Supplemental Materials
Tables

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This document contains tables for the model-based analysis described in "A model-based analysis of autonomic nervous function in response to the Valsalva maneuver". Table 1 summarizes the control subject data. Tables 2 - 4 display the individual patient data for the control subjects, including the patient number, age, sex, viable Valsalva maneuver (VM), baseline blood pressure ($\bar{P}$), baseline heart rate ($\bar{H}$), intrinsic heart rate (H_I), minimum heart rate due to respiration ($H_{R,m}$), maximal heart rate due to respiration ($H_{R,M}$), length of the VM, and average forced expiration (FE) during the VM. The clinical ratios for each data set are shown as well. Tables 5 - 7 display the optimal parameter values for parameters B, $\tau_{p,b}$, $\tau_{p,r}$, τ_s, $H_{p,b}$, $H_{p,r}$, and H_s for the control subjects. Optimized parameter values that were not identifiable, *i.e.* the parameter hit either its upper or lower bound, are indicated with asterisks. Table 8 displays the patient data for patients with autonomic dysfunction and Table 9 displays the optimized parameter values. Table 10 shows the results of the cross-validation computed by varying the optimized parameter values by $\pm 20\%$ of their nominal value and re-optimizing to the data.

Patient	Age	Sex	# VMs	Miscellaneous	Patient	Age	Sex	# VMs	Miscellaneous
1	41	Female	4		19	N/A	Female	N/A	Omitted due to pregnancy
2	21	Female	5		20	43	Female	1	
3	21	Female	2		21	45	Male	3	
4	25	Female	6		22	26	Female	3	
5	N/A	N/A	5	Assumed male age 32	23	28	Male	4	
6	N/A	N/A	3	Assumed female age 32	24	21	Female	5	
7	29	Female	3		25	22	Female	3	
8	30	Female	4		26	21	Female	2	
9	25	Female	6		27	20	Male	4	
10	30	Male	3		28	27	Female	4	
11	27	Male	5		29	27	Male	4	
12	27	Female	3		30	58	Male	4	
13	21	Female	4		31	28	Male	3	
14	20	Male	4		32	27	Female	5	
15	27	Female	3		33	63	Male	2	
16	38	Female	5		34	61	Male	4	
17	52	Female	4		35	39	Male	3	
18	51	Female	5		36	29	Female	N/A	Omitted due to noisy data
					37	43	Female	N/A	Omitted due to prenancy

Table 1: Control subject data.

