Updated PRAiS logistic regression risk model

Probability of death within 30 days following paediatric cardiac surgery $=\frac{1}{1+e^{-z}}$, where

$$Z = -4.450 + 0.080 * age - 0.039 * weight + \sum_{i=1}^{39} B_i X_i.$$

Parameters i=1-39 are tabulated below along with their corresponding regression coefficients, B_i , and the condition that must be satisfied for $X_i=1$ ($X_i=0$ otherwise). Note that patient age must be in units of years and patient weight in units of kilograms. The model was developed using records for patients **under 16 years old**.

1 Specific Procedure = Anomalous coronary artery repair 2 Specific Procedure = Antric valvotomy 3 Specific Procedure = Arterial switch (for isolated transposition) 4 Specific Procedure = Arterial switch (for isolated transposition) 5 Specific Procedure = Arterial switch + VSD closure 6 Specific Procedure = Arterial switch + VSD closure 7 Specific Procedure = AsD repair 7 Specific Procedure = AsD repair 8 Specific Procedure = As ortic valve Replacement - non Ross 114.633 9 Specific Procedure = Aortic Valve Replacement - Ross 114.633 9 Specific Procedure = Artioventricular septal defect (complete) repair 11 Specific Procedure = Airioventricular septal defect (complete) repair 12 Specific Procedure = Bidirectional cavopulmonary shunt 13 Specific Procedure = Bidirectional cavopulmonary shunt 14 Specific Procedure = Heart Transplant 15 Specific Procedure = Heart Transplant 16 Specific Procedure = Interrupted aortic arch repair 17 Specific Procedure = Interrupted aortic arch repair 18 Specific Procedure = Isolated Coarctation repair 19 Specific Procedure = Low volume group 10 Specific Procedure = Low volume group 11 Specific Procedure = No specific procedure 12 Specific Procedure = No specific procedure 13 Specific Procedure = No specific procedure 14 Specific Procedure = No specific procedure 15 Specific Procedure = PDA ligation (surgical) 16 Specific Procedure = PDA ligation (surgical) 17 Specific Procedure = Rastelli procedure 18 Specific Procedure = Rastelli procedure 19 Specific Procedure = Rastelli procedure 20 Specific Procedure = Rastelli procedure 21 Specific Procedure = Rastelli procedure 22 Specific Procedure = Rastelli procedure 23 Specific Procedure = Rastelli procedure 24 Specific Procedure = Rastelli procedure 25 Specific Procedure = Rastelli procedure 26 Specific Procedure = Rastelli procedure 27 Specific Procedure = Rastelli procedure 28 Specific Procedure = Rastelli procedure 29 Specific Procedure = Rastelli procedure 30 Specific Procedure = Rastelli procedure 31 Specific Procedure = Rastelli proced	i	$\boldsymbol{X}_{i}=1$ if condition satisfied ($\boldsymbol{X}_{i}=0$ otherwise)	B_{i}
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5 Specific Procedure = Arterial switch + VSD closure 6 Specific Procedure = ASD repair 7 Specific Procedure = Atrioventricular septal defect (partial) repair 8 Specific Procedure = Aortic Valve Replacement - non Ross 11.673 9 Specific Procedure = Aortic valve replacement - non Ross 11.4673 10 Specific Procedure = Atrioventricular septal defect (complete) repair 11.426 11 Specific Procedure = Bidirectional cavopulmonary shunt 12 Specific Procedure = Bidirectional cavopulmonary shunt 13 Specific Procedure = Fontan procedure 14 Specific Procedure = Heart Transplant 15 Specific Procedure = Heart Transplant 16 Specific Procedure = Interrupted aortic arch repair 17 Specific Procedure = Isolated coarctation repair 18 Specific Procedure = Isolated Pulmonary artery band 19 Specific Procedure = Low volume group 20 Specific Procedure = Mitral valve replacement 21 Specific Procedure = Norwood procedure (Stage 1) 22 Specific Procedure = Norwood procedure (Stage 1) 23 Specific Procedure = PDA ligation (surgical) 24 Specific Procedure = PDA ligation (surgical) 25 Specific Procedure = Pulmonary atresia VSD repair 26 Specific Procedure = Repair of total anomalous pulmonary venous drainage 17 Specific Procedure = Repair of total anomalous pulmonary venous drainage 18 Specific Procedure = Subvalvar aortic stenosis repair 27 Specific Procedure = Subvalvar aortic stenosis repair 28 Specific Procedure = Supravalvar aortic stenosis repair 29 Specific Procedure = Supravalvar aortic stenosis repair 20 Specific Procedure = Supravalvar aortic stenosis repair 20 Specific Procedure = VSD Repair 21 Specific Procedure = VSD Repair 22 Specific Procedure = VSD Repair 33 Diagnosis group = Low risk 34 Diagnosis group = Low risk 35 Diagnosis group = Medium risk 36 Diagnosis group = High risk 37 Age group = Child 38 Age group = Infant	3	Specific Procedure = Arterial switch (for isolated transposition)	0.038
