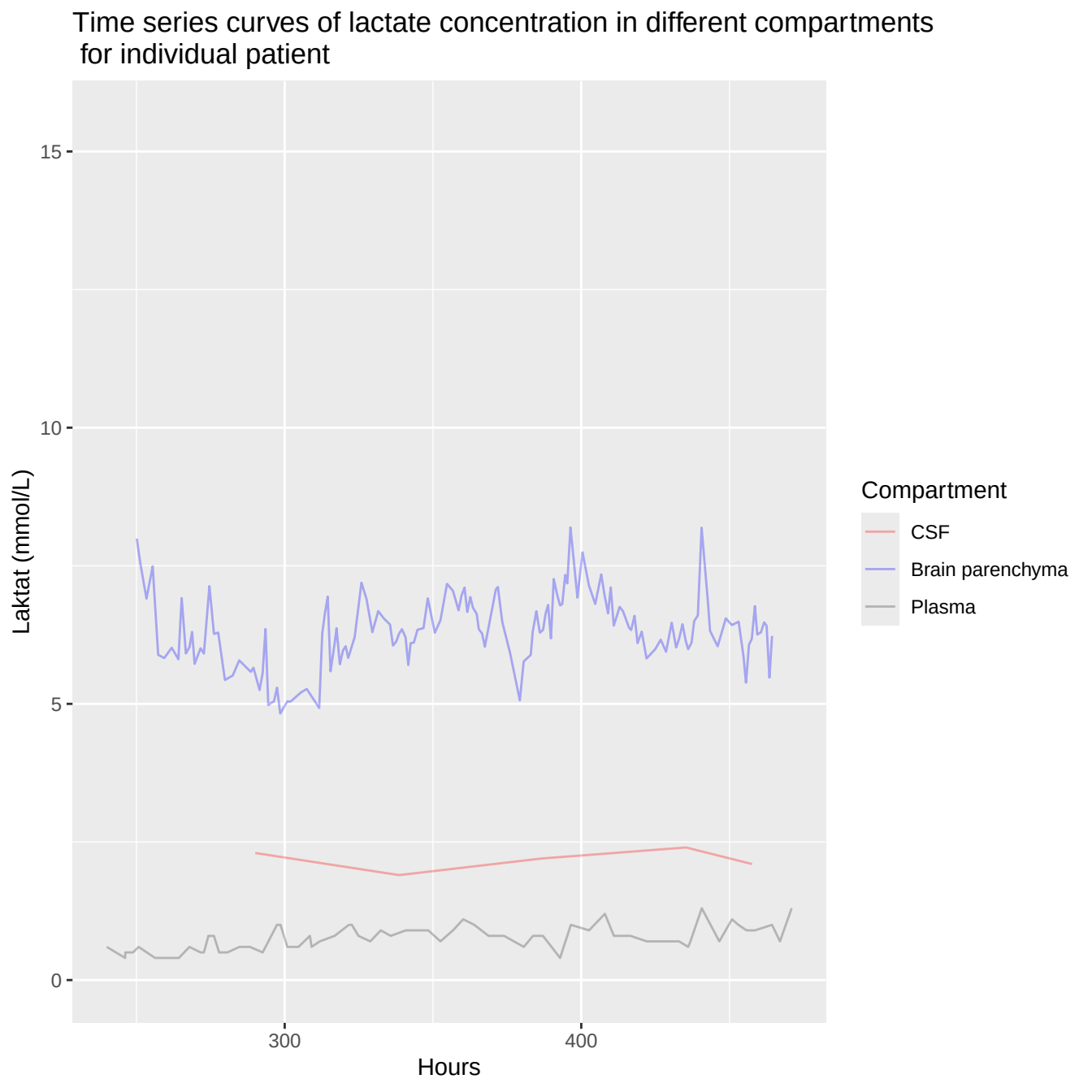

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
150
200
250
Hours
Compartment
CSF
Brain parenchyma
Plasma

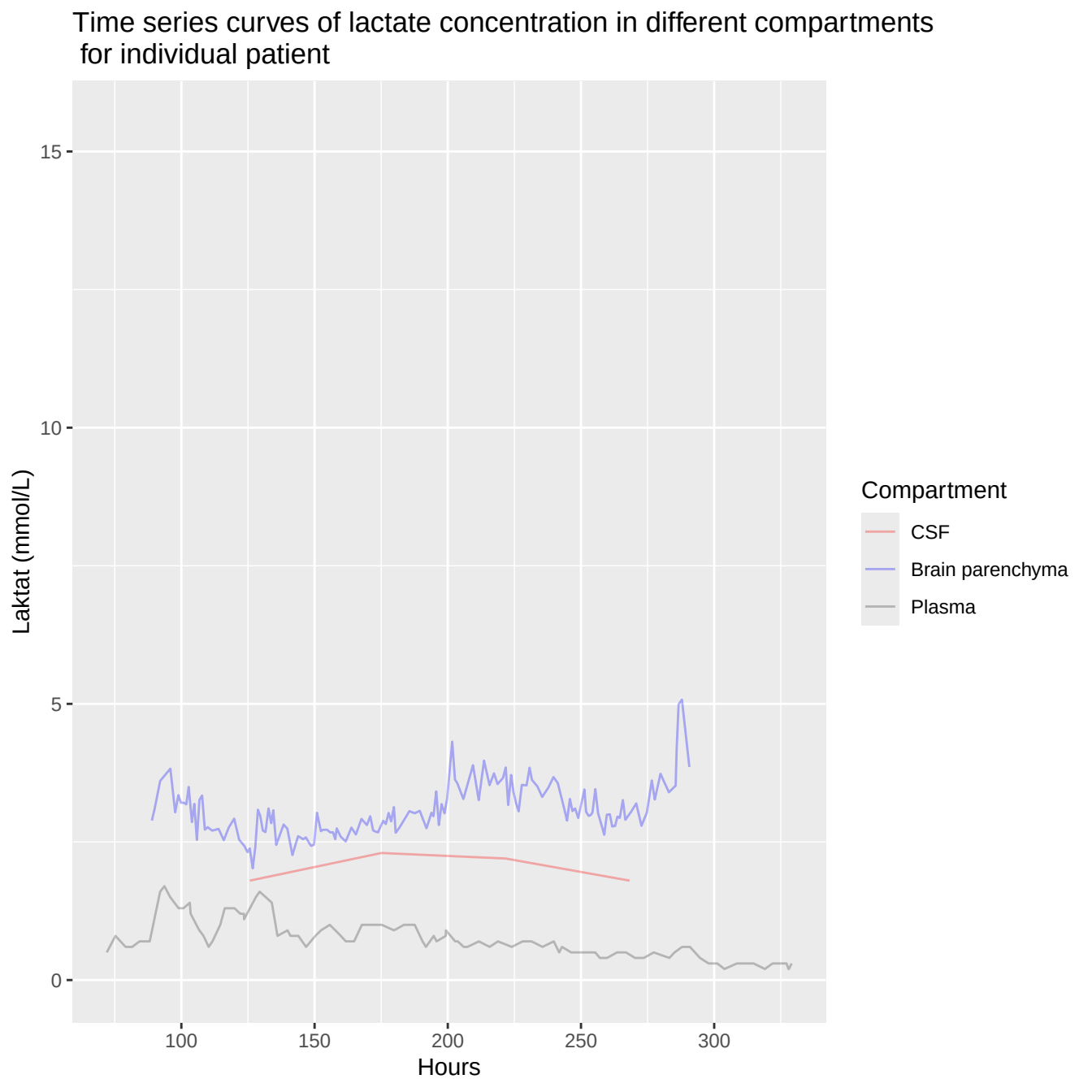

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

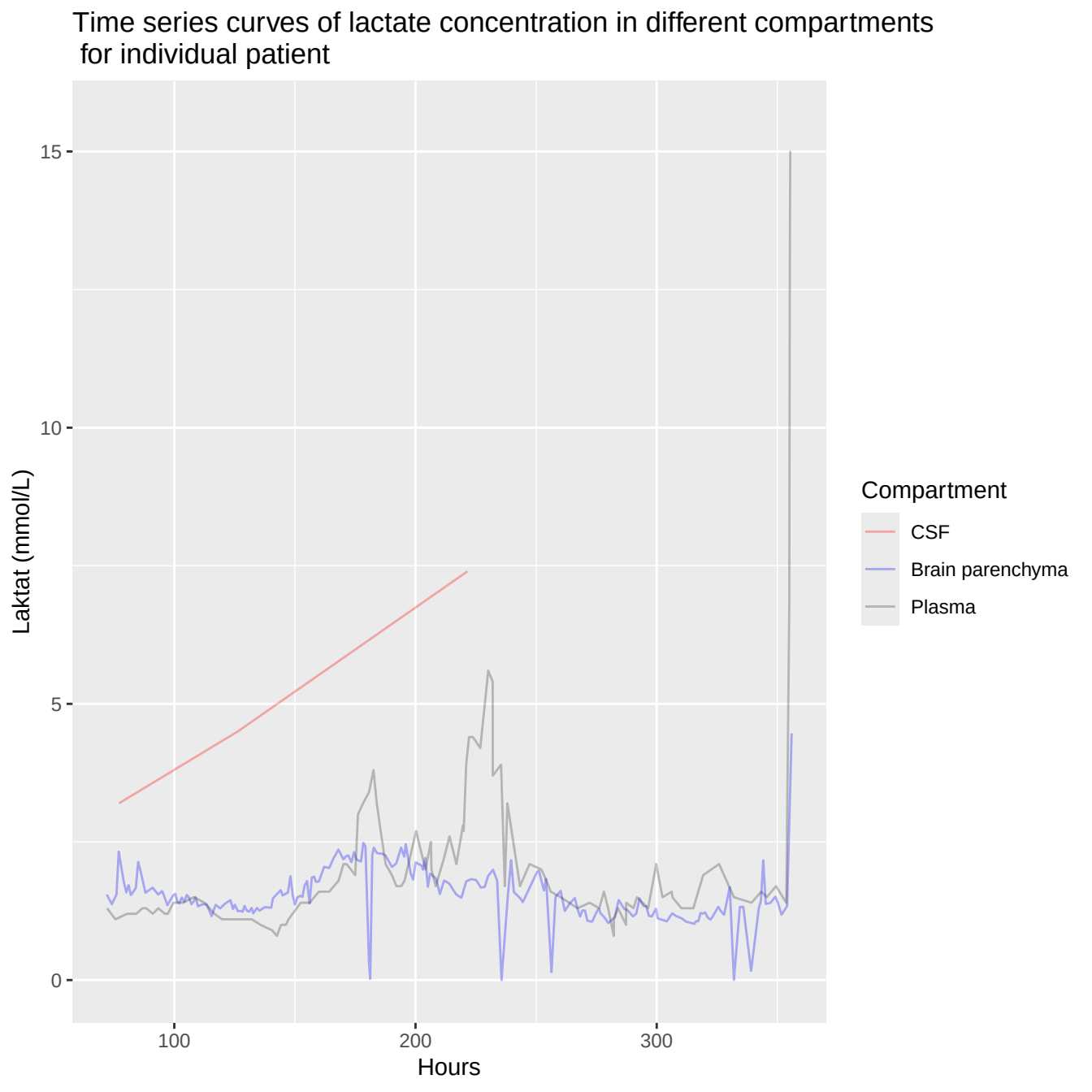

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

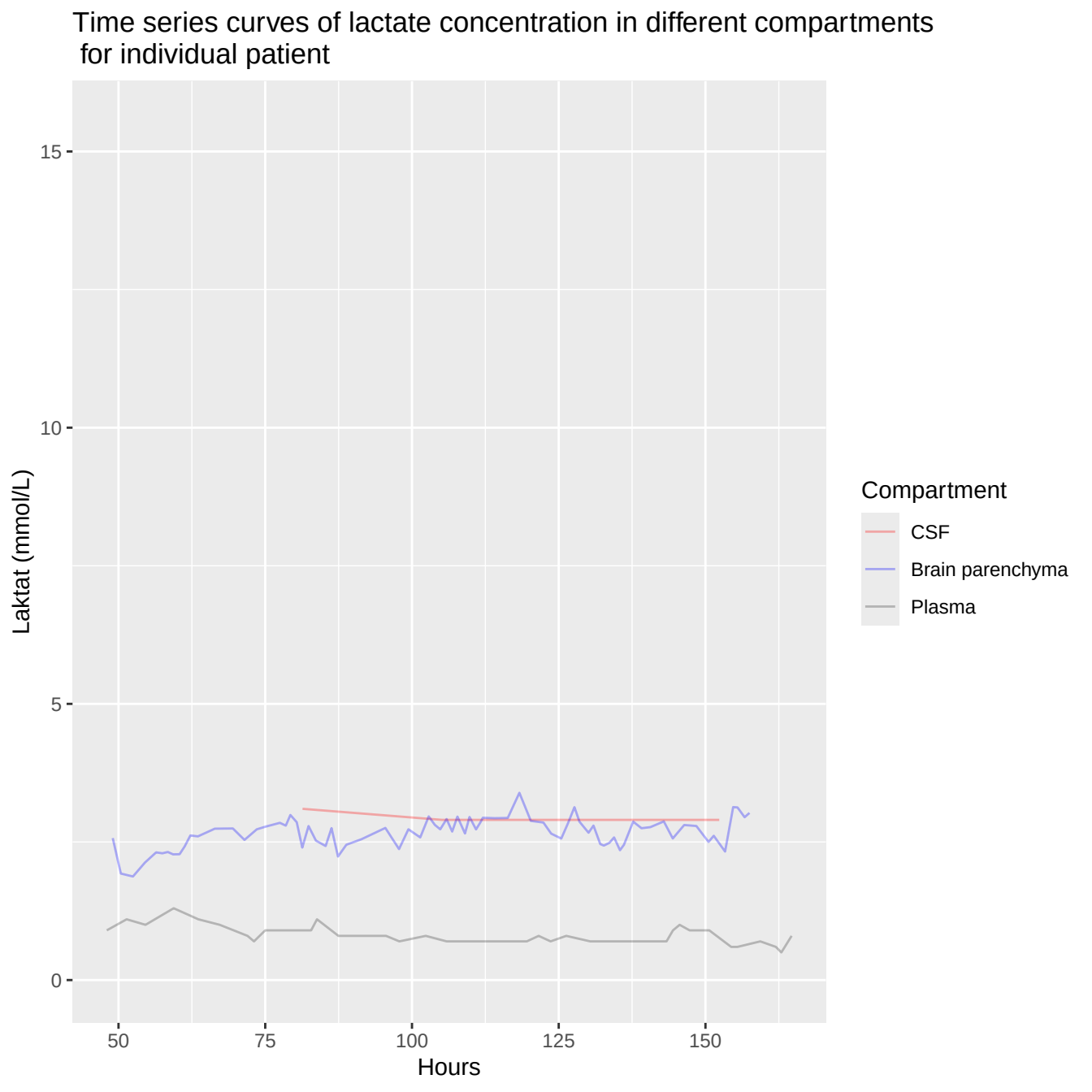

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
0
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

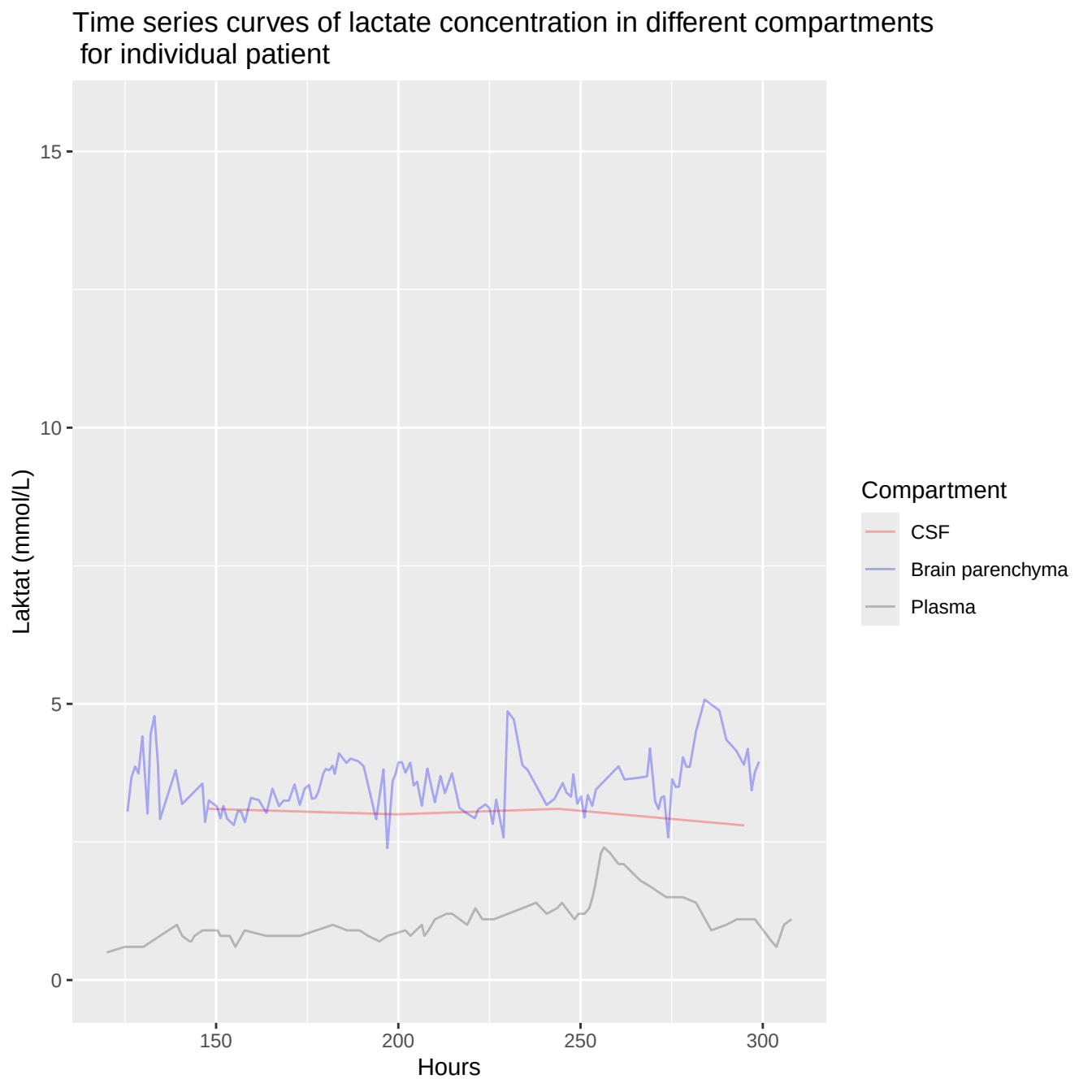

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

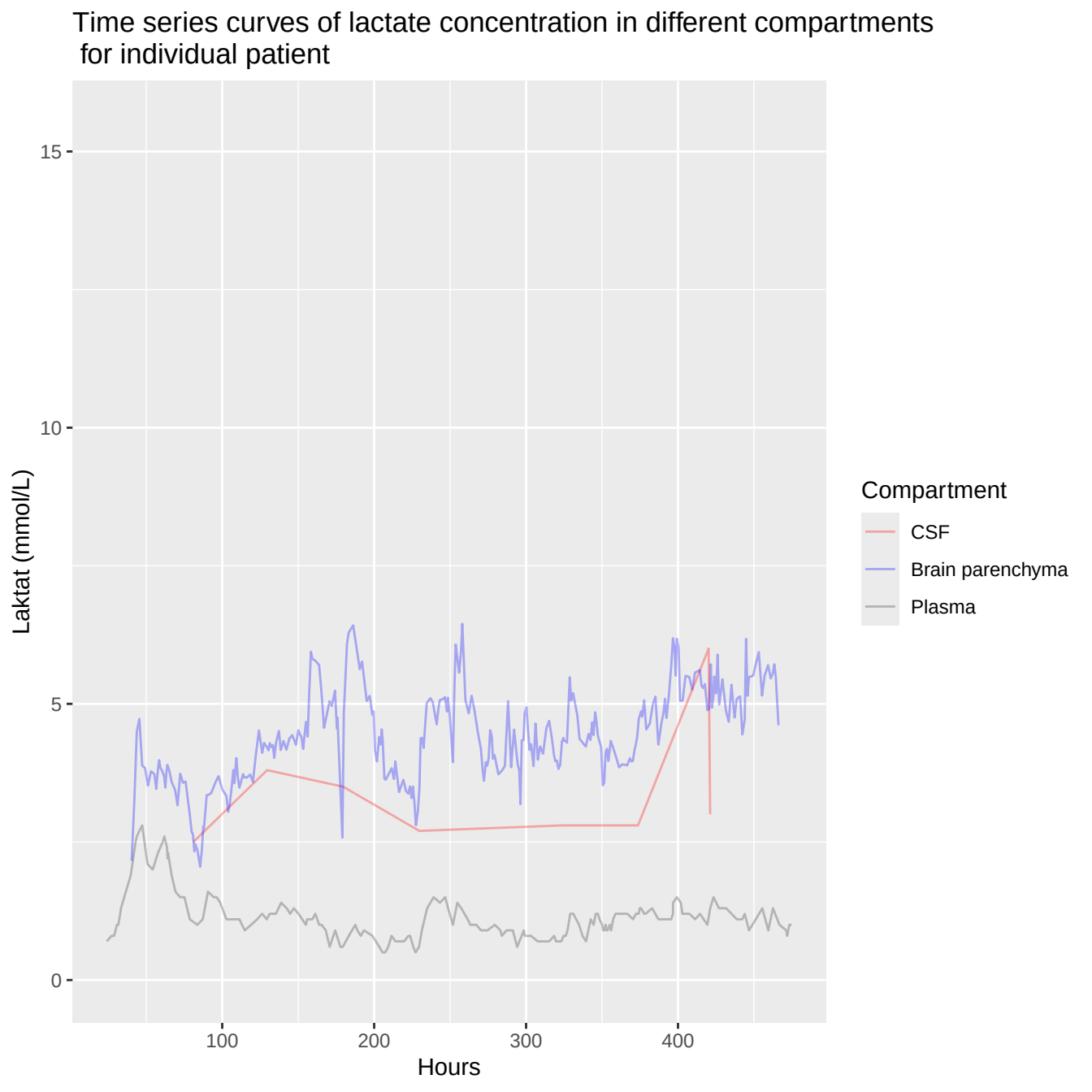

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma

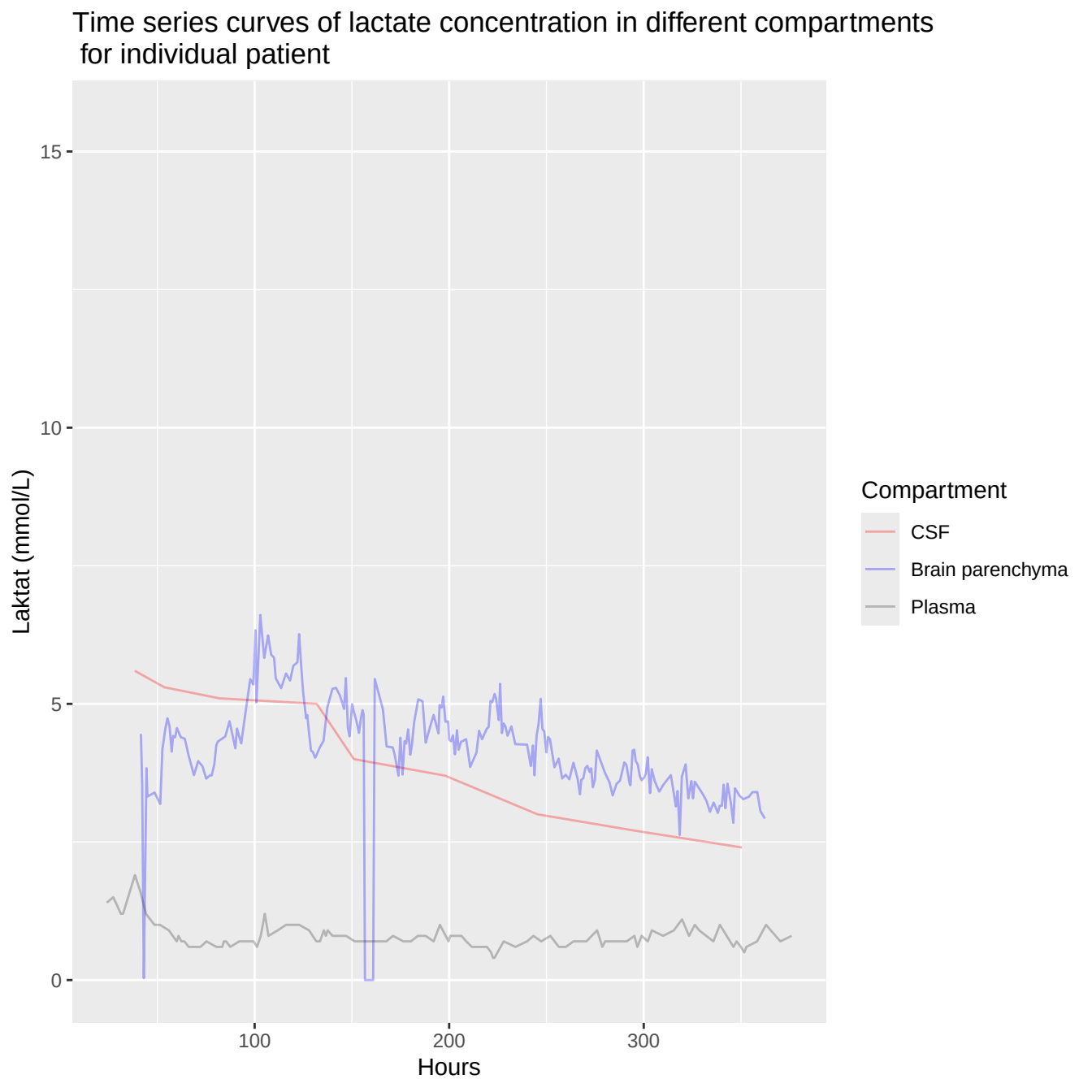

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
150
200
250
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

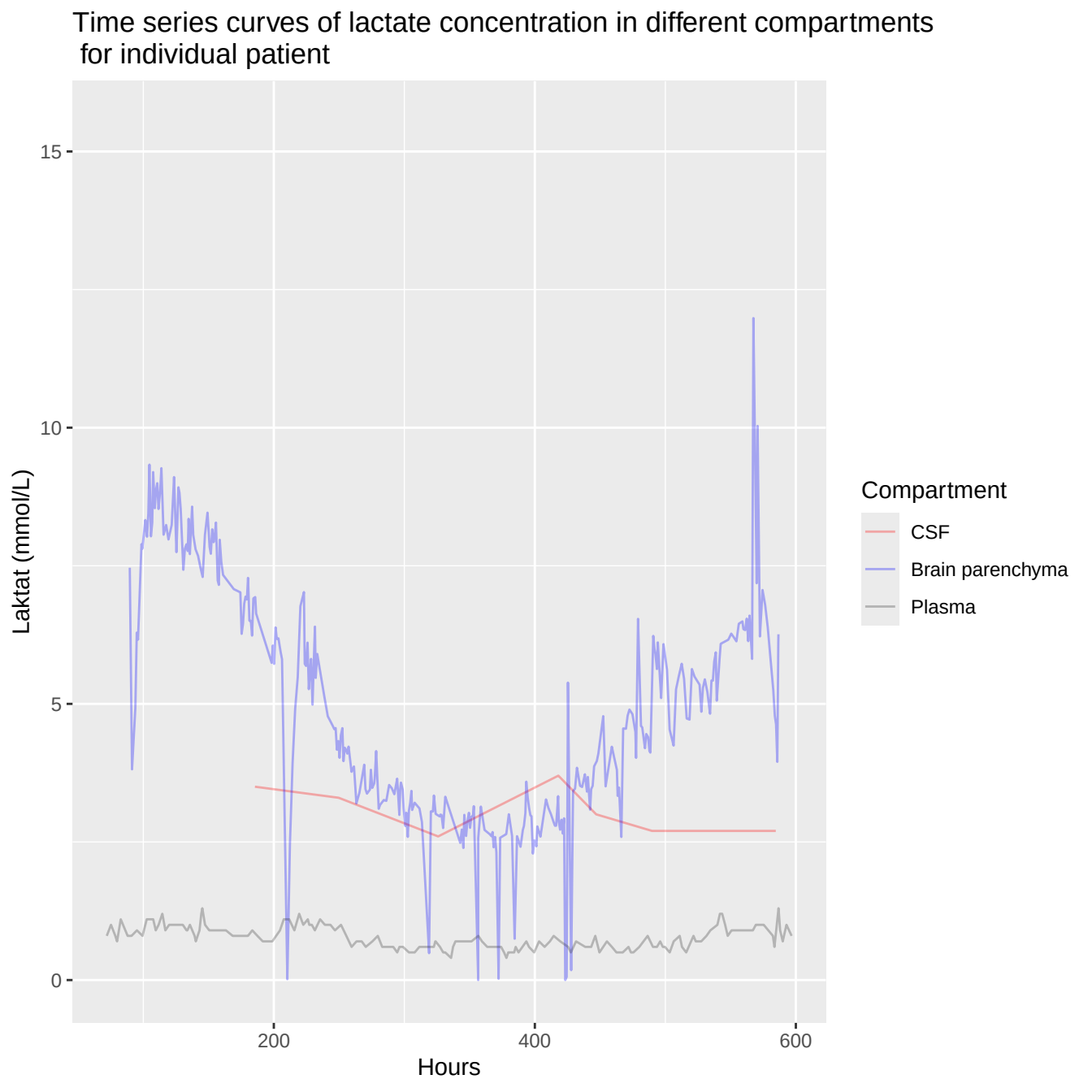

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma

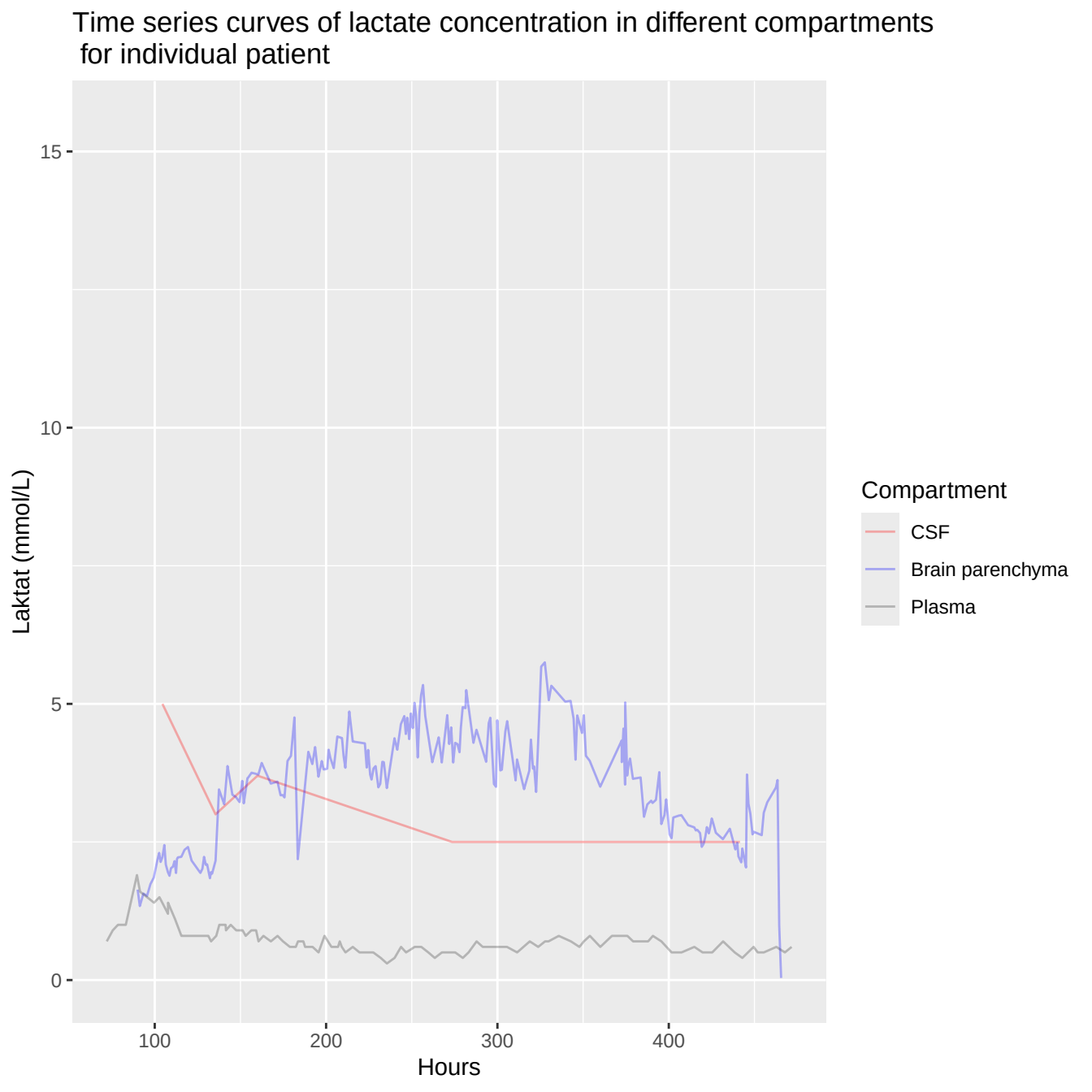

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
50
75
100
125
150
Hours
Compartment
CSF
Brain parenchyma
Plasma

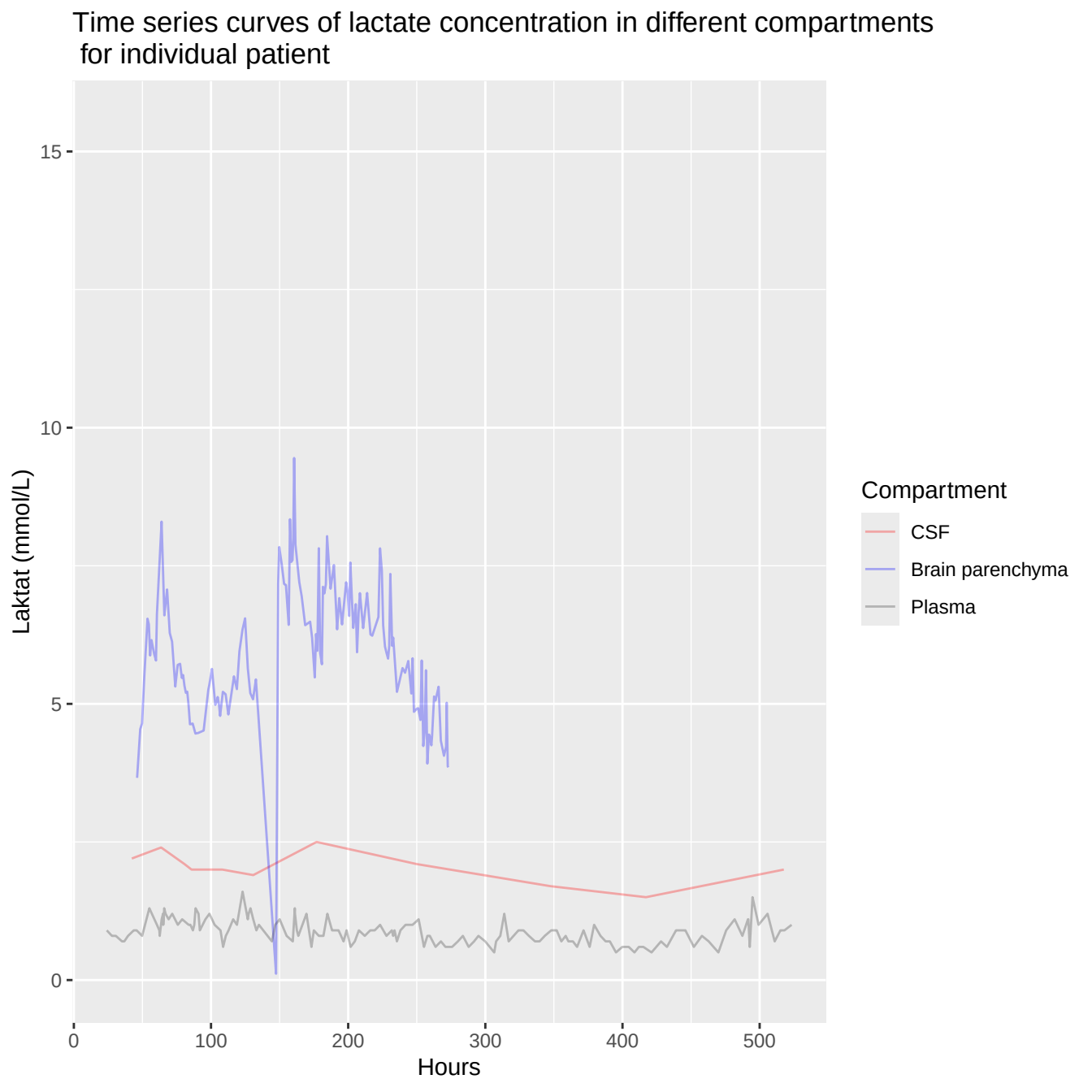

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
150
200
250
300
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
200
400
600
Hours
Compartment
CSF
Brain parenchyma
Plasma

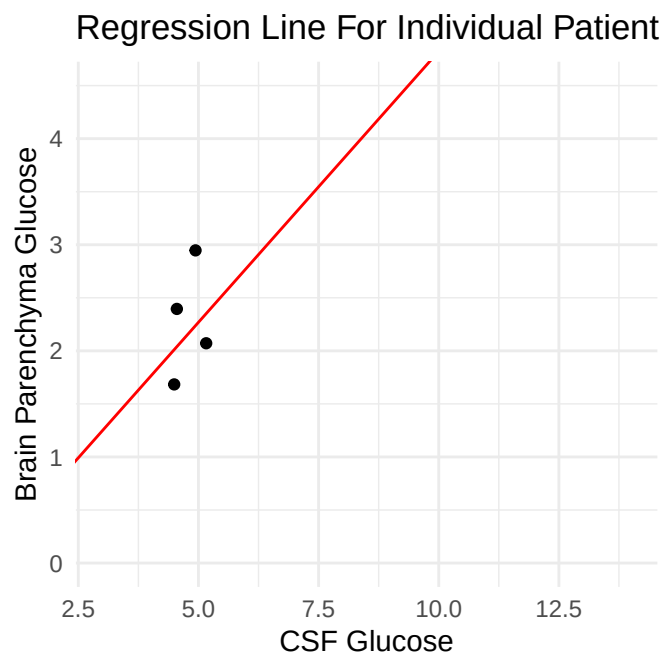

Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
100
200
300
400
Hours
Compartment
CSF
Brain parenchyma
Plasma


Time series curves of lactate concentration in different compartments for individual patient
15
10
5
0
Laktat (mmol/L)
0
100
200
300
400
500
Hours
Compartment
CSF
Brain parenchyma
Plasma

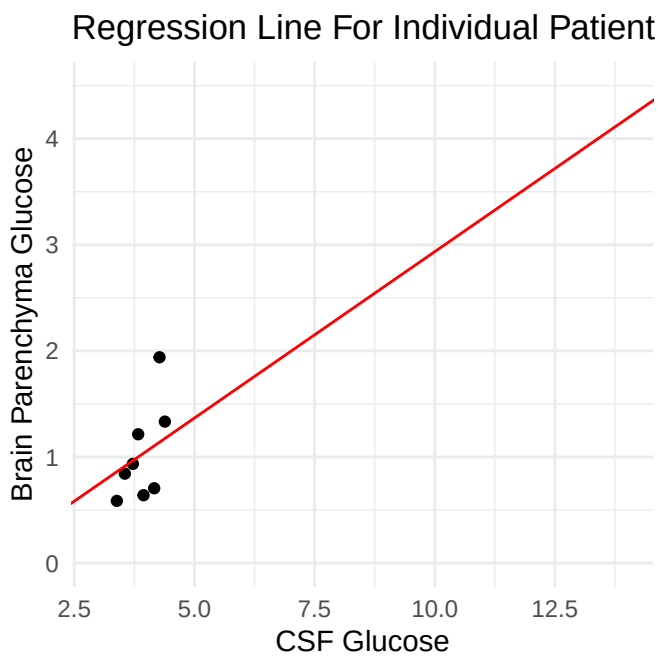
5. Scatter Plots

Values above 15mmol/L where cut off at 15 mmol/L in the following plots.

