

**Table S1:** The parameters of left and right atriums and ventricles in the adult and child cardiovascular system models.

	Left Ventricle		Right Ventricle		Left Atrium		Right Atrium	
	Adult	Child	Adult	Child	Adult	Child	Adult	Child
A	1	1	1	1	-	-	-	-
B	0.0252	0.024	0.0252	0.024	-	-	-	-
D [s]	-	-	-	-	0.05×T	0.05×T	0.05×T	0.05×T
E <sub>max</sub> [mmHg/mL]	2.5	3.5	1	1.4	0.3	0.4	0.3	0.4
E <sub>min</sub> [mmHg/mL]	-	-	-	-	0.2	0.2	0.2	0.2
K	1.15	1.5	1.75	3.25	1.20	2.5	1.20	2.5
I [cm]	8	7	8	7	5.5	4.5	5.5	4.5
T [s]	0.8	0.75	0.8	0.75	0.8	0.75	0.8	0.75
T <sub>a</sub> [s]	-	-	-	-	0.8×T	0.8×T	0.8×T	0.8×T
T <sub>1</sub> [s]	0.33×T	0.33×T	0.33×T	0.33×T	-	-	-	-
T <sub>2</sub> [s]	0.45×T	0.45×T	0.45×T	0.45×T	-	-	-	-
V <sub>0</sub> [mL]	15	10	40	25	5	5	5	5

**Table S2:** The parameters used in the systemic and pulmonary circulatory system. R, L and C denote resistance, inertance and compliance of blood vessels (The values in the brackets denote the parameter values in the simulation of coarctation of the aorta).

	R [mmHg s/mL]		C [mL/mmHg]		L [mmHg s <sup>2</sup> /mL]	
	Adult	Child	Adult	Child	Adult	Child
Aorta	0.01	0.02	0.04 (0.02)	0.10 (0.008)	1e-4	1e-5
Aortic Arch	0.05	0.05	0.25 (0.12)	0.20 (0.08)	1e-4	1e-5
Systemic Arterioles	0.75 (1.20)	0.75 (1.25)	2 (0.7)	1.1 (0.6)	1e-4	1e-5
Systemic Capillaries	0.24	0.24	4	2	-	-
Systemic Veins	0.10	0.12	30	17	-	-
Pulmonary Arteries	0.02	0.02	3	2.2	1e-4	1e-5
Pulmonary Arterioles	0.10	0.10	6	3.4	1e-4	1e-5
Pulmonary Veins	0.10	0.12	30	17	-	-
Mitral Valve	0.0025	0.0025	-	-	-	-
Aortic Valve	0.0025	0.0025	-	-	-	-
Tricuspid Valve	0.001	0.001	-	-	-	-
Pulmonary Valve	0.001	0.001	-	-	-	-

**Table S3:** The circle of Willis parameters used in the adult cardiovascular system model. R, L and C denote resistance, inertance and compliance of blood vessels, S represents stage. (**ICA**: Internal Carotid Arteries, **VA**: Vertebral Arteries, **BA**: Basilar Artery, **ACA**: Anterior Cerebral Arteries, **ACHA**: Anterior Choroidal Arteries, **ACOA**: Anterior Communicating Artery, **MCA**: Middle Cerebral Arteries, **PCA**: Posterior Cerebral Arteries, **PCOA**: Posterior Communicating Arteries, **SCA**: Superior Cerebellar Arteries, **OA**: Ophthalmic Arteries, **PC**: Pial Arterioles, **CC**: Cerebral Capillaries, **VC**: Cerebral Veins).

**Table S4:** The circle of Willis parameters used in the child cardiovascular system model. R, L and C denote resistance, inertance and compliance of blood vessels, S represents stage. (**ICA**: Internal Carotid Arteries, **VA**: Vertebral Arteries, **BA**: Basilar Artery, **ACA**: Anterior Cerebral Arteries, **ACHA**: Anterior Choroidal Arteries, **ACOA**: Anterior Communicating Artery, **MCA**: Middle Cerebral Arteries, **PCA**: Posterior Cerebral Arteries, **PCOA**: Posterior Communicating Arteries, **SCA**: Superior Cerebellar Arteries, **OA**: Ophthalmic Arteries, **PC**: Pial Arterioles, **CC**: Cerebral Capillaries, **VC**: Cerebral Veins).