Specific Procedure = ASD repair Specific Procedure = Atrioventricular septal defect (partial) repair Specific Procedure = Aortic Valve Replacement - non Ross -14.673 Specific Procedure = Aortic valve replacement - non Ross -14.673 Specific Procedure = Aortic valve replacement - Ross -14.847 Specific Procedure = Atrioventricular septal defect (complete) repair Specific Procedure = Bidirectional cavopulmonary shunt -15 Specific Procedure = Bidirectional cavopulmonary shunt -16 Specific Procedure = Fontan procedure -17 Specific Procedure = Heart Transplant -18 Specific Procedure = Interrupted aortic arch repair -19 Specific Procedure = Isolated coarctation repair -19 Specific Procedure = Isolated Pulmonary artery band -10 Specific Procedure = Isolated Pulmonary artery band -10 Specific Procedure = Mitral valve replacement -10 Specific Procedure = Mitral valve replacement -10 Specific Procedure = No specific procedure -10 Specific Procedure = No specific procedure -11 Specific Procedure = No specific procedure -12 Specific Procedure = PDA ligation (surgical) -13 Specific Procedure = Pulmonary valve replacement -14 Specific Procedure = Pulmonary valve replacement -15 Specific Procedure = Rastelli procedure -16 Specific Procedure = Rastelli procedure -17 Specific Procedure = Repair of total anomalous pulmonary venous drainage -18 Specific Procedure = Supravalvar aortic stenosis repair -19 Specific Procedure = Supravalvar aortic stenosis repair -19 Specific Procedure = Supravalvar aortic stenosis repair -19 Specific Procedure = Tetralogy repair -10 Specific Procedure = Tetralogy repair -11 Specific Procedure = Supravalvar aortic stenosis repair -11 Specific Procedure = Supravalvar aortic stenosis repair -11 Specific Procedure = Supravalvar aortic stenosis repair -12 Specific Procedure = Supravalvar aortic stenosis repair -13 Specific Procedure = Supravalvar aortic stenosis repair -14 Specific Procedure = Supravalvar aortic stenosis repair -15 Specific Procedure = Supravalvar aortic stenosis repair -17 Specific Procedu	4	Specific Procedure = Arterial shunt	2.580
7 Specific Procedure = Atrioventricular septal defect (partial) repair 8 Specific Procedure = Aortic Valve Replacement - non Ross 9 Specific Procedure = Aortic valve replacement - Ross 1-14.673 9 Specific Procedure = Atrioventricular septal defect (complete) repair 1 Specific Procedure = Bidirectional cavopulmonary shunt 10 Specific Procedure = Bidirectional cavopulmonary shunt 10 Specific Procedure = Fontan procedure 10 Specific Procedure = Heart Transplant 12 Specific Procedure = Heart Transplant 13 Specific Procedure = Interrupted aortic arch repair 14 Specific Procedure = Isolated coarctation repair 15 Specific Procedure = Isolated Pulmonary artery band 16 Specific Procedure = Low volume group 17 Specific Procedure = Mitral valve replacement 18 Specific Procedure = No specific procedure 19 Specific Procedure = No specific procedure 20 Specific Procedure = Norwood procedure (Stage 1) 21 Specific Procedure = PDA ligation (surgical) 22 Specific Procedure = Plamonary atresia VSD repair 23 Specific Procedure = Pulmonary valve replacement 24 Specific Procedure = Restelli procedure 25 Specific Procedure = Restelli procedure 26 Specific Procedure = Repair of total anomalous pulmonary venous drainage 27 Specific Procedure = Subvalvar aortic stenosis repair 28 Specific Procedure = Subvalvar aortic stenosis repair 29 Specific Procedure = Tetralogy repair 20 Specific Procedure = Turncus arteriosus repair 20 Specific Procedure = Tetralogy repair 20 Specific Procedure = Tetralogy repair 21 Specific Procedure = Turncus arteriosus repair 22 Specific Procedure = Tetralogy repair 23 Specific Procedure = Tetralogy repair 24 Specific Procedure = Tetralogy repair 25 Specific Procedure = Tetralogy repair 26 Specific Procedure = Tetralogy repair 27 Specific Procedure = Tetralogy repair 28 Specific Procedure = VDR Repair 39 Specific Procedure = VDR Repair 40 Specific Procedure = VDR	5	Specific Procedure = Arterial switch + VSD closure	0.823