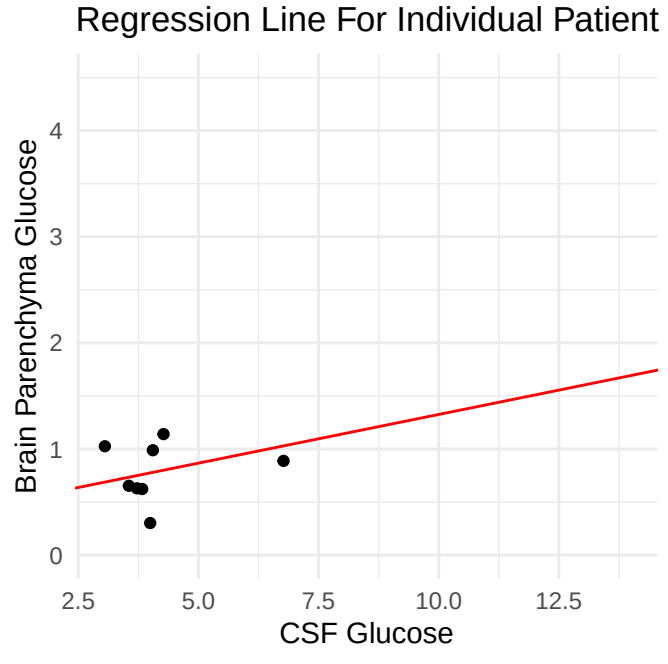
5.1 CSF Glucose vs. Brain Parenchyma Glucose



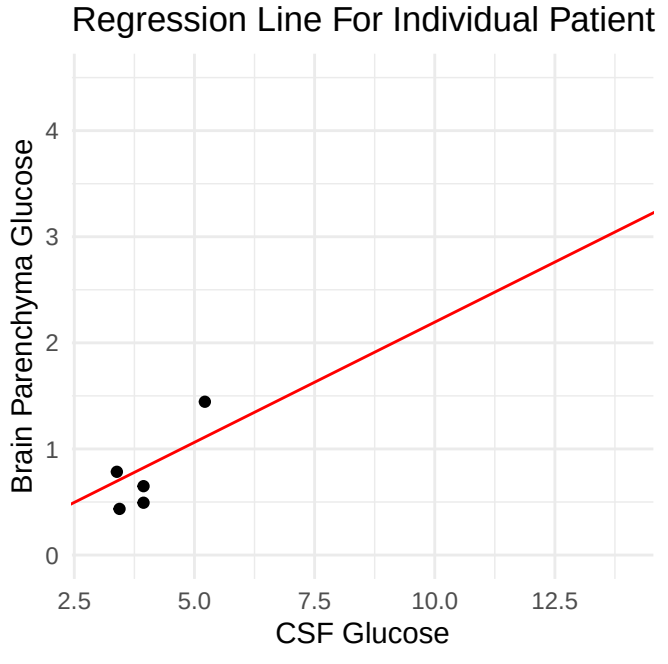
Regression Line For Individual Patient



Regression Line For Individual Patient



Regression Line For Individual Patient

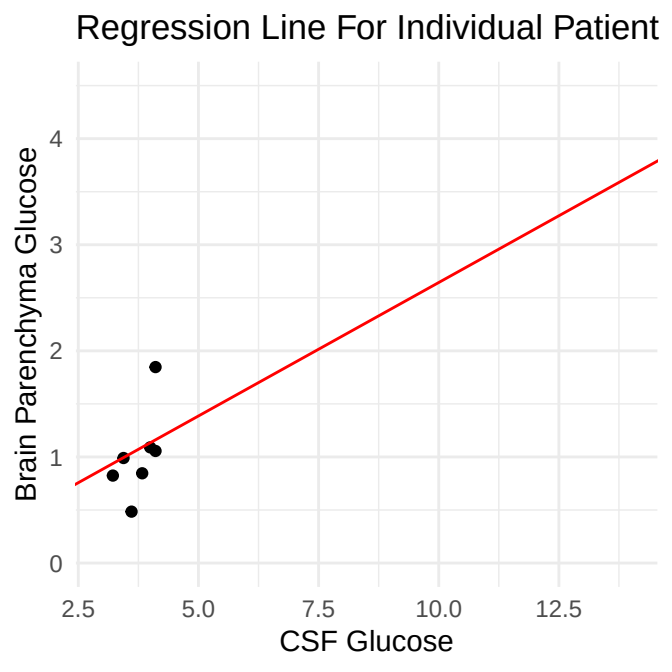


Regression Line For Individual Patient


Regression Line For Individual Patient


Regression Line For Individual Patient

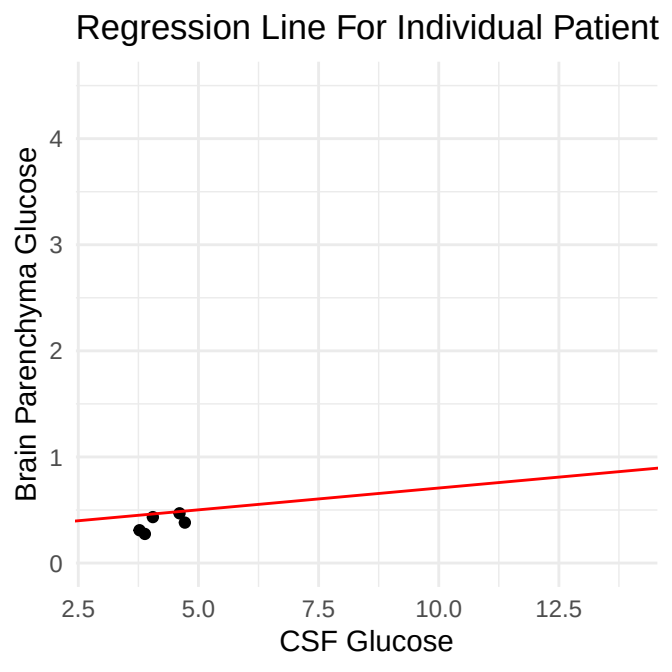

Regression Line For Individual Patient

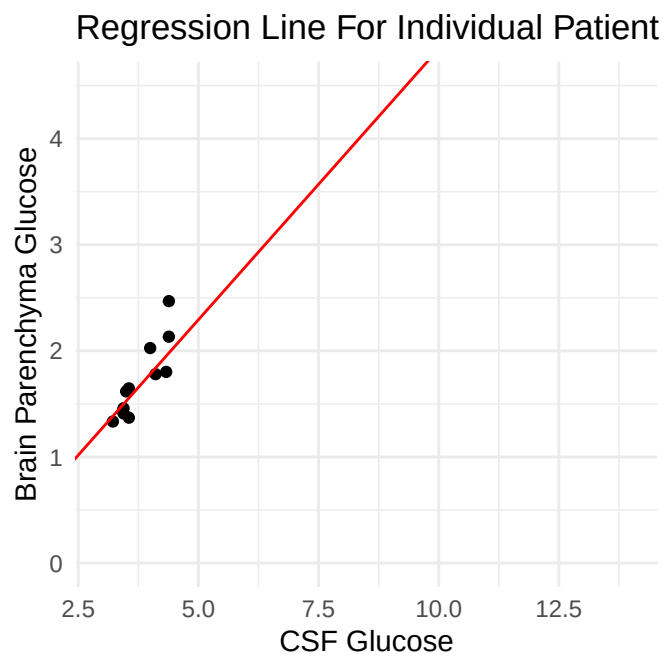

Regression Line For Individual Patient

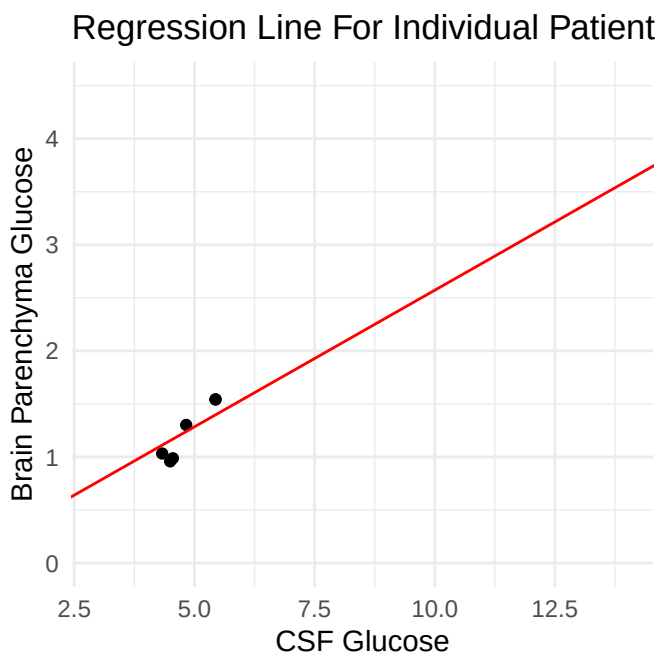

Regression Line For Individual Patient

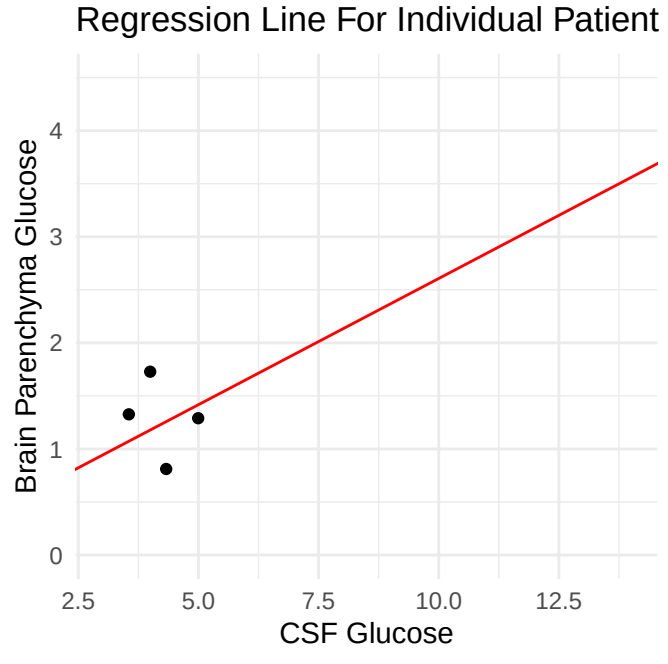

Regression Line For Individual Patient

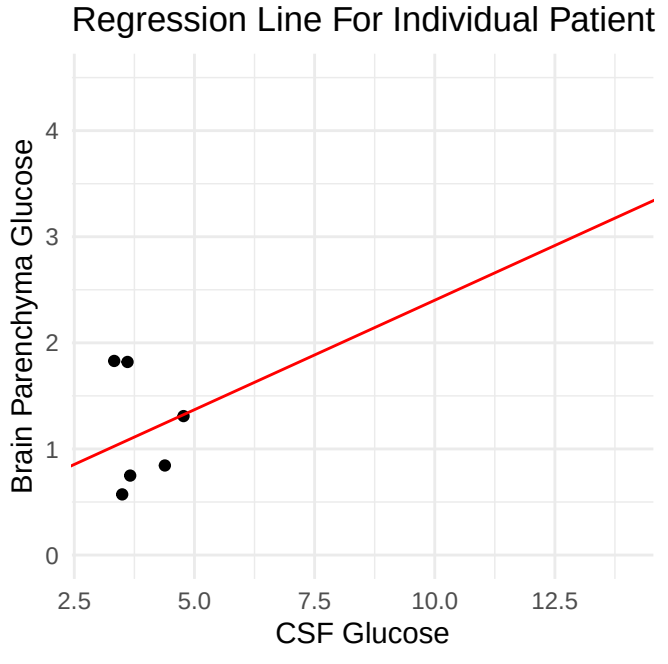

Regression Line For Individual Patient


Regression Line For Individual Patient


Regression Line For Individual Patient

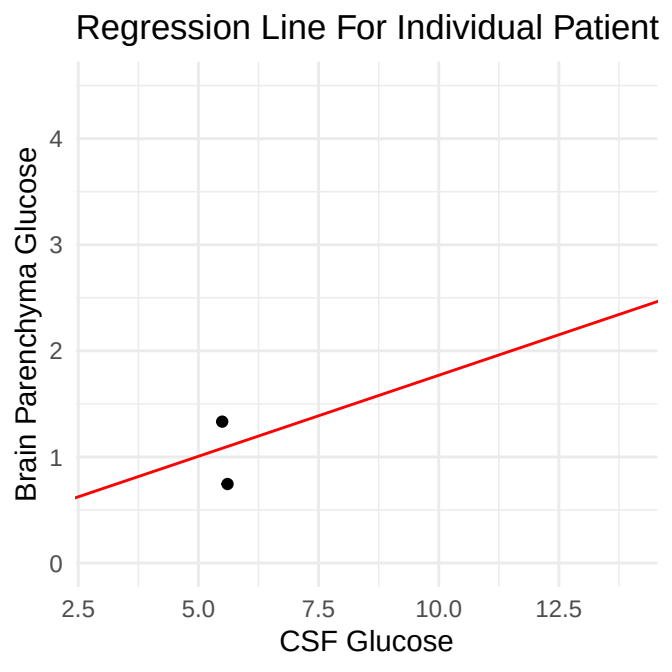

Regression Line For Individual Patient

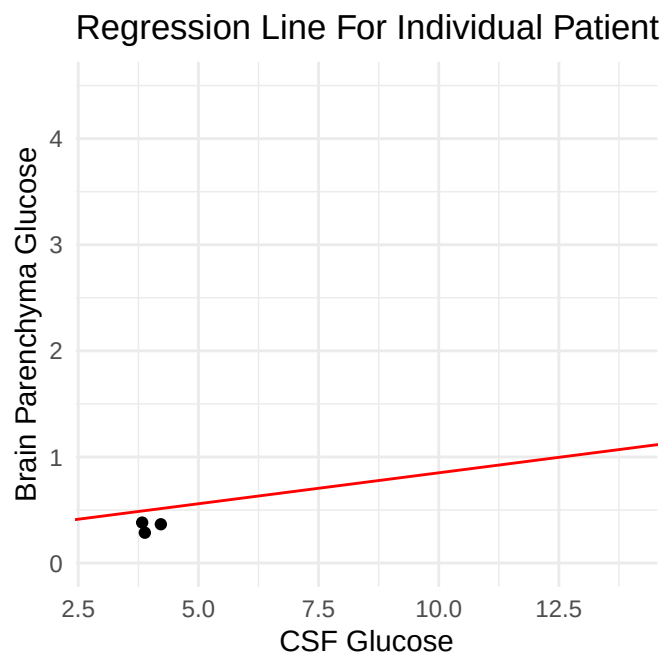

Regression Line For Individual Patient


Regression Line For Individual Patient


Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
CSF Glucose

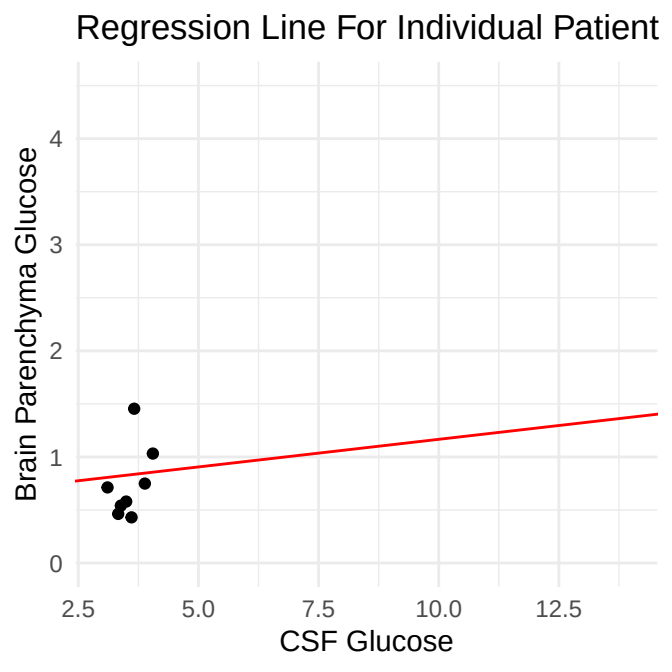

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
CSF Glucose


Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
CSF Glucose


Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
CSF Glucose

Regression Line For Individual Patient

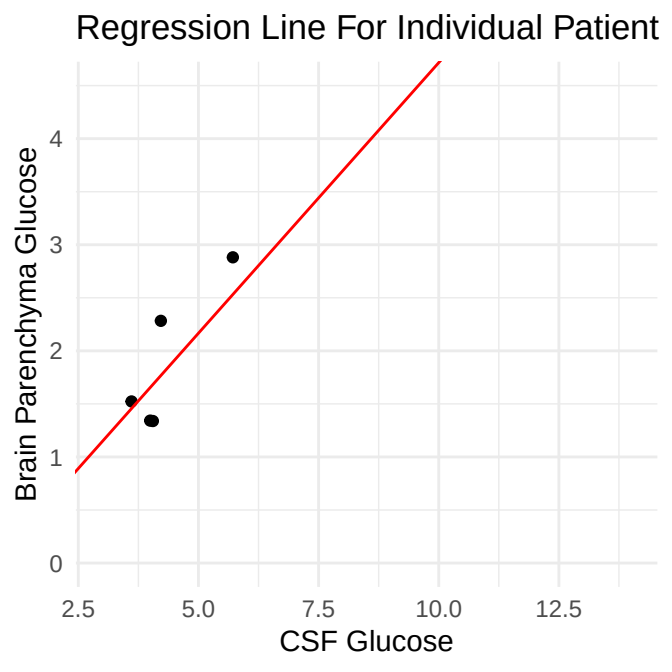
Regression Line For Individual Patient



Regression Line For Individual Patient

Regression Line For Individual Patient

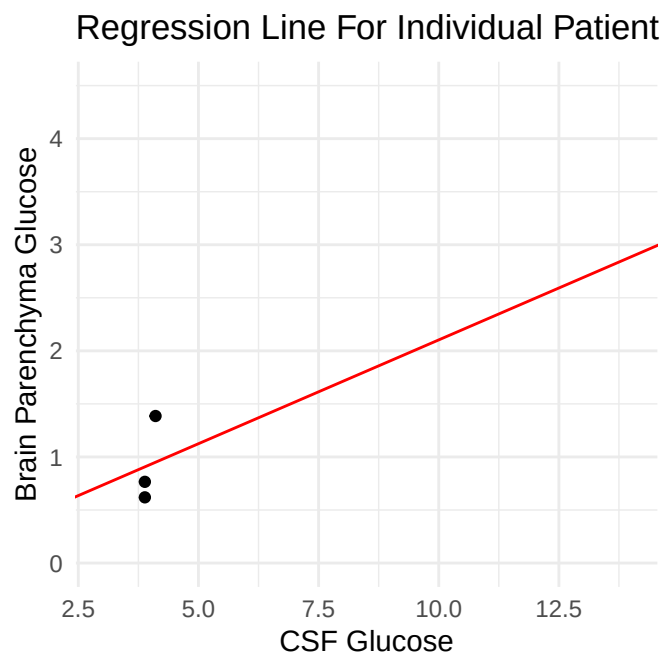
Regression Line For Individual Patient



Regression Line For Individual Patient

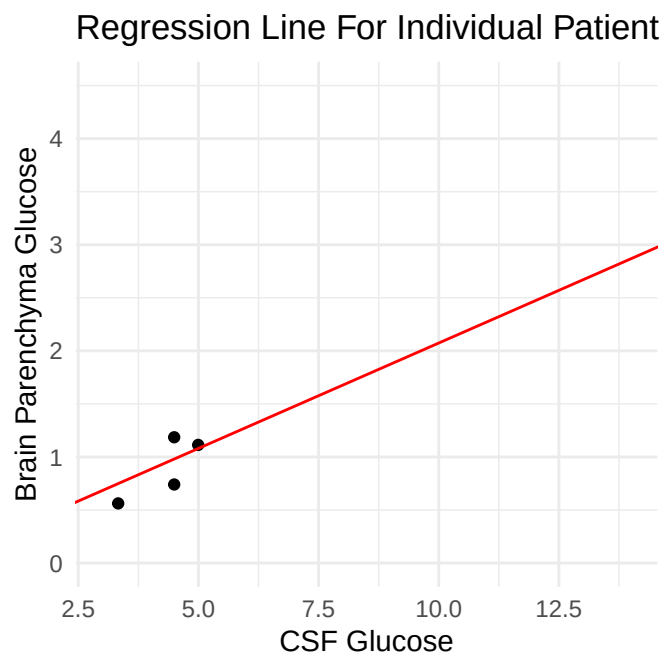
Regression Line For Individual Patient

Regression Line For Individual Patient



Regression Line For Individual Patient

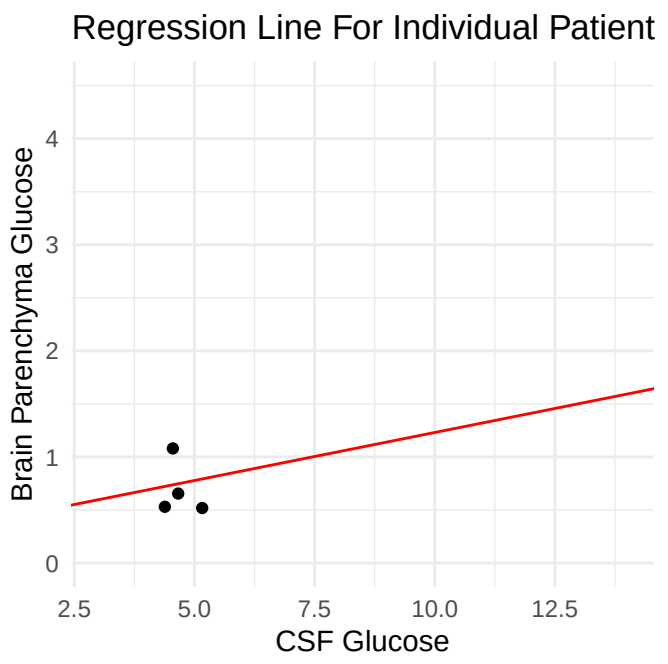
Regression Line For Individual Patient

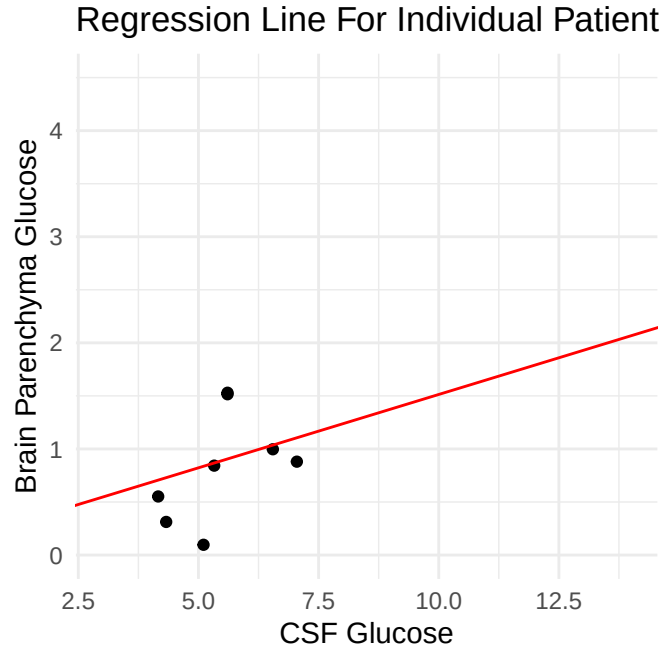


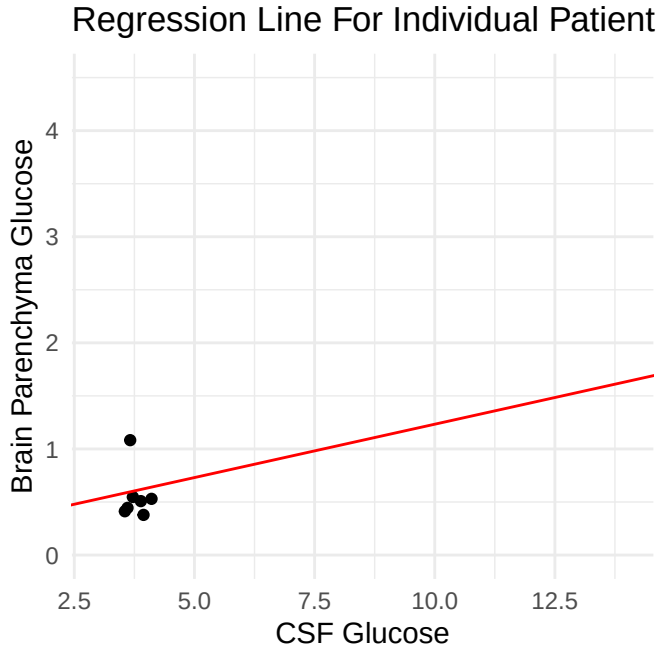
Regression Line For Individual Patient

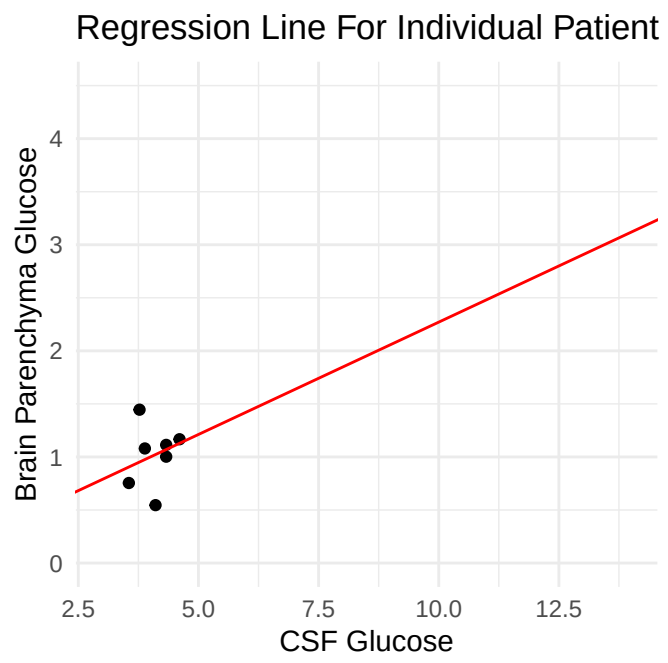
Regression Line For Individual Patient

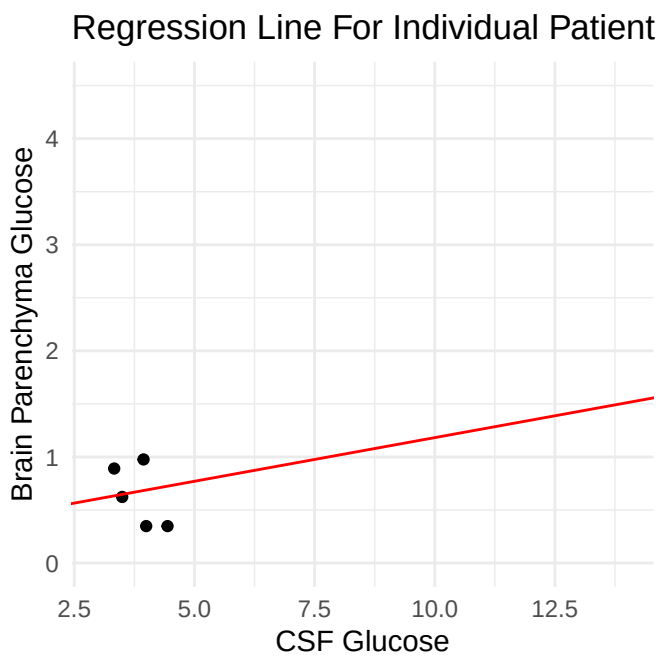

Regression Line For Individual Patient

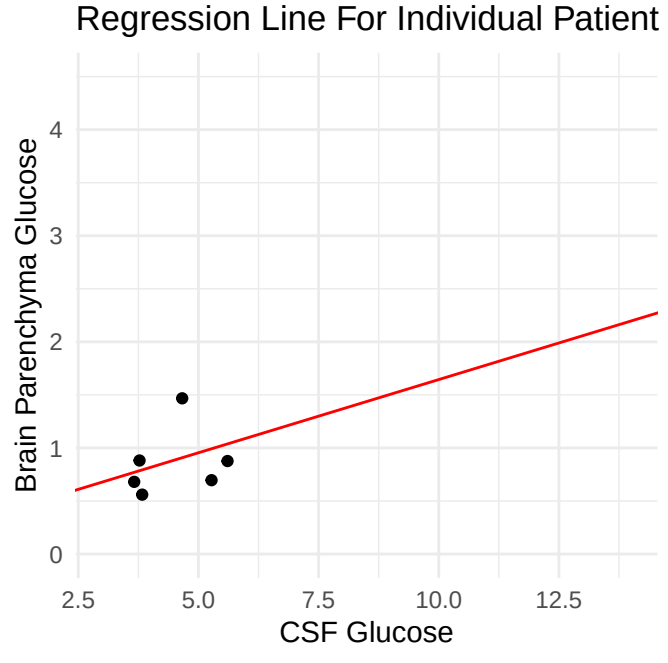

Regression Line For Individual Patient


Regression Line For Individual Patient

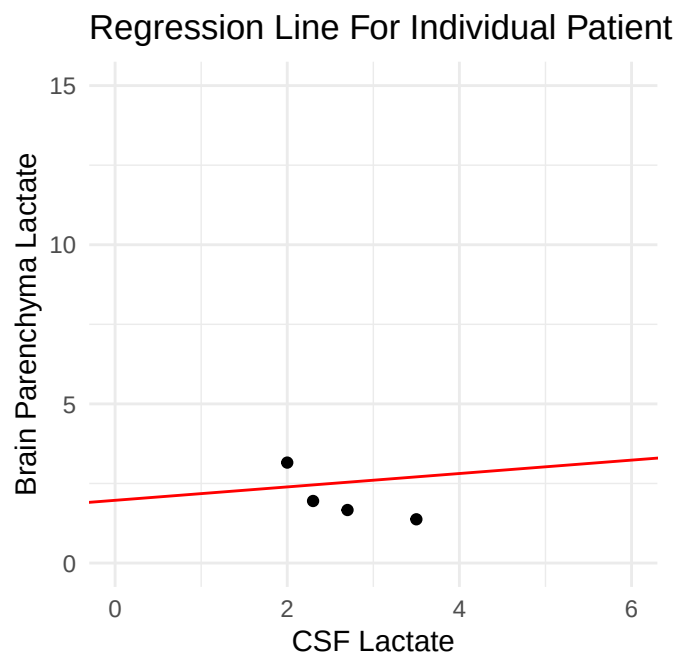

Regression Line For Individual Patient

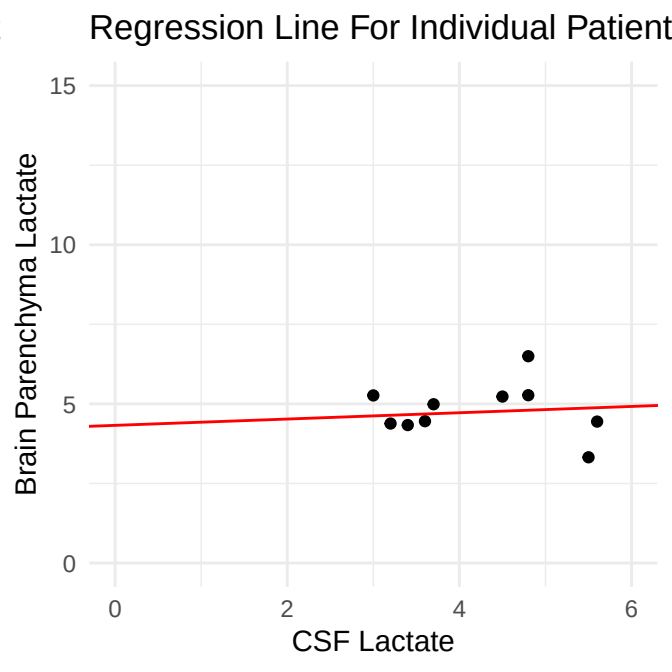

Regression Line For Individual Patient
Brain Parenchyma Glucose
CSF Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

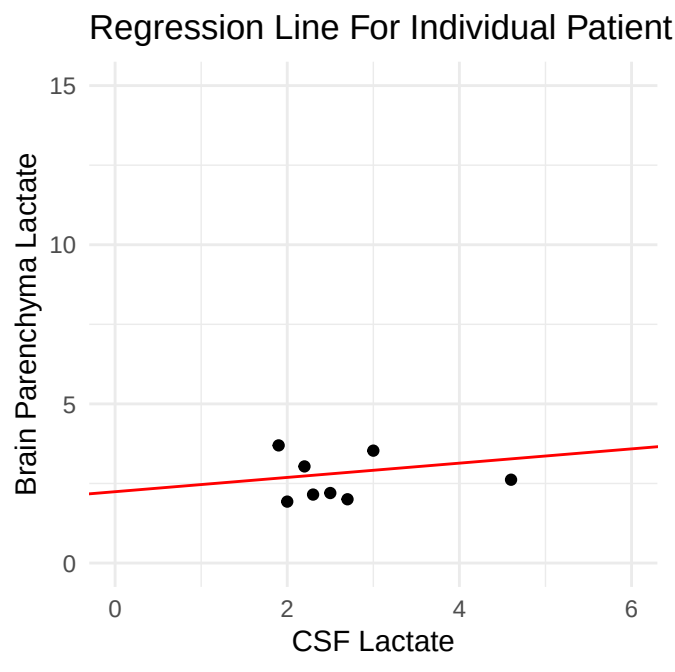

Regression Line For Individual Patient
Brain Parenchyma Glucose
CSF Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

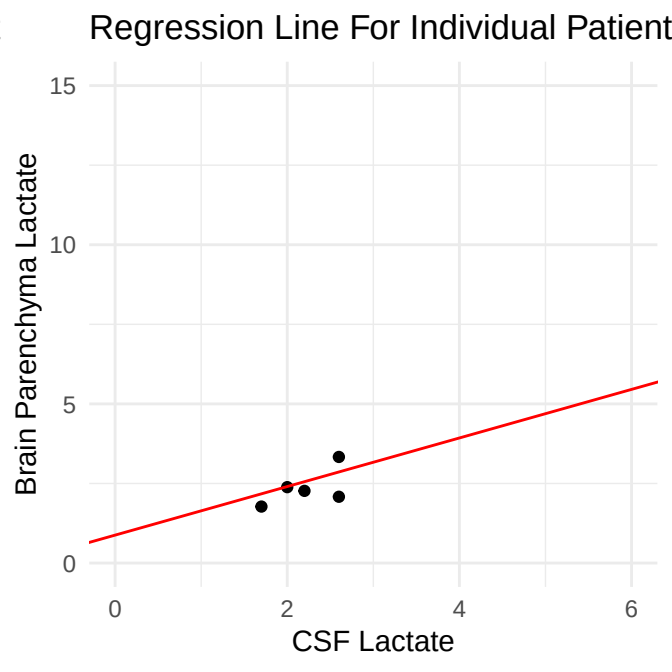

Regression Line For Individual Patient
Brain Parenchyma Glucose
CSF Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

