Analysis of the Claudia TBI Data
Multiple linear mixed models

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1 Multiple linear mixed model

It seems only model one has enough observations; when adding other predictors to model one, we lose most of the observations due to missingness.

1.1 Model one

```
Model: ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + GCS.sum + MAP + SjvO2 + PCO2
```

Table 1: Number of obs: 2927, groups: IDNo, 368

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	11.99	2.07	1908.53	5.78	0.00
HAI	0.01	0.00	2888.86	3.46	0.00
c_Age	-0.14	0.03	323.17	-5.40	0.00
Gendermale	1.67	1.14	315.17	1.47	0.14
GCS.sum	-0.46	0.08	2917.78	-5.76	0.00
MAP	0.06	0.01	2902.79	4.58	0.00
SjvO2	0.02	0.01	2827.07	1.17	0.24
PCO2	0.02	0.03	2918.03	0.51	0.61

```
ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + eyereactivity +
    newCT + GCS.sum + MAP + SjvO2 + PCO2
```

Table 2: Number of obs: 2050, groups: IDNo, 258

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	8.51	2.74	946.47	3.10	0.00
HAI	0.01	0.00	2026.66	1.68	0.09
c_Age	-0.14	0.03	222.91	-4.45	0.00
Gendermale	1.53	1.43	222.38	1.08	0.28
eyereactivity1	0.64	2.13	214.17	0.30	0.76
eyereactivity2	-1.06	0.99	212.80	-1.08	0.28
newCTD2	3.22	1.45	215.46	2.22	0.03
newCTM	4.28	1.14	226.80	3.76	0.00
GCS.sum	-0.44	0.10	2037.69	-4.51	0.00
MAP	0.06	0.02	2032.60	4.05	0.00
SjvO2	0.02	0.02	1982.45	1.26	0.21
PCO2	0.04	0.04	2037.43	0.99	0.32

1.2 Model two

```
Model: ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + GCS.sum + MAP +
    SjvO2 + PCO2 + PbtO2
```

Table 3: With PbtO2 added into Model one; Number of obs: 205, groups: IDNo, 35

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	19.34	7.81	162.27	2.48	0.01
HAI	0.04	0.02	183.60	2.27	0.02
c_Age	-0.10	0.12	25.46	-0.77	0.45
Gendermale	4.11	3.93	23.40	1.05	0.31
GCS.sum	-0.30	0.33	188.97	-0.89	0.37
MAP	-0.07	0.06	183.49	-1.18	0.24
SjvO2	0.04	0.06	179.83	0.70	0.48
PCO2	-0.06	0.12	193.28	-0.51	0.61
PbtO2	0.05	0.04	195.96	1.31	0.19

```
ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + eyereactivity +
    newCT + GCS.sum + MAP + SjvO2 + PCO2 + PbtO2
```

Table 4: With PbtO2 added into Model one; Number of obs: 109, groups: IDNo, 16

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	6.93	15.34	12.52	0.45	0.66
HAI	0.00	0.02	88.68	0.15	0.88
c_Age	0.27	0.38	9.11	0.71	0.50
Gendermale	7.87	11.52	9.24	0.68	0.51
eyereactivity2	-6.86	7.83	9.58	-0.88	0.40
newCTD2	0.52	11.98	9.24	0.04	0.97
newCTM	2.17	10.78	9.08	0.20	0.84
GCS.sum	-0.15	0.31	87.60	-0.50	0.62
MAP	-0.02	0.06	87.10	-0.30	0.76
SjvO2	0.14	0.07	88.90	2.05	0.04
PCO2	0.08	0.12	90.28	0.69	0.49
PbtO2	0.01	0.04	89.98	0.18	0.86

1.3 Model three

```
Model: ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + GCS.sum + MAP +
    SjvO2 + PCO2 + cbf_new + CMRO2
```

Table 5: Number of obs: 79, groups: IDNo, 58

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	24.18	12.85	69.00	1.88	0.06
HAI	0.02	0.03	68.84	0.76	0.45
c_Age	-0.16	0.07	54.42	-2.23	0.03
Gendermale	4.62	3.94	53.41	1.17	0.25
GCS.sum	-1.35	0.58	61.83	-2.31	0.02
MAP	0.02	0.08	69.00	0.26	0.79
SjvO2	-0.08	0.14	66.97	-0.61	0.54
PCO2	0.15	0.15	68.33	1.04	0.30
cbf_new	0.02	0.08	66.61	0.31	0.76
CMRO2	-3.41	1.69	69.00	-2.02	0.05

```
ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + eyereactivity +
    newCT + GCS.sum + MAP + SjvO2 + PCO2 + cbf_new + CMRO2
```

Table 6: Number of obs: 56, groups: IDNo, 42

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	3.62	16.98	41.97	0.21	0.83
HAI	0.06	0.03	38.73	1.82	0.08
c_Age	-0.15	0.08	30.57	-1.80	0.08
Gendermale	4.31	5.10	34.57	0.84	0.40
eyereactivity1	-8.79	6.77	35.40	-1.30	0.20
eyereactivity2	-4.48	2.96	29.28	-1.51	0.14
newCTD2	-0.50	5.50	28.73	-0.09	0.93
newCTM	1.20	4.84	29.18	0.25	0.81
GCS.sum	-0.97	0.65	37.87	-1.51	0.14
MAP	0.08	0.11	36.96	0.74	0.46
SjvO2	-0.04	0.18	42.00	-0.23	0.82
PCO2	0.37	0.16	38.92	2.31	0.03
cbf_new	0.01	0.09	37.85	0.10	0.92
CMRO2	-1.39	1.93	41.00	-0.72	0.48

1.4 Model four

```
Model: ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + GCS.sum + MAP +
    SjvO2 + PCO2 + L.P.Ratio
```

Table 7: Number of obs: 37, groups: IDNo, 21

	Estimate	Std. Error	df	t value	Pr($>$|t|)
(Intercept)	8.86	12.85	17.34	0.69	0.50
HAI	-0.03	0.02	24.51	-1.61	0.12
c_Age	-0.12	0.09	5.87	-1.41	0.21
Gendermale	-1.15	4.51	5.54	-0.26	0.81
GCS.sum	0.04	0.60	15.70	0.06	0.95
MAP	0.07	0.09	16.45	0.80	0.43
SjvO2	0.14	0.11	26.73	1.26	0.22
PCO2	-0.05	0.24	26.77	-0.19	0.85
L.P.Ratio	-0.07	0.05	26.99	-1.58	0.13

```
ICP ~ 1 + (1 | IDNo) + HAI + c_Age + Gender + eyereactivity +
    newCT + GCS.sum + MAP + SjvO2 + PCO2 + L.P.Ratio
```

Table 8: Number of obs: 27, groups: IDNo, 14

	Estimate	Std. Error	df	t value	Pr($>$|t|)
(Intercept)	-8.01	19.96	13.60	-0.40	0.69
HAI	-0.06	0.03	14.74	-2.09	0.05
c_Age	-0.16	0.16	4.77	-0.98	0.37
Gendermale	6.82	9.33	6.31	0.73	0.49
eyereactivity2	4.04	5.59	5.64	0.72	0.50
newCTD2	8.07	7.29	5.54	1.11	0.31
newCTM	1.49	6.59	6.95	0.23	0.83
GCS.sum	1.63	0.84	13.70	1.95	0.07
MAP	0.10	0.09	10.21	1.08	0.31
SjvO2	0.30	0.14	11.37	2.14	0.05
PCO2	-0.55	0.44	14.98	-1.24	0.23
L.P.Ratio	0.01	0.05	10.99	0.17	0.87