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9 Specific Procedure = Aortic valve replacement - Ross 1.4.847 10 Specific Procedure = Atrioventricular septal defect (complete) repair 1.426 11 Specific Procedure = Bidirectional cavopulmonary shunt 0.950 12 Specific Procedure = Fontan procedure 0.230 13 Specific Procedure = Heart Transplant 2.5558 14 Specific Procedure = Heart Transplant 1.711 15 Specific Procedure = Interrupted aortic arch repair 0.924 16 Specific Procedure = Isolated coarctation repair 0.924 17 Specific Procedure = Isolated Pulmonary artery band 2.065 18 Specific Procedure = Low volume group 2.882 19 Specific Procedure = Mitral valve replacement 3.106 19 Specific Procedure = No specific procedure (Stage 1) 1.985 20 Specific Procedure = Norwood procedure (Stage 1) 1.985 21 Specific Procedure = PDA ligation (surgical) 1.087 22 Specific Procedure = PUmonary atresia VSD repair 2.319 23 Specific Procedure = Pulmonary valve replacement 1.880 24 Specific Procedure = Rastelli procedure 1.799 25 Specific Procedure = Rastelli procedure 1.799 26 Specific Procedure = Repair of total anomalous pulmonary venous drainage 1.799 27 Specific Procedure = Subvalvar aortic stenosis repair 1.797 28 Specific Procedure = Subvalvar aortic stenosis repair 2.422 29 Specific Procedure = Tetralogy repair 1.146 29 Specific Procedure = Tetralogy repair 1.146 20 Specific Procedure = Tetralogy repair 1.146 21 Specific Procedure = Tetralogy repair 1.146 22 Specific Procedure = Tetralogy repair 1.146 23 Specific Procedure = Tetralogy repair 1.146 24 Specific Procedure = Tetralogy repair 1.146 25 Specific Procedure = Tetralogy repair 1.146 26 Specific Procedure = Tetralogy repair 1.146 27 Specific Procedure = Tetralogy repair 1.146 28 Specific Procedure = Tetralogy repair 1.146 29 Specific Procedure = Tetralogy repair 1.146 20 Specific Procedure = Tetralogy repair 1.146 21 Diagnosis group = Hedium risk 1.0167 22 Specific Procedure = Tetralogy repair 1.146 23 Not identified as univentricular heart 1.0644 24 Not identified as univentricular heart 1.0644 25 Not recorded non-Down	7	Specific Procedure = Atrioventricular septal defect (partial) repair	1.073
10 Specific Procedure = Atrioventricular septal defect (complete) repair 11 Specific Procedure = Bidirectional cavopulmonary shunt 12 Specific Procedure = Fontan procedure 13 Specific Procedure = Heart Transplant 14 Specific Procedure = Heart Transplant 15 Specific Procedure = Interrupted aortic arch repair 16 Specific Procedure = Isolated coarctation repair 17 Specific Procedure = Isolated Pulmonary artery band 18 Specific Procedure = Low volume group 19 Specific Procedure = Mitral valve replacement 20 Specific Procedure = Norwood procedure 21 Specific Procedure = Norwood procedure (Stage 1) 22 Specific Procedure = PDA ligation (surgical) 23 Specific Procedure = PUlmonary attersia VSD repair 24 Specific Procedure = Pulmonary valve replacement 25 Specific Procedure = Rastelli procedure 26 Specific Procedure = Rapair of total anomalous pulmonary venous drainage 27 Specific Procedure = Repair of total anomalous pulmonary venous drainage 28 Specific Procedure = Subvalvar aortic stenosis repair 29 Specific Procedure = Supravalvar aortic stenosis repair 20 Specific Procedure = Tetralogy repair 21 Specific Procedure = Tetralogy repair 22 Specific Procedure = Tetralogy repair 23 Specific Procedure = Tetralogy repair 24 Specific Procedure = Tetralogy repair 25 Specific Procedure = Tetralogy repair 26 Specific Procedure = Tetralogy repair 27 Specific Procedure = Tetralogy repair 28 Specific Procedure = Tetralogy repair 39 Specific Procedure = Tetralogy repair 30 Specific Procedure = Tetralogy repair 31 Procedure Type = Bypass 32 Diagnosis group = Low risk 33 Diagnosis group = Medium risk 34 Diagnosis group = Medium risk 35 Not identified as univentricular heart 36 No recorded non-Down's co-morbidities 37 Age group = Child 38 Age group = Infant 39 O.139	8	Specific Procedure = Aortic Valve Replacement - non Ross	-14.673
11Specific Procedure = Bidirectional cavopulmonary shunt0.95012Specific Procedure = Fontan procedure0.23013Specific Procedure = Heart Transplant2.55814Specific Procedure = Interrupted aortic arch repair1.71115Specific Procedure = Isolated coarctation repair0.92416Specific Procedure = Isolated Pulmonary artery band2.06517Specific Procedure = Low volume group2.88218Specific Procedure = Mitral valve replacement3.10619Specific Procedure = No specific procedure1.94320Specific Procedure = Norwood procedure (Stage 1)1.98521Specific Procedure = PDA ligation (surgical)1.08722Specific Procedure = Pulmonary atresia VSD repair2.31923Specific Procedure = Pulmonary valve replacement1.88024Specific Procedure = Rapair of total anomalous pulmonary venous drainage1.79925Specific Procedure = Repair of total anomalous pulmonary venous drainage1.79727Specific Procedure = Subvalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Tetralogy repair1.14629Specific Procedure = Tetralogy repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk0.059133Diagnosis group = Medium risk0.059134Not identified as univentricular heart0.04435Not identifie	9	Specific Procedure = Aortic valve replacement - Ross	-14.847