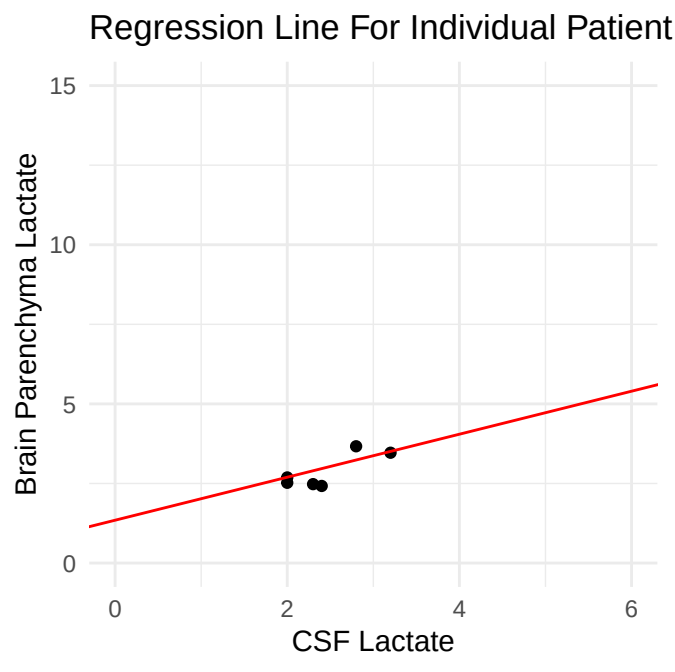
5.2 CSF Lactate vs. Brain Parenchyma Lactate