Patient	Sex	Age	VM	Patient Data							Clinical Ratios		
				$\bar{P}$	$\bar{H}$	H_I	$H_{R,m}$	$H_{R,M}$	Length VM	Avg FE	α	β	γ
1	F	41	2	127	92	94.63	76	105	15.1	37	5.30	6.90	1.80
			3	131	90	94.63	84	101	14.5	38	8.30	8.80	1.60
			4	132	85	94.63	80	92	14.1	39	2.90	9.90	1.80
			6	130	89	94.63	84	96	13.9	38	2.60	6.10	1.40
2	F	22	2	144	102	106.03	95	115	14	35	6.20	6.20	1.90
			3	140	96	106.03	77	120	14	37	11.60	5.30	1.80
			6	149	97	106.03	81	112	13.9	39	11.30	7.90	2.10
			7	144	92	106.03	84	116	14.1	38	12.00	4.00	1.80
			8	143	91	106.03	80	105	14	41	6.20	7.70	1.90
3	F	21	4	123	93	106.03	70	109	14.5	39	11.60	15.20	2.10
			8	115	78	106.03	68	94	15.2	38	16.90	0.00	1.00
4	F	25	2	99	90	103.75	73	103	14	37	4.90	8.80	1.50
			3	100	87	103.75	67	103	16.3	36	8.70	15.20	1.70
			4	87	84	103.75	71	96	14.6	37	13.70	4.40	1.10
			6	77	84	103.75	70	98	14.6	40	11.00	7.20	1.40
			7	81	82	103.75	64	101	14.7	37	6.90	7.50	1.70
			8	93	89	103.75	79	101	14.1	38	10.40	7.20	1.50
5	NA	N/A	1	123	110	109.85	104	116	14.5	37	4.00	5.50	1.70
			3	127	103	102.62	97	111	16.3	35	3.50	8.70	1.50
			4	131	101	100.62	91	111	14	37	3.90	7.00	1.40
			7	118	103	103.47	97	110	15.2	37	3.60	4.60	1.40
			8	123	108	108.07	104	116	14.5	37	4.40	4.30	1.30
6	NA	N/A	2	98	84	99.76	79	96	13.4	36	6.80	6.40	2.70
			5	109	80	99.76	68	88	14	37	5.70	6.50	1.70
			7	110	85	99.76	76	92	13.4	37	6.50	2.50	1.60
7	F	29	3	125	86	101.47	71	91	14	39	9.30	6.30	1.30
			4	129	90	101.47	72	99	12.9	38	7.80	4.60	1.30
			7	142	80	101.47	67	95	14	37	10.00	0.70	1.10
8	F	30	3	117	88	100.90	82	98	13.4	37	8.10	2.10	1.20
			4	118	82	100.90	73	91	12.8	37	7.10	11.70	1.20
			5	119	81	100.90	70	90	13.9	38	9.70	1.70	1.10
			8	117	93	100.90	78	105	13.4	36	8.60	7.60	1.30
9	F	25	3	108	99	103.75	83	112	14.5	32	2.70	6.50	2.40
			4	108	96	103.75	88	104	14.6	37	3.50	8.30	2.60
			5	114	100	103.75	75	109	14	36	3.90	6.30	2.00
			8	116	99	103.75	88	109	12.8	32	3.20	5.30	1.60
			9	107	96	103.75	90	103	13.9	37	5.40	5.10	2.00
			10	114	98	103.75	89	107	14	35	4.40	3.30	1.50
10	M	30	4	116	72	100.90	61	84	14.6	38	3.60	15.30	1.30
			5	112	65	100.90	54	75	11.6	37	1.70	24.40	1.70
			7	115	70	100.90	63	77	14.5	37	4.50	24.80	1.80
11	M	27	5	124	87	102.61	73	95	13.4	38	7.10	20.40	1.80
			6	110	74	102.61	61	86	13.4	38	7.10	15.60	2.10
			7	110	75	102.61	64	85	14	32	5.30	12.00	1.70
			8	118	82	102.61	69	98	13.4	39	6.60	21.90	2.30
			10	104	69	102.61	54	80	14	38	5.60	11.40	2.30
12	F	27	7	124	75	102.61	72	80	14	34	3.80	8.30	1.50
			8	122	77	102.61	68	88	15.2	38	7.70	5.50	1.50
			9	115	83	102.61	71	92	14	36	1.90	3.80	1.30
13	F	21	4	145	80	106.03	67	99	13.5	37	7.80	12.60	2.10
			5	146	74	106.03	61	93	14.6	35	4.70	21.40	2.00
			6	144	72	106.03	62	86	14	37	4.10	14.80	1.90
			10	148	82	106.03	63	96	12.9	36	4.70	13.10	2.60

Table 2: Individual patient data and clinical ratios for control subjects 1-13.

