

## Online supplement

### Reference values for exercise capacity in children with congenital heart disease.

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### **CPET protocol per center**

All exercise tests were performed on a cycle ergometer in the upright position: Jaeger ER9000 (Viasys Healthcare, Hoechberg, Germany) in Rotterdam and Leiden, Lode Corival (Lode BV, Groningen, the Netherlands) in Utrecht, Ergoselect 200P (Vyaire Medical, Hoechberg, Germany) in Nijmegen. Breath-by-breath gas analyses was done using an Oxycon Champion System (Viasys Healthcare, Conshohocken, United States) in Rotterdam, ZAN 600 (Accuramed BVBA, Lummen, Belgium) in Utrecht, Masterscreen CPX (Vyaire Medical, Hoechberg, Germany) in Nijmegen and Leiden. Heart rate was measured by a continuous 12 lead ECG. In all centres the test started with 3 minutes of unloaded cycling after which the workload was increased based on their height by 15 or 20 watt per minute (smaller or larger than 150 cm respectively). In Rotterdam a stepwise increase was used (28), in Utrecht both ramp and stepwise increase were used (29), in Nijmegen a ramp protocol was used. Before each exercise test weight and height were measured on calibrated scales and measuring stick. All tests were overseen by a medical qualified person to conduct these tests.

## Quality Control

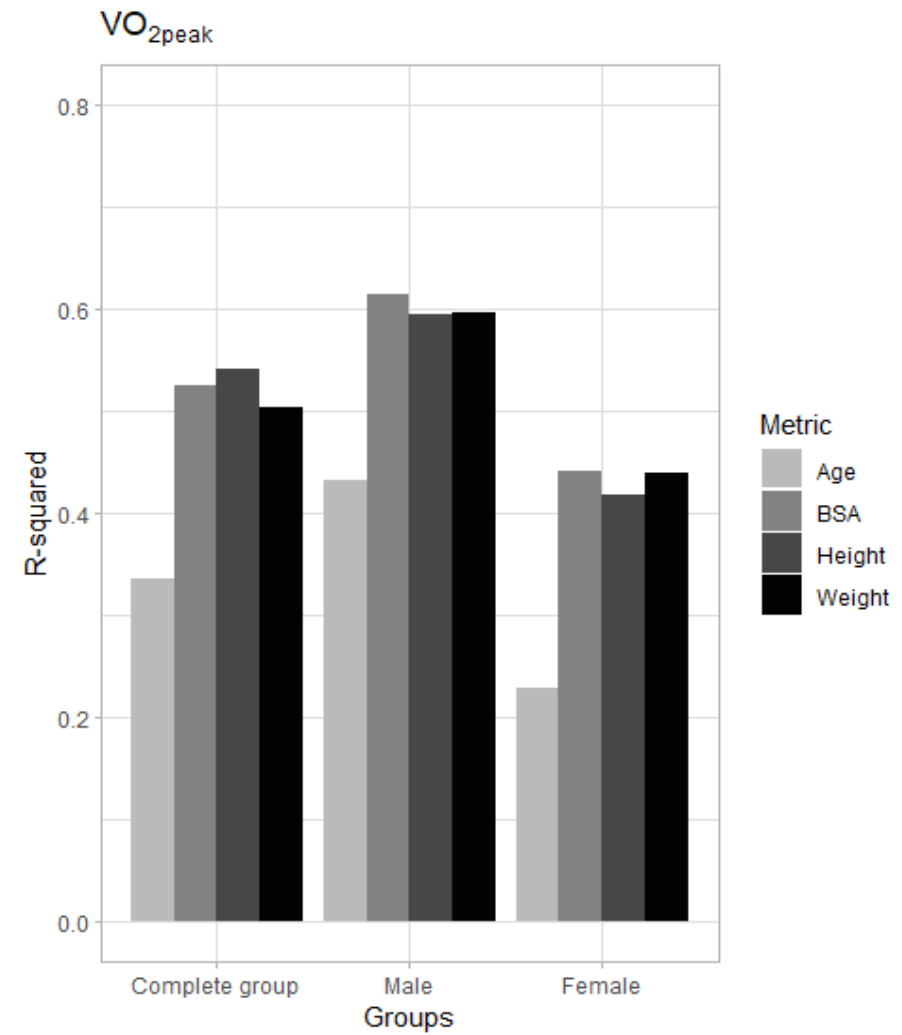
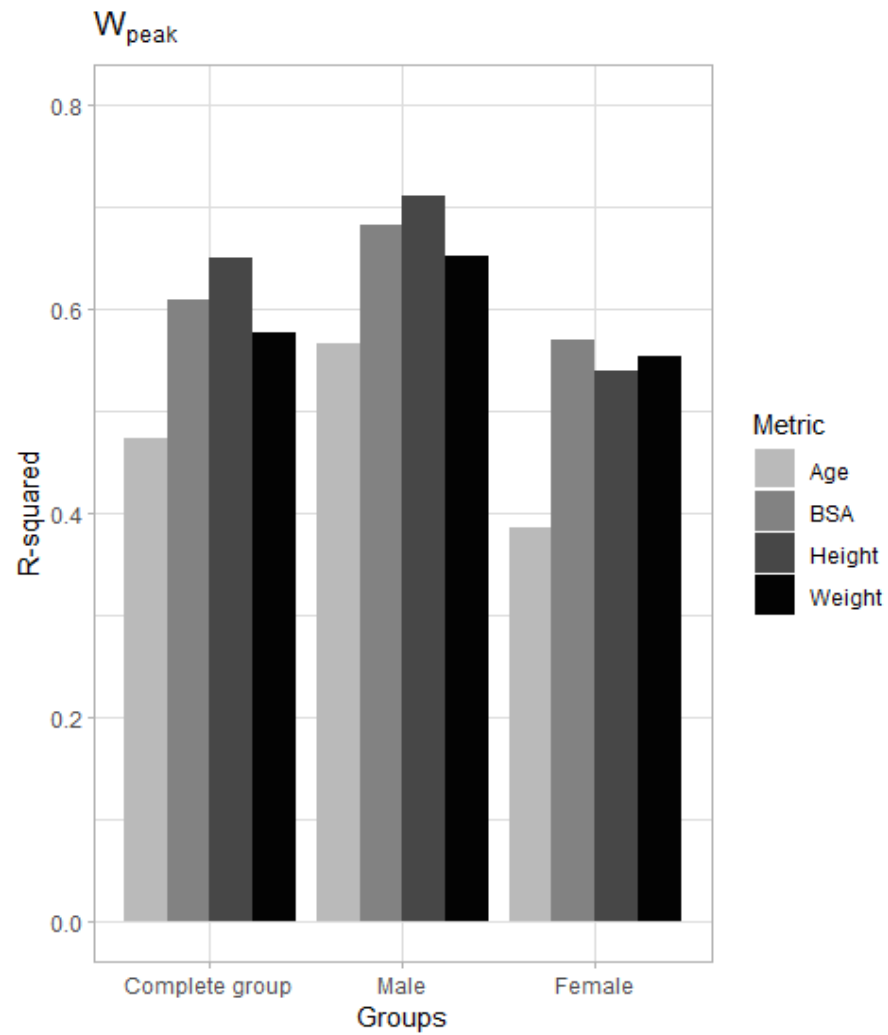
In two centres the full test data was collected and from these values at peak were extracted, in two centres summary reports including peak values were extracted. We routinely checked input from 1/100 files (randomized) and manually inspected all tests with a Z score larger than 2.5 or smaller than -2.5 for the parameters  $VO_{2peak}$ ,  $W_{peak}$  and maximum heart rate ( $HR_{peak}$ ) for irregularities during the test.