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17Specific Procedure = Low volume group2.88218Specific Procedure = Mitral valve replacement3.10619Specific Procedure = No specific procedure1.94320Specific Procedure = Norwood procedure (Stage 1)1.98521Specific Procedure = PDA ligation (surgical)1.08722Specific Procedure = Pulmonary atresia VSD repair2.31923Specific Procedure = Pulmonary valve replacement1.88024Specific Procedure = Rastelli procedure1.79925Specific Procedure = Repair of total anomalous pulmonary venous drainage1.79926Specific Procedure = Subvalvar aortic stenosis repair1.79727Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	15	Specific Procedure = Isolated coarctation repair	0.924
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19Specific Procedure = No specific procedure1.94320Specific Procedure = Norwood procedure (Stage 1)1.98521Specific Procedure = PDA ligation (surgical)1.08722Specific Procedure = Pulmonary atresia VSD repair2.31923Specific Procedure = Pulmonary valve replacement1.88024Specific Procedure = Rastelli procedure1.79925Specific Procedure = Repair of total anomalous pulmonary venous drainage1.79926Specific Procedure = Subvalvar aortic stenosis repair1.79727Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	17	Specific Procedure = Low volume group	2.882
20Specific Procedure = Norwood procedure (Stage 1)1.98521Specific Procedure = PDA ligation (surgical)1.08722Specific Procedure = Pulmonary atresia VSD repair2.31923Specific Procedure = Pulmonary valve replacement1.88024Specific Procedure = Rastelli procedure1.79925Specific Procedure = Repair of total anomalous pulmonary venous drainage1.79926Specific Procedure = Subvalvar aortic stenosis repair1.79727Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	18	Specific Procedure = Mitral valve replacement	3.106
21 Specific Procedure = PDA ligation (surgical) 22 Specific Procedure = Pulmonary atresia VSD repair 23 Specific Procedure = Pulmonary valve replacement 25 Specific Procedure = Rastelli procedure 26 Specific Procedure = Repair of total anomalous pulmonary venous drainage 27 Specific Procedure = Subvalvar aortic stenosis repair 28 Specific Procedure = Supravalvar aortic stenosis repair 29 Specific Procedure = Tetralogy repair 20 Specific Procedure = Tetralogy repair 21 Specific Procedure = Truncus arteriosus repair 22 Specific Procedure = Truncus arteriosus repair 23 Specific Procedure = VSD Repair 24 Specific Procedure = VSD Repair 25 Specific Procedure = VSD Repair 26 Specific Procedure = Truncus arteriosus repair 27 Specific Procedure = Truncus arteriosus repair 28 Specific Procedure = Truncus arteriosus repair 39 Specific Procedure = VSD Repair 30 Specific Procedure = WSD Repair 31 Procedure Type = Bypass 32 Diagnosis group = Low risk 33 Diagnosis group = Medium risk 34 Diagnosis group = Medium risk 35 Not identified as univentricular heart 36 No recorded non-Down's co-morbidities 37 Age group = Child 38 Age group = Infant 30 O.139	19	Specific Procedure = No specific procedure	1.943
22Specific Procedure = Pulmonary atresia VSD repair2.31923Specific Procedure = Pulmonary valve replacement1.88024Specific Procedure = Rastelli procedure1.79925Specific Procedure = Repair of total anomalous pulmonary venous drainage1.79926Specific Procedure = Subvalvar aortic stenosis repair1.79727Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	20	Specific Procedure = Norwood procedure (Stage 1)	1.985