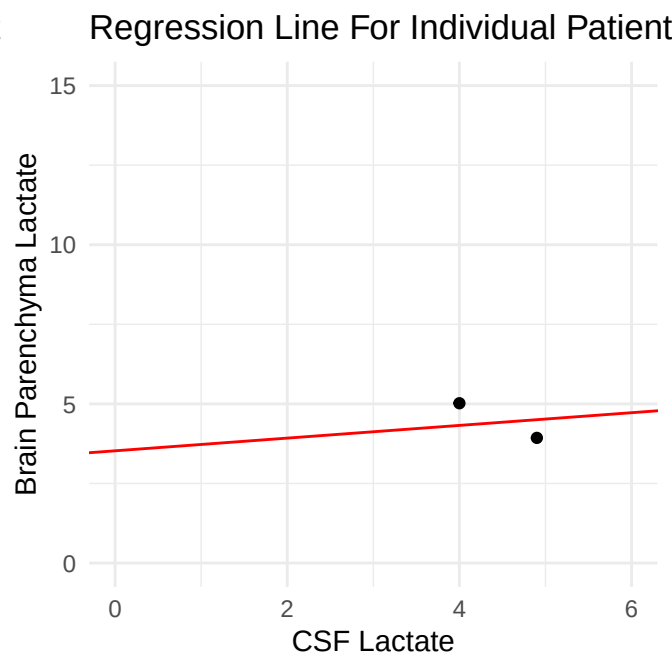

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

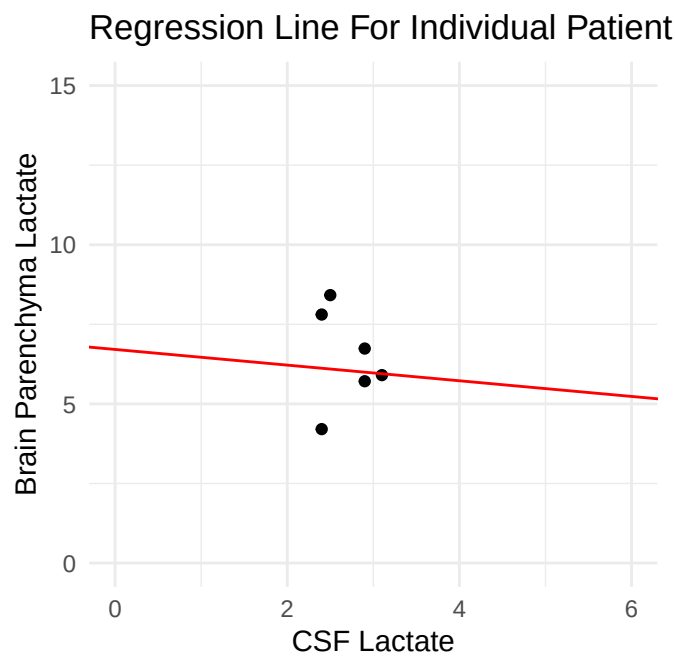

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

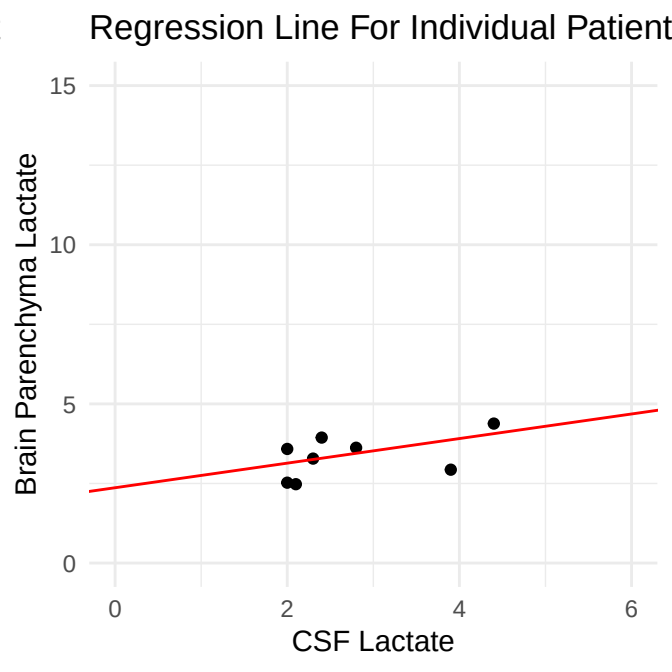

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

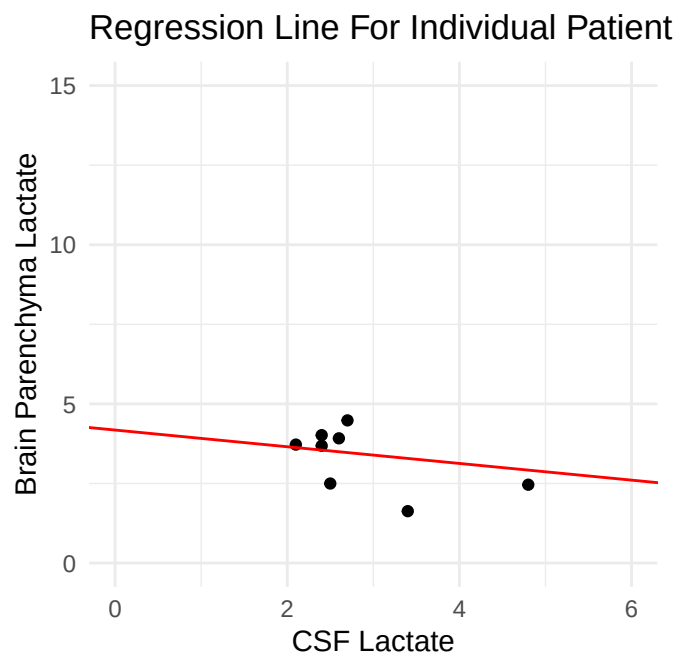

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

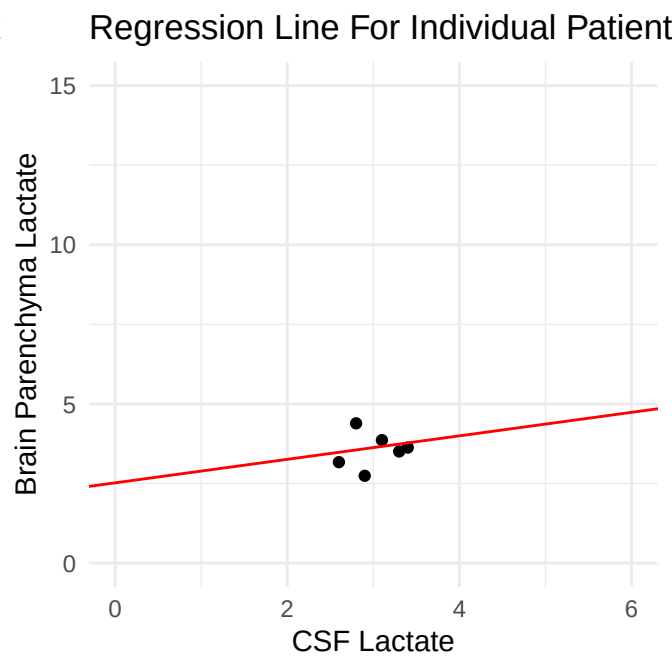

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

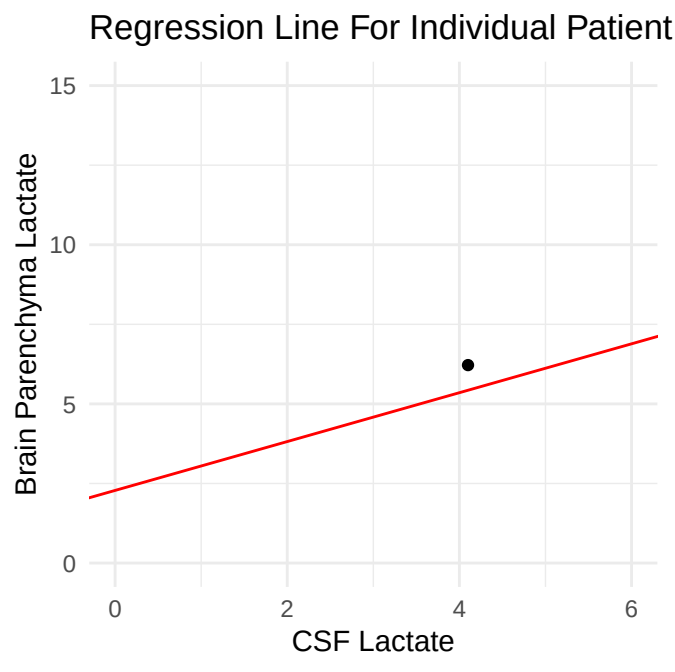

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

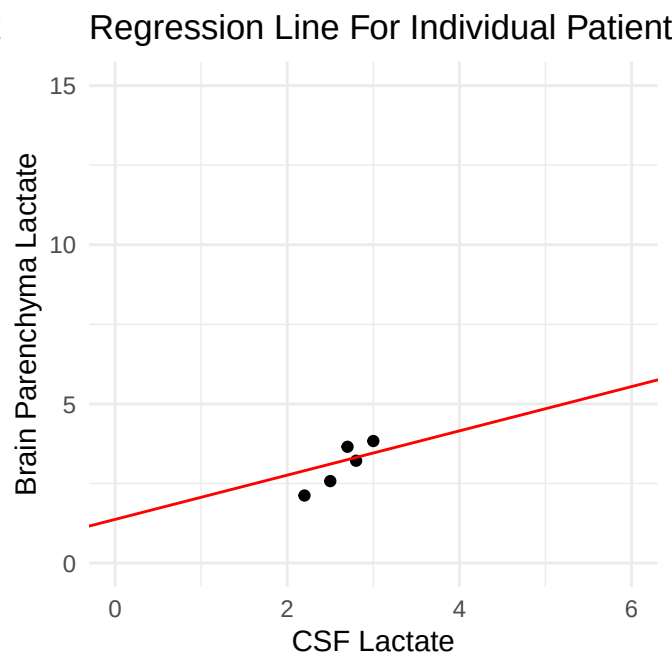

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

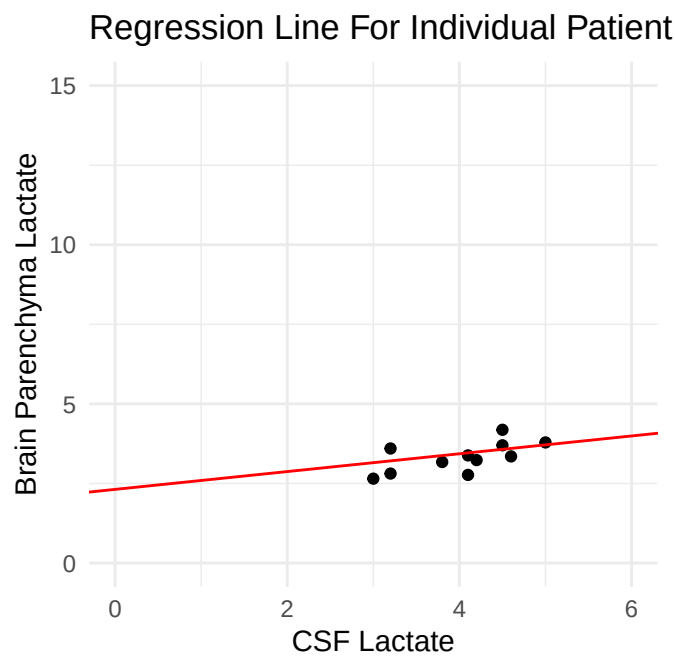

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

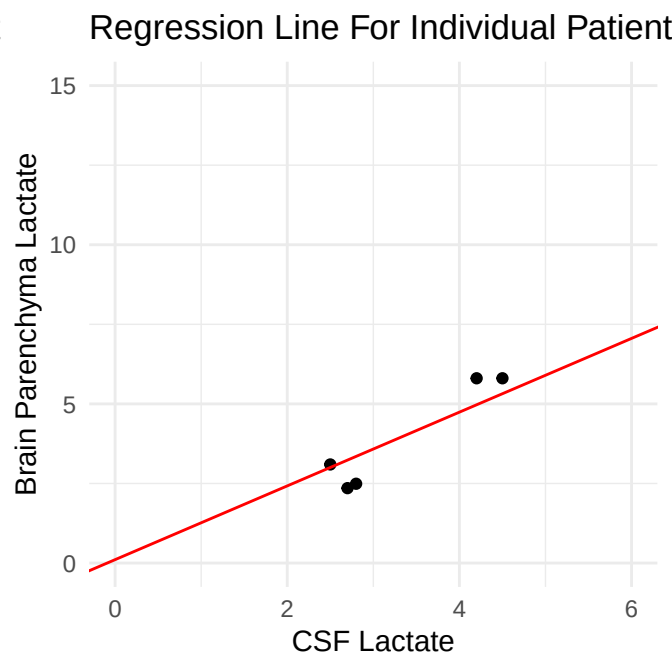

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

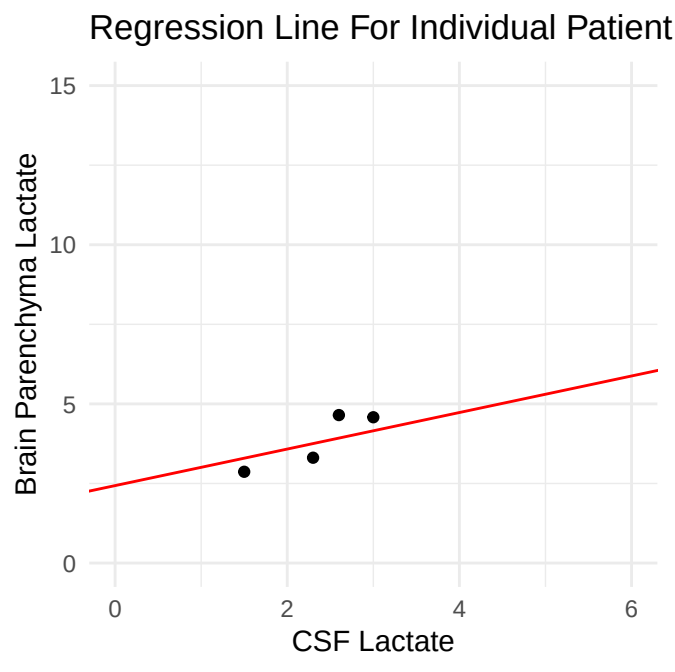

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

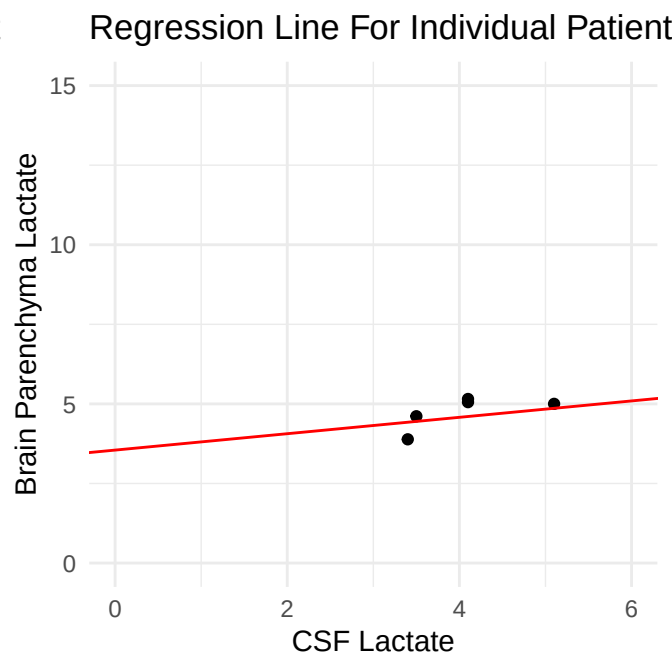

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

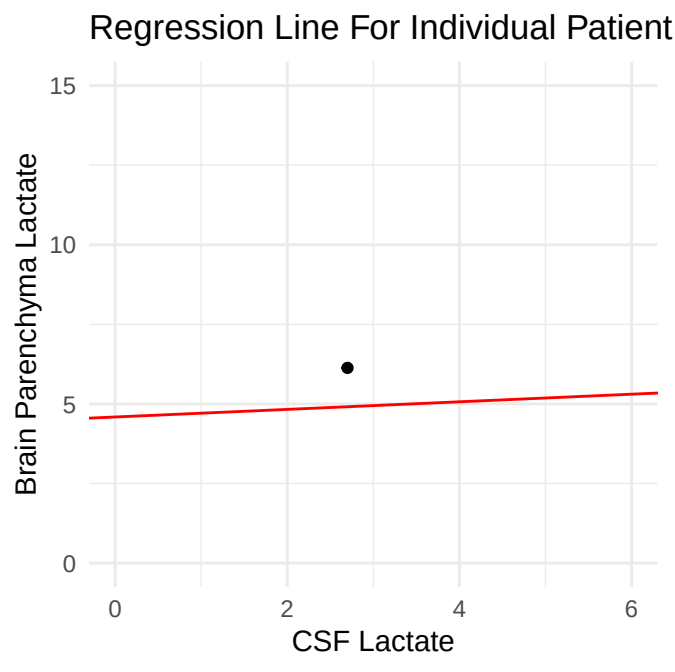

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

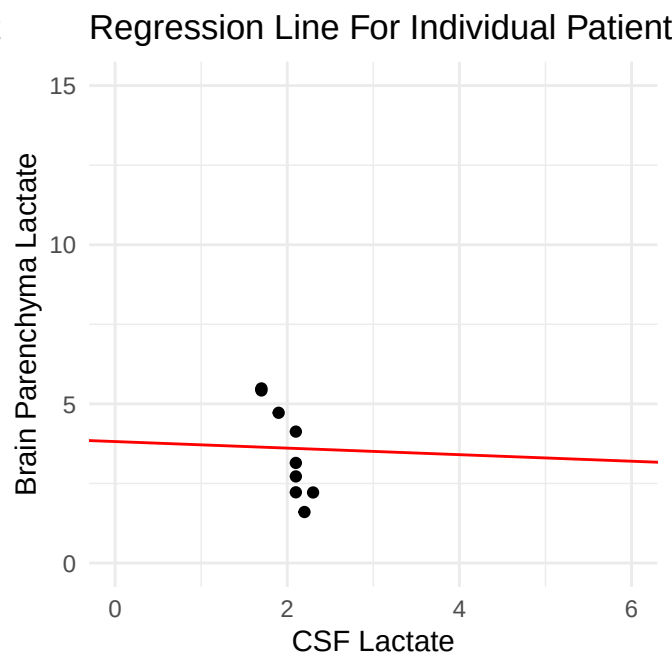

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

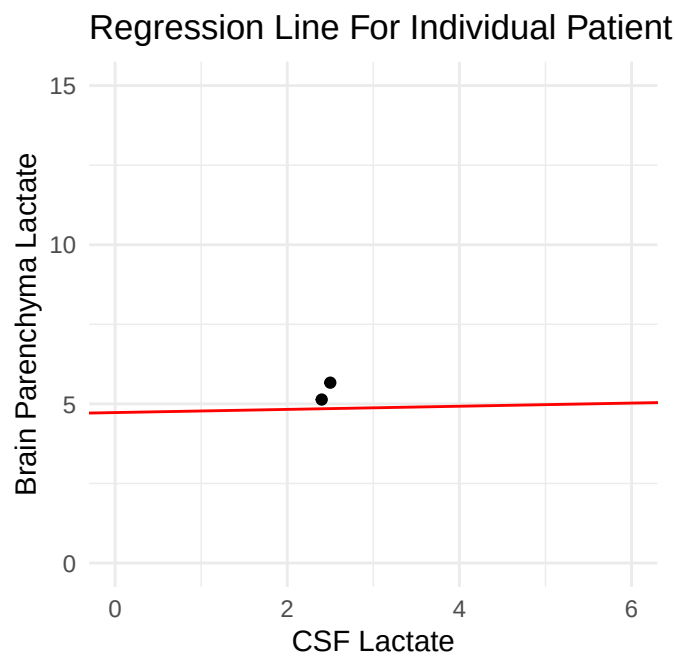

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

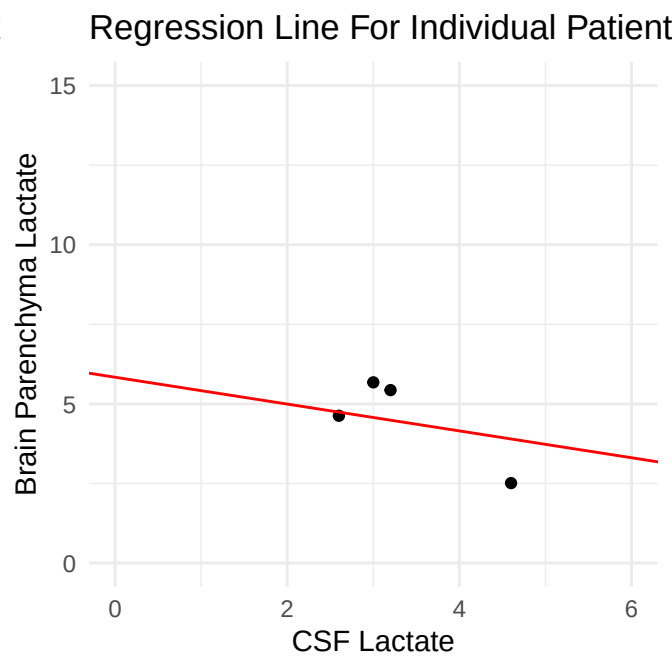

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

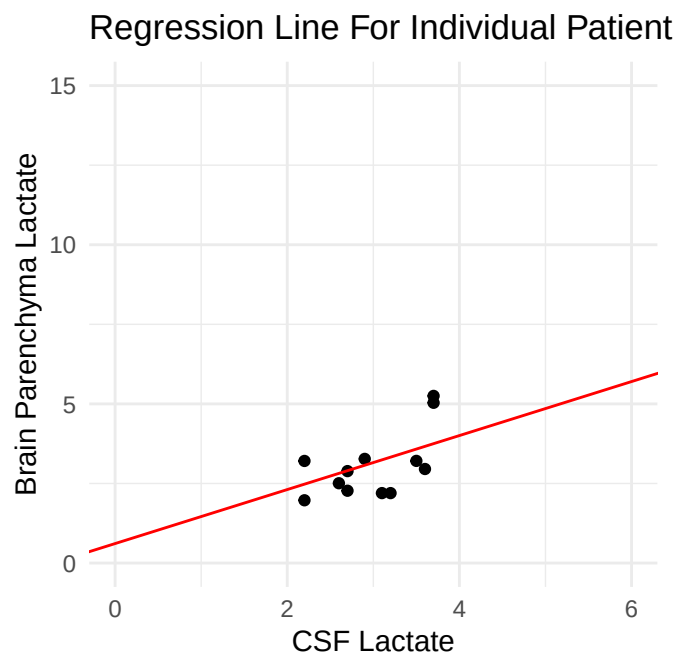

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

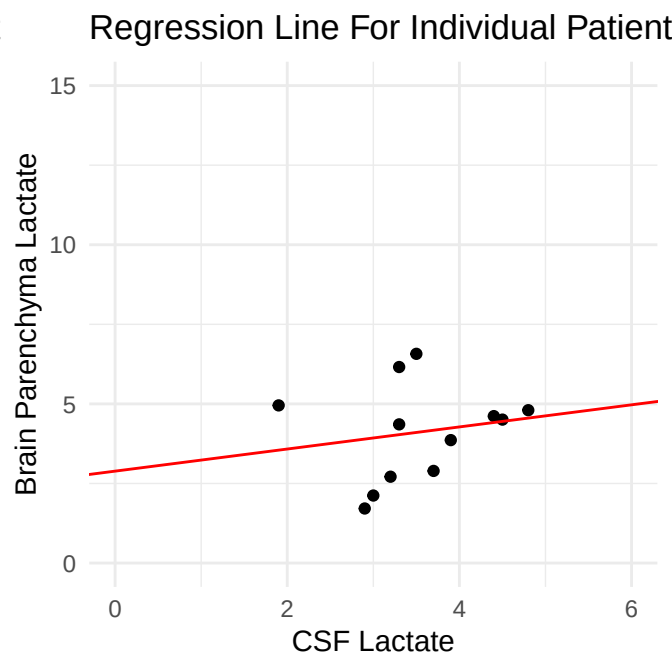

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

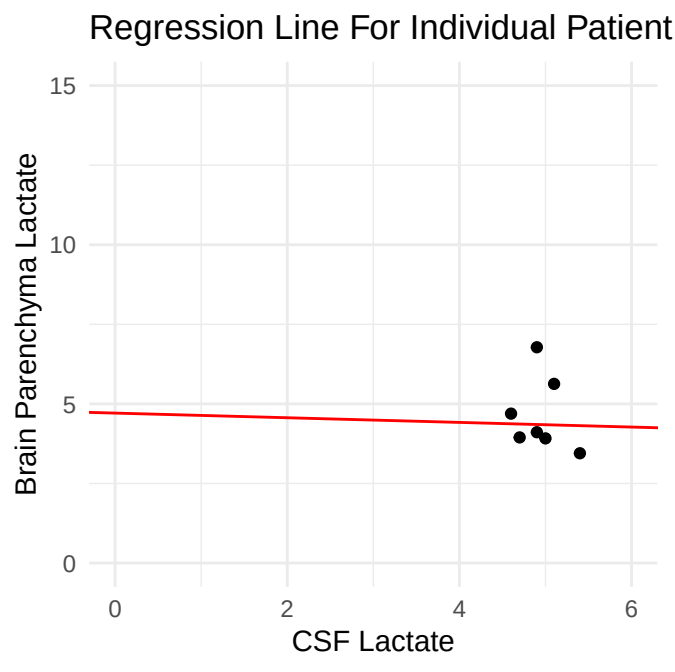

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

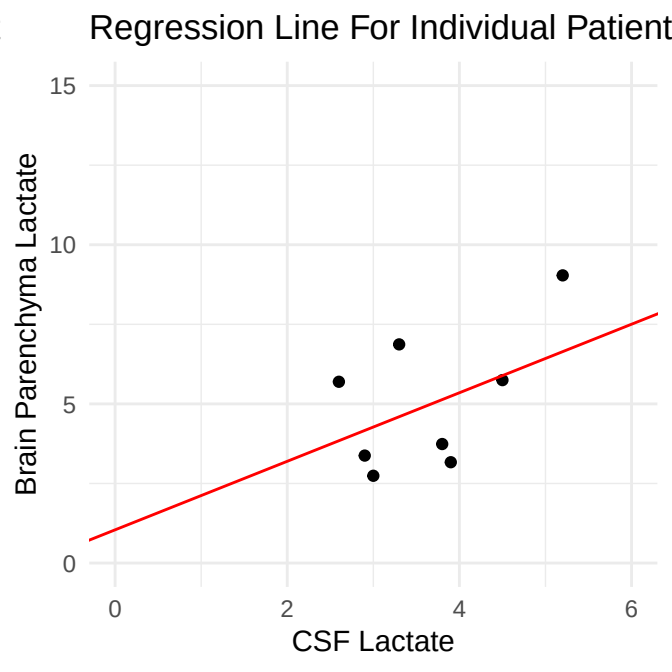

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

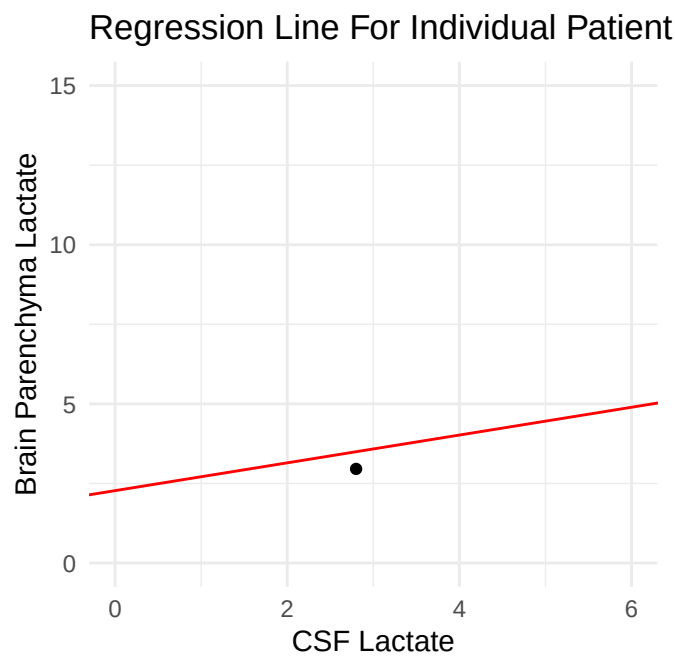

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

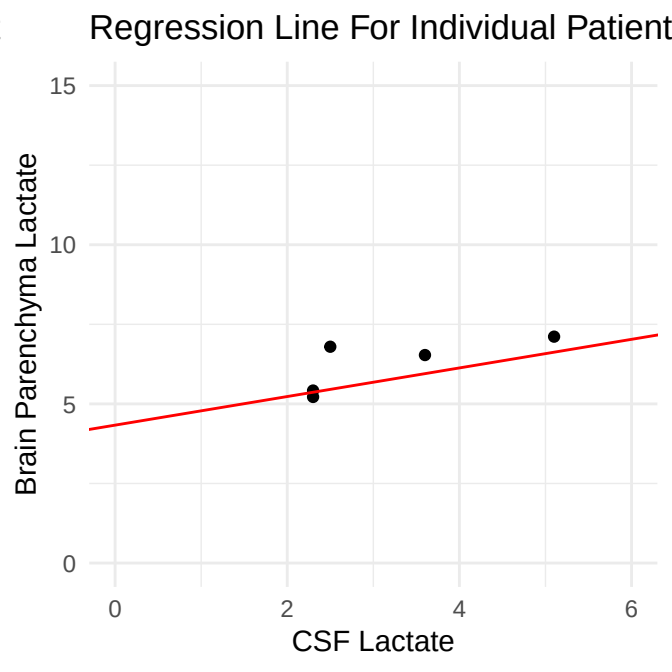

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

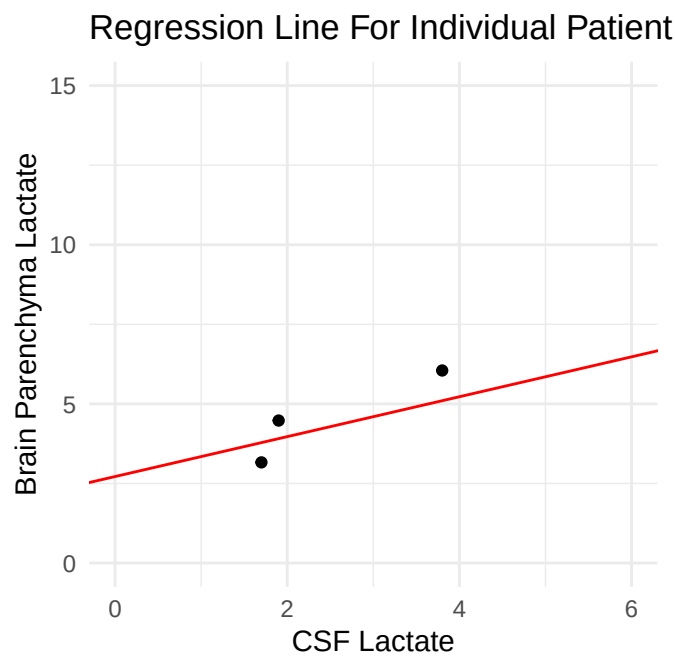

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

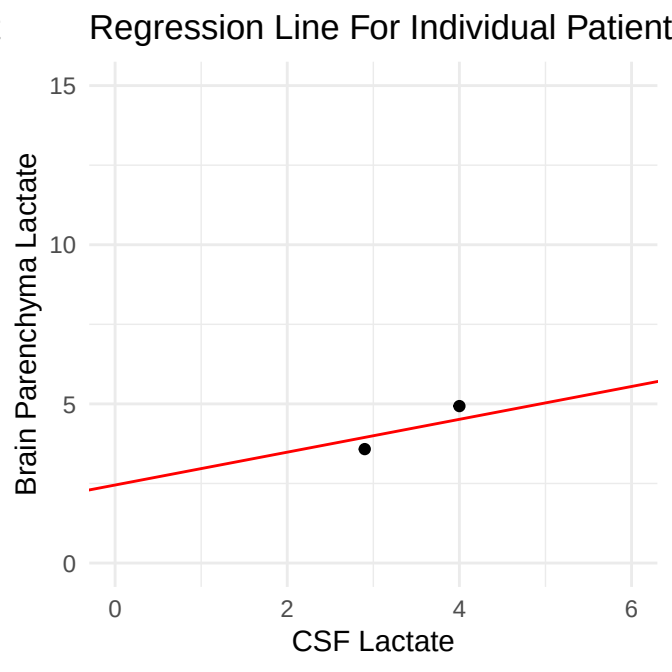

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

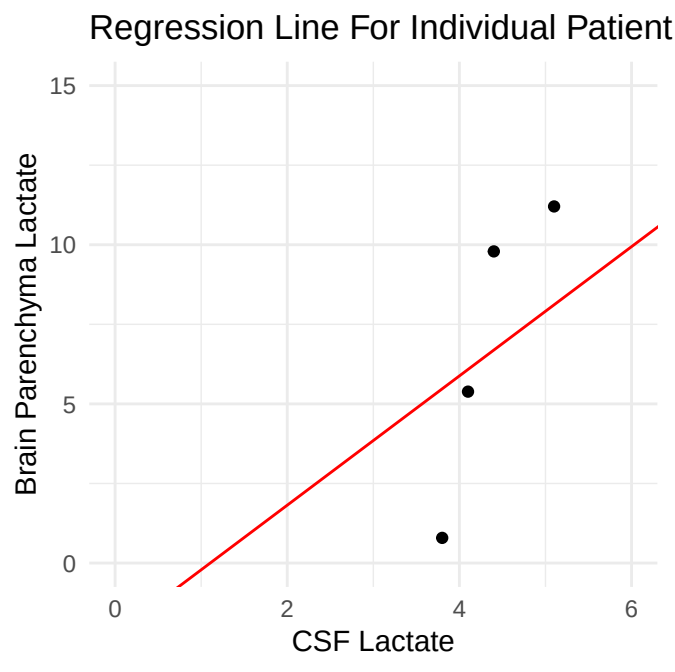

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

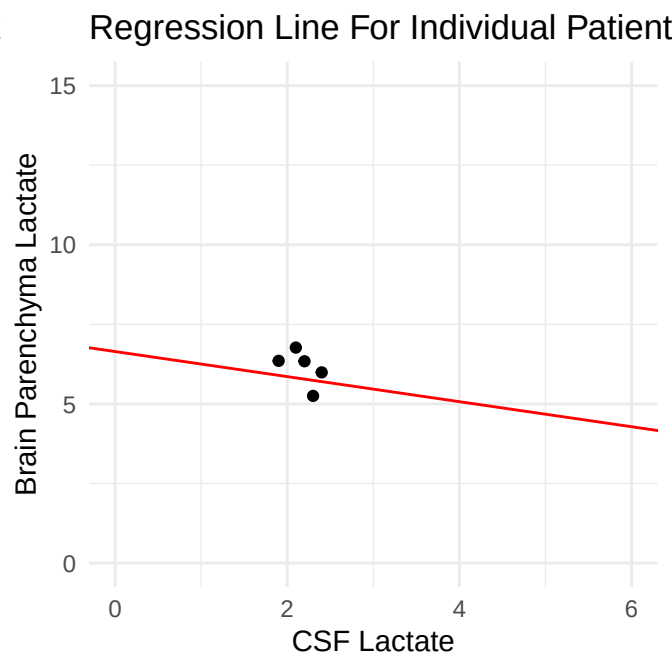

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

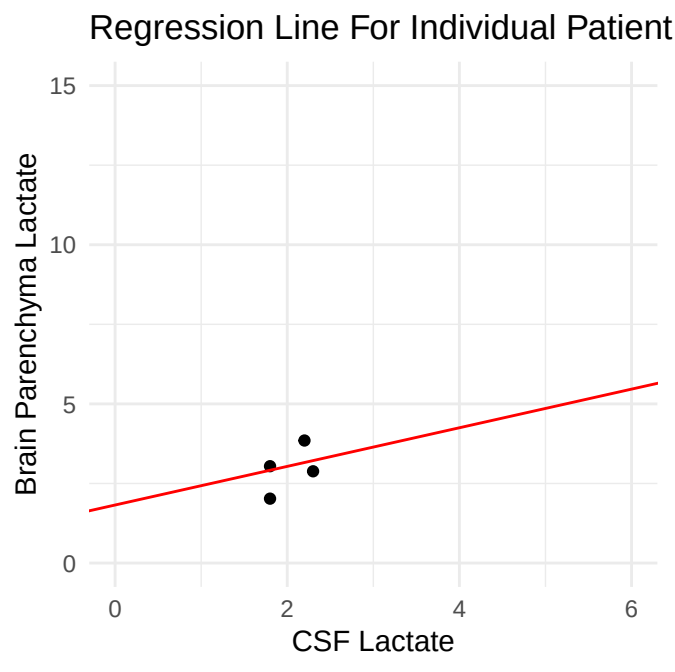

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

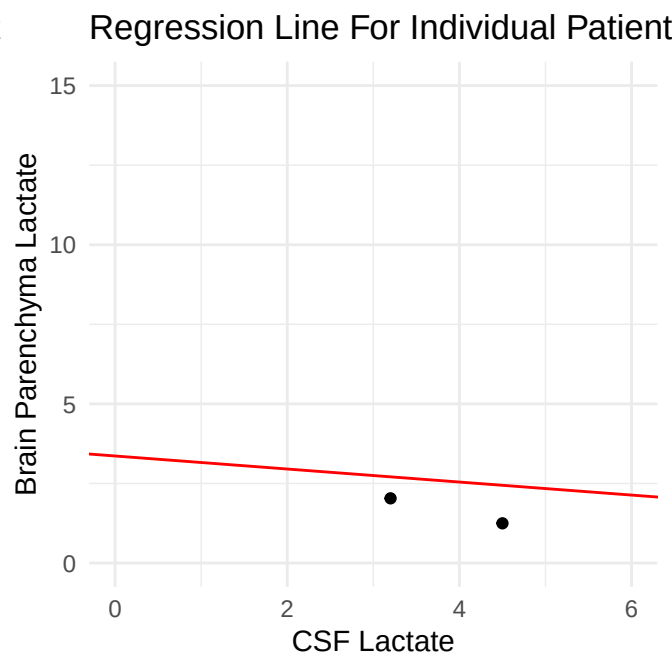

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

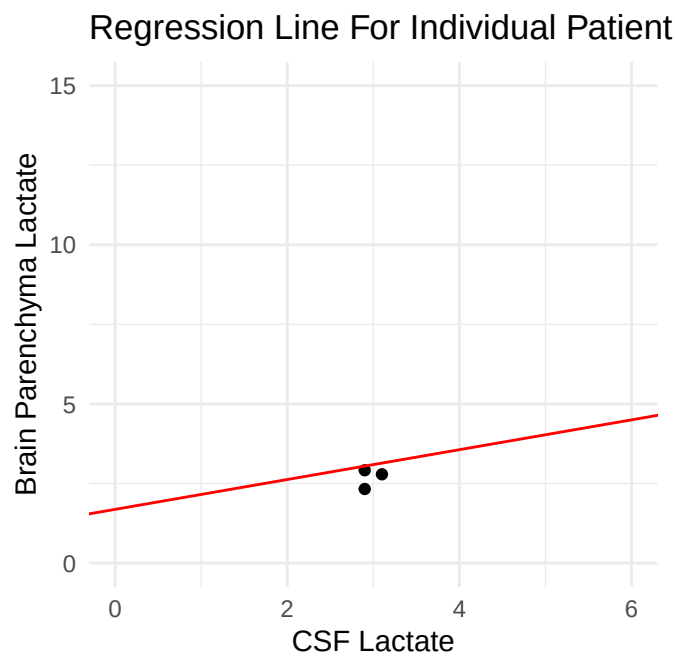

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

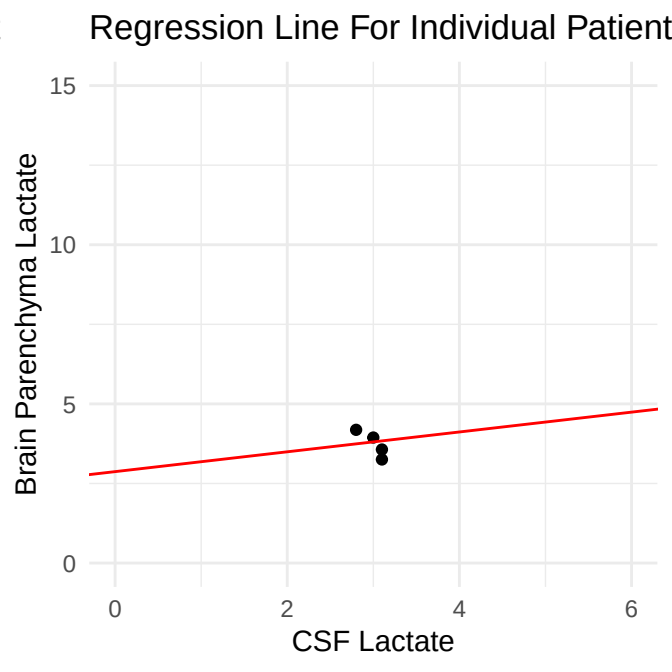

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

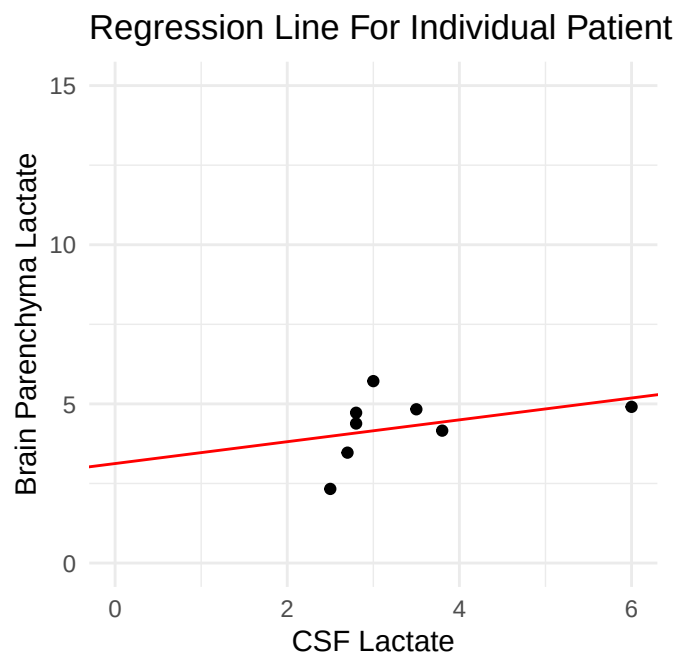

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

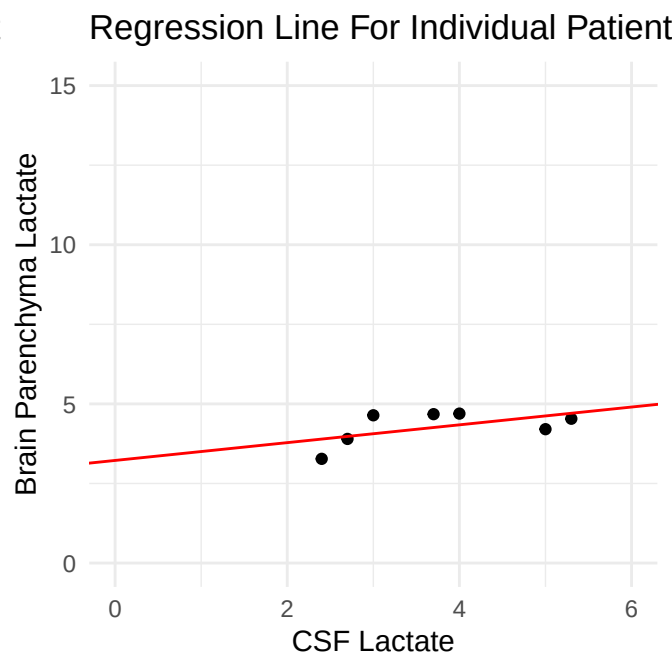

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

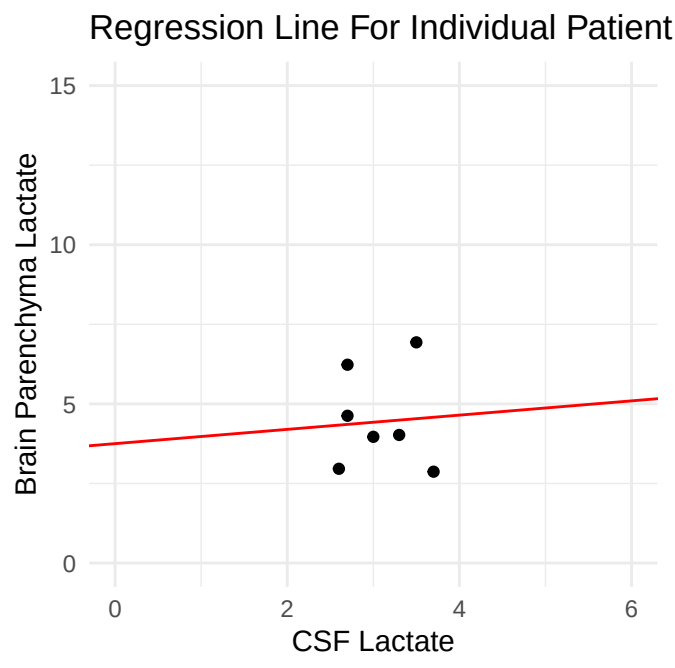

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

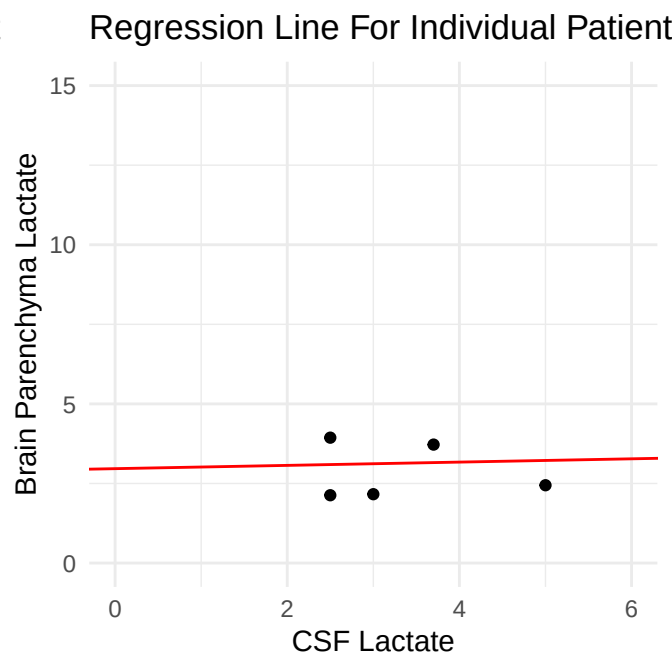

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

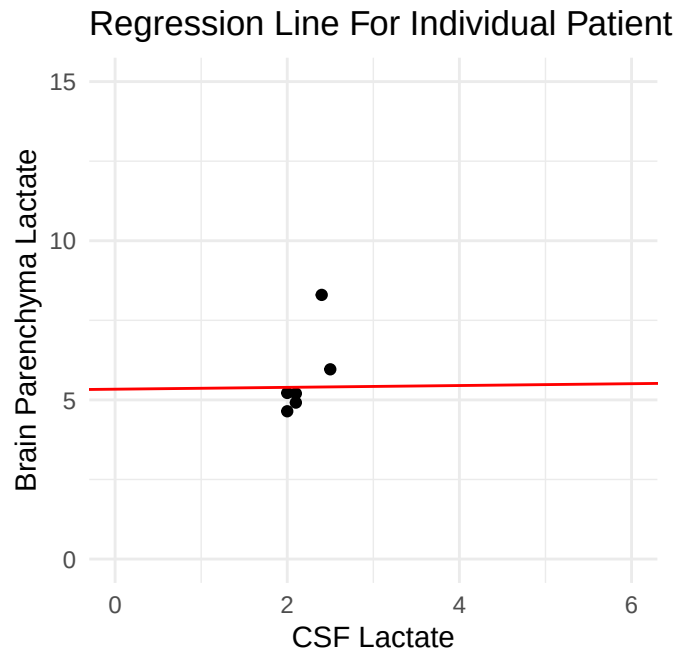

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

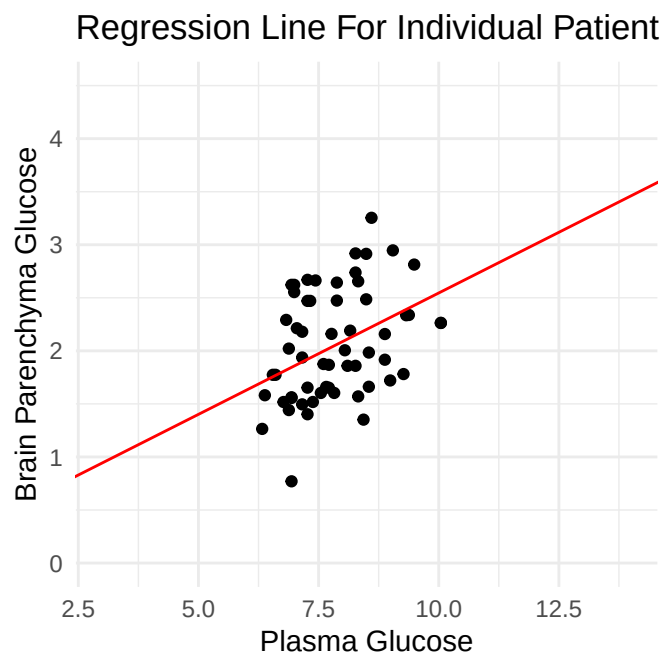

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

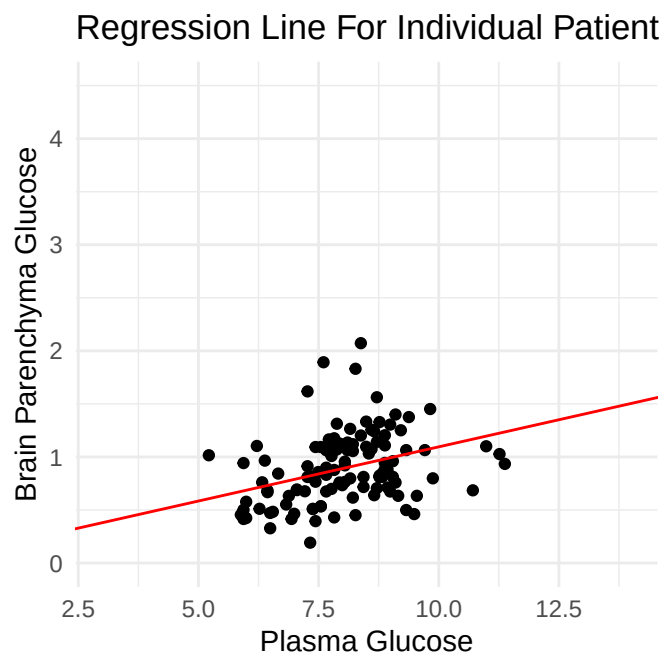

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

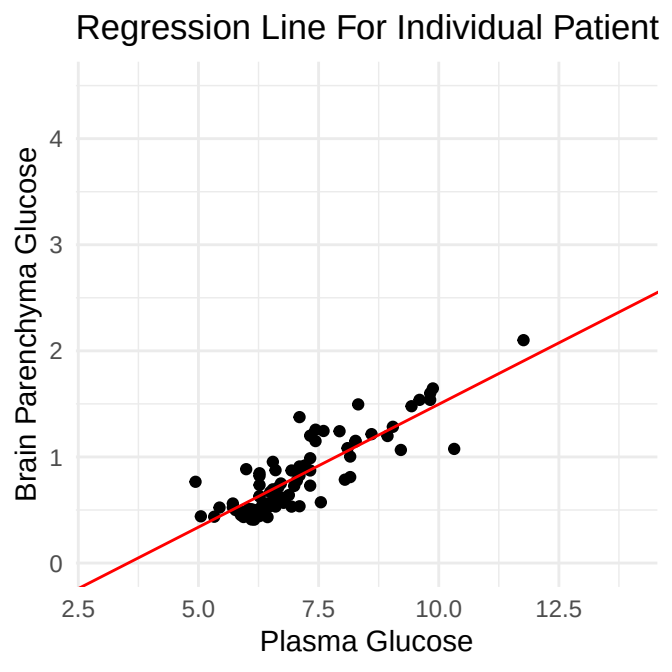

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

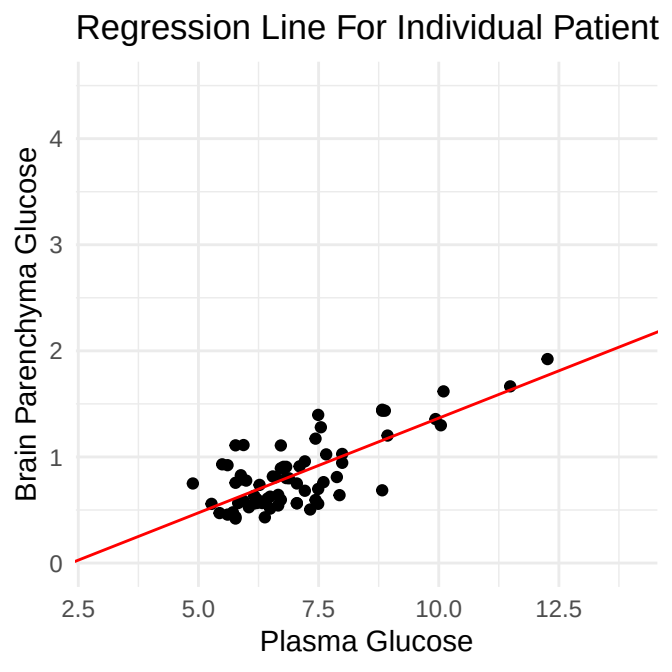

Regression Line For Individual Patient
Brain Parenchyma Lactate
CSF Lactate
0
5
10
15
0
2
4
6

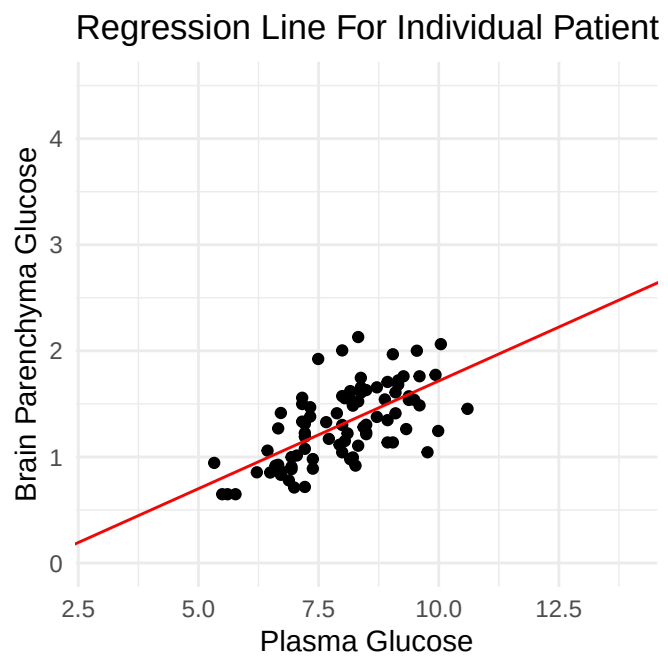
5.3 Plasma Glucose vs. Brain Parenchyma Glucose


Regression Line For Individual Patient

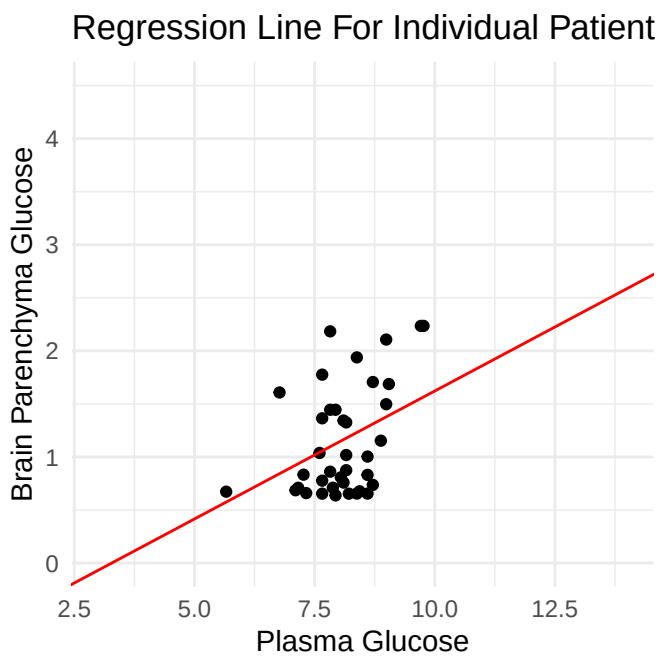

Regression Line For Individual Patient


Regression Line For Individual Patient

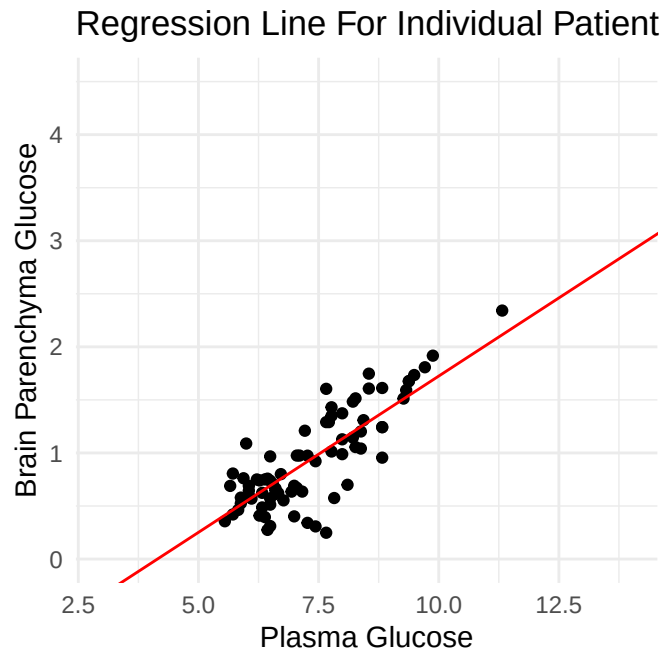

Regression Line For Individual Patient



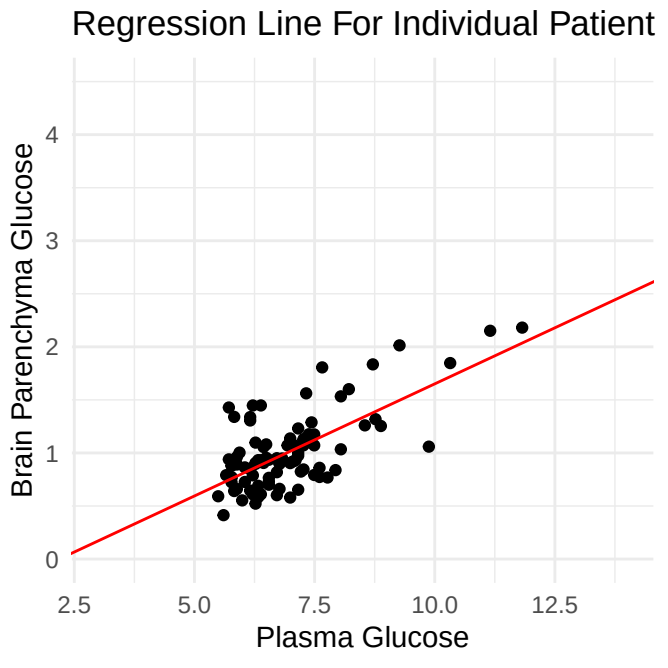
Regression Line For Individual Patient



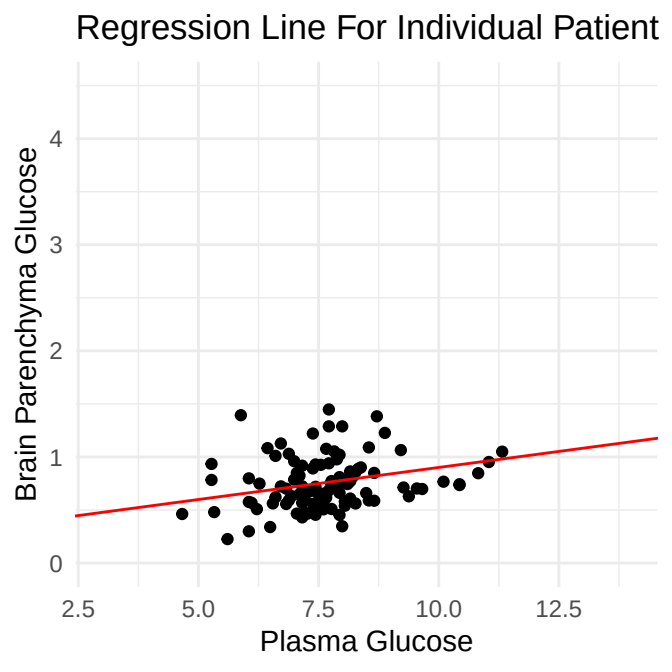
Regression Line For Individual Patient

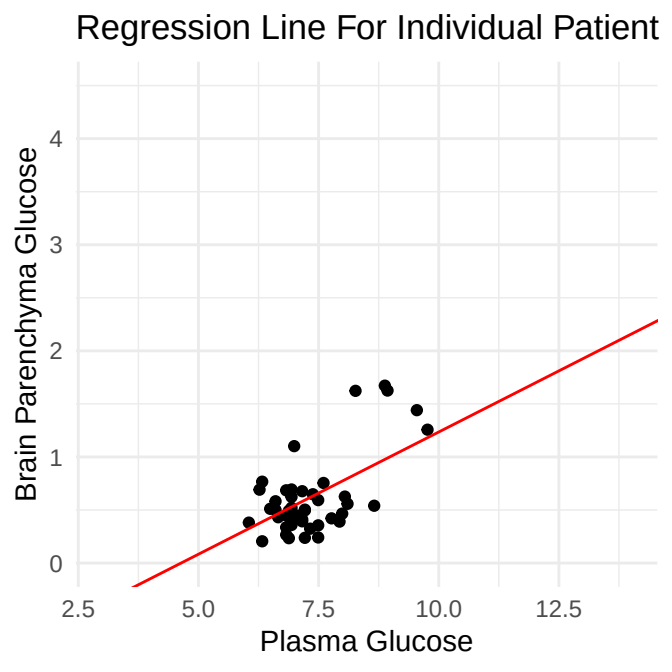


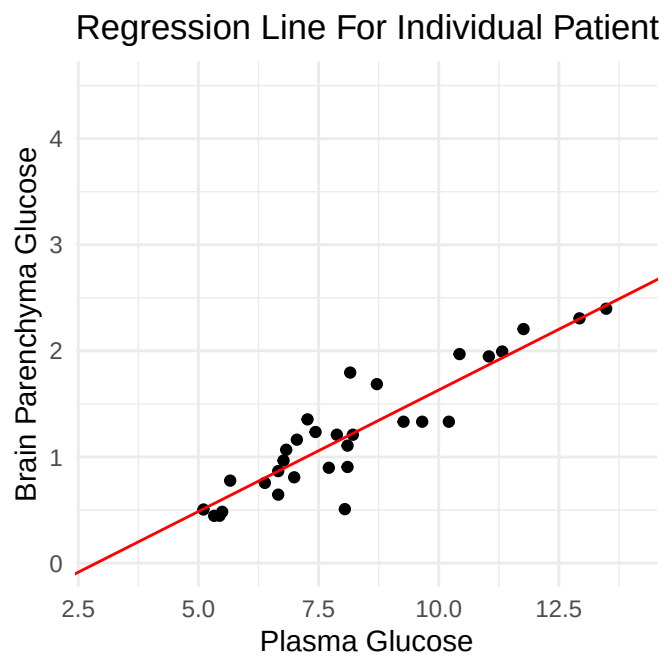
Regression Line For Individual Patient

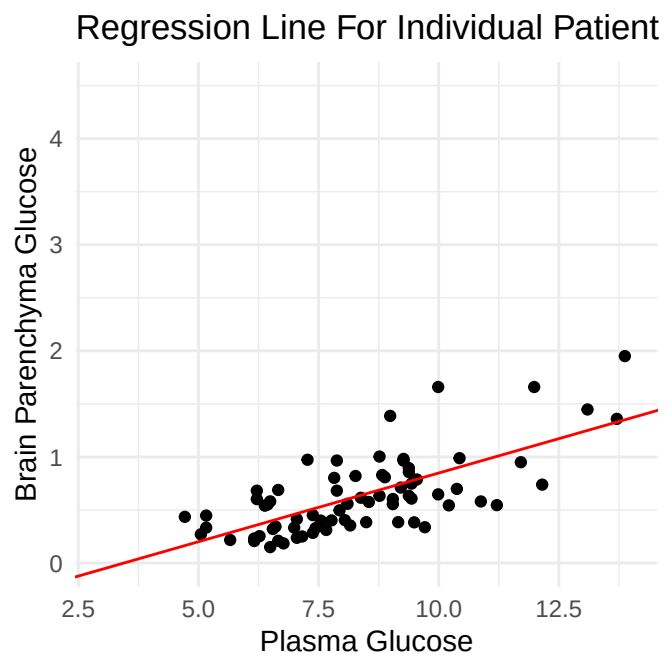


Regression Line For Individual Patient

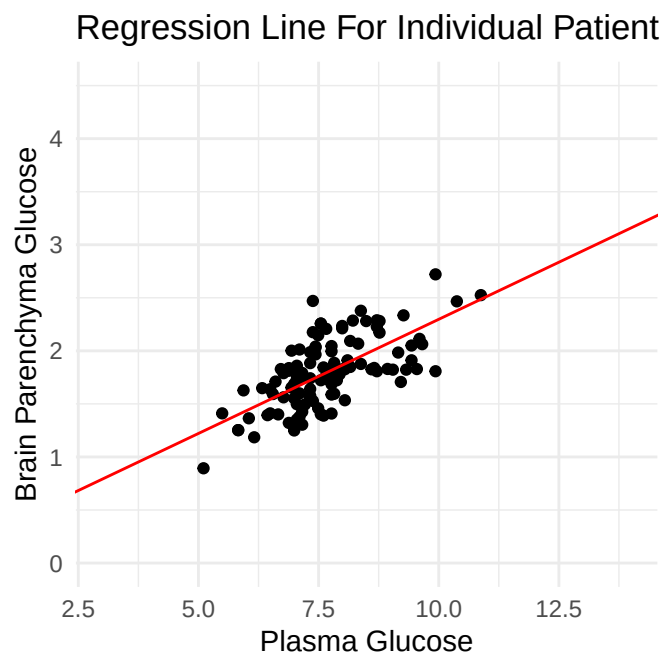




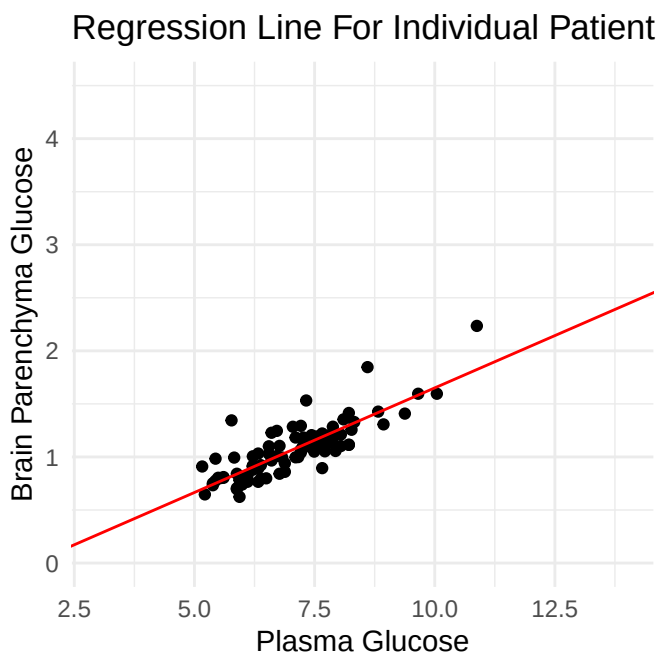




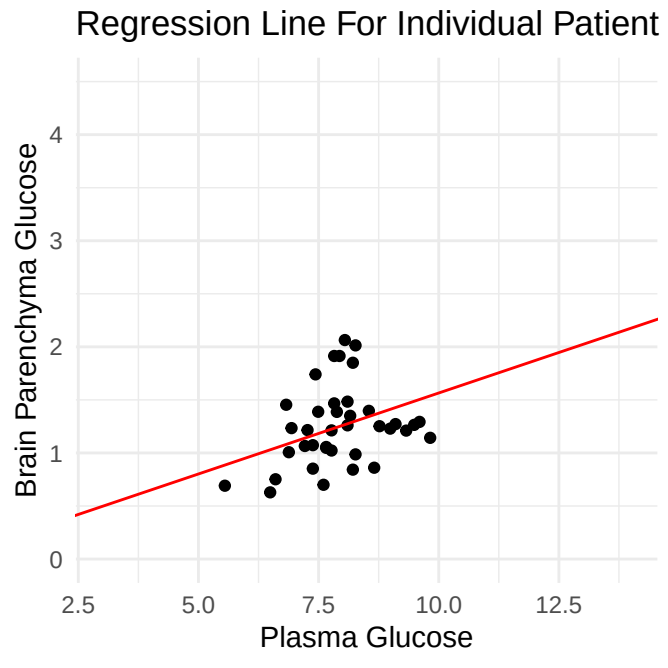
Regression Line For Individual Patient
Regression Line For Individual Patient
Regression Line For Individual Patient
Regression Line For Individual Patient
Brain Parenchyma Glucose
Plasma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5