**Supplemental table1:** patient characteristics

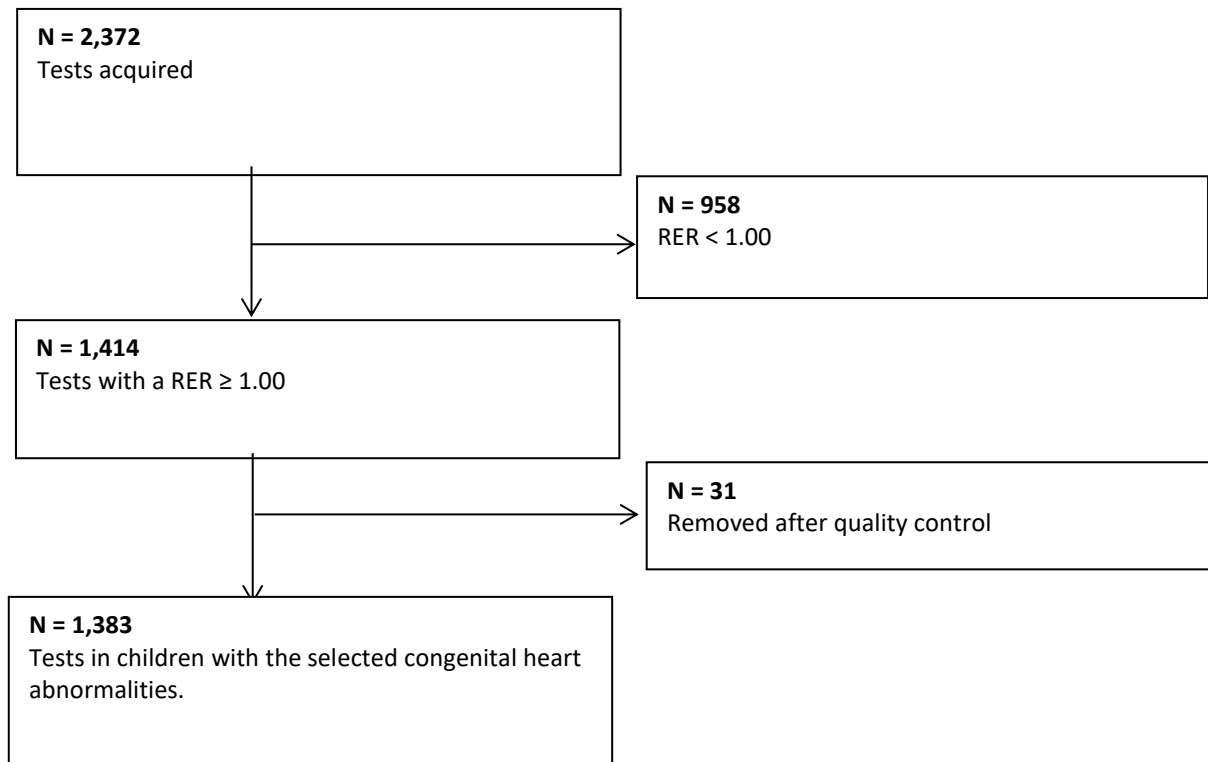
|                                     | Count | Sex      | Age            |                                                 | Weight      |                                                 | Height         |                                                 | BSA            |                                                 |
|-------------------------------------|-------|----------|----------------|-------------------------------------------------|-------------|-------------------------------------------------|----------------|-------------------------------------------------|----------------|-------------------------------------------------|
|                                     | N     | Male (%) | Median (years) | (25 <sup>th</sup> -75 <sup>th</sup> percentile) | Median (kg) | (25 <sup>th</sup> -75 <sup>th</sup> percentile) | Median (years) | (25 <sup>th</sup> -75 <sup>th</sup> percentile) | Median (years) | (25 <sup>th</sup> -75 <sup>th</sup> percentile) |
| ASD                                 | 70    | 43       | 14.1           | (12.0 - 15.5)                                   | 51.0        | (41.5 - 58.2)                                   | 161.5          | (151.8 - 170.0)                                 | 1.49           | (1.31 - 1.67)                                   |
| VSD                                 | 180   | 57       | 13.1           | (11.7 - 14.8)                                   | 46.3        | (38.5 - 57.5)                                   | 159.0          | (149.3 - 168.0)                                 | 1.43           | (1.25 - 1.62)                                   |
| AV valve abnormality                | 78    | 44       | 14.0           | (12.2 - 15.7)                                   | 47.0        | (37.3 - 57.7)                                   | 157.6          | (148.6 - 167.6)                                 | 1.42           | (1.25 - 1.63)                                   |
| Pulmonary stenosis                  | 80    | 54       | 14.4           | (12.1 - 16.3)                                   | 50.9        | (37.0 - 61.7)                                   | 162.0          | (149.8 - 174.0)                                 | 1.45           | (1.23 - 1.72)                                   |
| Aortic stenosis                     | 187   | 68       | 13.6           | (11.9 - 15.6)                                   | 47.3        | (38.0 - 61.6)                                   | 162.5          | (149.0 - 171.0)                                 | 1.53           | (1.24 - 1.71)                                   |
| Aortic Coarctation                  | 141   | 53       | 13.9           | (11.9 - 15.8)                                   | 49.5        | (38.1 - 62.0)                                   | 161.0          | (147.0 - 171.0)                                 | 1.49           | (1.24 - 1.71)                                   |
| Transposition of the great arteries | 182   | 69       | 14.0           | (12.2 - 15.6)                                   | 50.0        | (37.1 - 59.0)                                   | 161.8          | (152.6 - 171.0)                                 | 1.46           | (1.30 - 1.67)                                   |
| Tetralogy of Fallot                 | 252   | 55       | 14.0           | (11.8 - 15.9)                                   | 48.0        | (41.0 - 58.2)                                   | 164.0          | (149.9 - 171.0)                                 | 1.50           | (1.25 - 1.66)                                   |
| Univentricular heart                | 213   | 56       | 13.1           | (11.4 - 15.6)                                   | 43.3        | (36.0 - 54.0)                                   | 155.0          | (147.0 - 166.0)                                 | 1.35           | (1.20 - 1.56)                                   |
|                                     |       |          |                |                                                 |             |                                                 |                |                                                 |                |                                                 |
| Total                               | 1,383 | 58       | 13.7           | (11.8 - 15.7)                                   | 48.0        | (37.3 - 58.6)                                   | 160.3          | (149.0 - 170.0)                                 | 1.45           | (1.24 - 1.66)                                   |