Specific Procedure = Pulmonary valve replacement Specific Procedure = Rastelli procedure Specific Procedure = Repair of total anomalous pulmonary venous drainage Specific Procedure = Subvalvar aortic stenosis repair Specific Procedure = Supravalvar aortic stenosis repair Specific Procedure = Supravalvar aortic stenosis repair Specific Procedure = Tetralogy repair Specific Procedure = Truncus arteriosus repair Specific Procedure = VSD Repair Specific Procedure = VSD Repair O.091 Procedure Type = Bypass Diagnosis group = Low risk Diagnosis group = Medium risk Diagnosis group = High risk Not identified as univentricular heart No recorded non-Down's co-morbidities Age group = Child Age group = Infant 1.880 1.799 1.799 1.799 1.797 2.422 2.422 2.80 2.422 2.81 2.422 2.81 2.422 2.81 2.91 3.0	21	Specific Procedure = PDA ligation (surgical)	1.087
Specific Procedure = Rastelli procedure Specific Procedure = Repair of total anomalous pulmonary venous drainage Specific Procedure = Subvalvar aortic stenosis repair Specific Procedure = Supravalvar aortic stenosis repair Specific Procedure = Supravalvar aortic stenosis repair Specific Procedure = Tetralogy repair Specific Procedure = Truncus arteriosus repair Specific Procedure = VSD Repair Specific Procedure = VSD Repair Specific Procedure = VSD Repair Diagnosis group = Low risk Diagnosis group = Medium risk Diagnosis group = High risk Not identified as univentricular heart No recorded non-Down's co-morbidities Age group = Child Age group = Infant 1.799 1.797 1.799 1.799 1.799 1.799 1.799 1.799	22	Specific Procedure = Pulmonary atresia VSD repair	2.319
Specific Procedure = Repair of total anomalous pulmonary venous drainage Specific Procedure = Subvalvar aortic stenosis repair Specific Procedure = Supravalvar aortic stenosis repair Specific Procedure = Tetralogy repair Specific Procedure = Tetralogy repair Specific Procedure = Truncus arteriosus repair Specific Procedure = VSD Repair Specific Procedure = VSD Repair Specific Procedure = Bypass Specific Procedure = Low risk Specific Procedure = Hedium risk Specific Procedure = WSD Repair Specific Procedure = VSD Repair Specific Procedure = Truncus arteriosus repair Specific Procedure = Tetralogy repair Specific Procedure = Subvalvar aortic stenosis repair Specific Procedure = Tetralogy repair Specific Procedure = Tetralo	23	Specific Procedure = Pulmonary valve replacement	1.880
26Specific Procedure = Subvalvar aortic stenosis repair1.79727Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	24	Specific Procedure = Rastelli procedure	1.799
27Specific Procedure = Supravalvar aortic stenosis repair2.42228Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	25	Specific Procedure = Repair of total anomalous pulmonary venous drainage	1.799
28Specific Procedure = Tetralogy repair1.14629Specific Procedure = Truncus arteriosus repair2.27130Specific Procedure = VSD Repair0.09131Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	26	Specific Procedure = Subvalvar aortic stenosis repair	1.797
29 Specific Procedure = Truncus arteriosus repair 20 Specific Procedure = VSD Repair 31 Procedure Type = Bypass 32 Diagnosis group = Low risk 33 Diagnosis group = Medium risk 34 Diagnosis group = High risk 35 Not identified as univentricular heart 36 No recorded non-Down's co-morbidities 37 Age group = Child 38 Age group = Infant 39 O.993 39 Age group = Infant 30 O.991 30 O.991 31 Procedure = Truncus arteriosus repair 30 O.991 31 Procedure = VSD Repair 30 O.991 32 O.991 33 Diagnosis group = High risk 34 O.424 35 O.424 36 No recorded non-Down's co-morbidities 37 Age group = Child 38 Age group = Infant 39 O.993	27	Specific Procedure = Supravalvar aortic stenosis repair	2.422
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31Procedure Type = Bypass0.38832Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	29	Specific Procedure = Truncus arteriosus repair	2.271
32Diagnosis group = Low risk-0.59133Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	30	Specific Procedure = VSD Repair	0.091
33Diagnosis group = Medium risk0.16734Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	31	Procedure Type = Bypass	0.388
34Diagnosis group = High risk0.42435Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	32	Diagnosis group = Low risk	-0.591
35Not identified as univentricular heart-0.64436No recorded non-Down's co-morbidities-0.49837Age group = Child-0.90338Age group = Infant0.139	33	Diagnosis group = Medium risk	0.167
36 No recorded non-Down's co-morbidities -0.498 37 Age group = Child -0.903 38 Age group = Infant 0.139	34	Diagnosis group = High risk	0.424
37 Age group = Child -0.903 38 Age group = Infant 0.139	35	Not identified as univentricular heart	-0.644
38 Age group = Infant 0.139	36	No recorded non-Down's co-morbidities	-0.498
38 Age group = Infant 0.139	37	Age group = Child	-0.903
	38		0.139
	39		0.764