				Patient Data							Clinical Ratios		
Patient	**Sex**	**Age**	**VM**	$\bar{P}$	$\bar{H}$	H_I	$H_{R,m}$	$H_{R,M}$	**Length VM**	**Avg FE**	α	β	γ
14	M	20	3	133	90	106.60	81	100	13.9	36	2.70	6.20	1.20
			5	128	81	106.60	73	89	14	37	1.20	8.00	1.90
			6	121	81	106.60	72	99	13.9	38	5.10	6.40	1.70
			7	135	84	106.60	76	96	12.9	38	2.60	9.40	1.50
15	F	27	6	117	60	102.61	54	89	15.1	41	0.50	52.10	2.20
			7	118	66	102.61	51	77	14	38	2.50	50.10	2.20
			8	114	56	102.61	49	80	14	39	2.70	33.10	2.20
16	F	38	1	113	66	96.34	57	85	14.5	37	0.10	25.20	1.60
			2	121	68	96.34	59	76	15.1	37	5.50	11.20	1.40
			3	125	73	96.34	64	83	14.6	36	3.50	18.20	1.90
			4	130	66	96.34	57	83	14.5	39	3.70	22.90	2.30
			6	126	67	96.34	56	78	14.6	38	5.50	18.50	1.80
17	F	52	3	107	73	88.36	66	85	15.7	38	3.10	24.80	2.20
			5	103	79	88.36	74	89	15.7	36	4.30	18.60	2.20
			6	103	83	88.36	73	90	15.7	39	4.40	16.90	2.40
			7	103	79	88.36	73	90	15.2	38	3.40	15.40	2.10
18	F	51	2	104	55	88.93	51	64	14.6	36	1.80	18.20	1.40
			4	107	55	88.93	51	60	13.4	37	1.80	15.80	1.60
			5	108	51	88.93	48	61	13.9	37	1.00	30.30	1.50
			6	102	56	88.93	50	66	13.5	40	0.80	17.90	1.50
			7	102	56	88.93	51	62	13.9	38	1.10	13.80	1.60
20	F	43	5	123	68	93.49	61	78	12.8	38	7.00	10.50	1.40
21	M	45	4	151	54	92.35	51	67	12.3	38	1.50	7.40	1.30
			6	166	58	92.35	50	63	13.5	37	5.10	9.50	1.20
			8	153	59	92.35	55	68	13.9	37	5.60	10.10	1.40
22	F	26	4	137	84	103.18	71	95	14.6	37	4.50	4.10	1.20
			5	132	82	103.18	72	93	14	35	7.80	5.90	1.60
			6	111	84	103.18	73	93	14.1	35	1.30	5.90	1.40
23	M	28	1	120	84	102.04	69	92	15.2	38	7.60	13.80	1.80
			2	125	83	102.04	77	91	13.4	38	8.20	13.30	1.70
			3	132	74	102.04	64	88	14.1	37	3.70	34.30	2.10
			6	127	78	102.04	67	89	14	37	2.10	28.30	2.20
24	F	21	2	129	73	106.03	61	86	13.4	37	3.50	14.20	1.60
			3	119	78	106.03	63	93	13.3	38	5.90	10.20	1.70
			4	119	70	106.03	57	81	13.4	35	0.50	23.10	1.80
			5	116	75	106.03	64	88	12.8	37	17.10	25.20	1.70
			7	119	72	106.03	62	88	13.4	39	2.80	61.90	1.70
25	F	22	2	133	79	105.46	71	92	13.4	37	5.80	4.60	1.20
			3	129	73	105.46	67	85	13.4	36	3.20	12.30	1.50
			5	129	73	105.46	65	89	13.4	37	4.50	18.20	1.70
26	F	21	7	153	70	106.03	53	88	14.5	38	3.50	23.80	1.40
			8	153	71	106.03	58	88	14	40	6.10	16.10	1.30
27	M	20	2	161	73	106.60	64	84	13.9	35	9.40	14.10	1.60
			3	148	74	106.60	61	83	14	36	7.80	12.60	1.90
			5	153	66	106.60	57	74	14	37	2.90	13.80	1.80
			6	172	69	106.60	55	86	13.4	37	7.90	13.70	1.90
28	F	27	1	126	100	102.61	94	110	12.9	36	3.10	8.40	1.90
			3	119	104	103.96	96	109	13.3	38	12.30	8.70	1.90
			4	120	92	102.61	82	106	13.4	35	2.70	14.00	1.50
			5	118	95	102.61	88	106	13.4	37	5.30	7.20	1.60
29	M	27	1	108	87	102.61	74	99	12.9	38	7.00	10.70	1.60
			4	99	82	102.61	76	96	13.9	37	2.90	11.90	2.00
			5	106	80	102.61	70	84	13.9	39	2.30	14.10	2.20
			6	95	81	102.61	75	90	13.4	39	4.60	9.90	1.60

Table 3: Individual patient data and clinical ratios for control subjects 14-29.