Abbreviations: ASD: Atrial septal defect; VSD: Ventricular septal defect; AV: Atrioventricular; BSA: Body surface area ; Values are medians (25<sup>th</sup> – 75<sup>th</sup> percentile) or percentages.

**Supplemental figure 1:** R-squared for LMS models using different metrics

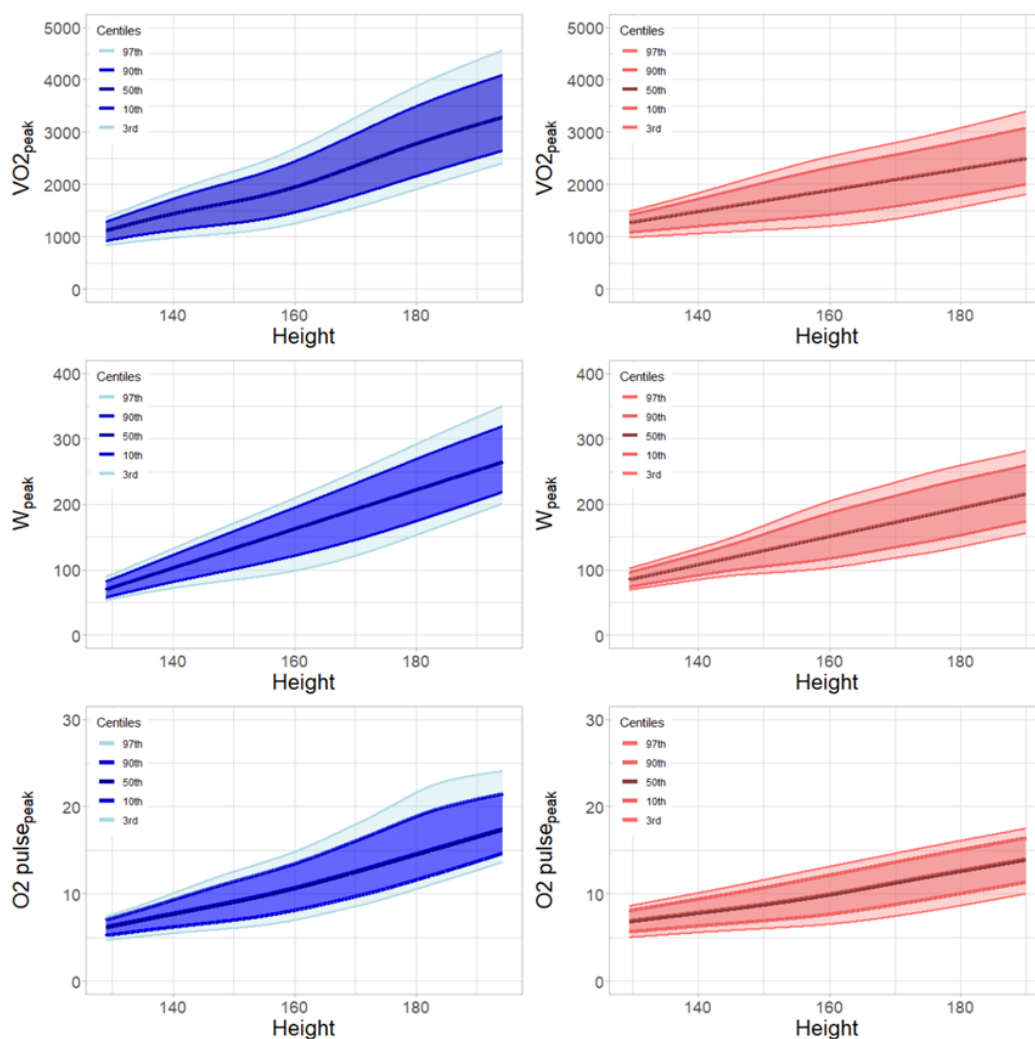


**Supplemental figure 2:** selection of study population



**Supplemental figure 3:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_2pulse_{peak}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as% of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of predicted in patients with Aortic stenosis, in males and females separately.