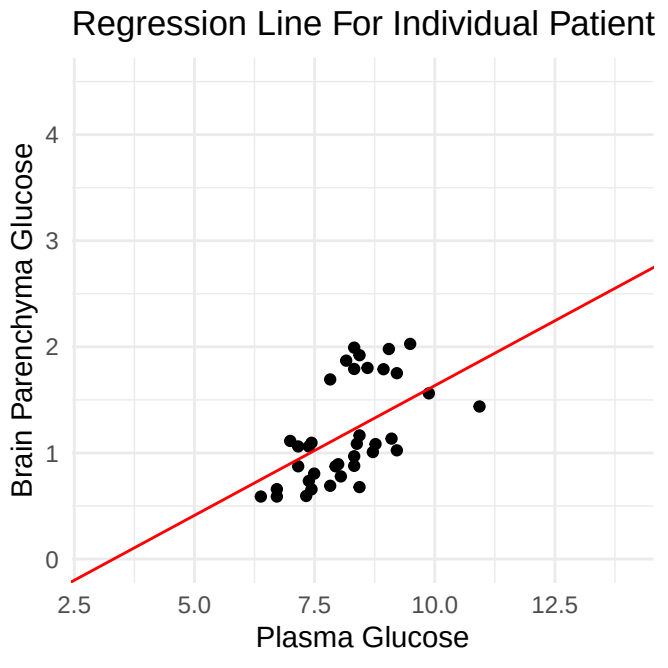
Regression Line For Individual Patient



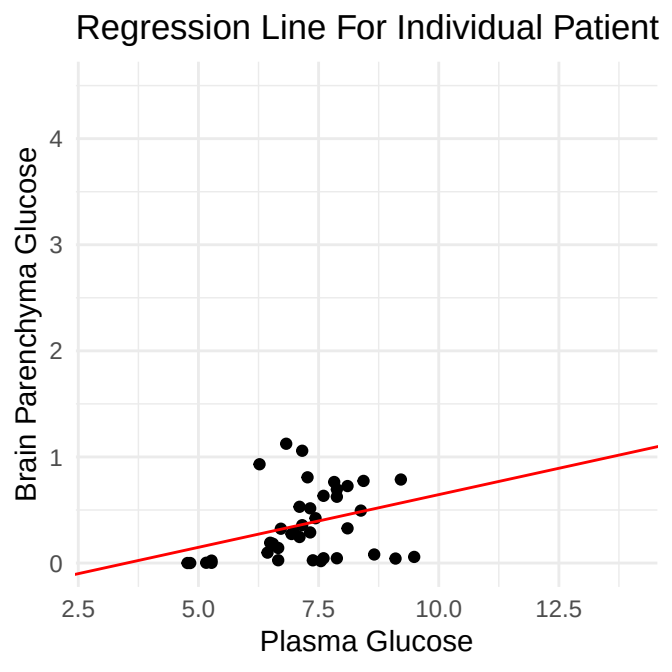
Regression Line For Individual Patient



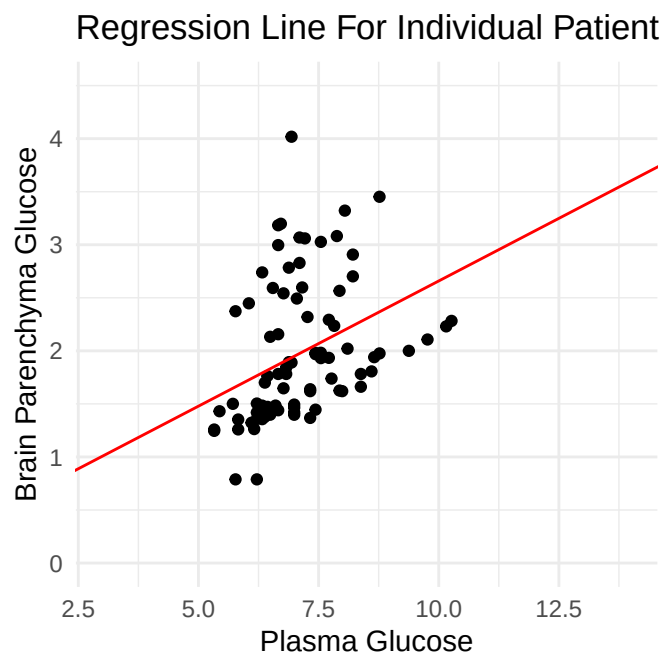
Regression Line For Individual Patient



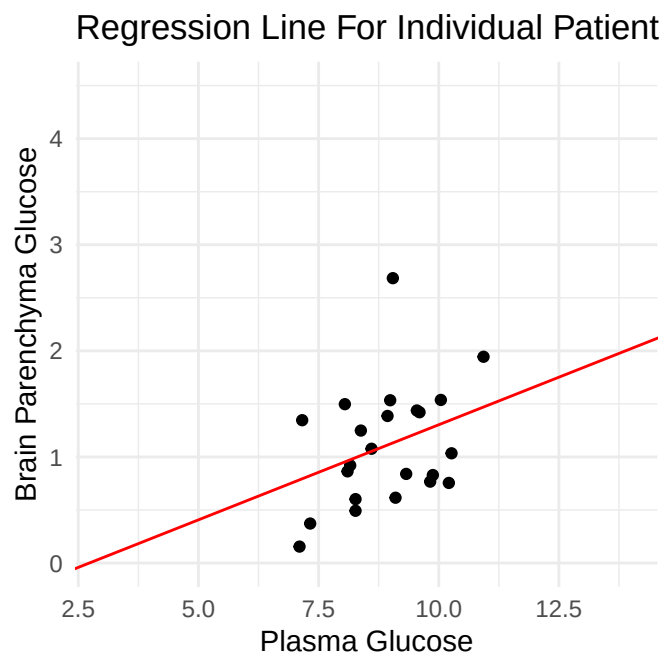
Regression Line For Individual Patient



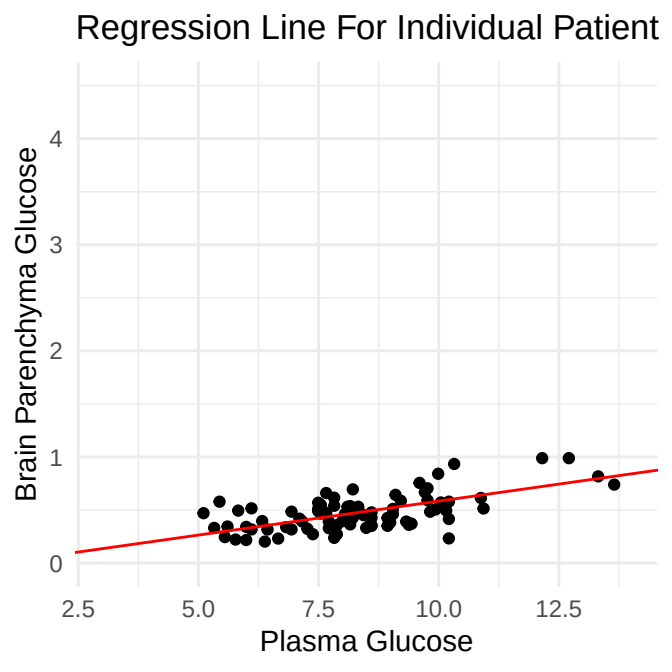
Regression Line For Individual Patient



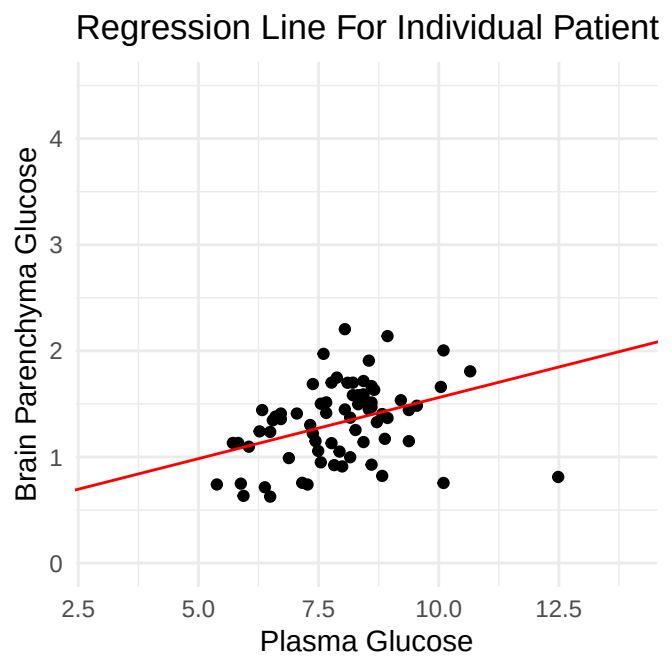
Regression Line For Individual Patient

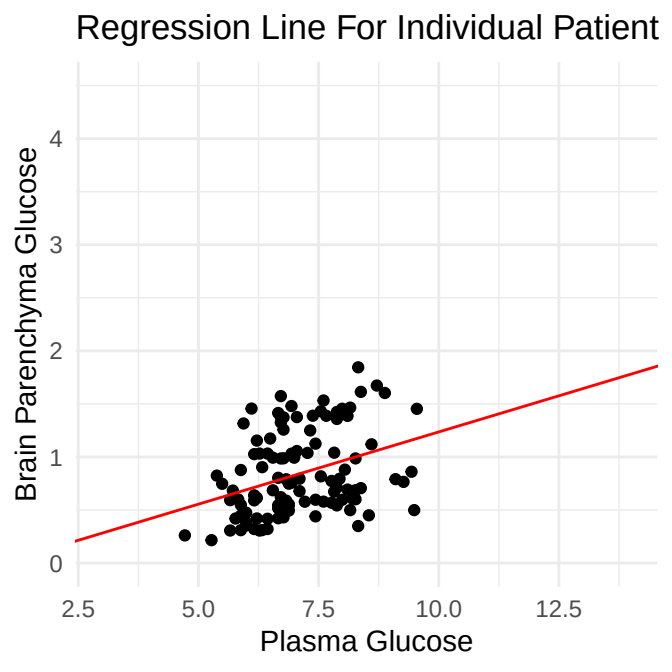


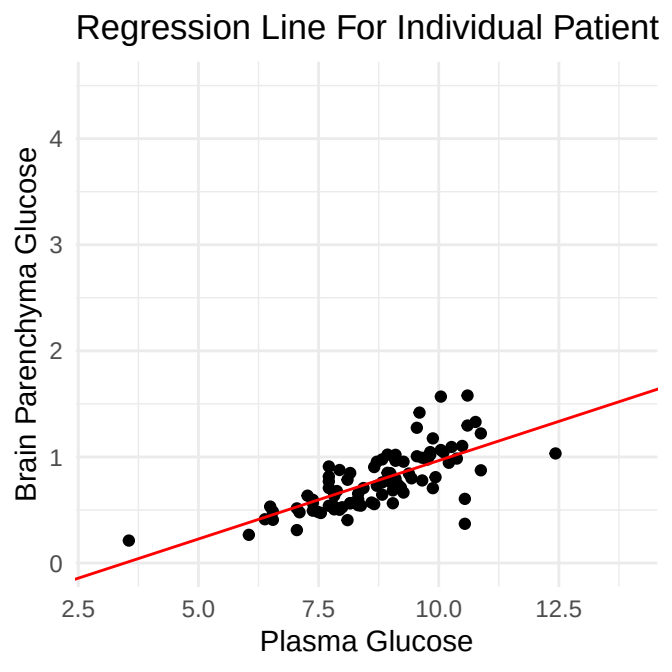
Regression Line For Individual Patient

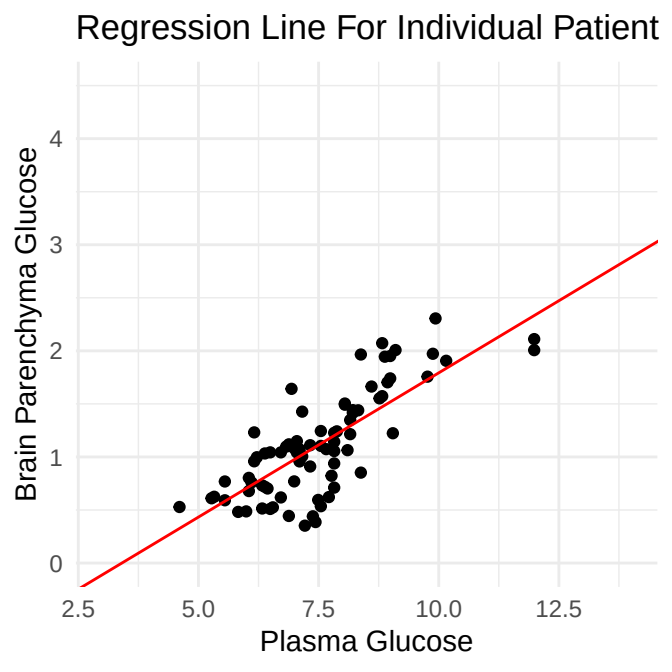


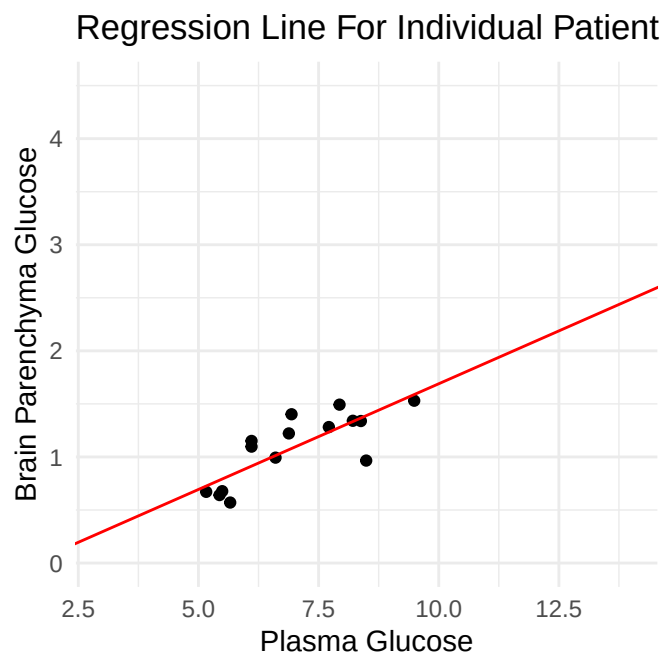
Regression Line For Individual Patient

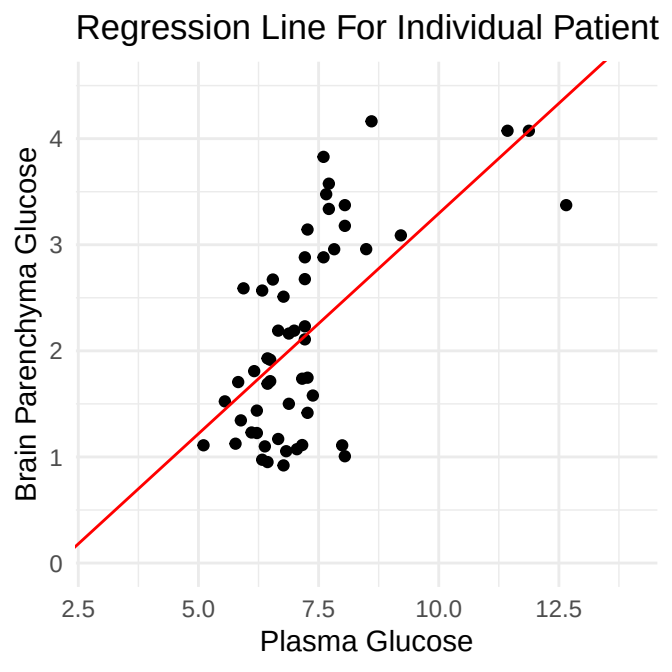

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose

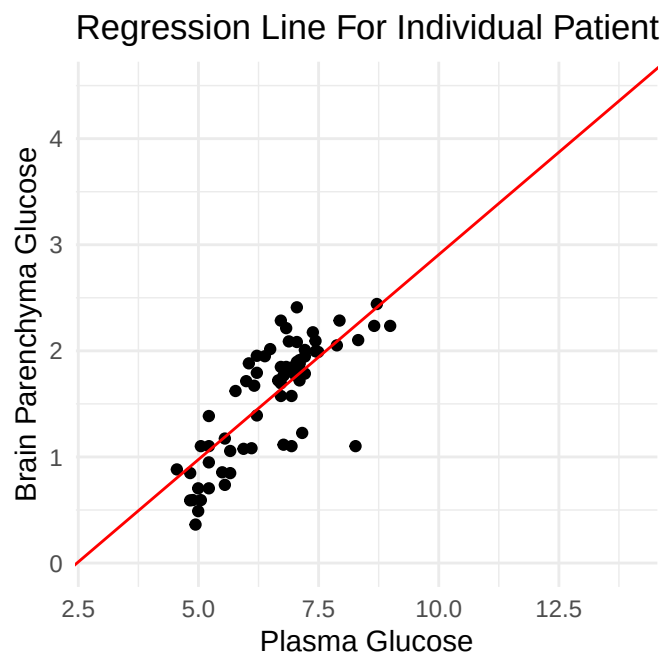

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose

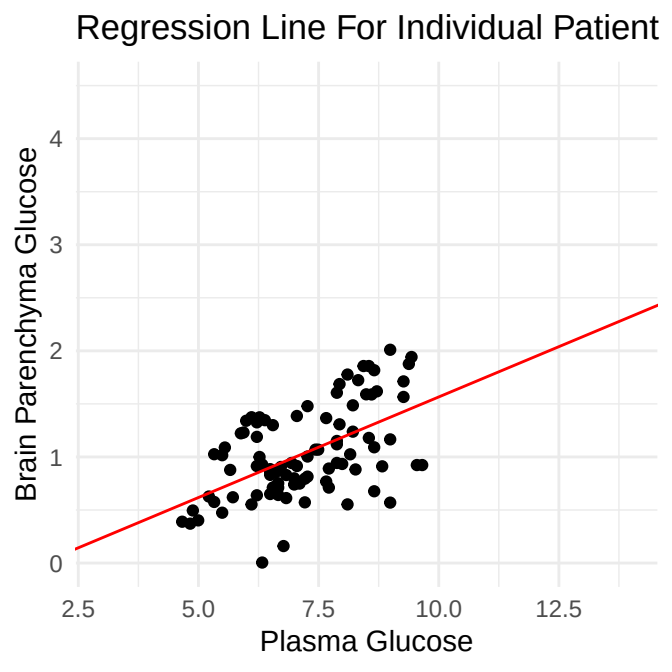

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose

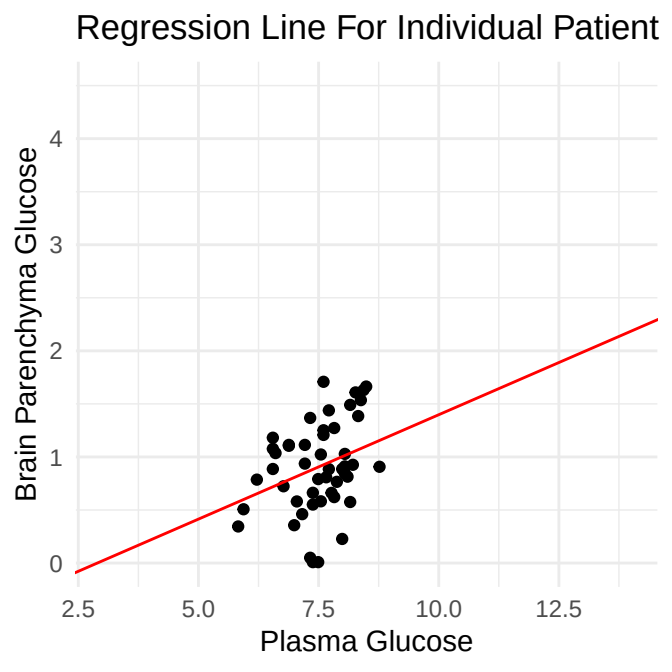

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose


Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose

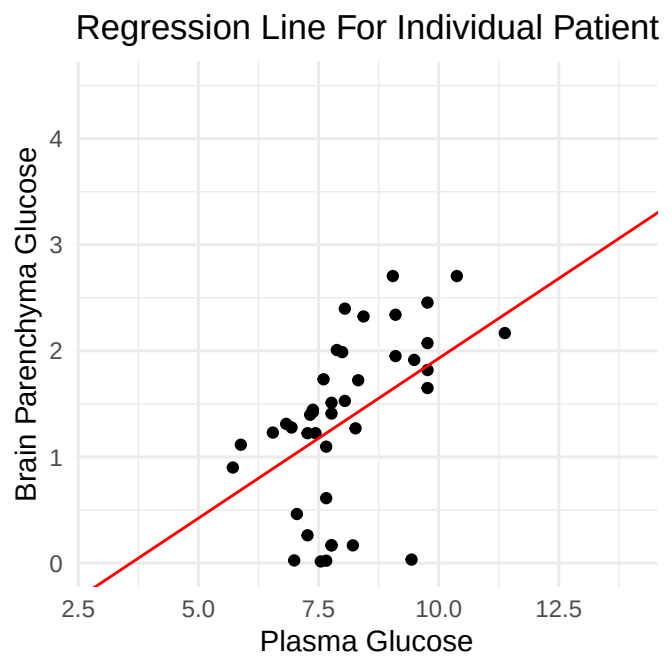

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose


Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose

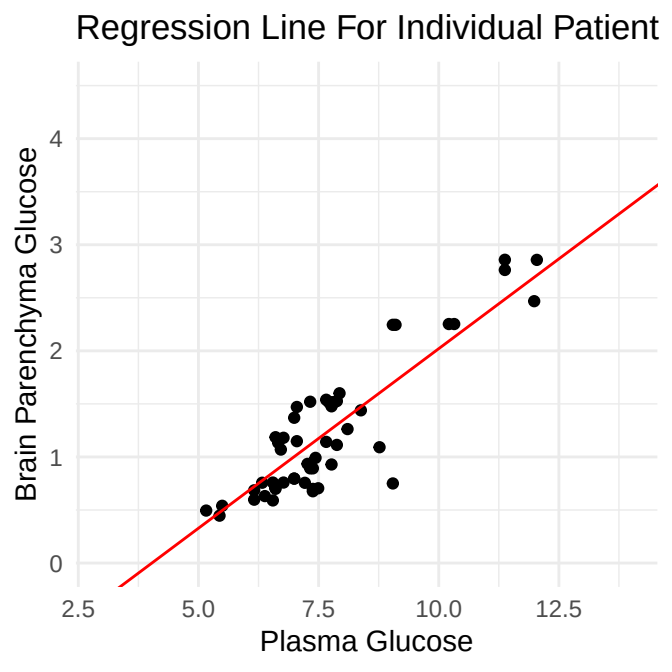

Regression Line For Individual Patient
Brain Parenchyma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5
Plasma Glucose



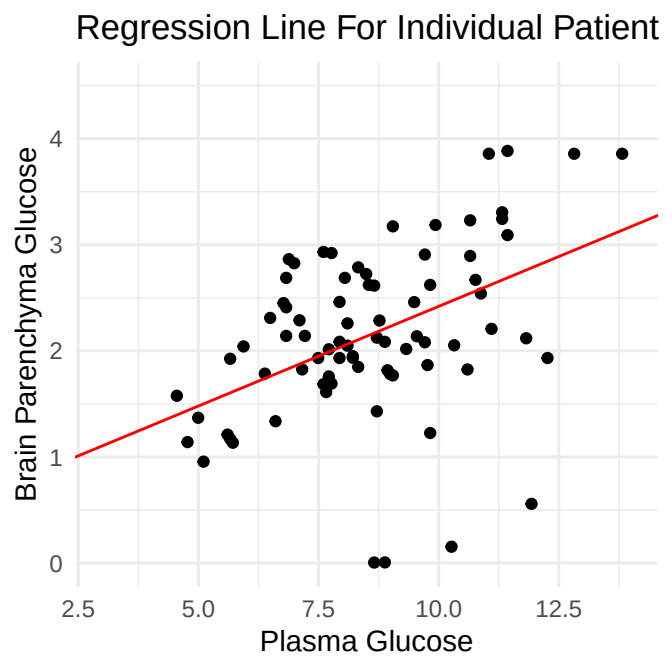
Regression Line For Individual Patient



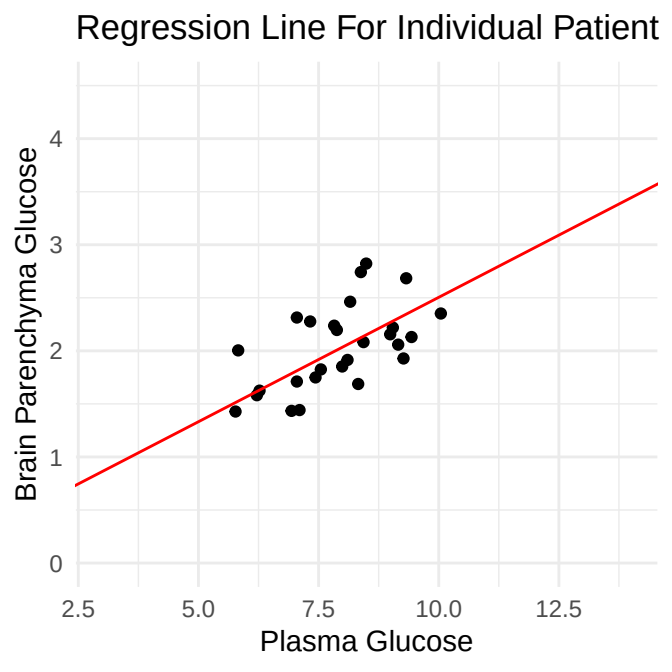
Regression Line For Individual Patient

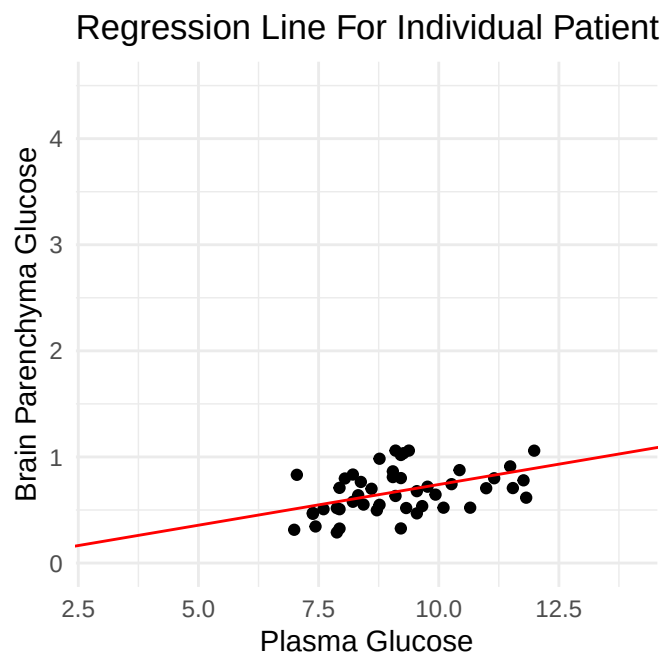


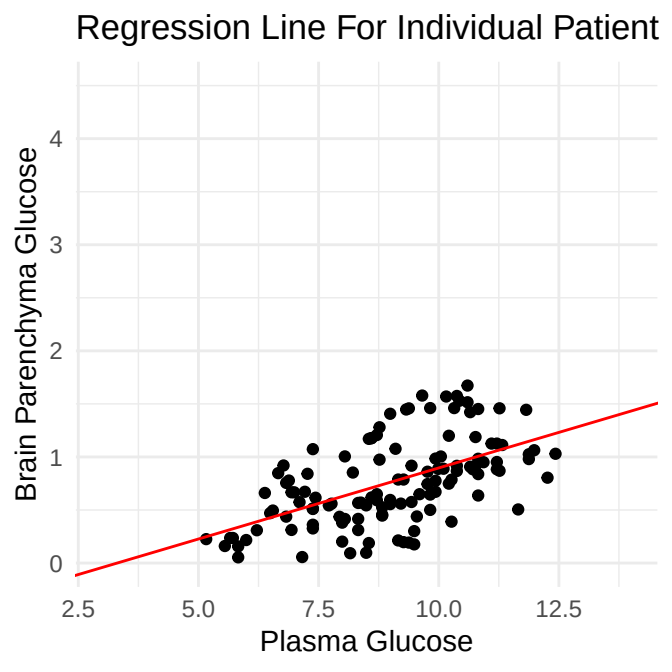
Regression Line For Individual Patient

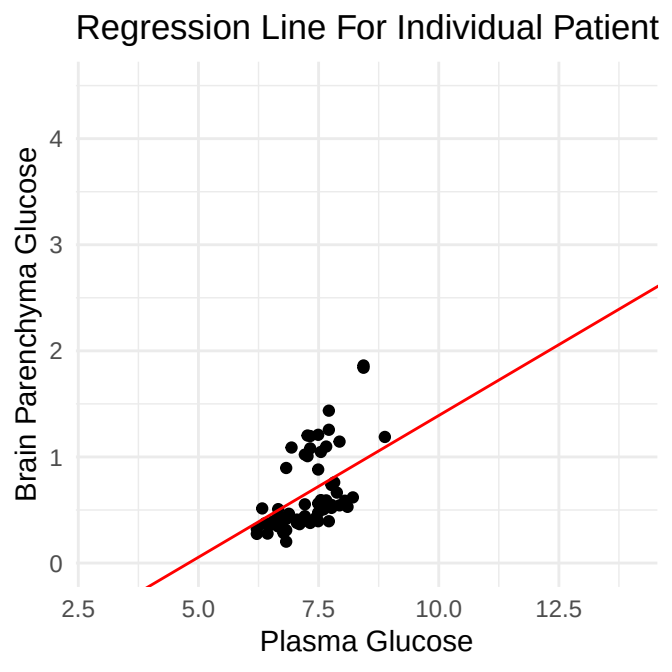


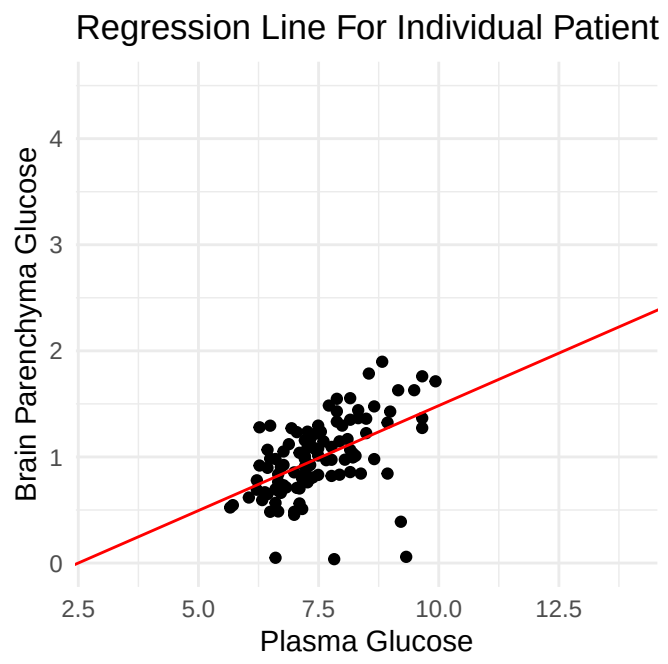
Regression Line For Individual Patient

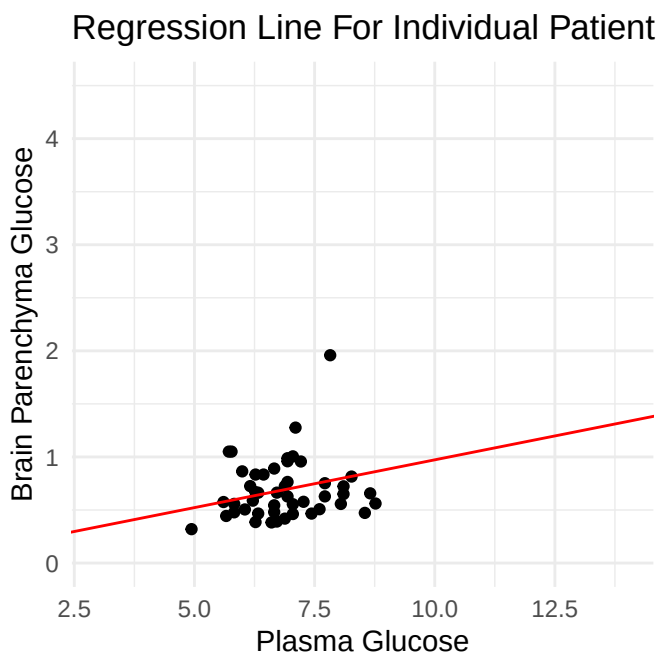

Regression Line For Individual Patient

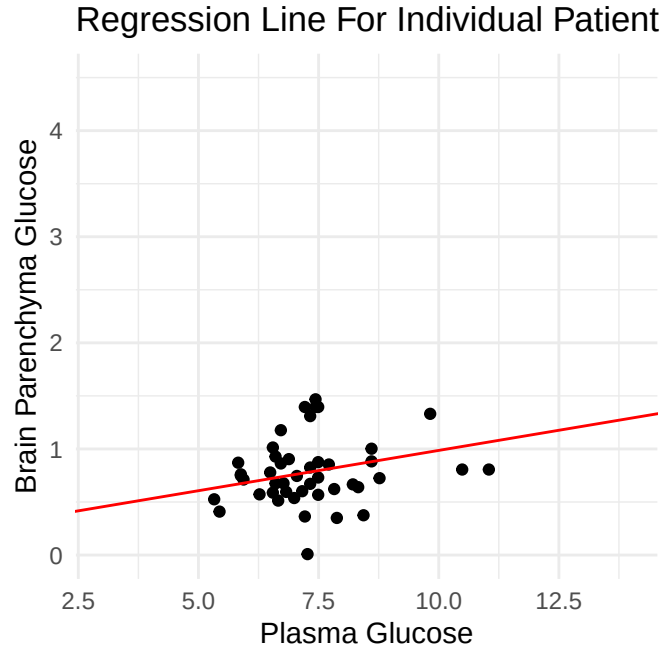

Regression Line For Individual Patient


Regression Line For Individual Patient

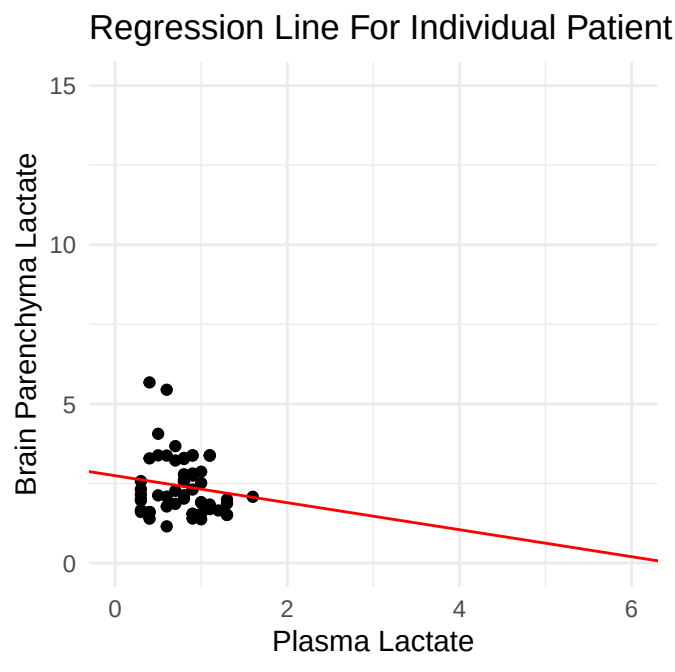

Regression Line For Individual Patient

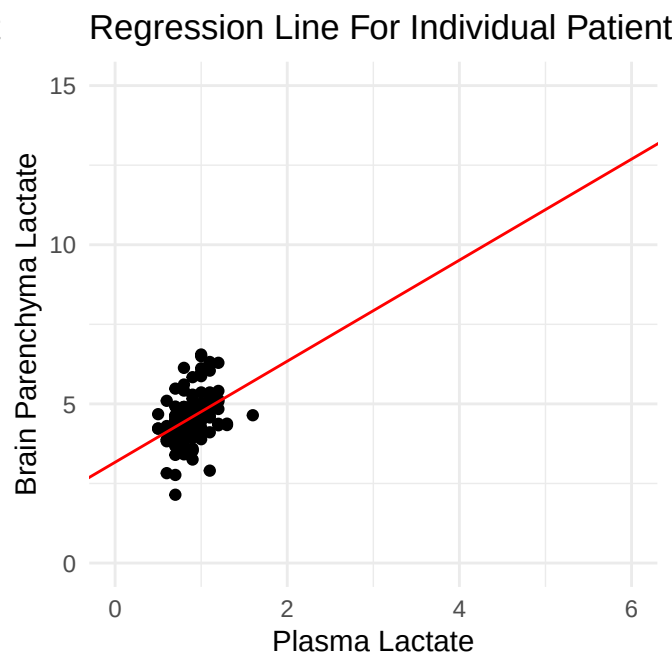

Regression Line For Individual Patient
Brain Parenchyma Glucose
Plasma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

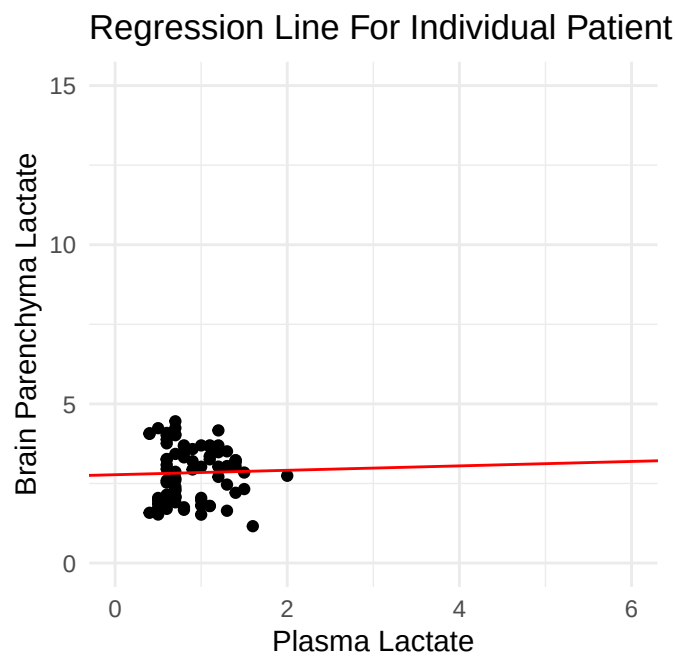

Regression Line For Individual Patient
Brain Parenchyma Glucose
Plasma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

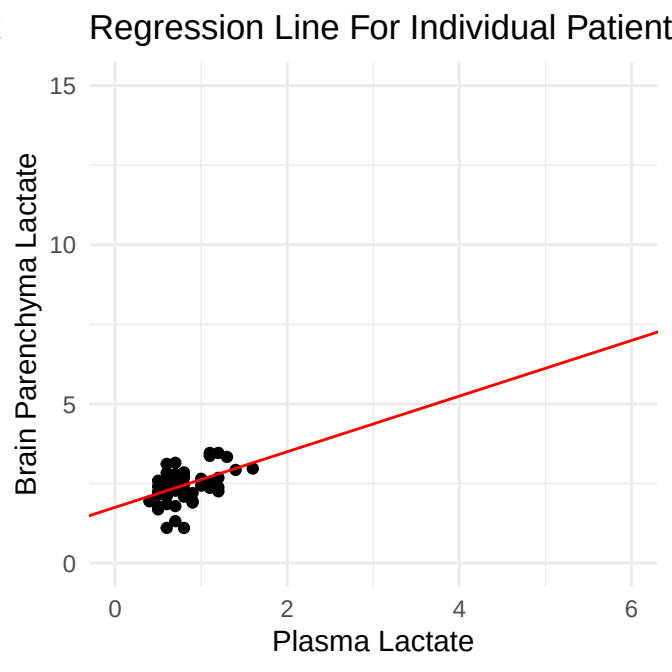

Regression Line For Individual Patient
Brain Parenchyma Glucose
Plasma Glucose
0
1
2
3
4
2.5
5.0
7.5
10.0
12.5

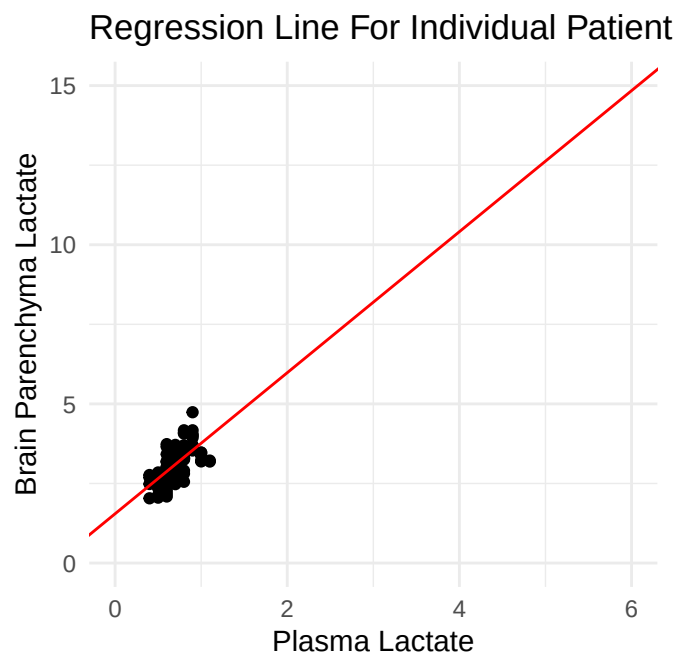
5.4 Plasma Lactate vs. Brain Parenchyma Lactate