				Patient Data							Clinical Ratios		
Patient	**Sex**	**Age**	**VM**	$\bar{P}$	$\bar{H}$	H_I	$H_{R,m}$	$H_{R,M}$	**Length VM**	**Avg FE**	α	β	γ
30	M	58	2	138	67	84.94	61	78	12.8	34	2.80	11.50	2.20
			4	141	65	84.94	51	79	12.9	35	2.60	14.80	2.20
			5	132	65	84.94	59	75	13.9	36	3.10	11.50	2.10
			6	144	63	84.94	58	71	12.8	36	3.20	11.40	2.50
31	M	28	3	159	109	108.74	92	115	14	38	22.20	4.50	1.20
			4	152	100	102.04	73	112	13.4	38	8.10	4.40	1.30
			6	167	101	102.04	86	114	13.4	37	10.30	8.50	1.50
32	F	27	3	129	91	102.61	82	101	14	35	6.70	16.00	1.40
			4	127	89	102.61	73	107	14	35	4.80	4.60	1.30
			5	136	88	102.61	76	109	12.8	33	5.40	5.00	1.20
			6	133	91	102.61	83	105	13.4	34	5.00	5.60	1.20
			7	133	92	102.61	76	103	13.5	38	6.10	10.10	1.50
33	M	63	6	71	92	91.82	85	100	14.5	33	1.80	23.90	2.00
			10	71	87	87.00	79	96	14.6	36	1.90	46.40	1.90
34	M	61	4	131	60	83.23	58	64	14.5	39	5.70	13.40	2.00
			6	123	61	83.23	58	65	14.6	40	0.00	17.00	1.90
			7	127	57	83.23	54	63	14	43	0.00	11.70	1.70
			8	123	56	83.23	47	65	13.9	42	0.00	19.10	2.00
35	M	39	3	132	55	95.77	47	64	14	37	3.60	15.30	1.60
			4	131	58	95.77	54	64	14.5	38	5.80	17.50	1.60
			7	120	57	95.77	50	65	14	38	2.50	15.40	1.60

Table 4: Individual patient data and clinical ratios for control subjects 30-35.