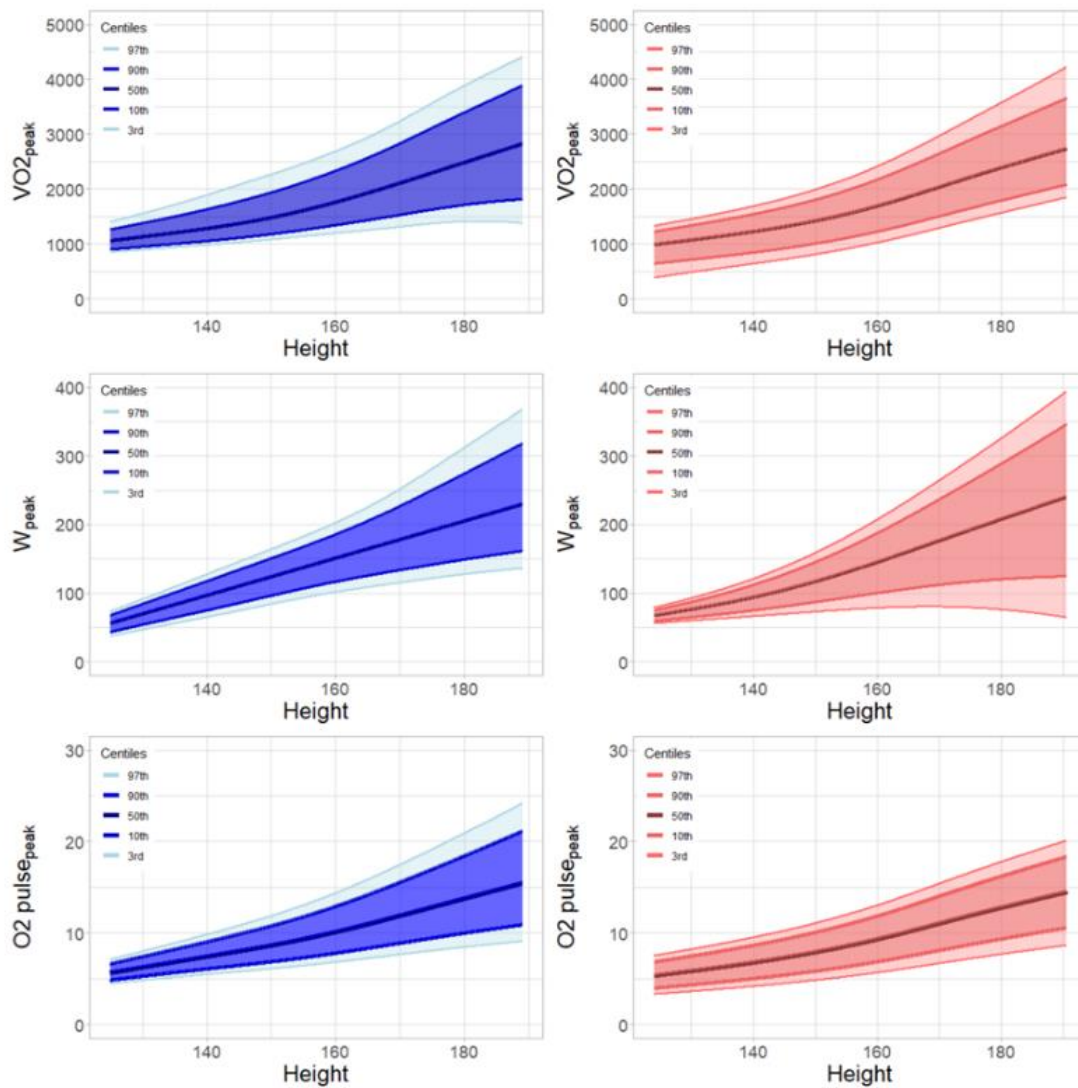
## Aortic Stenosis



|                          | Male   |                                                  | Female |                                                  |
|--------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                          | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| HR peak                  | 184    | (178 – 190)                                      | 188    | (179 – 193)                                      |
| $VO_{2peak}/kg$          | 44,1   | (36,9 – 48,8)                                    | 37,4   | (31,6 – 41,3)                                    |
| $VO_2$ as % of predicted | 83,6   | (67,9 – 95,9)                                    | 89,7   | (78,7 – 103,5)                                   |
| $W$ as % of predicted    | 83,2   | (71,3 – 97,2)                                    | 89,8   | (76,5 – 99,1)                                    |
| HR as % of predicted     | 96,9   | (71,3 – 97,2)                                    | 89,8   | (76,5 – 99,1)                                    |
| VE/ $VCO_2$ Slope        | 27,2   | (23,6 – 31,2)                                    | 30,0   | (25,6 – 32,6)                                    |

**Supplemental figure 4:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_{2pulse_{peak}}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as% of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of predicted in patients with VSD in males and females separately.

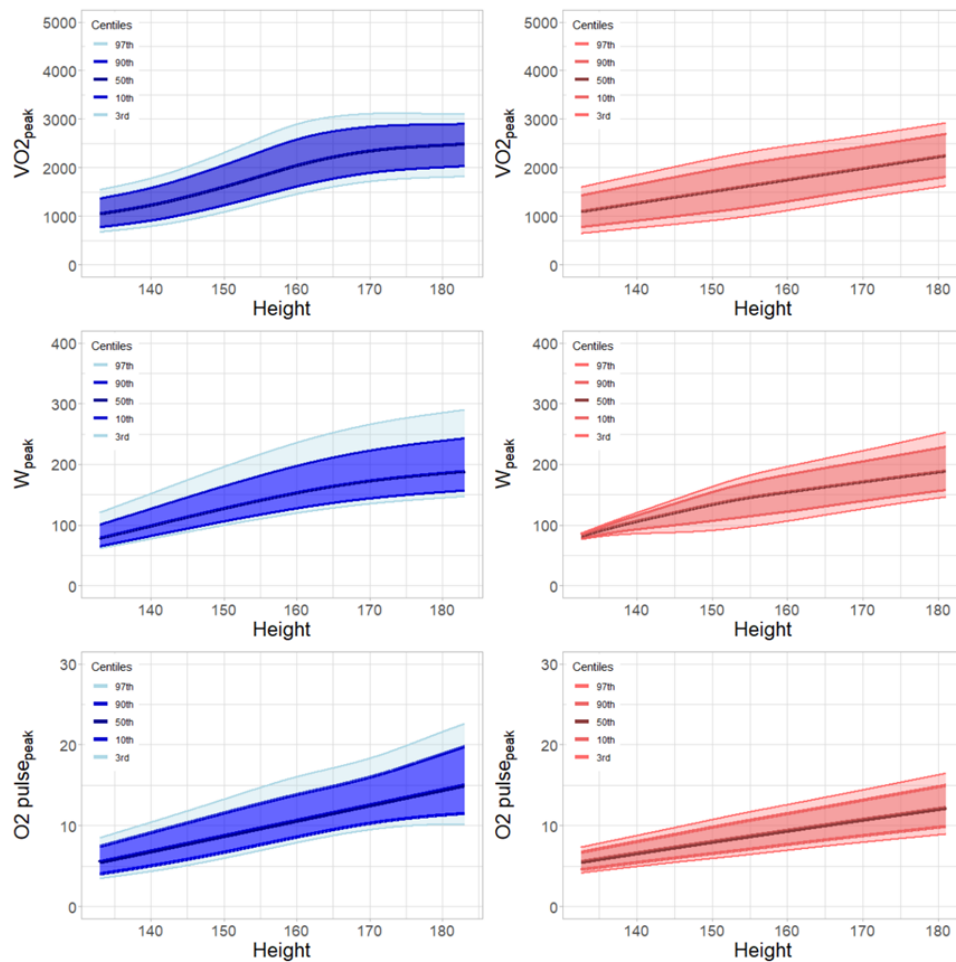
## VSD



|                                            | Male   |                                                  | Female |                                                  |
|--------------------------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                                            | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| <b>HR peak</b>                             | 180    | (169 – 190)                                      | 184    | (173 – 193)                                      |
| <b><math>VO_{2peak}/kg</math></b>          | 38,7   | (33,9 – 45,2)                                    | 35,0   | (30,0 – 40,9)                                    |
| <b><math>VO_2</math> as % of predicted</b> | 74,7   | (61,4 – 90)                                      | 81     | (67,4 – 97,4)                                    |
| <b><math>W</math> as % of predicted</b>    | 80,3   | (65,5 – 92,7)                                    | 86,3   | (67,2 – 97,4)                                    |
| <b>HR as % of predicted</b>                | 95,3   | (89,5 – 99,6)                                    | 96,7   | (91,0 – 101,6)                                   |
| <b><math>VE/VCO_2</math> Slope</b>         | 27,4   | (24,1 – 32,0)                                    | 25,4   | (23,2 – 29,0)                                    |

**Supplemental figure 5:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_{2pulse_{peak}}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as% of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of predicted patients with ASD, in males and females separately.