We note that caution is needed when interpreting individual coefficients as these are not clinically meaningful when taken in isolation of the other risk factors. The predicted risk comes from the *combination* of procedure, age, weight, severity of diagnosis and co-morbidity information.

The original risk model was published in: Crowe, S, Brown, K, Pagel, C, Muthialu, N, Cunningham, D, Gibbs, J, Bull, C, Franklin, R, Utley, M, Tsang, V (2012). Development of a diagnosis and procedure based risk model for 30-day outcome following paediatric cardiac surgery, Journal of the Thoracic and Cardiovascular Surgery, doi:10.1016/j.jtcvs.2012.06.23. The original PRAiS risk model was developed on a subset of national CCAD data from 2000-2010 and then tested on a pristine validation set. It was also developed using the 2010 CCAD specific procedure algorithm. For this update, we have recalibrated the model parameters on the full 2007-2010 CCAD data set using the most recent 2012 CCAD specific procedure algorithm.

We note that this recalibrated version has not been tested in a pristine data set, but that only the value of the model parameters changed and not the risk factors included. Recalibration on the full data has inevitably helped redress an observed imbalance in neonatal outcomes between the original model development data set and the validation data set. As with any risk model, its performance in prospective data cannot be guaranteed.

NOTE: In our implementation of the risk model we set the minimum risk for an episode to be 0.1% (0.0001). This is because there were no deaths for some combinations of risk factors in the historical data from 2007-2010 leading to an estimated risk of 0%. We do not consider this to have clinical face validity and so have specified a minimum risk of 0.1% for such episodes (in the long run, 1 death expected in 1000 episodes).

Age Band Classification:

Neonate is defined as less than or equal to 30 days old.

Infant is defined as between 31 days and one year old inclusive.

Child is defined as older than a year and less than 16 years old.