Patient	Sex	Age	VM	Optimized Parameters						
				B	$\tau_{p,b}$	$\tau_{p,r}$	τ_s	$H_{p,b}$	$H_{p,r}$	H_s
1	F	41	2	0.43	0.39	4.05	6.12	0.20	0.07	0.07
			3	0.70	2.95	25.56	4.21	0.20	0.11	0.06
			4	1.00	1.11	4.89	10.91	0.29	0.13	0.25
			6	0.53	1.95	1.51	10.65	0.25	0.12	0.52
2	F	22	2	0.26	3.49	12.09	11.05	0.27	0.12	0.36
			3	0.41	3.09	4.44	17.67	0.32	0.19	0.48
			6	0.75	4.74	2.84	22.32	0.59	0.58	0.72
			7	0.18	15.20	27.39	6.85	0.39	0.71	0.31
			8	0.27	3.59	1.57	20.24	0.48	0.40	0.51
3	F	21	4	0.22	1.25	1.93	12.30	0.45	0.34	0.16
			8	1.00	0.95	0.85	19.03	0.24	0.05	0.15
4	F	25	2	0.04	13.71	1.72	3.52	0.41	0.06	0.12
			3	1.00	7.72	19.40	9.46	0.62	0.58	0.11
			4	0.59	4.94	2.49	2.74	0.30	0.08	0.05
			6	0.27	8.54	1.42	8.73	0.39	0.19	0.19
			7	0.50	4.97	6.17	10.96	0.39	0.36	0.24
			8	0.55	18.00*	5.19	7.99	0.66	0.34	0.30
5	NA	N/A	1	0.23	0.68	1.65	12.40	0.27	0.09	0.84
			3	0.01	0.18*	60.00*	4.11	0.10	0.03	0.36
			4	0.01	0.18*	60.00*	6.34	0.14	0.04	0.25
			7	0.07	6.38	35.50	15.79	0.22	0.17	0.57
			8	0.32	17.80	53.80	9.72	0.26	0.09	0.43
6	NA	N/A	2	0.04	17.97	6.92	6.98	0.45	0.27	0.76
			5	0.03	17.30	2.98	12.27	0.61	0.07	1.69
			7	0.01	18.00*	9.84	14.45	0.56	0.03	1.16
7	F	29	3	1.00	4.43	1.91	29.21	0.41	0.40	0.02
			4	0.14	17.98	2.12	5.67	0.32	0.17	0.27
			7	0.08	18.00*	2.38	32.67	0.76	0.40	0.93
8	F	30	3	0.77	17.82	4.01	15.88	0.50	0.12	1.20
			4	0.74	3.40	1.25	7.46	0.32	0.11	0.20
			5	0.65	10.10	1.11	8.52	0.44	0.11	0.50
			8	0.35	14.27	11.20	14.24	0.79	0.60	0.59
9	F	25	3	0.14	0.83	2.96	5.14	0.19	0.08	0.27
			4	0.01	1.93	0.60*	38.52	0.45	0.27	0.74
			5	0.69	0.18*	0.63	16.12	0.32	0.13	0.68
			8	0.02	0.24	0.81	13.25	0.27	0.16	0.36
			9	0.15	6.01	0.88	15.71	0.39	0.30	0.60
			10	0.01	0.65	0.60	26.26	0.18	0.05	0.50
10	M	30	4	0.74	2.06	4.57	21.94	0.61	0.36	0.06
			5	0.15	2.50	1.70	25.96	0.46	0.04	0.12
			7	0.46	1.77	1.30	11.03	0.41	0.04	0.06
11	M	27	5	0.47	1.58	3.72	2.12	0.52	0.41	0.03
			6	0.45	0.27	0.85	5.51	0.32	0.05	0.15
			7	0.10	2.66	8.80	2.80	0.34	0.04	0.02
			8	0.29	4.60	6.85	4.39	0.60	0.43	0.11
			10	0.34	1.57	2.27	12.89	0.42	0.05	0.19
12	F	27	7	0.08	18.00*	0.95	5.21	0.48	0.03	0.15
			8	0.17	17.85	13.15	8.87	0.71	0.60	0.20
			9	0.14	18.00*	0.68	3.88	0.44	0.13	0.17
13	F	21	4	0.76	5.43	4.21	13.38	0.45	0.17	0.24
			5	0.10	4.68	2.16	9.22	0.65	0.43	0.02
			6	1.00	4.02	2.62	28.93	0.38	0.06	0.19
			10	0.58	4.09	2.21	16.52	0.53	0.35	0.07

Table 5: Optimized parameter values for control subjects 1-13.