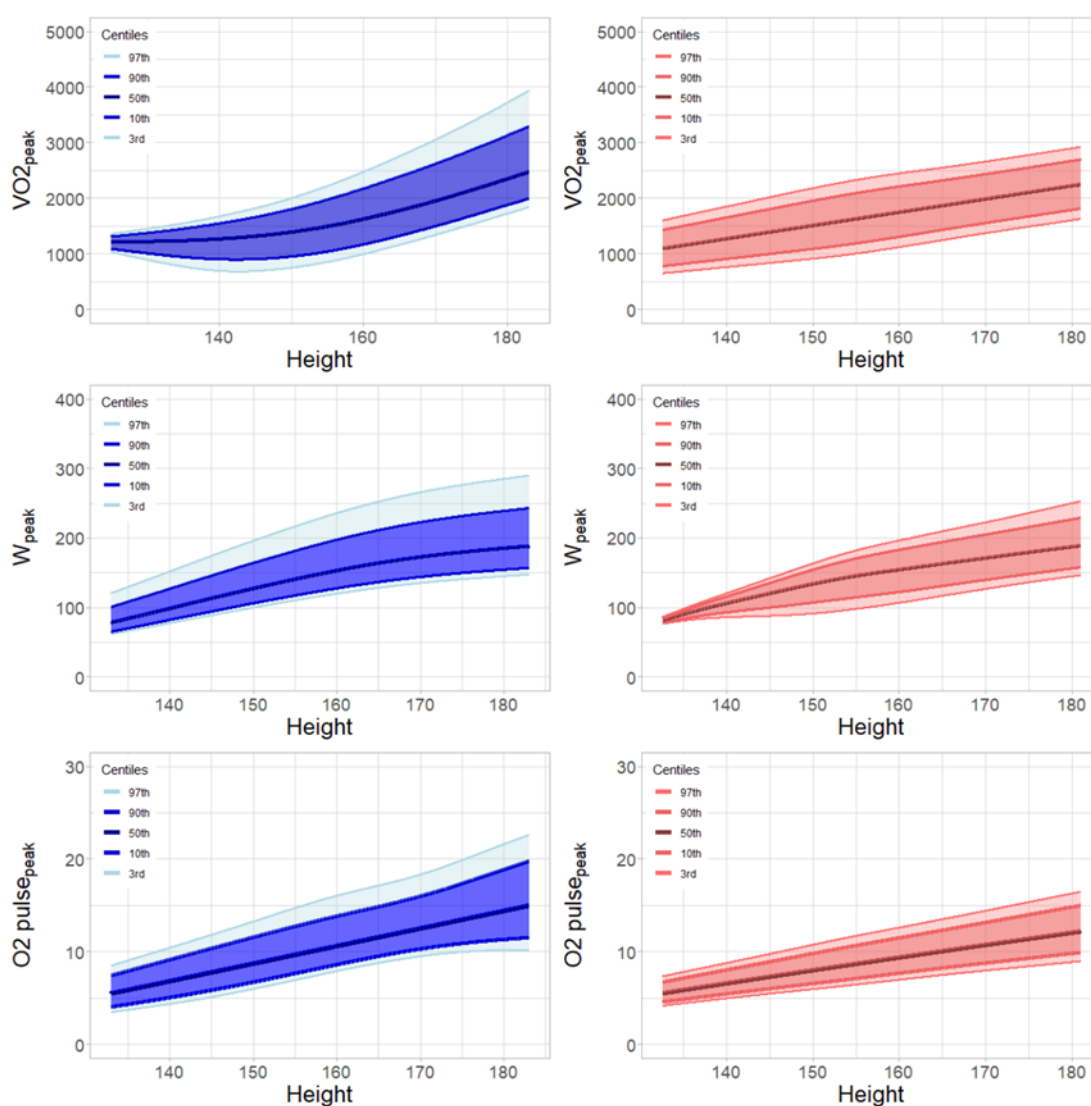
## ASD



|                                            | Male   |                                                  | Female |                                                  |
|--------------------------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                                            | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| <b>HR<sub>peak</sub></b>                   | 187    | (178 – 195)                                      | 188    | (178 – 194)                                      |
| <b><math>VO_{2peak}/kg</math></b>          | 39,9   | (36,4 – 45,5)                                    | 34,6   | (27,9 – 41,6)                                    |
| <b><math>VO_2</math> as % of predicted</b> | 85,2   | (68,1 – 92,3)                                    | 83,8   | (70,9 – 93,4)                                    |
| <b><math>W</math> as % of predicted</b>    | 84,9   | (69,5 – 95,8)                                    | 90,1   | (77,8 – 100,2)                                   |
| <b><math>HR</math> as % of predicted</b>   | 99,9   | (94,1 – 103,3)                                   | 98,7   | (94,1 – 102,1)                                   |
| <b><math>VE/VCO_2</math> Slope</b>         | 30,2   | (26,6 – 32,3)                                    | 29,0   | (25,9 – 32,3)                                    |

**Supplemental figure 6:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_{2pulse_{peak}}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as% of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of predicted in patients with AV valve abnormalities, in males and females separately.