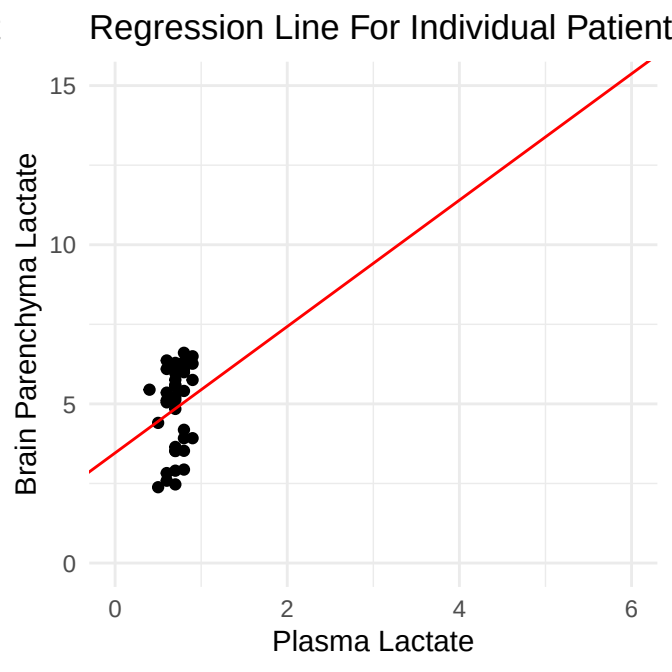

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

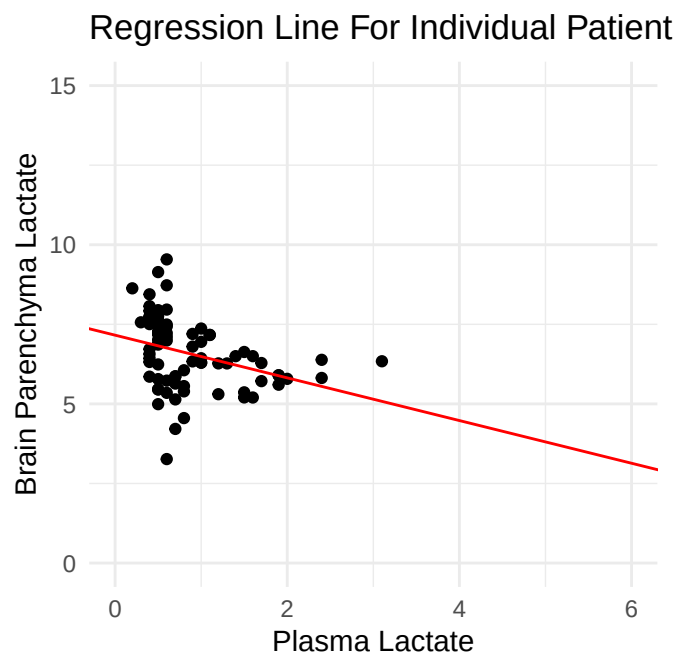

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

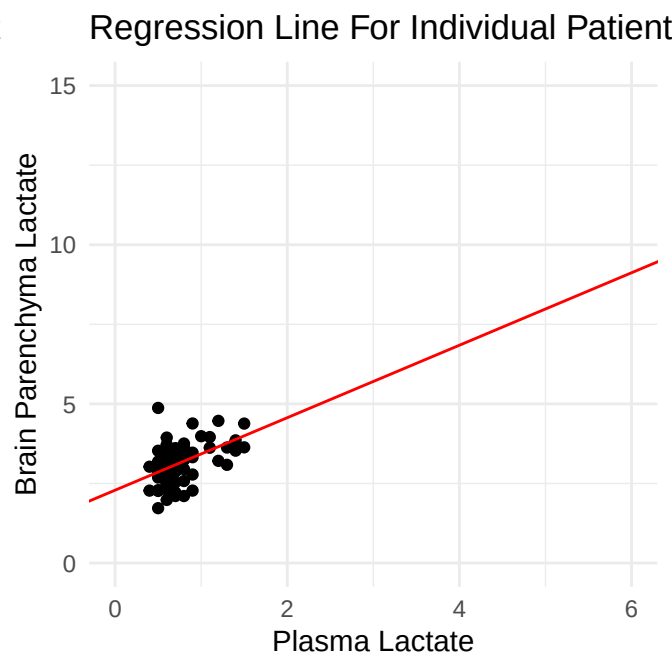

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

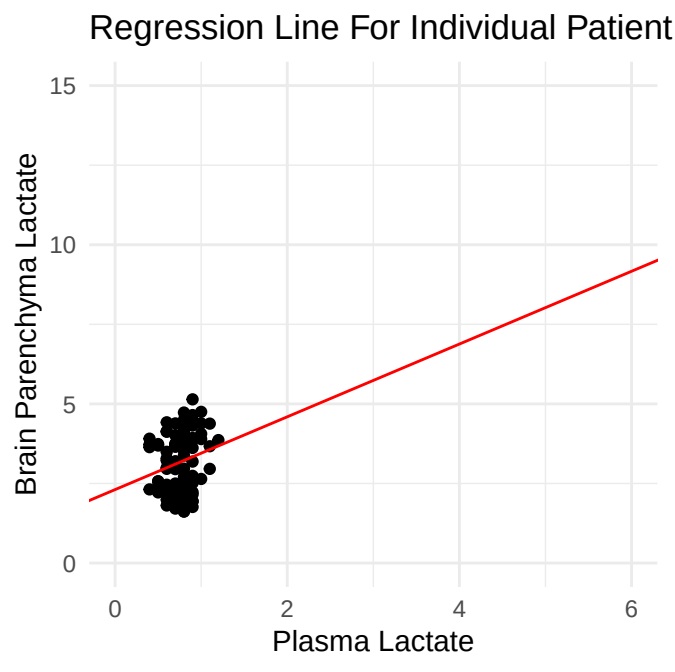

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

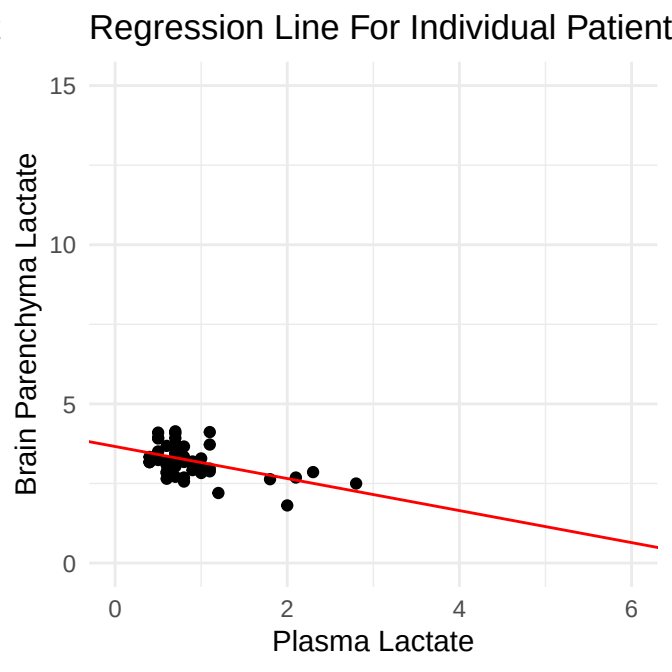

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

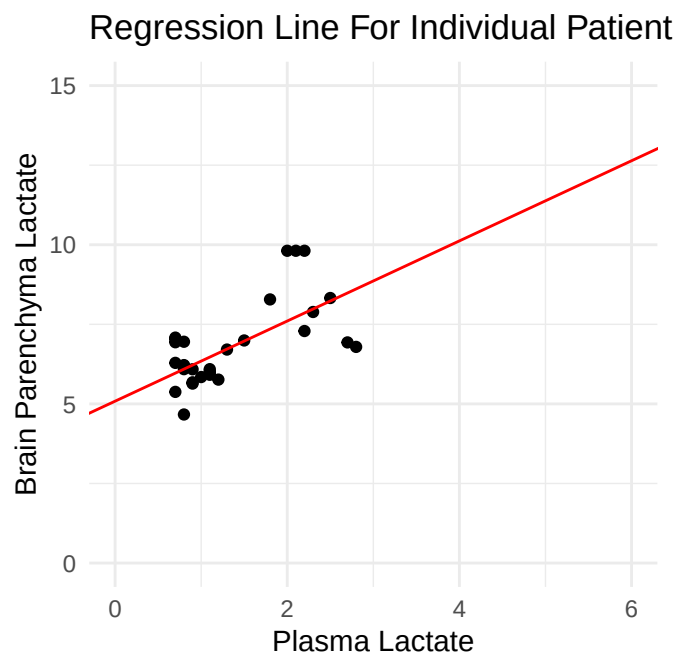

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

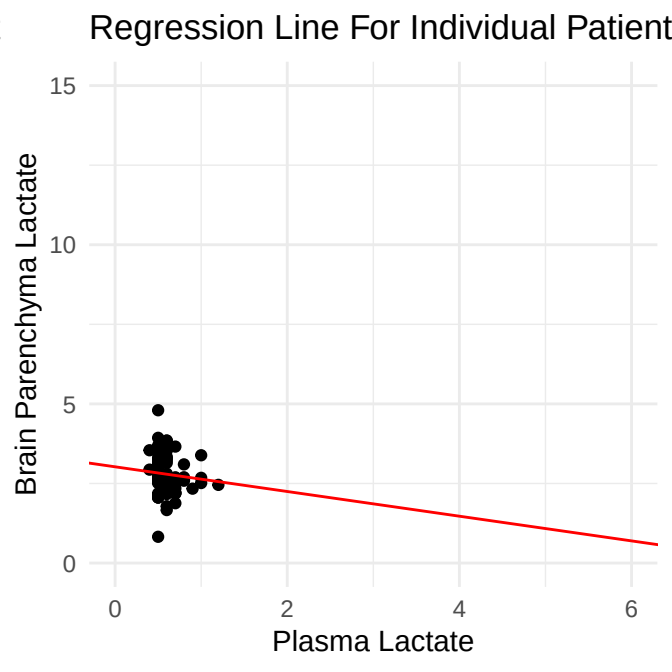

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

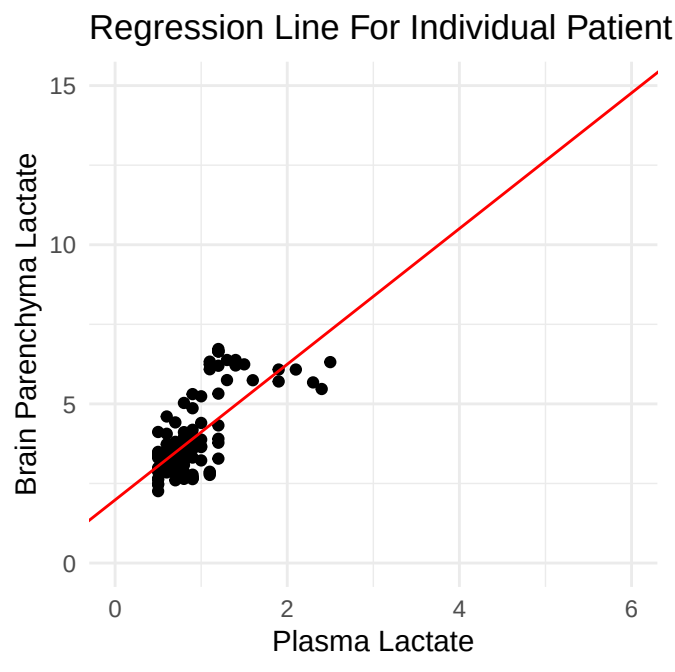

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

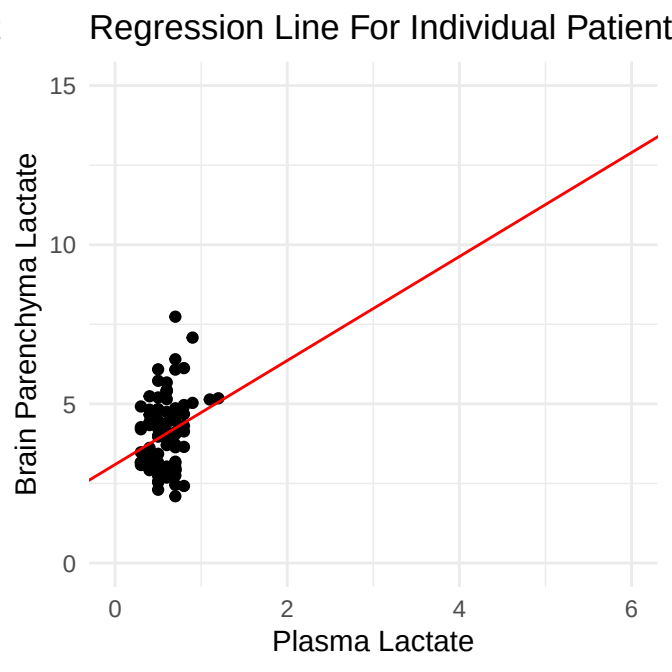

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

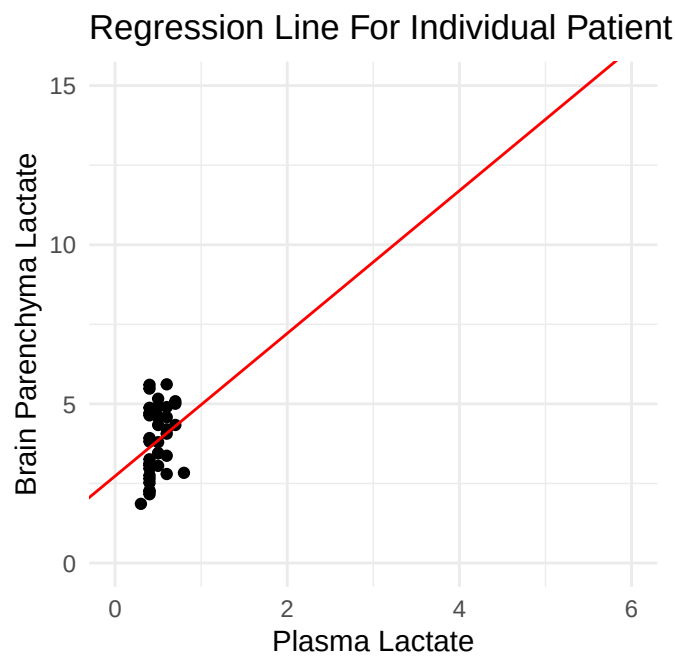

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
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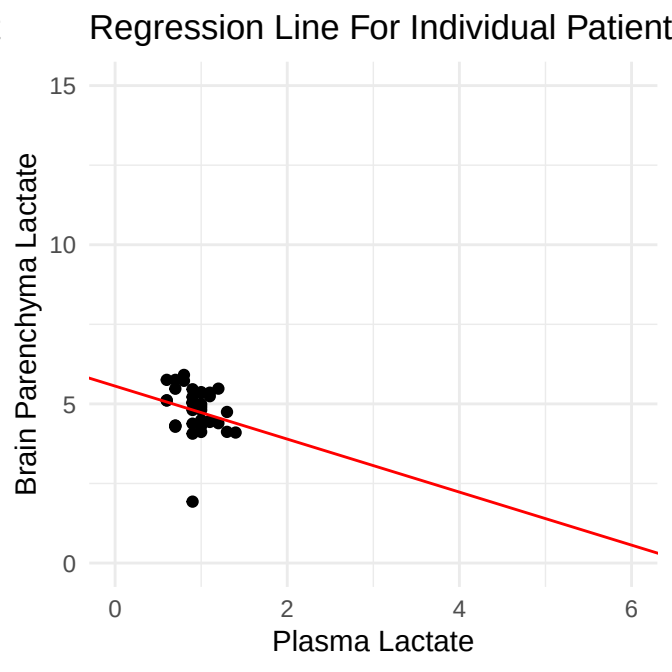
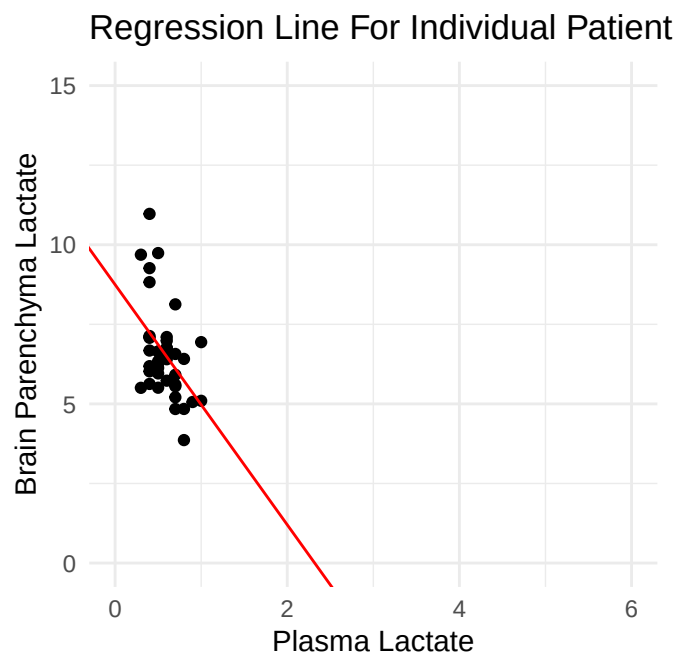
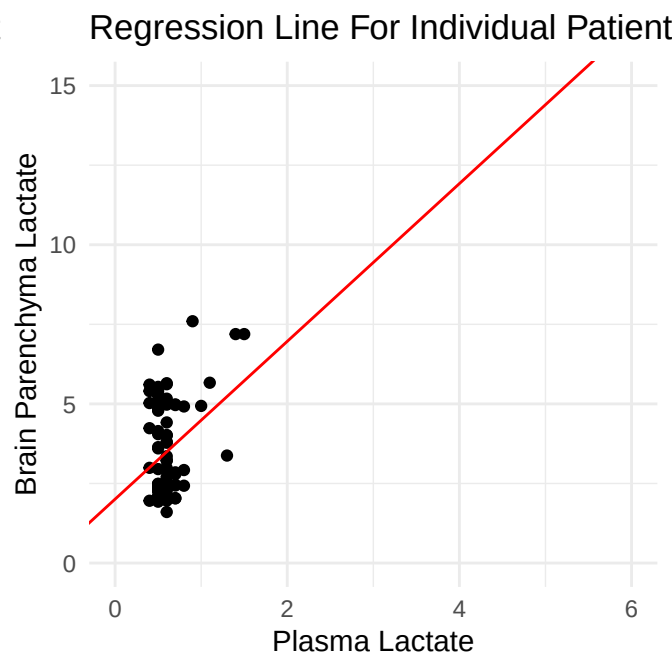
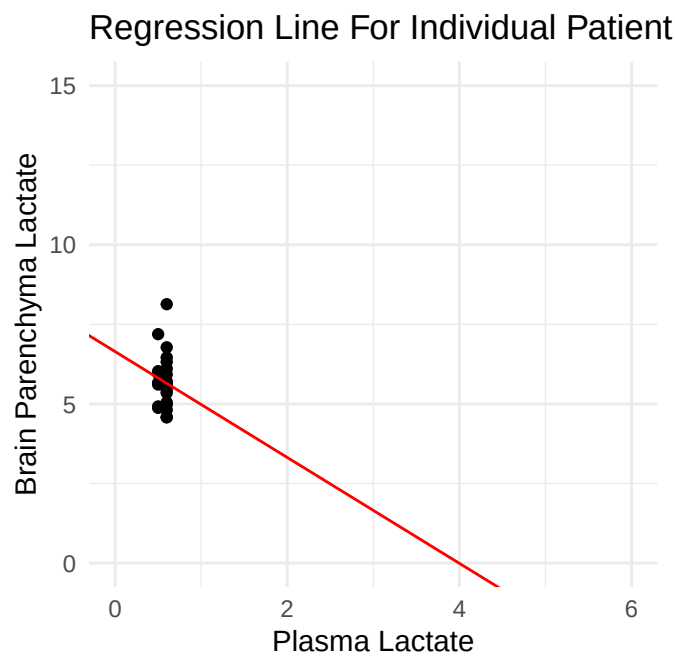
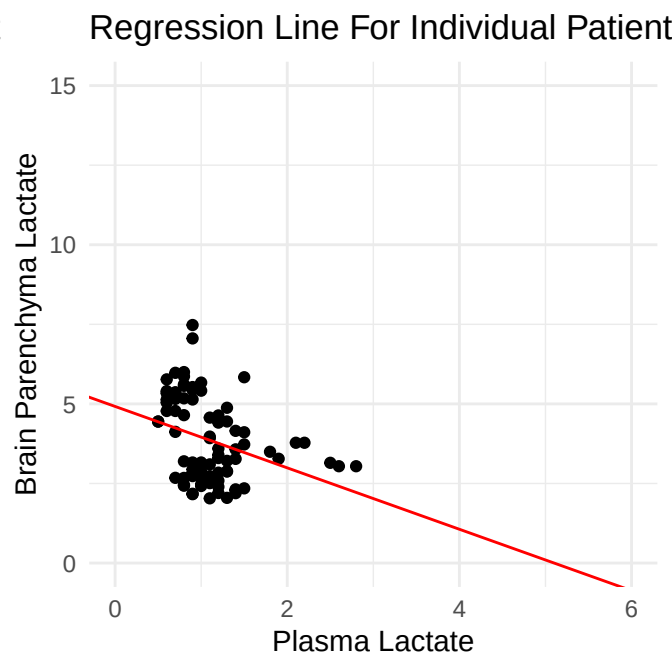
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
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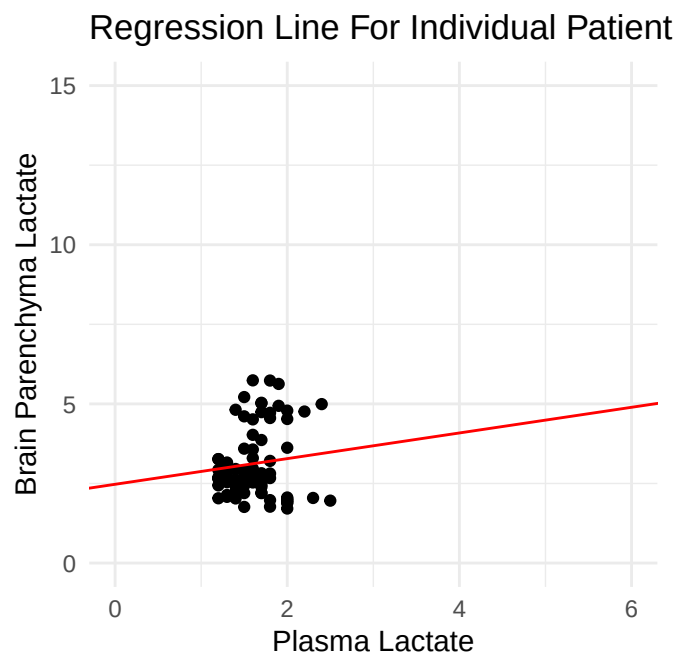
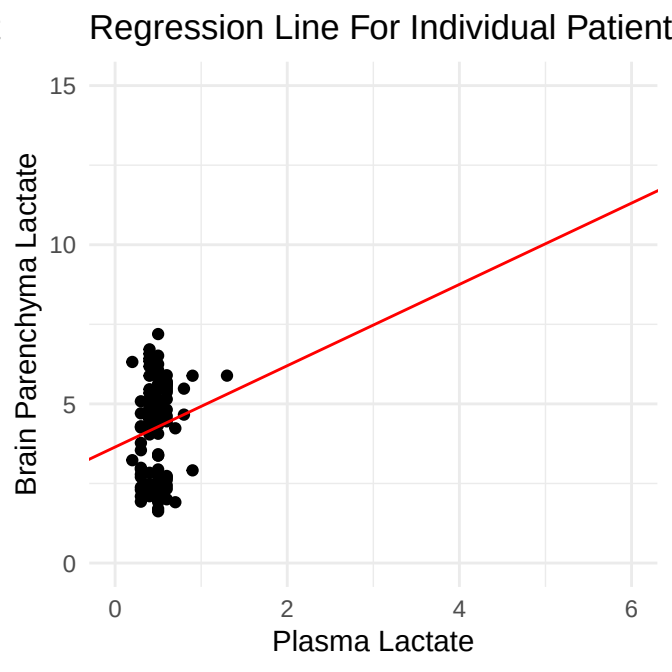
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
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10
15
0
2
4
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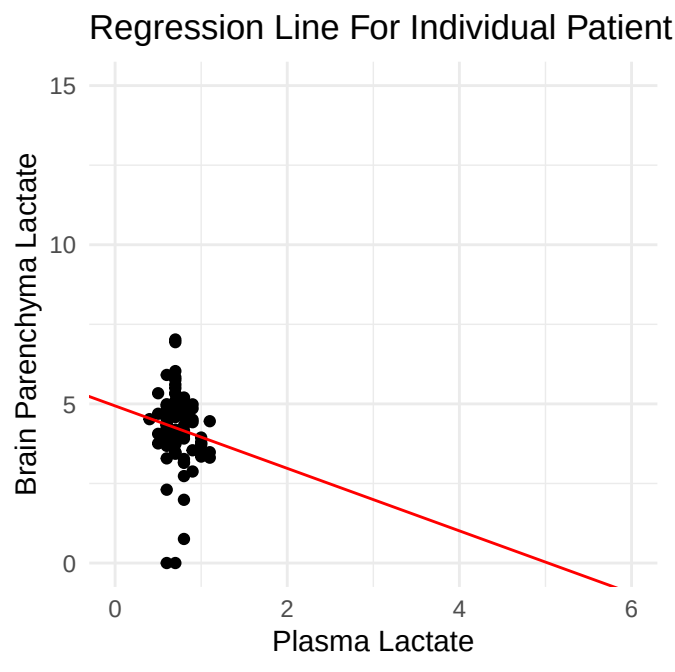
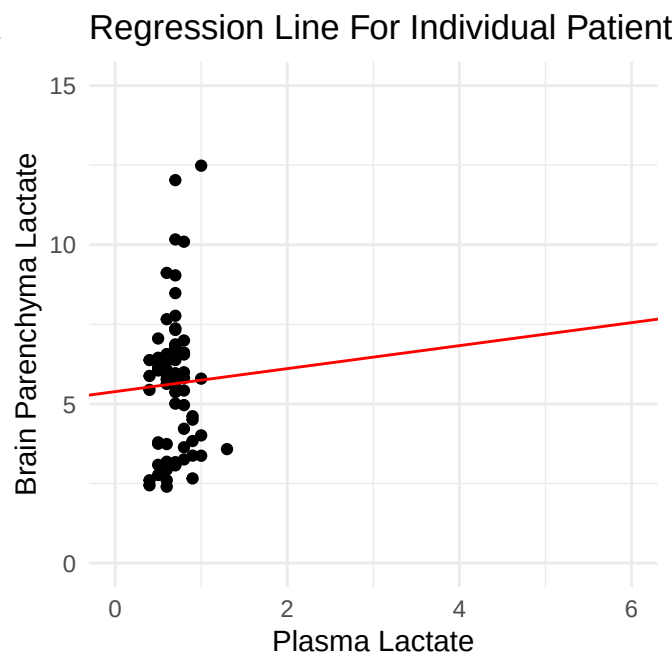
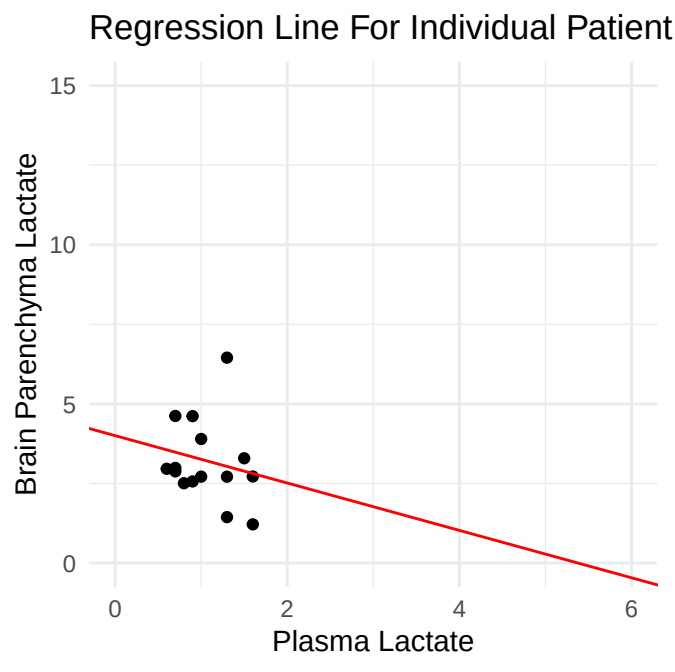
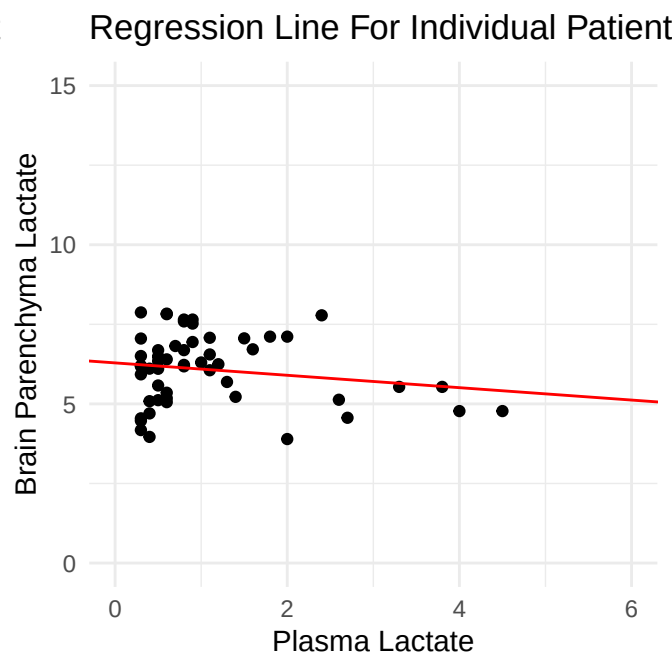
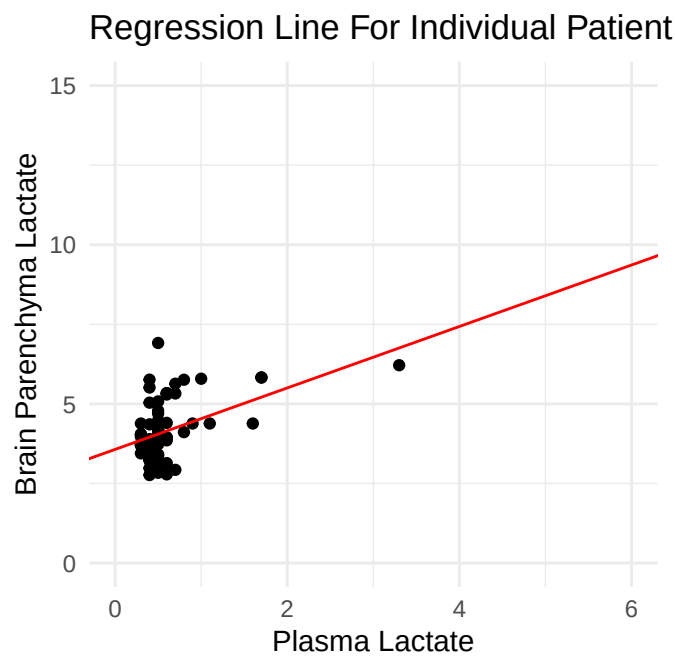

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
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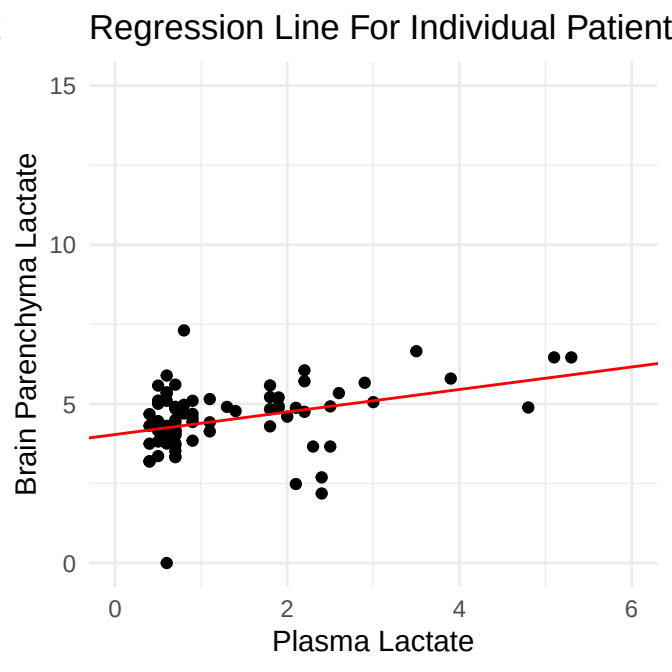
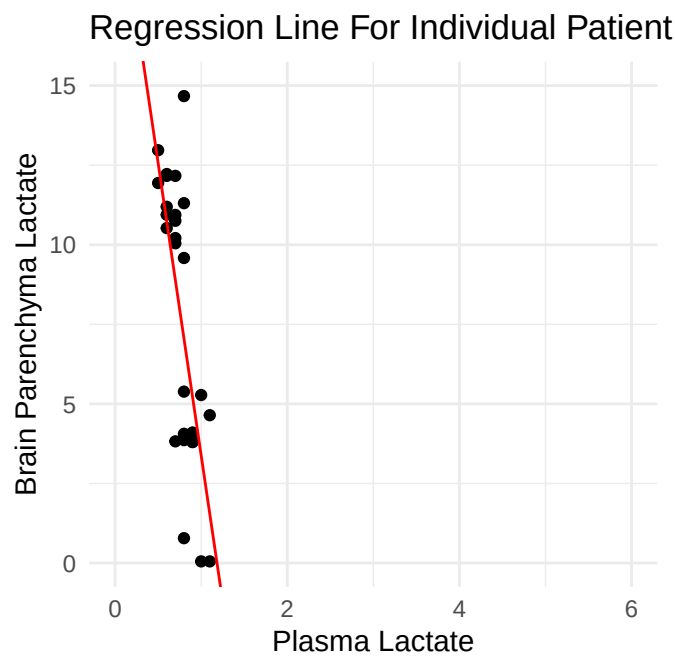
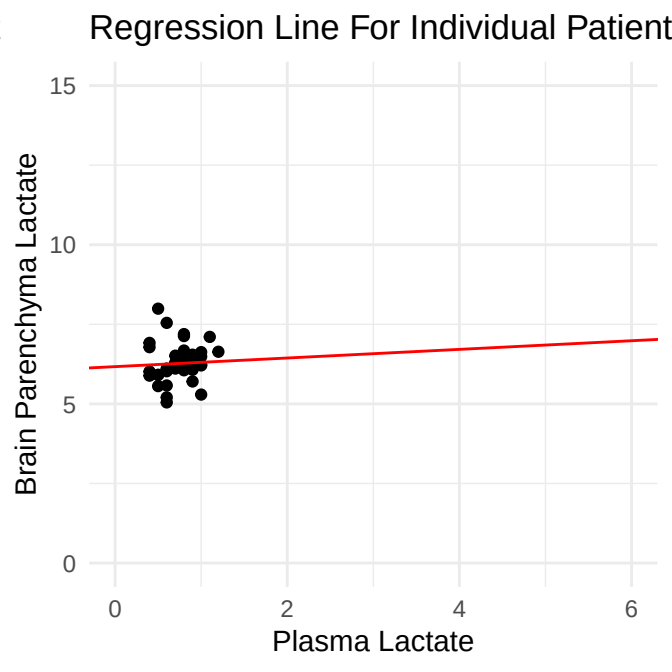
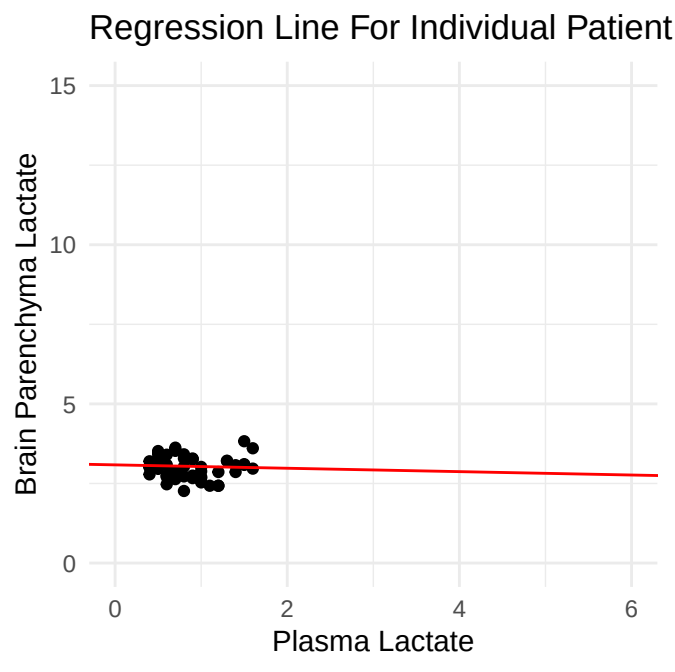
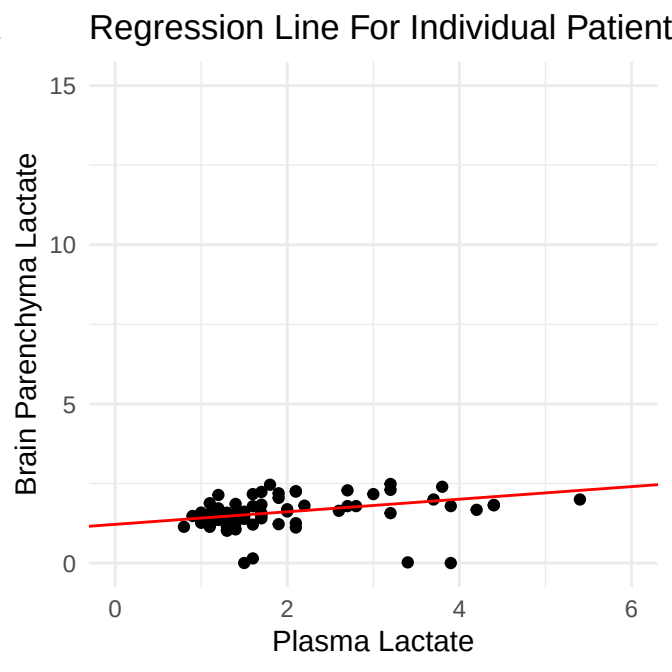
0
2
4
6