Patient	Sex	Age	VM	Optimized Parameters						
				B	$\tau_{p,b}$	$\tau_{p,r}$	τ_s	$H_{p,b}$	$H_{p,r}$	H_s
14	M	20	3	0.01	0.40	56.50	37.23	0.29	0.11	0.02
			5	0.03	2.16	7.09	14.68	0.35	0.03	0.37
			6	0.04	0.18*	60.00*	15.61	0.28	0.05	0.17
			7	0.07	0.18*	1.01	11.16	0.31	0.04	0.07
15	F	27	6	0.75	6.36	0.60*	35.45	0.75	0.14	1.03
			7	0.85	3.70	1.78	23.67	0.70	0.12	0.90
			8	0.12	5.65	0.67	36.93	0.61	0.06	0.26
16	F	38	1	0.27	2.45	2.21	16.71	0.43	0.06	0.19
			2	0.35	4.22	2.04	3.05	0.37	0.04	0.24
			3	0.29	7.62	7.75	4.10	0.42	0.04	0.27
			4	0.06	2.57	0.62	18.81	0.47	0.05	0.35
			6	0.10	18.00*	0.60*	3.72	0.54	0.06	0.37
17	F	52	3	0.28	4.20	1.14	7.44	0.47	0.19	0.48
			5	0.08	3.97	20.63	8.02	0.28	0.06	0.59
			6	0.04	6.89	1.97	40.08	0.64	0.15	1.88
			7	0.02	2.73	1.11	6.45	0.20	0.04	0.48
18	F	51	2	0.06	16.63	2.64	13.61	0.74	0.08	0.64
			4	0.01	18.00*	0.79	6.17	0.62	0.14	0.29
			5	0.26	1.73	3.41	11.31	0.68	0.11	0.26
			6	0.22	10.63	8.93	5.65	0.69	0.21	0.34
			7	0.64	0.28	0.60*	3.12	0.39	0.02	0.06
20	F	43	5	0.37	16.44	0.70	13.37	0.54	0.29	0.24
21	M	45	4	1.00	2.55	0.91	12.22	0.38	0.06	0.09
			6	0.62	18.00*	3.98	26.88	0.57	0.04	0.08
			8	0.98	9.07	14.65	28.96	0.41	0.03	0.04
22	F	26	4	0.07	17.45	5.37	8.84	0.64	0.16	0.68
			5	0.02	18.00*	5.61	10.24	0.52	0.04	0.45
			6	0.06	1.18	3.72	12.85	0.30	0.04	0.36
23	M	28	1	0.75	1.79	26.44	11.86	0.40	0.35	0.16
			2	0.83	2.01	42.42	12.95	0.48	0.08	0.81
			3	0.35	5.91	24.37	14.61	0.86	0.62	0.02
			6	0.42	0.44	0.60*	5.91	0.47	0.09	0.14
24	F	21	2	0.11	18.00*	19.39	5.92	0.99	0.66	0.18
			3	1.00	3.86	1.48	13.49	0.43	0.20	0.20
			4	0.06	5.15	3.76	7.58	0.82	0.47	0.08
			5	0.55	4.87	17.79	30.17	0.76	0.38	0.02
			7	0.37	5.48	8.69	5.94	0.84	0.57	0.12
25	F	22	2	0.94	4.91	22.76	7.94	0.40	0.12	0.16
			3	0.05	10.25	0.60*	10.91	0.51	0.09	0.15
			5	0.10	6.29	0.61	17.52	0.49	0.06	0.17
26	F	21	7	0.89	1.24	9.24	23.91	0.45	0.08	0.02
			8	0.86	1.31	5.56	34.23	0.41	0.06	0.02
27	M	20	2	0.28	18.00*	12.08	4.58	0.89	0.83	0.13
			3	0.63	5.72	3.10	16.56	0.85	0.97	0.10
			5	0.79	2.25	1.48	29.36	0.38	0.03	0.02
			6	0.14	18.00*	0.67	3.14	0.64	0.06	0.10
28	F	27	1	0.96	0.77	23.03	12.62	0.28	0.22	0.17
			3	0.12	1.88	2.14	11.23	0.52	0.62	0.24
			4	0.31	2.97	4.44	10.77	0.72	0.70	0.25
			5	0.04	12.26	1.08	7.46	0.35	0.23	0.59
29	M	27	1	0.36	2.48	5.09	7.44	0.50	0.35	0.22
			4	1.00	0.27	1.62	4.80	0.32	0.11	0.31
			5	0.84	1.66	2.15	9.64	0.35	0.03	0.29
			6	0.34	1.93	2.87	4.34	0.32	0.11	0.21

Table 6: Optimized parameter values for control subjects 14-29.

				Optimized Parameters						
Patient	**Sex**	**Age**	**VM**	B	$\tau_{p,b}$	$\tau_{p,r}$	τ_s	$H_{p,b}$	$H_{p,r}$	H_s
30	M	58	2	0.16	3.03	10.00	11.07	0.37	0.04	0.21
			4	0.34	2.22	8.04	10.85	0.45	0.15	0.21
			5	0.19	1.53	1.47	17.96	0.37	0.04	0.34
			6	0.27	2.67	7.63	12.68	0.41	0.03	0.34
31	M	28	3	0.92	0.19	3.74	100.00*	0.17	0.17	0.01*
			4	0.14	0.75	0.79	13.74	0.25	0.25	0.14
			6	0.16	1.69	0.75	34.13	0.14	0.15	0.04
32	F	27	3	0.48	1.35	45.20	7.43	0.34	0.16	0.20
			4	0.28	0.24	0.85	35.58	0.33	0.40	0.02
			5	0.10	7.76	1.45	8.96	0.43	0.27	0.14
			6	0.90	0.64	0.60*	9.62	0.28	0.04	0.48
			7	0.87	0.54	2.30	14.33	0.37	0.11	0.55
33	M	63	6	0.56	4.67	36.28	5.17	0.80	0.92	0.19
			10	0.91	8.58	29.60	6.07	1.40	2.01	0.35
34	M	61	4	1.00	1.45	3.56	12.64	0.33	0.07	0.12
			6	0.78	2.66	6.75	8.79	0.35	0.02	0.02
			7	1.00	3.30	3.25	17.13	0.34	0.02	0.04
			8	1.00	2.74	5.13	12.76	0.38	0.04	0.03
35	M	39	3	0.31	12.11	11.53	36.90	0.59	0.04	0.02
			4	0.60	10.73	16.29	26.12	0.53	0.02	0.02
			7	0.61	9.23	11.19	31.59	0.48	0.03	0.02