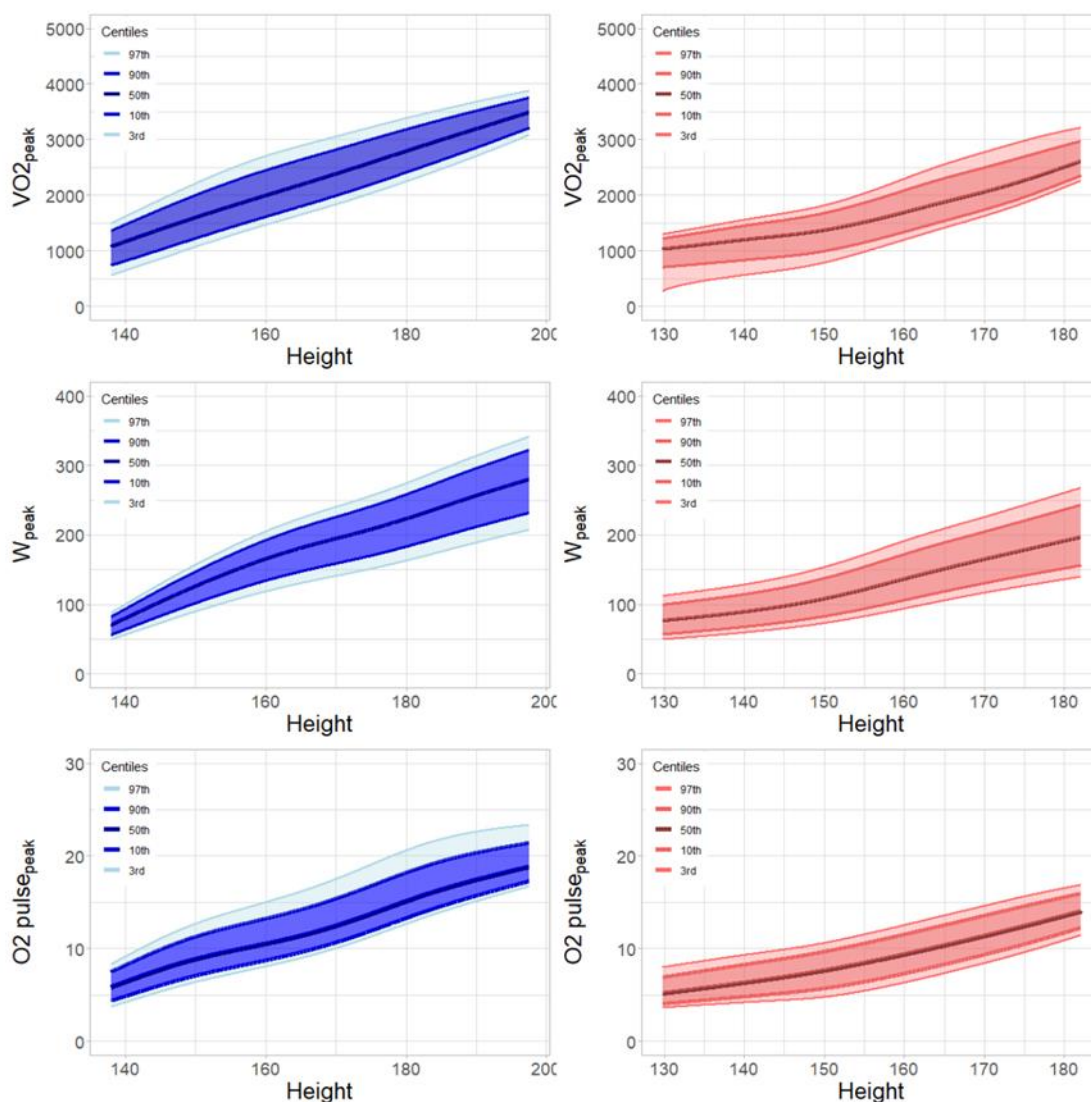
## AV valve abnormality



|                          | Male   |                                                  | Female |                                                  |
|--------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                          | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| HR peak                  | 187    | (178 – 195)                                      | 188    | (178 – 194)                                      |
| $VO_{2peak}/kg$          | 39,9   | (36,4 – 45,5)                                    | 34,6   | (27,9 – 41,6)                                    |
| $VO_2$ as % of predicted | 85,2   | (68,1 – 92,3)                                    | 83,8   | (70,9 – 93,4)                                    |
| $W$ as % of predicted    | 84,9   | (69,5 – 95,8)                                    | 90,1   | (77,8 – 100,2)                                   |
| HR as % of predicted     | 99,9   | (94,1 – 103,3)                                   | 98,7   | (94,1 – 102,1)                                   |
| VE/ $VCO_2$ Slope        | 33,2   | (29,8 – 43,7)                                    | 28,0   | (24,9 – 34,3)                                    |

**Supplemental figure 7:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_{2pulse_{peak}}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as % of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of predicted in patients with pulmonary stenosis, in males and females separately.