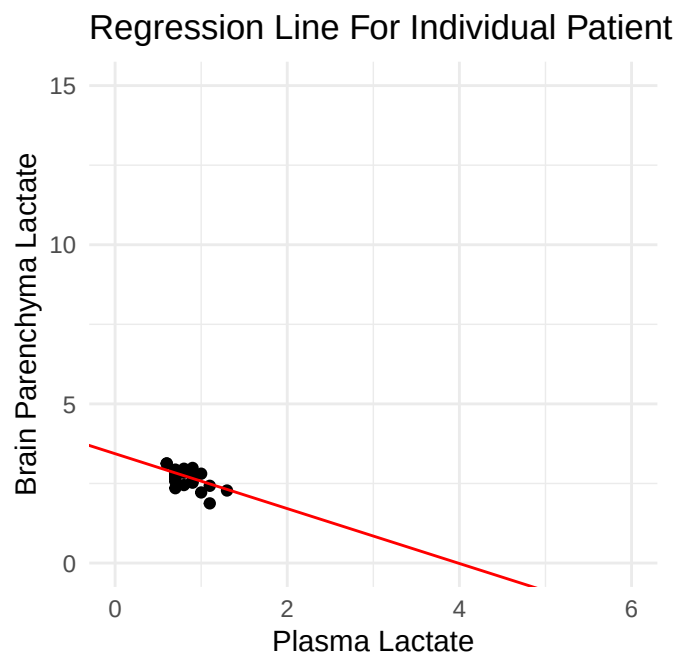

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

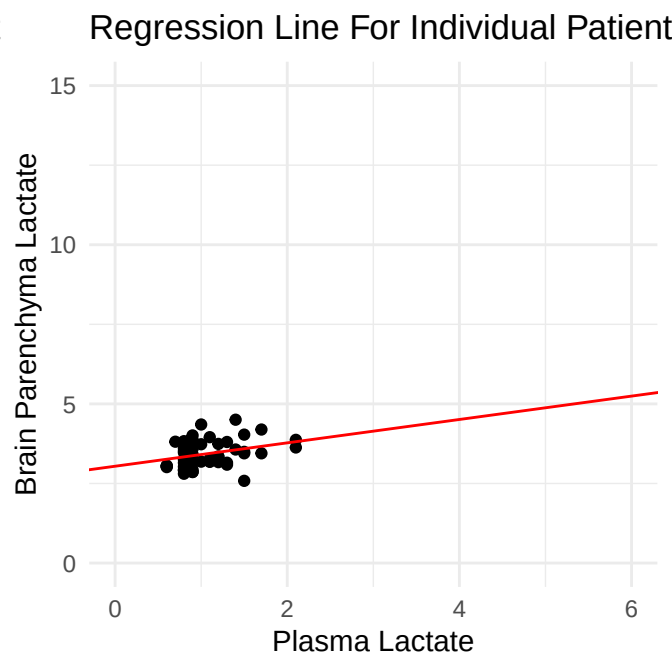

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

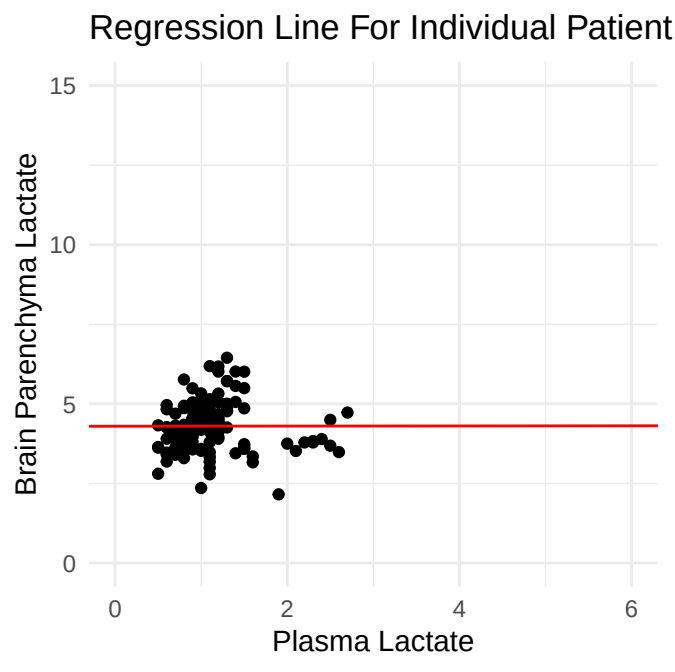

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

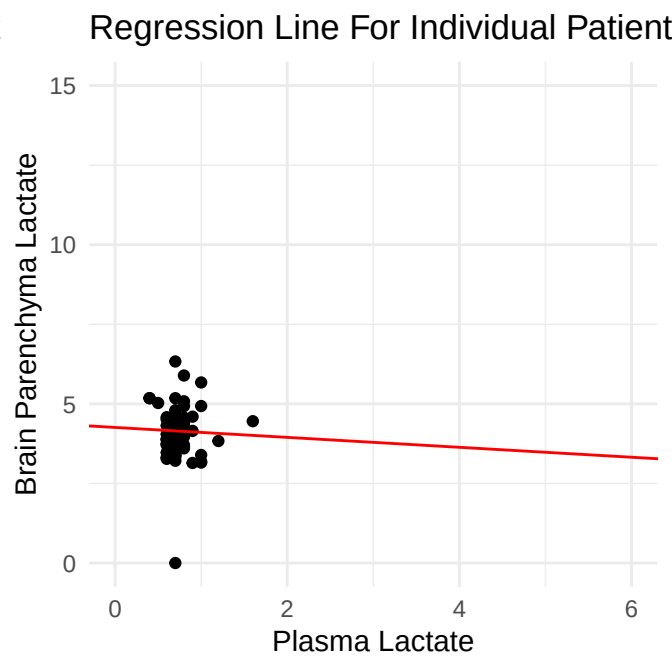

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

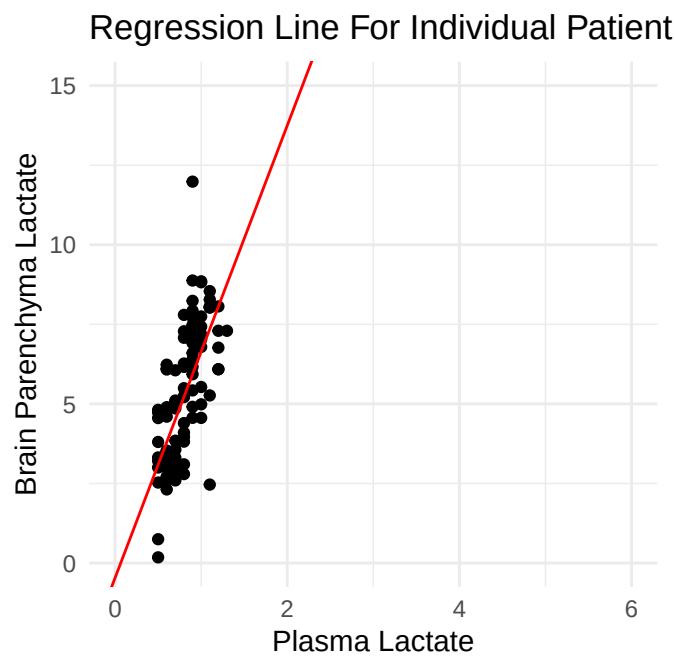

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

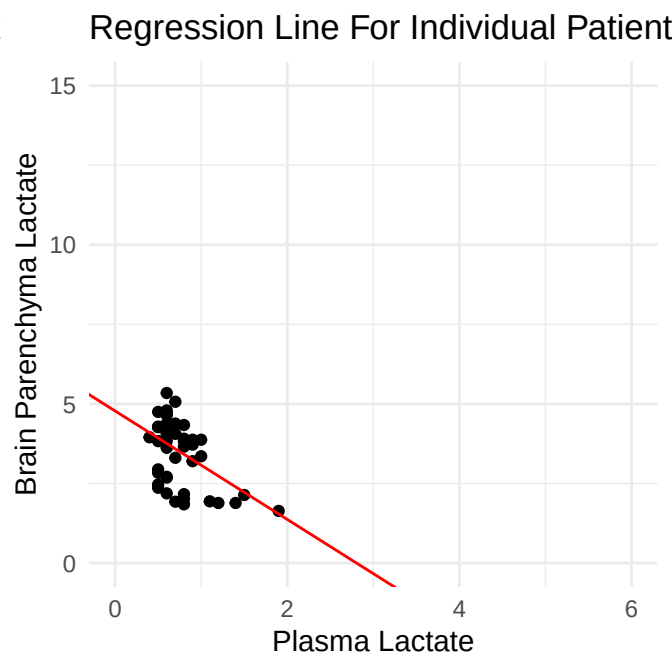

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

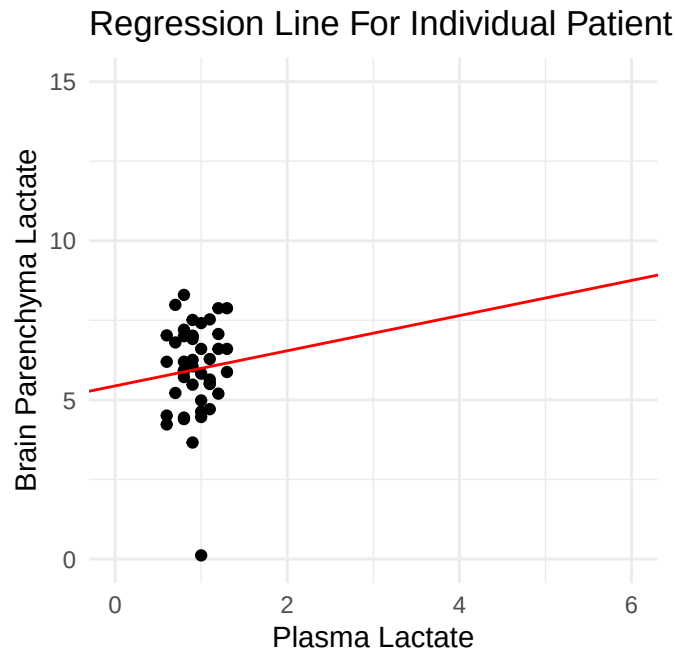

Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6


Regression Line For Individual Patient
Brain Parenchyma Lactate
Plasma Lactate
0
5
10
15
0
2
4
6

5.5 Plasma Glucose vs. CSF Glucose


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

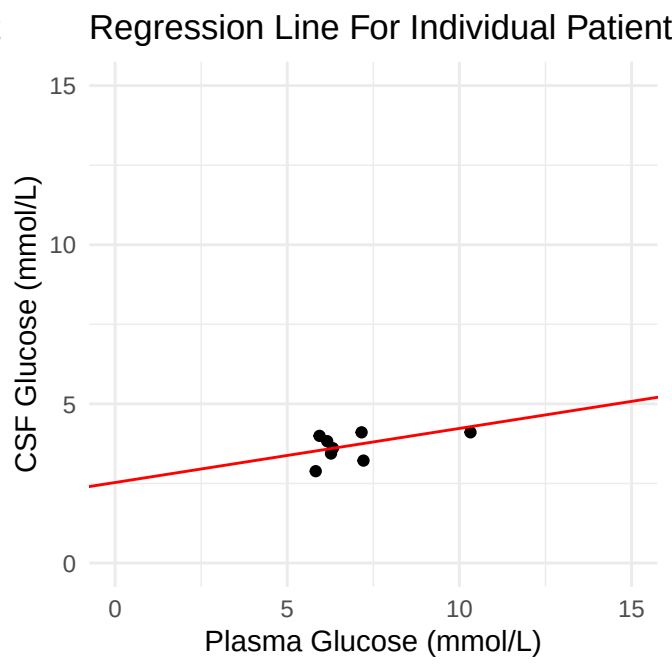

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

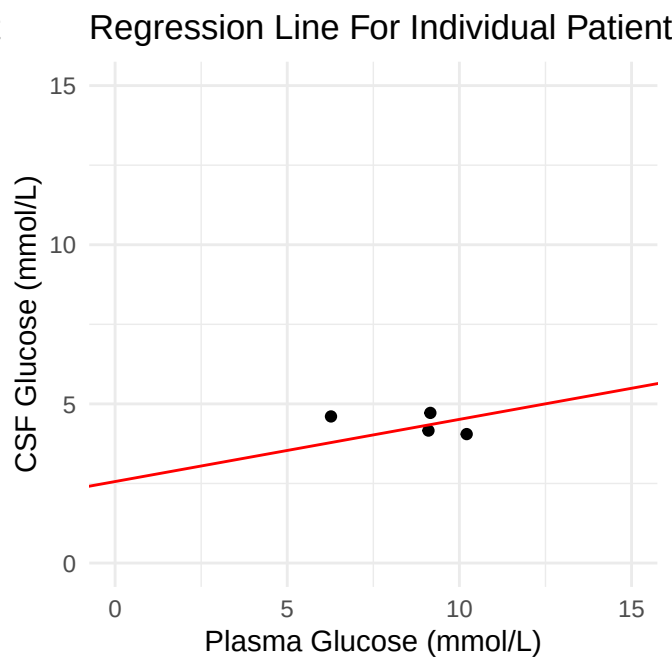

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

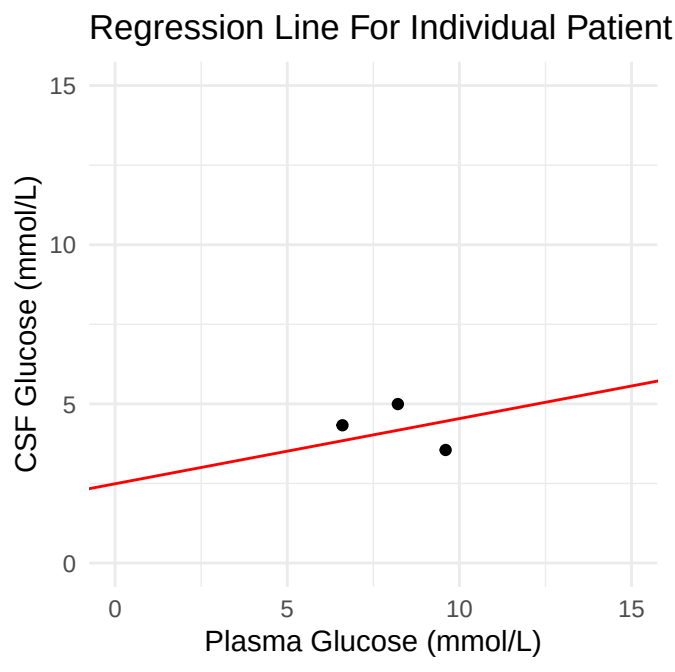

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

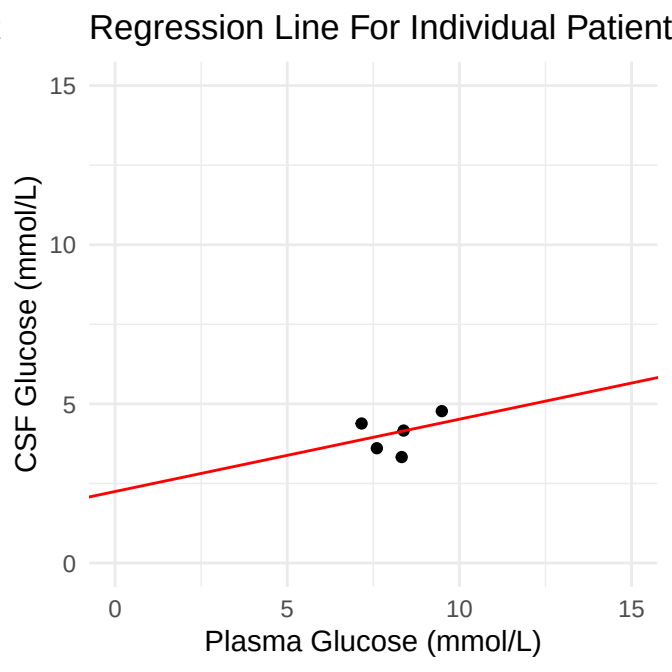

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

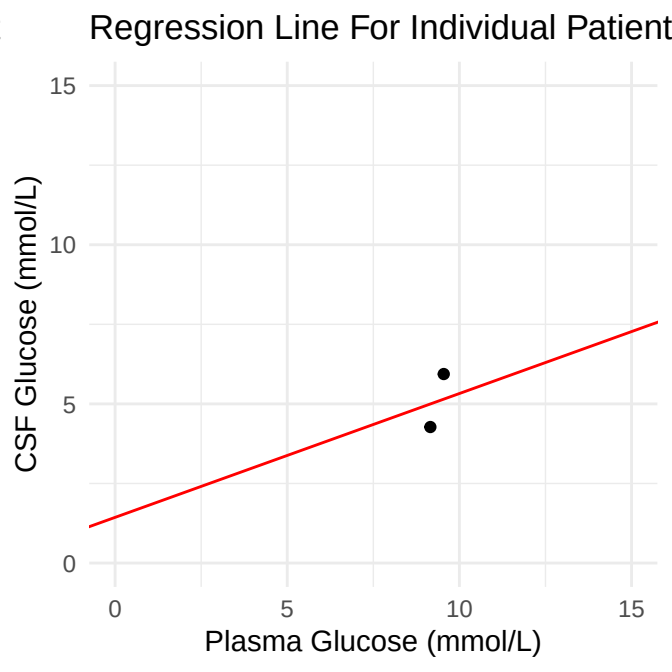

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

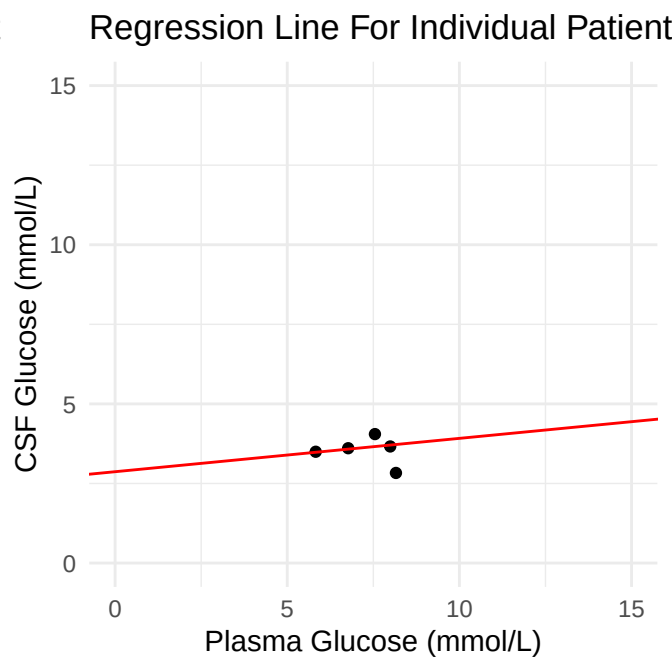

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

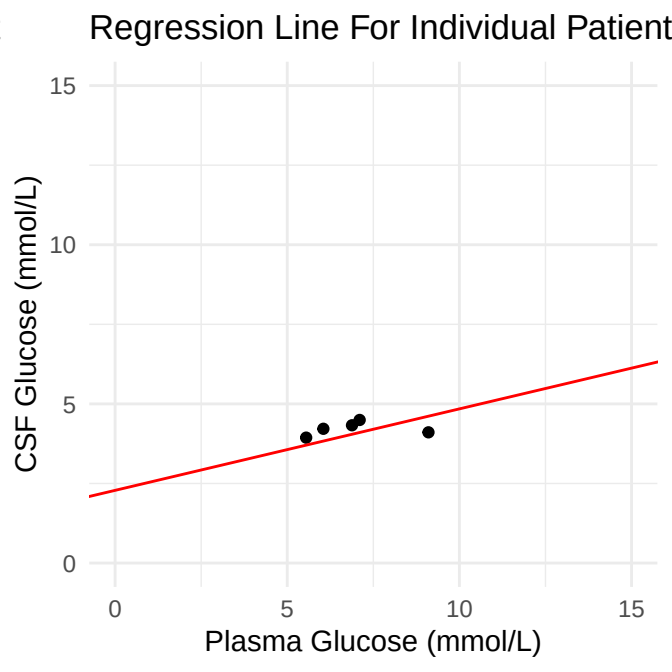

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

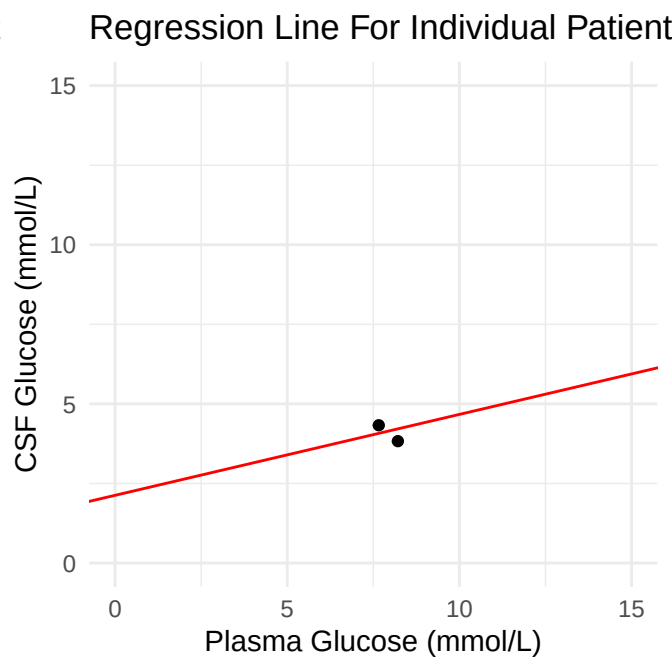

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

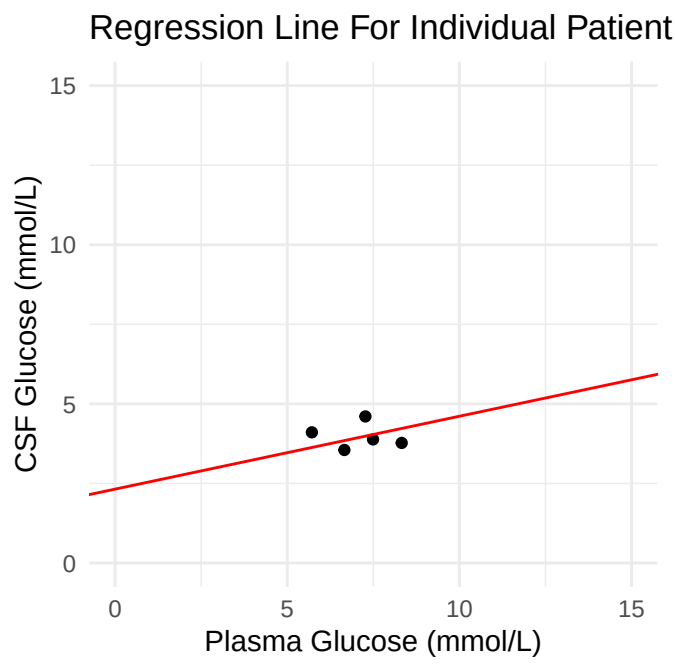

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

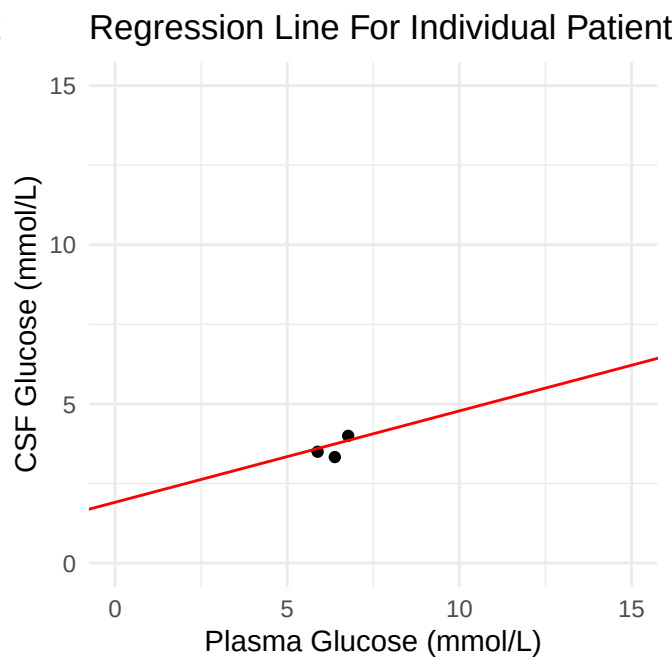

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

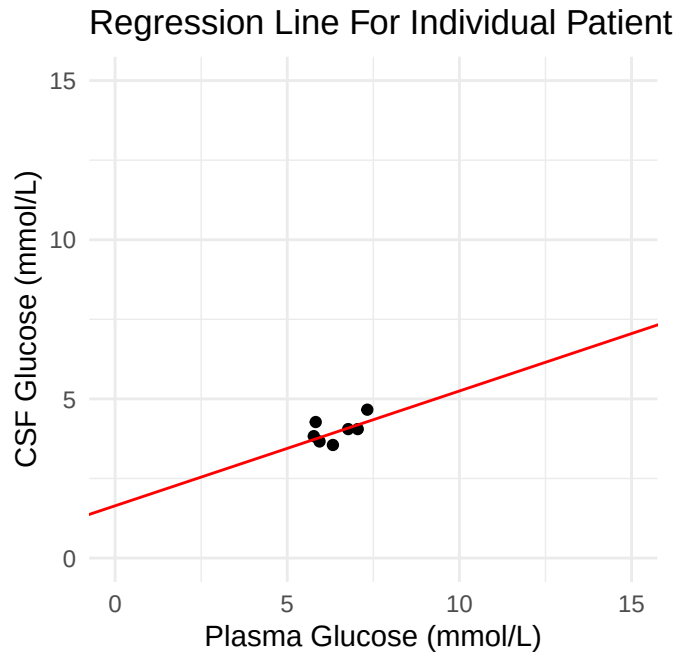

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15


Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

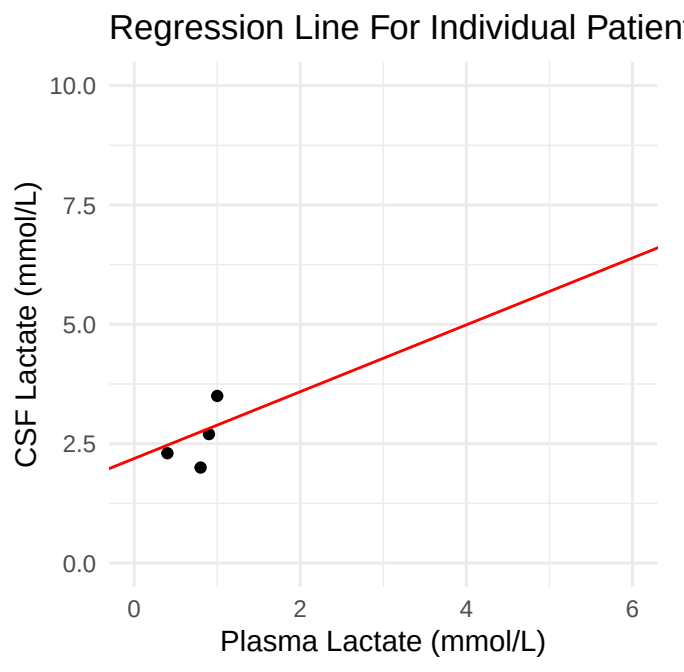

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

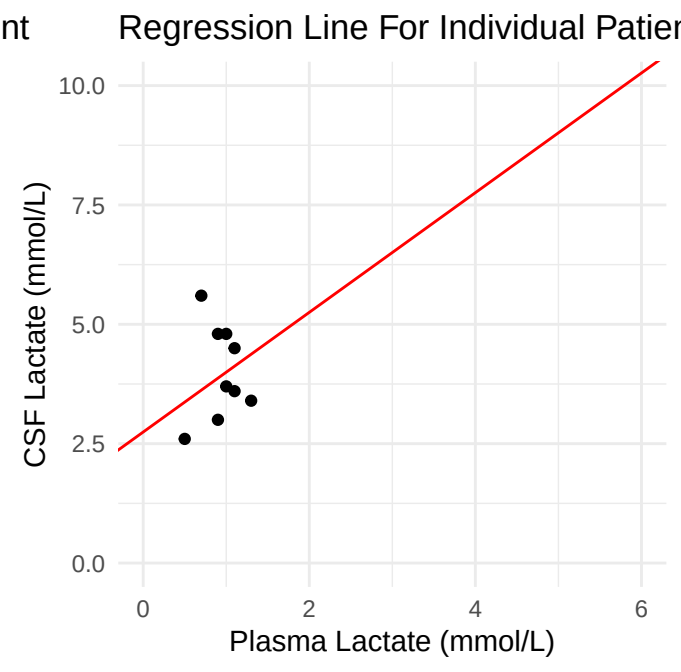

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

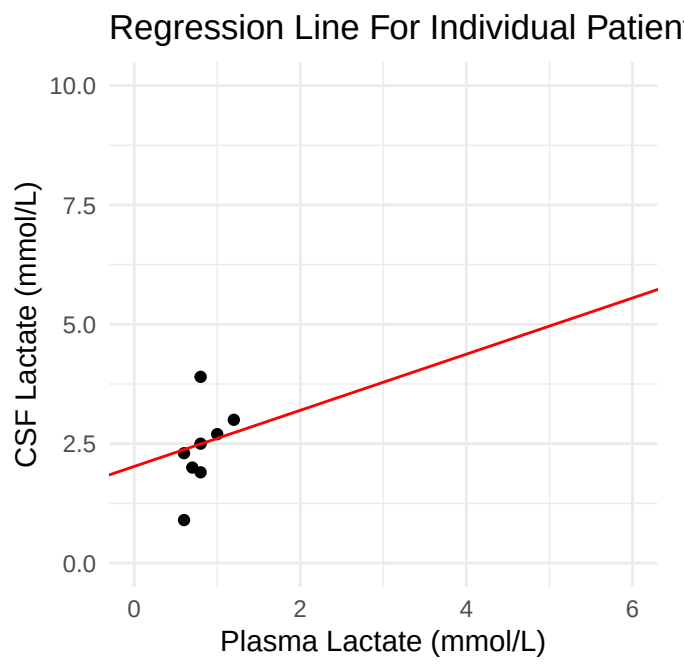

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

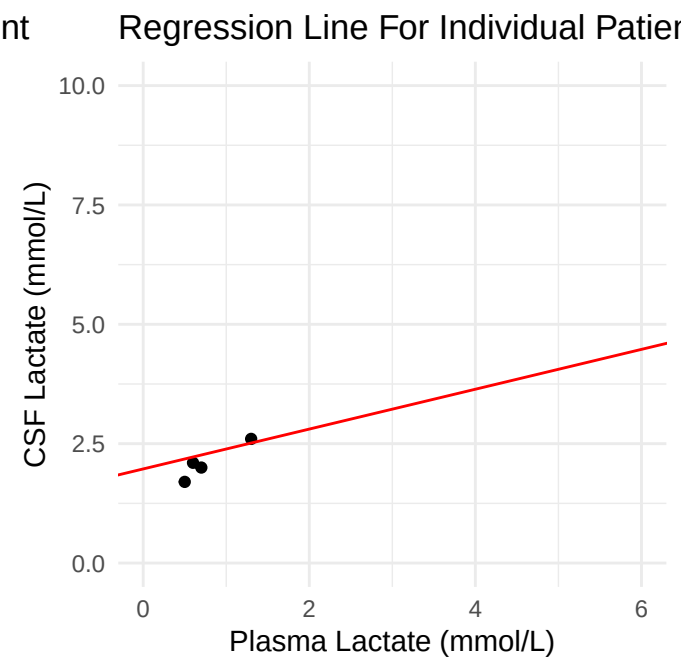

Regression Line For Individual Patient
CSF Glucose (mmol/L)
Plasma Glucose (mmol/L)
0
5
10
15