Table 7: Optimized parameter values for control subjects 30-35.

				Patient Data						Clinical Ratios		
Patient	**Sex**	**Age**	**VM**	$\bar{P}$	$\bar{H}$	H_I	$H_{R,m}$	$H_{R,M}$	**Length VM**	α	β	γ
1	F	72	1	114	114	124.94	112	117	13.4	0.2	4.5	1
			2	114	116	127.64	116	119	14.9	0.1	2.6	1
2	M	79	1	159	73	72.97	68	76	10.9	0	3.3	1
3	M	71	1	130	83	90.87	80	86	13.9	0	13	1.1
			2	133	82	90.74	81	91	13.4	0	12.4	1.1
4	M	83	1	103	56	70.69	56	59	14.4	0	18.3	1
5	M	75	1	165	85	93.08	77	90	14.4	0.5	0.2	1
			2	175	88	96.26	77	94	14.6	0.8	0.1	1

Table 8: Individual patient data and clinical ratios for patients.

				Optimized Parameters						
Patient	**Sex**	**Age**	**VM**	B	$\tau_{p,b}$	$\tau_{p,r}$	τ_s	$H_{p,b}$	$H_{p,r}$	H_s
1	F	72	1	0.28	6.21	6.41	24.00	0.12	0.01*	0.03
			2	0.62	7.82	21.62	10.36	0.14	0.05	0.03
2	M	79	1	0.45	17.32	30.20	42.21	0.47	0.23	0.86
3	M	71	1	0.99	18.00*	1.79	13.08	0.17	0.02	0.27
			2	0.60	6.14	4.08	12.23	0.15	0.02	0.12
4	M	83	1	1.00	1.76	7.20	11.68	0.33	0.09	0.14
5	M	75	1	0.19	9.07	4.90	34.20	0.19	0.03	0.24
			2	1.00	9.06	0.60*	52.70	0.19	0.04	0.33

Table 9: Optimized parameter values for patients.

	Iteration												Coefficient
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**	**SD**	**of Variation**
B	0.78	0.74	0.74	0.50	0.69	0.77	0.64	0.71	0.77	0.77	0.71	0.08	0.12
$\tau_{p,b}$	4.75	4.78	4.58	4.31	4.62	4.88	4.52	4.75	4.69	4.85	4.67	0.17	0.04
$\tau_{p,r}$	2.82	2.89	2.68	2.54	2.77	2.97	2.70	2.89	2.79	2.92	2.80	0.13	0.05
τ_s	22.99	23.44	21.26	18.30	20.91	24.24	19.43	23.22	21.56	24.00	21.93	1.99	0.09
$H_{p,b}$	0.59	0.60	0.57	0.55	0.57	0.61	0.56	0.60	0.58	0.60	0.58	0.02	0.03
$H_{p,r}$	0.58	0.59	0.57	0.57	0.58	0.60	0.57	0.59	0.57	0.59	0.58	0.01	0.02
H_s	0.75	0.74	0.68	0.48	0.64	0.78	0.57	0.71	0.71	0.78	0.68	0.10	0.14

Table 10: Cross-validation performed on Control Subject 2 VM 6 by varying the initial parameter values by $\pm 20\%$

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