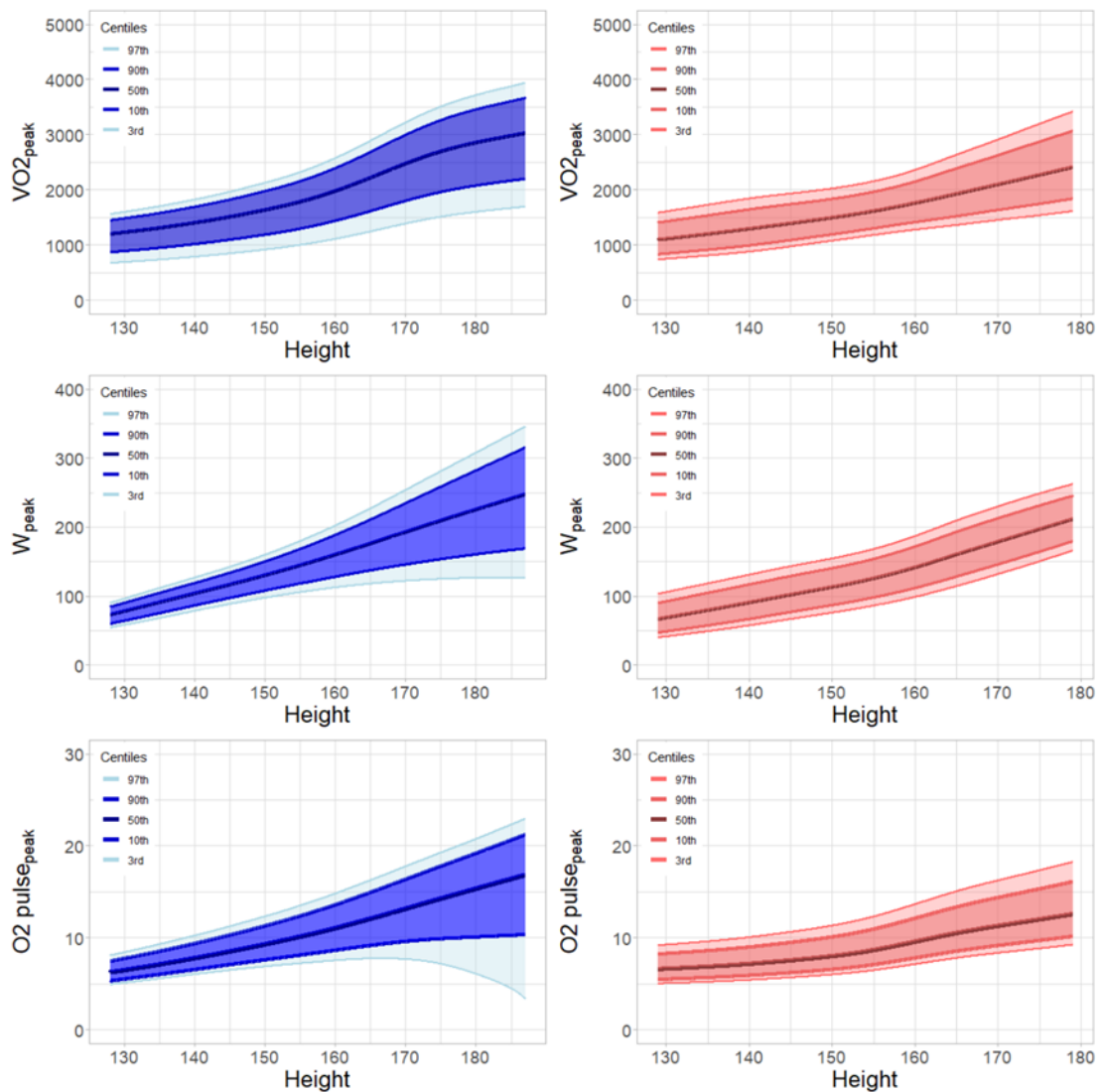
## Pulmonary Stenosis



|                                            | Male   |                                                  | Female |                                                  |
|--------------------------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                                            | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| <b>HR<sub>peak</sub></b>                   | 183    | (171 – 190)                                      | 184    | (174 – 193)                                      |
| <b><math>VO_{2peak}/kg</math></b>          | 42,9   | (38,3 – 47,0)                                    | 34,0   | (28,5 – 39,1)                                    |
| <b><math>VO_2</math> as % of predicted</b> | 79,8   | (70,4 – 89,1)                                    | 84,1   | (70,5 – 90,4)                                    |
| <b><math>W</math> as % of predicted</b>    | 79,1   | (73,3 – 89,4)                                    | 78,3   | (67,0 – 89,4)                                    |
| <b><math>HR</math> as % of predicted</b>   | 97,1   | (89,9 – 99,7)                                    | 97,0   | (94,1 – 102,1)                                   |
| <b><math>VE/VCO_2</math> Slope</b>         | 29,9   | (25,5 – 32,6)                                    | 31,3   | (28,8 – 34,9)                                    |

**Supplemental figure 8:** reference values for  $VO_{2peak}$ ,  $W_{peak}$  and  $O_2pulse_{peak}$  and median  $HR_{peak}$ ,  $VO_{2peak}/kg$ ,  $VO_2$  as % of predicted,  $W_{peak}$  as % of predicted and  $HR$  as % of in patients with Aortic Coarctation, in males and females separately.

# Aortic Coarctation



|                                            | Male   |                                                  | Female |                                                  |
|--------------------------------------------|--------|--------------------------------------------------|--------|--------------------------------------------------|
|                                            | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) | Median | (25 <sup>th</sup> – 75 <sup>th</sup> percentile) |
| <b>HR peak</b>                             | 182    | (173 – 190)                                      | 184    | (176 – 190)                                      |
| <b><math>VO_{2peak}/kg</math></b>          | 43,4   | (37,4 – 48,1)                                    | 35,4   | (31,8 – 40,2)                                    |
| <b><math>VO_2</math> as % of predicted</b> | 81,0   | (70,7 – 97,5)                                    | 86,1   | (72,4 – 97,0)                                    |
| <b>W as % of predicted</b>                 | 84,1   | (69,7 – 97,7)                                    | 83,0   | (69,7 – 95,8)                                    |
| <b>HR as % of predicted</b>                | 96,6   | (90,6 – 100,6)                                   | 96,7   | (92,8 – 100,03)                                  |
| <b>VE/<math>VCO_2</math> Slope</b>         | 29,5   | (23,1 – 34,9)                                    | 29,6   | (23,4 – 35,1)                                    |

**Supplemental table 2:** Tukey analysis of VO<sub>2peak</sub>

|                                               | diff    | lwr      | upr     | p adj            |
|-----------------------------------------------|---------|----------|---------|------------------|
| <u>Univentricular Heart vs</u>                |         |          |         |                  |
| ASD                                           | 430.332 | 177.516  | 683.149 | <b>&lt;0.001</b> |
| VSD                                           | 361.032 | 175.242  | 546.821 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 180.022 | -62.841  | 422.884 | 0.341            |
| Pulmonary stenosis                            | 528.066 | 287.436  | 768.696 | <b>&lt;0.001</b> |
| Aortic stenosis                               | 607.225 | 423.330  | 791.120 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 521.064 | 321.835  | 720.293 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 513.125 | 327.890  | 698.360 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 358.432 | 187.632  | 529.232 | <b>&lt;0.001</b> |
| <u>AV valve abnormality vs</u>                |         |          |         |                  |
| ASD                                           | 250.311 | -51.813  | 552.435 | 0.199            |
| VSD                                           | 181.010 | -67.748  | 429.768 | 0.367            |
| Pulmonary stenosis                            | 348.044 | 56.042   | 640.047 | 0.007            |
| Aortic stenosis                               | 427.203 | 179.857  | 674.549 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 341.043 | 82.093   | 599.993 | <b>0.001</b>     |
| Transposition of the great arteries           | 333.103 | 84.759   | 581.448 | <b>0.001</b>     |
| Tetralogy of Fallot                           | 178.411 | -59.361  | 416.182 | 0.324            |
| <u>Tetralogy of Fallot vs</u>                 |         |          |         |                  |
| ASD                                           | 71.900  | -176.030 | 319.830 | 0.993            |
| VSD                                           | 2.600   | -176.484 | 181.683 | 1.000            |
| Pulmonary stenosis                            | 169.634 | -65.857  | 405.125 | 0.382            |
| Aortic stenosis                               | 248.793 | 71.675   | 425.910 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 162.632 | -30.359  | 355.623 | 0.180            |
| Transposition of the great arteries           | 154.693 | -23.816  | 333.202 | 0.151            |
| <u>VSD vs</u>                                 |         |          |         |                  |
| ASD                                           | 69.301  | -189.184 | 327.786 | 0.996            |
| Pulmonary stenosis                            | 167.034 | -79.545  | 413.613 | 0.471            |
| Aortic stenosis                               | 246.193 | 54.579   | 437.807 | 0.002            |
| Aortic Coarctation                            | 160.033 | -46.342  | 366.408 | 0.280            |
| Transposition of the great arteries           | 152.093 | -40.807  | 344.994 | 0.258            |
| <u>ASD vs</u>                                 |         |          |         |                  |
| Pulmonary stenosis                            | 97.733  | -202.599 | 398.066 | 0.985            |
| Aortic stenosis                               | 176.892 | -80.234  | 434.019 | 0.448            |
| Aortic Coarctation                            | 90.732  | -177.576 | 359.040 | 0.981            |
| Transposition of the great arteries           | 82.793  | -175.294 | 340.880 | 0.986            |
| <u>Transposition of the great arteries vs</u> |         |          |         |                  |
| Pulmonary stenosis                            | 14.941  | -231.221 | 261.102 | 1.000            |
| Aortic stenosis                               | 94.100  | -96.977  | 285.176 | 0.841            |
| Aortic Coarctation                            | 7.939   | -197.937 | 213.816 | 1.000            |
| <u>Aortic Coarctation vs</u>                  |         |          |         |                  |
| Pulmonary stenosis                            | 7.001   | -249.856 | 263.859 | 1.000            |
| Aortic stenosis                               | 86.160  | -118.511 | 290.832 | 0.929            |
| <u>Pulmonary stenosis vs</u>                  |         |          |         |                  |
| Aortic stenosis                               | 79.159  | -165.996 | 324.314 | 0.986            |