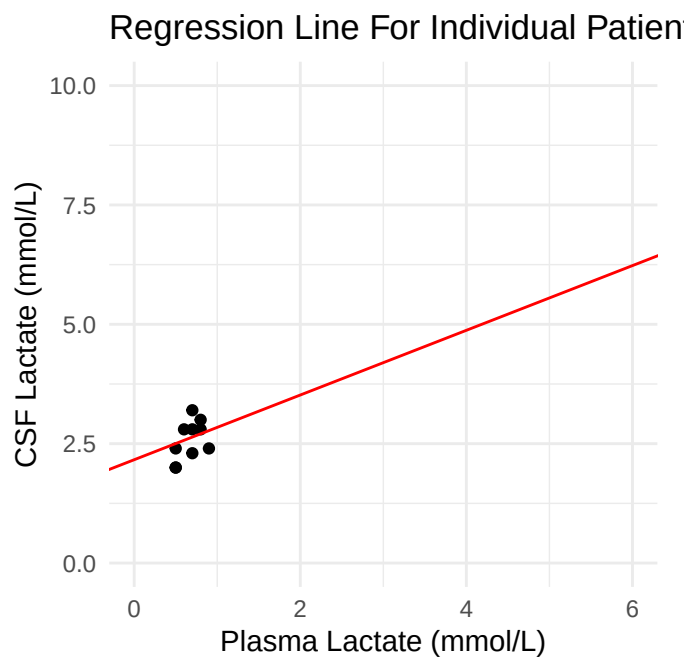
5.6 Plasma Lactate vs. CSF Lactate

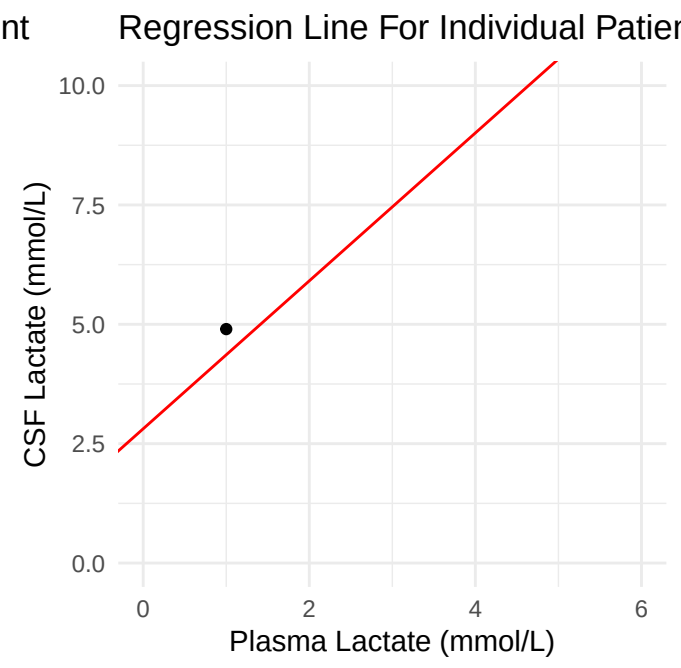

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

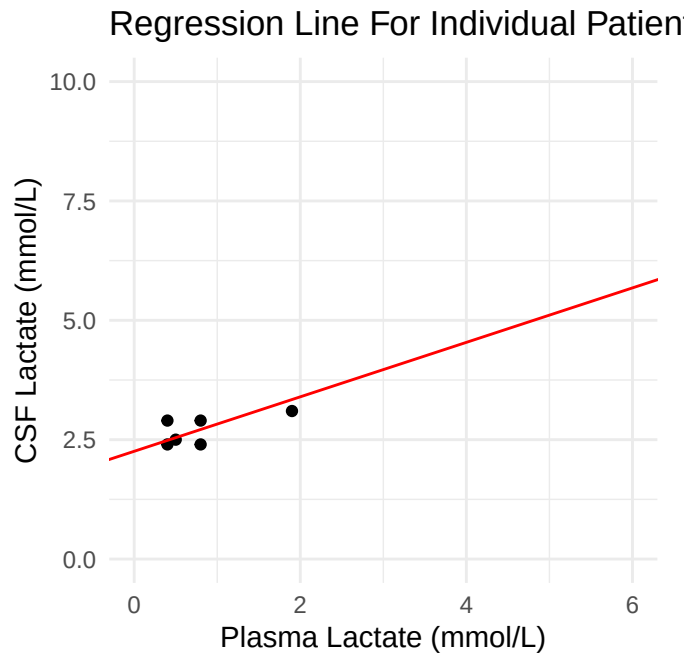

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

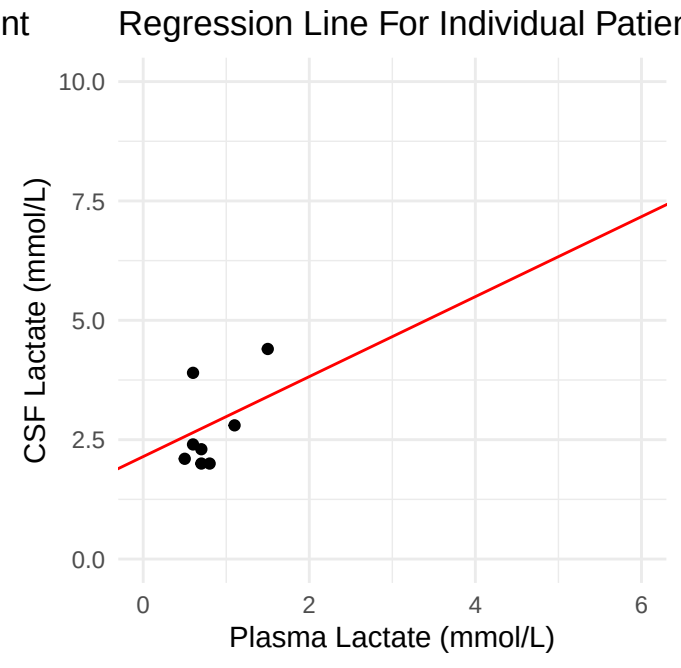

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

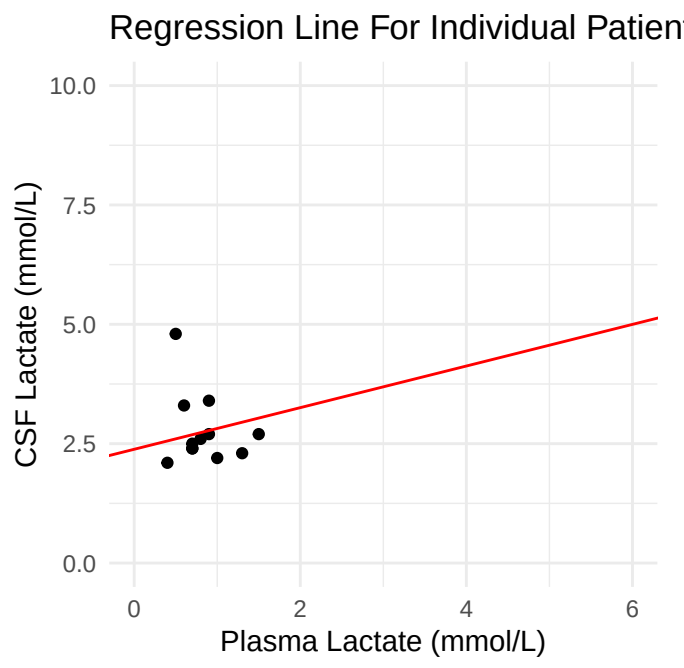

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

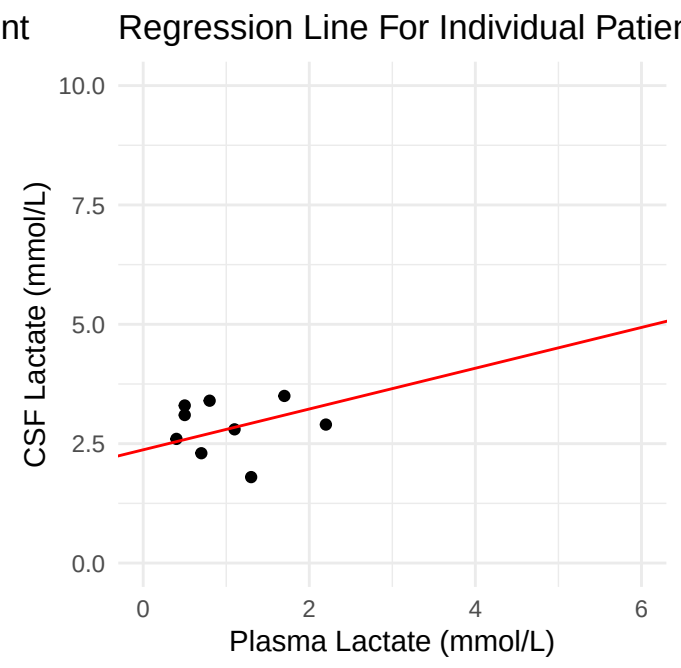

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

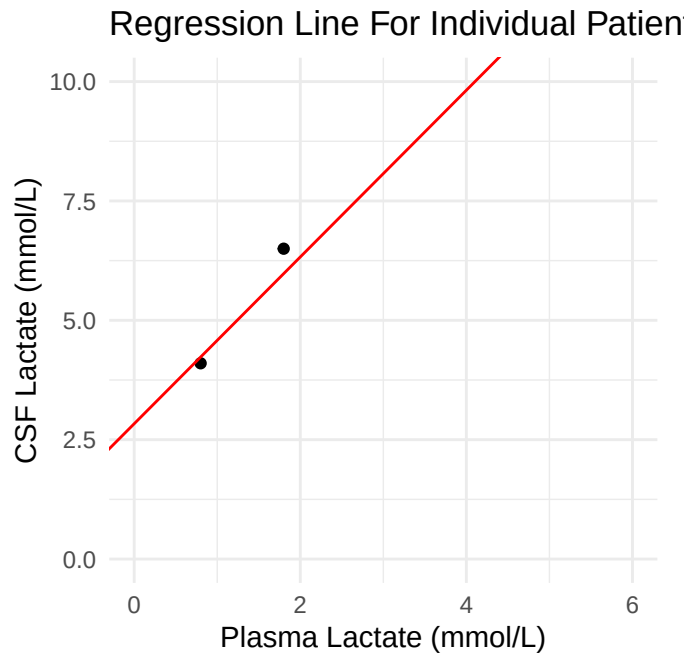

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

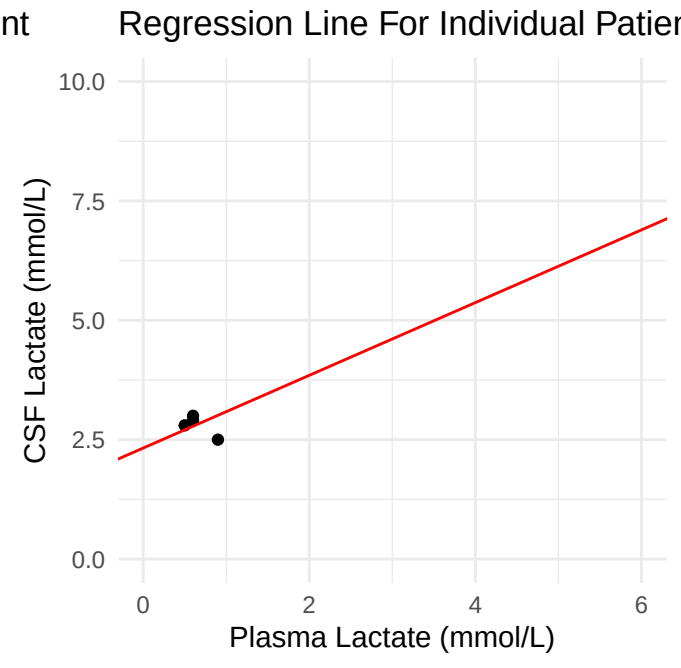

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

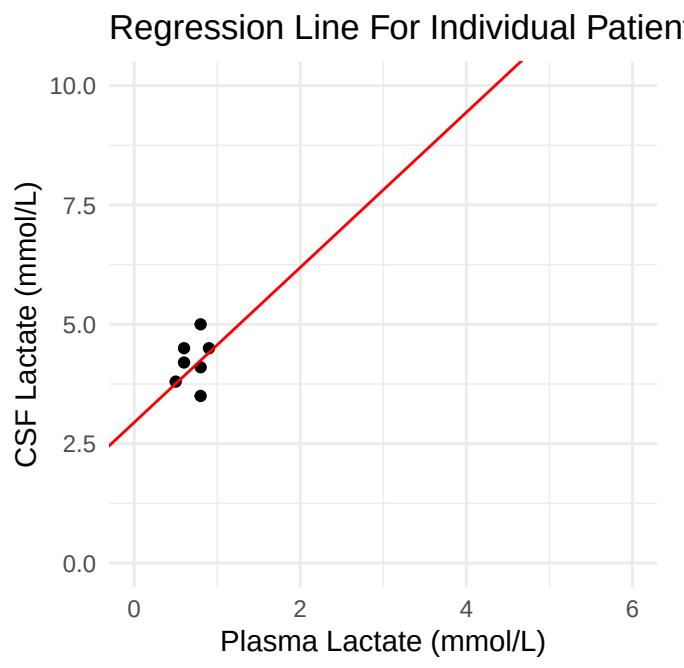

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

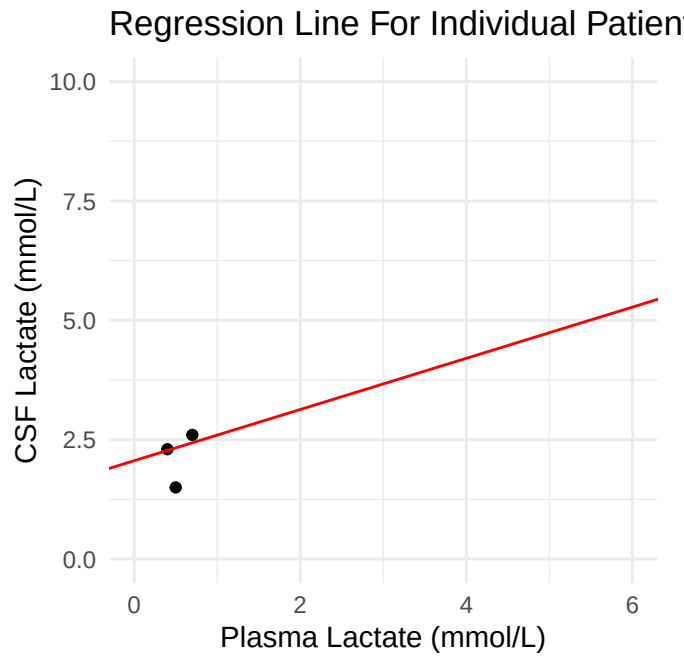

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

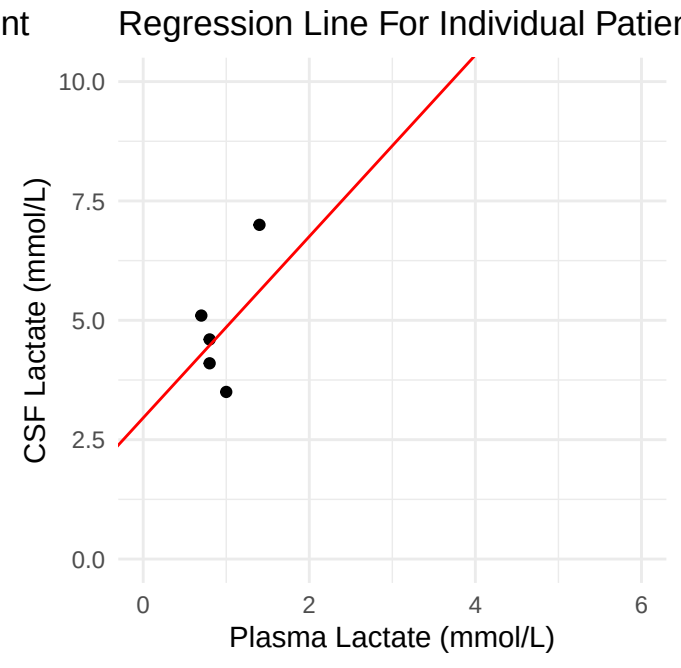

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

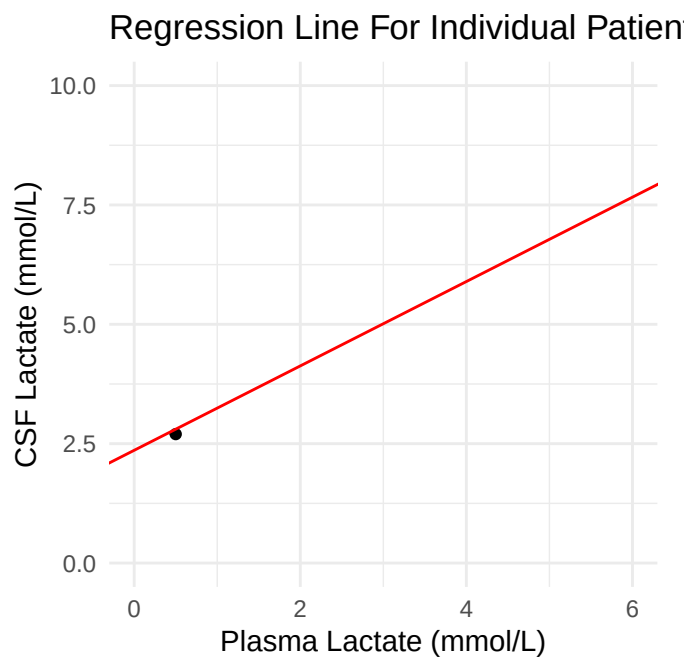

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

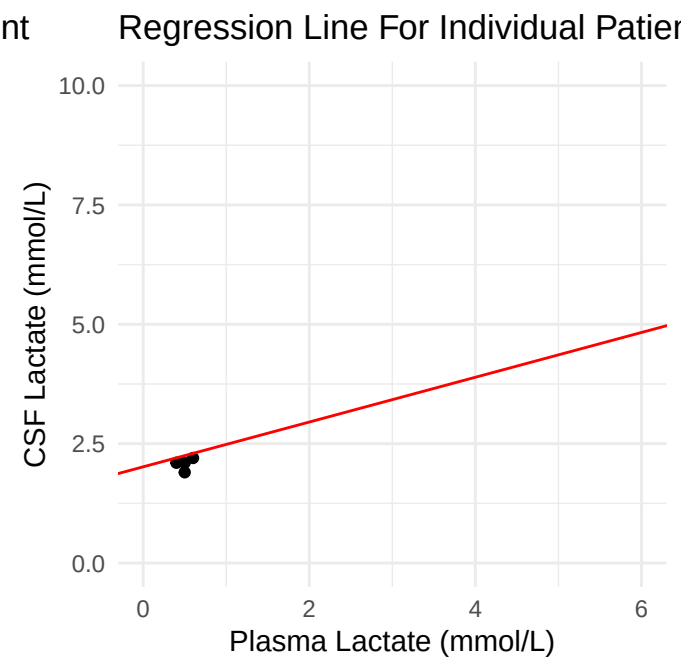

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

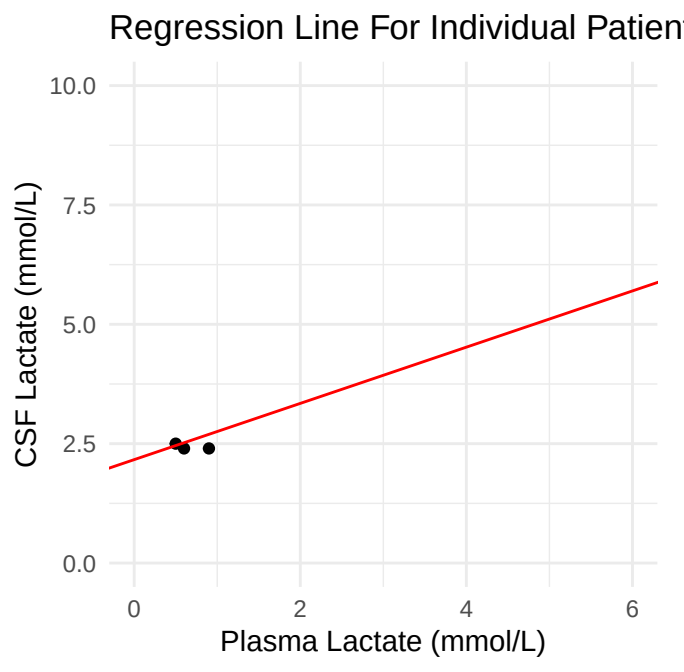

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

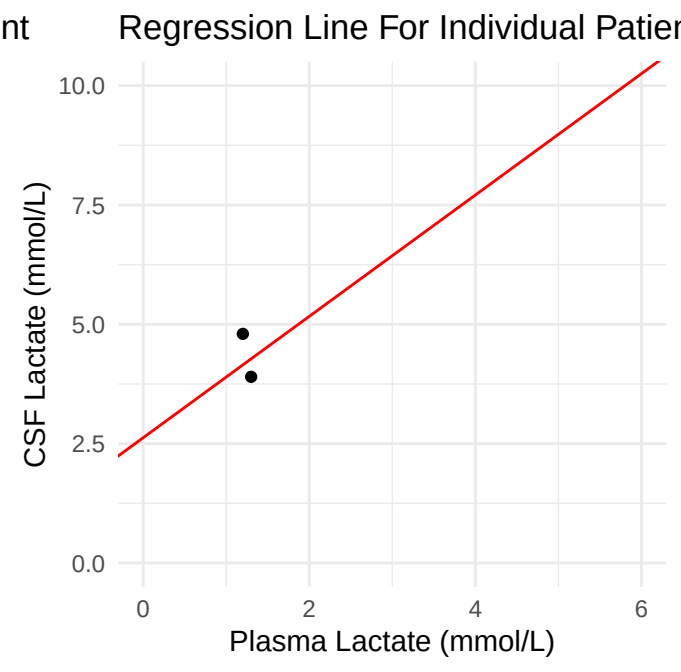

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

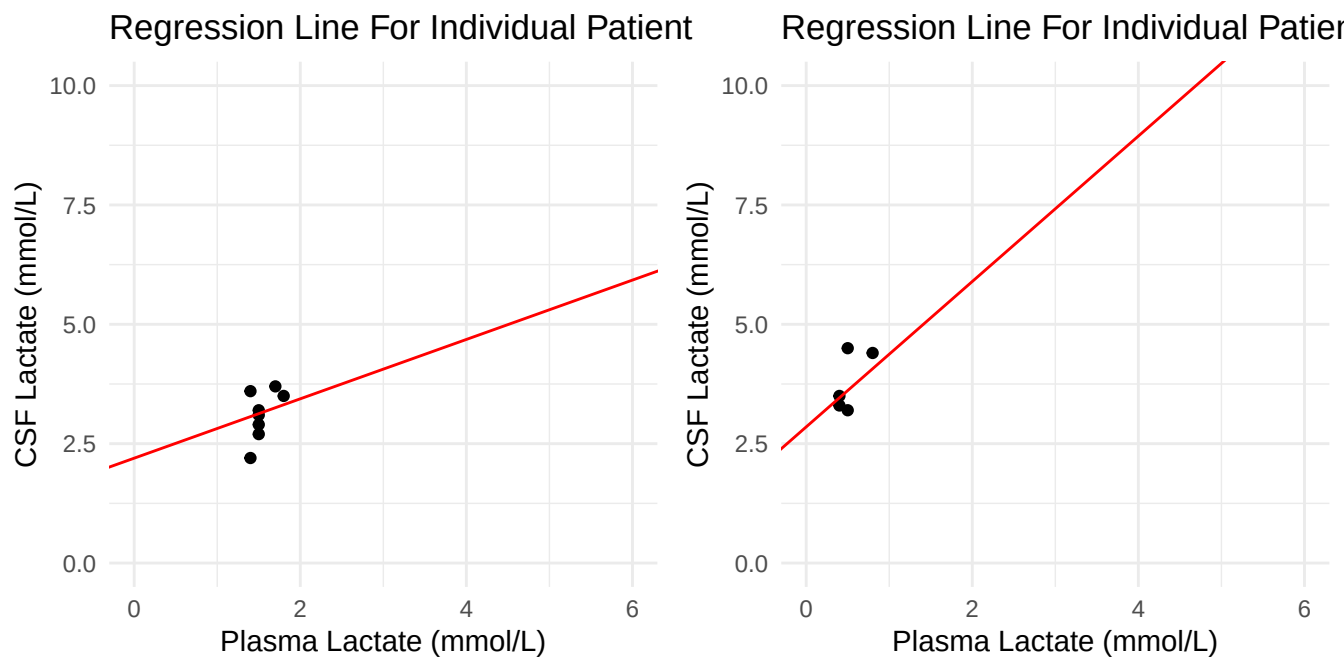

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

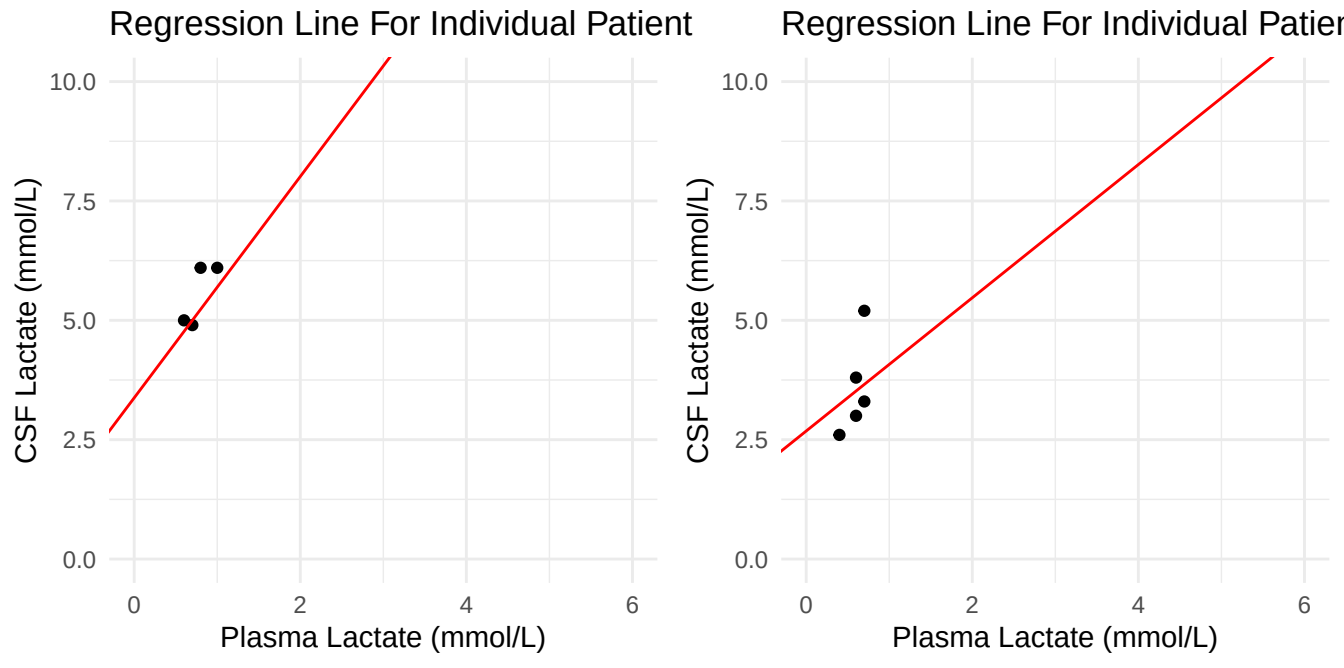

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

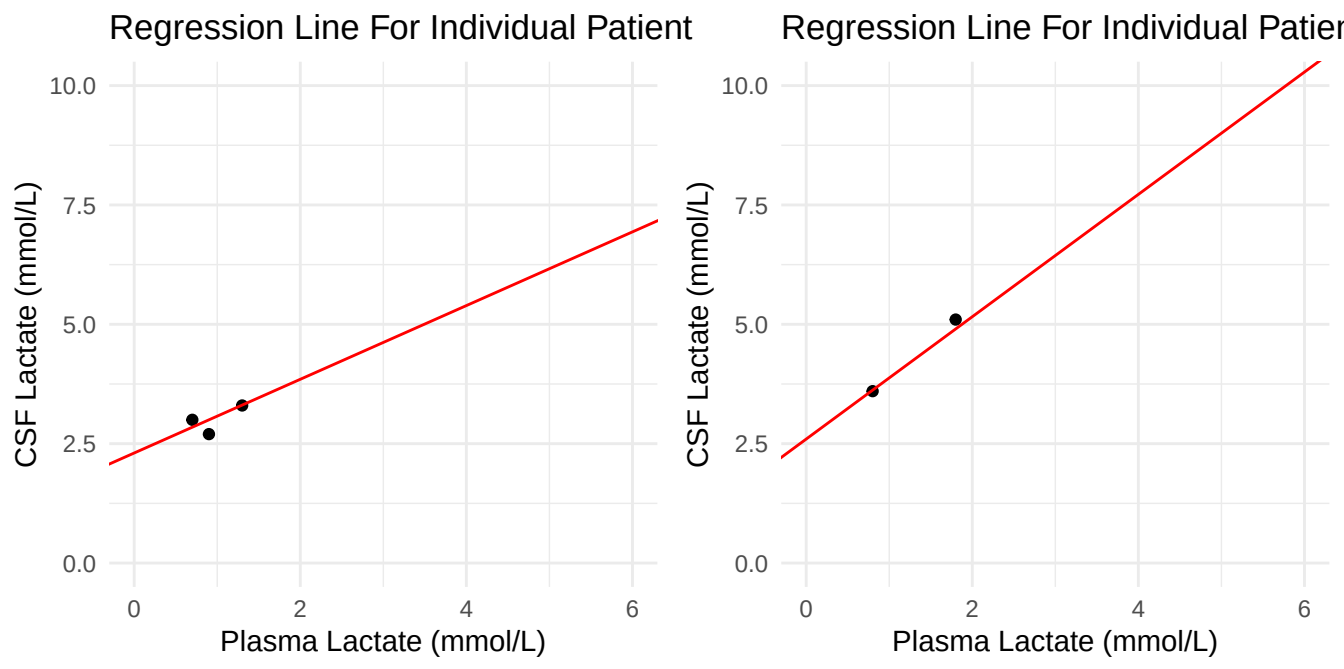

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

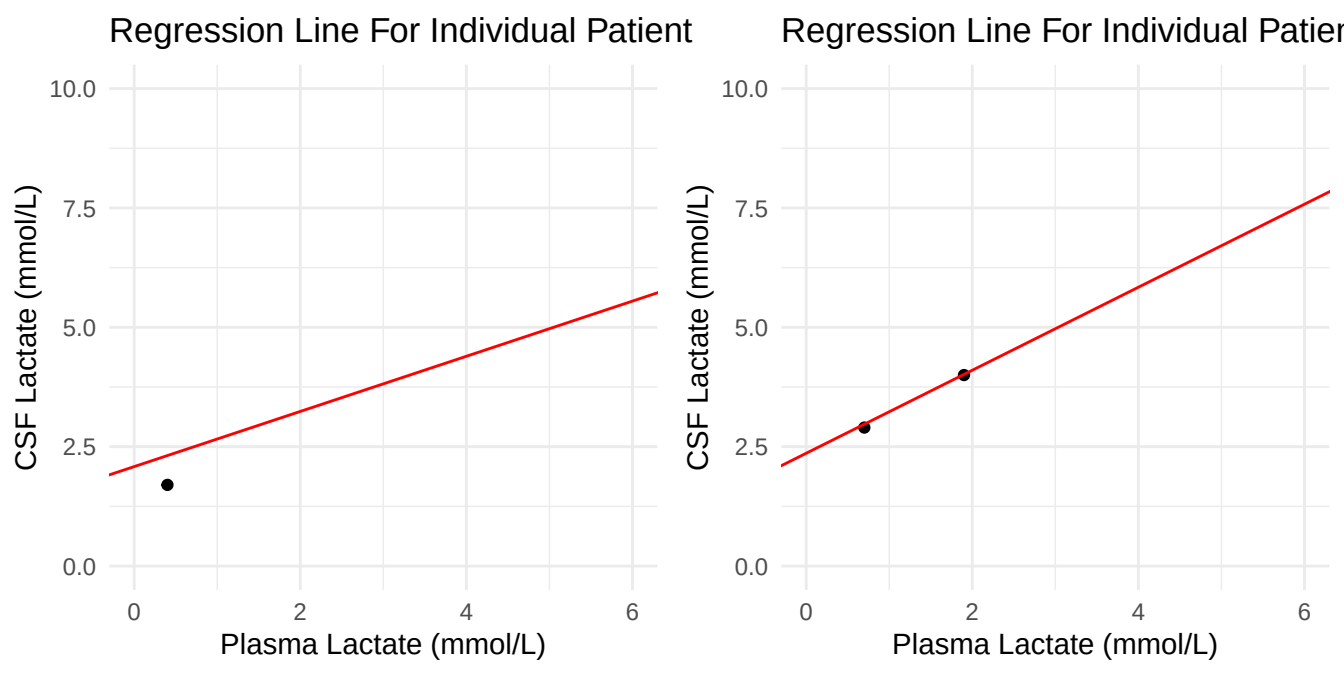

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

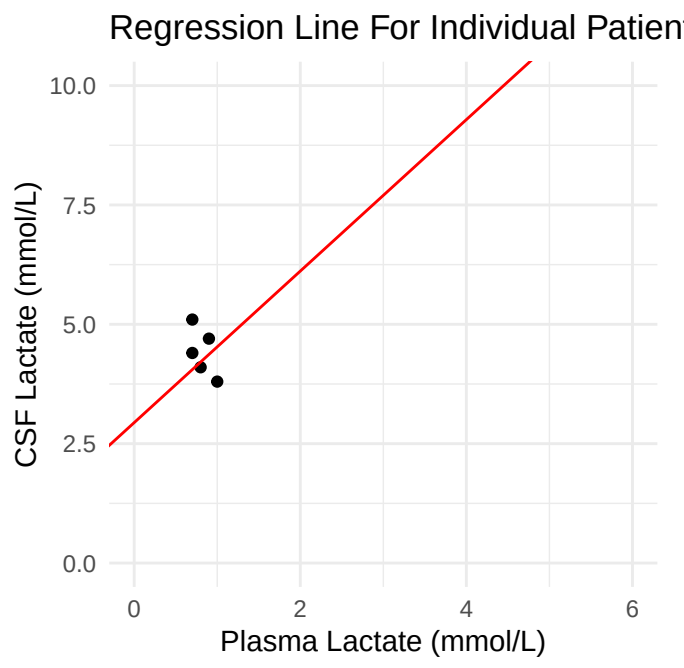

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

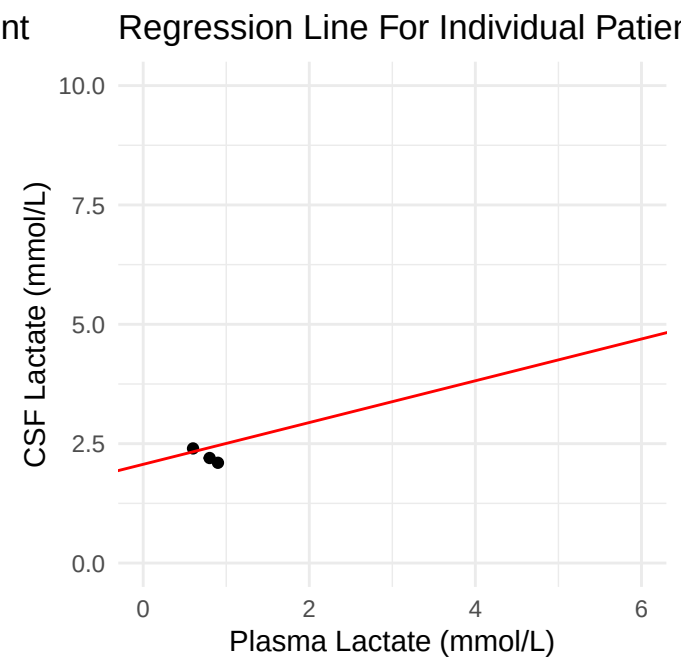

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

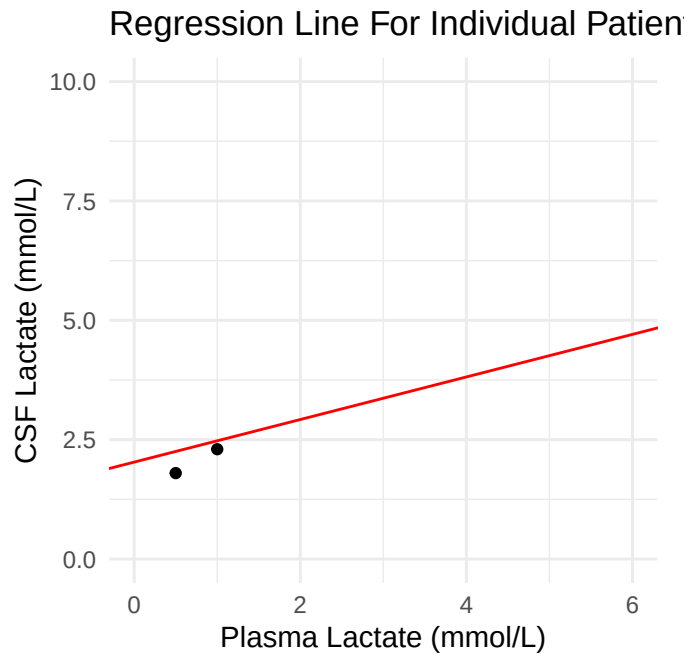

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

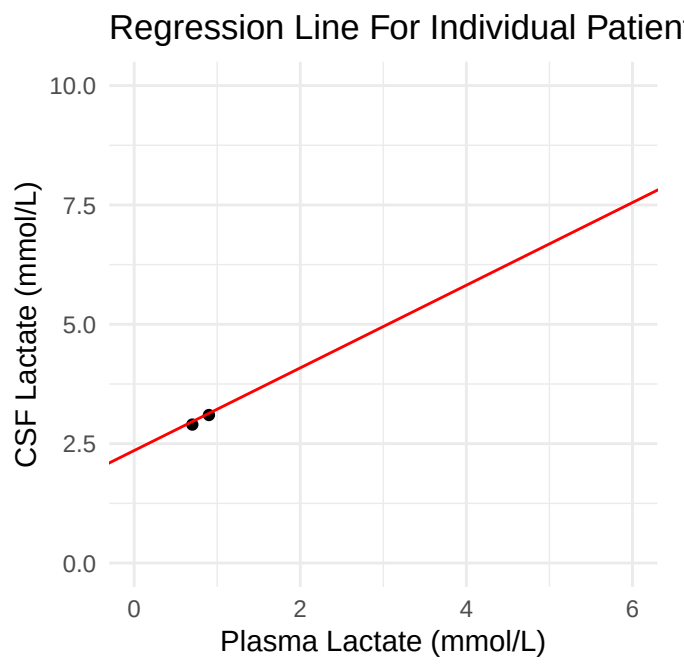

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

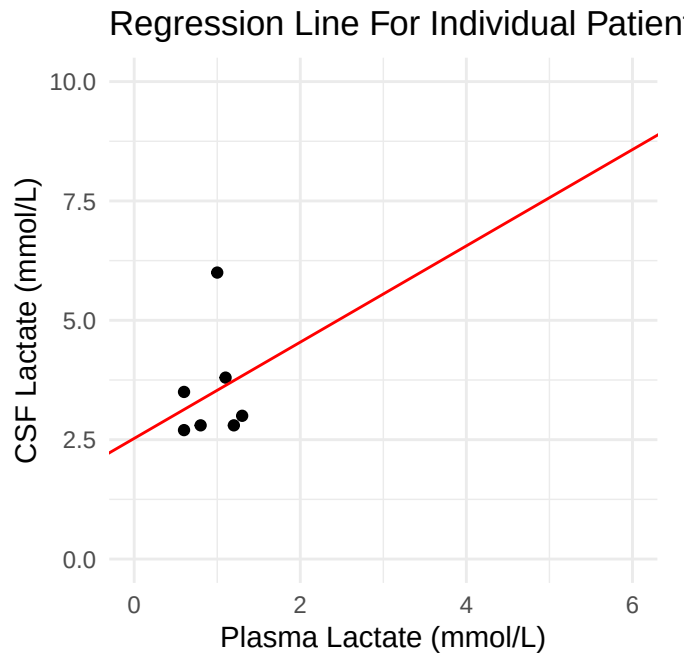

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

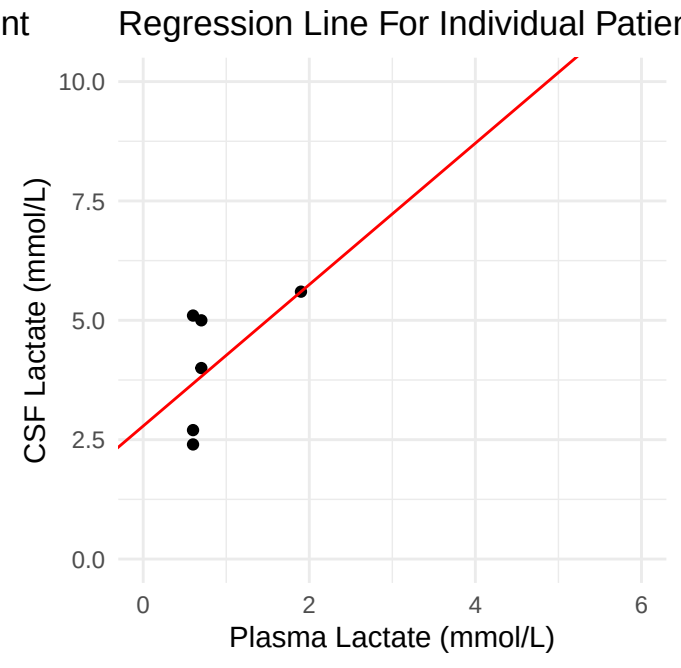

Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6

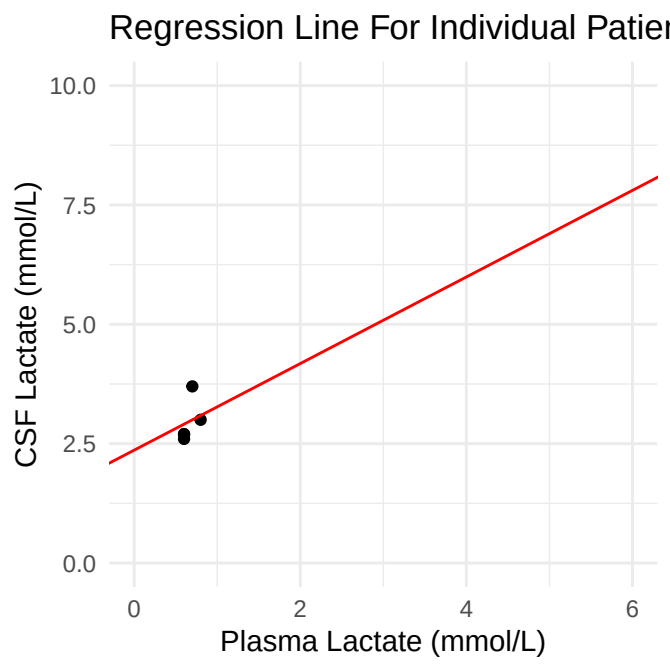

Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
5.0
2.5
0.0
0
2
4
6


Regression Line For Individual Patient
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
7.5
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0
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Regression Line For Individual Patien
CSF Lactate (mmol/L)
Plasma Lactate (mmol/L)
10.0
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4
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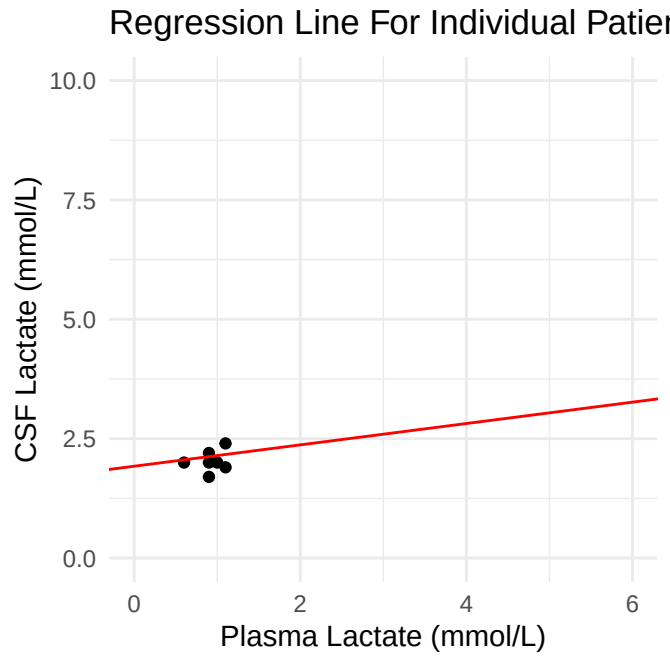
Regression Line For Individual Patient
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Plasma Lactate (mmol/L)
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7.5
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0.0
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