**Supplemental table 3:** Tukey analysis of  $VO_{2peak}/kg$ 

|                                               | diff   | lwr    | upr    | p adj            |
|-----------------------------------------------|--------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |        |        |        |                  |
| ASD                                           | 5.619  | -0.751 | 11.989 | 0.134            |
| VSD                                           | 7.053  | 2.608  | 11.498 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 0.751  | -5.520 | 7.023  | 1.000            |
| Pulmonary stenosis                            | 8.914  | 2.068  | 15.760 | 0.002            |
| Aortic stenosis                               | 9.450  | 4.933  | 13.966 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 10.501 | 5.297  | 15.704 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 9.290  | 4.518  | 14.062 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 6.010  | 1.663  | 10.357 | 0.001            |
| <u>AV valve abnormality vs</u>                |        |        |        |                  |
| ASD                                           | 5.619  | -0.751 | 11.989 | 0.134            |
| VSD                                           | 7.053  | 2.608  | 11.498 | <b>&lt;0.001</b> |
| Pulmonary stenosis                            | 9.665  | 1.619  | 17.712 | 0.006            |
| Aortic stenosis                               | 10.201 | 4.014  | 16.388 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 11.252 | 4.547  | 17.957 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 10.041 | 3.665  | 16.417 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 6.761  | 0.697  | 12.826 | 0.016            |
| <u>Tetralogy of Fallot vs</u>                 |        |        |        |                  |
| ASD                                           | 0.391  | -5.775 | 6.557  | 1.000            |
| VSD                                           | 1.043  | -3.105 | 5.191  | 0.997            |
| Pulmonary stenosis                            | 2.904  | -3.752 | 9.560  | 0.912            |
| Aortic stenosis                               | 3.440  | -0.785 | 7.664  | 0.217            |
| Aortic Coarctation                            | 4.882  | -1.915 | 11.678 | 0.382            |
| Transposition of the great arteries           | 3.280  | -1.217 | 7.776  | 0.360            |
| <u>VSD vs</u>                                 |        |        |        |                  |
| ASD                                           | 1.434  | -4.802 | 7.670  | 0.999            |
| Pulmonary stenosis                            | 1.861  | -4.860 | 8.582  | 0.995            |
| Aortic stenosis                               | 2.396  | -1.928 | 6.721  | 0.729            |
| Aortic Coarctation                            | 3.448  | -1.590 | 8.485  | 0.452            |
| Transposition of the great arteries           | 2.237  | -2.354 | 6.828  | 0.847            |
| <u>ASD vs</u>                                 |        |        |        |                  |
| Pulmonary stenosis                            | 3.295  | -4.828 | 11.418 | 0.941            |
| Aortic stenosis                               | 3.830  | -2.456 | 10.117 | 0.615            |
| Aortic Coarctation                            | 4.882  | -1.915 | 11.678 | 0.382            |
| Transposition of the great arteries           | 3.671  | -2.802 | 10.143 | 0.704            |
| <u>Transposition of the great arteries vs</u> |        |        |        |                  |
| Pulmonary stenosis                            | 0.376  | -6.565 | 7.317  | 1.000            |
| Aortic stenosis                               | 0.160  | -4.500 | 4.819  | 1.000            |
| Aortic Coarctation                            | 1.211  | -4.118 | 6.539  | 0.999            |
| <u>Aortic Coarctation vs</u>                  |        |        |        |                  |
| Pulmonary stenosis                            | 1.587  | -5.658 | 8.831  | 0.999            |
| Aortic stenosis                               | 1.051  | -4.049 | 6.152  | 0.999            |
| <u>Pulmonary stenosis vs</u>                  |        |        |        |                  |
| Aortic stenosis                               | 0.536  | -6.232 | 7.303  | 1.000            |

**Supplemental table 4:** Tukey analysis of  $W_{peak}$ 

|                                               | diff   | lwr    | upr    | p adj            |
|-----------------------------------------------|--------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |        |        |        |                  |
| ASD                                           | 5.619  | -0.751 | 11.989 | 0.134            |
| VSD                                           | 7.053  | 2.608  | 11.498 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 0.751  | -5.520 | 7.023  | 1.000            |
| Pulmonary stenosis                            | 8.914  | 2.068  | 15.760 | 0.002            |
| Aortic stenosis                               | 9.450  | 4.933  | 13.966 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 10.501 | 5.297  | 15.704 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 9.290  | 4.518  | 14.062 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 6.010  | 1.663  | 10.357 | 0.001            |
| <u>AV valve abnormality vs</u>                |        |        |        |                  |
| ASD                                           | 6.370  | -1.275 | 14.016 | 0.191            |
| VSD                                           | 7.804  | 1.669  | 13.940 | 0.003            |
| Pulmonary stenosis                            | 9.665  | 1.619  | 17.712 | 0.006            |
| Aortic stenosis                               | 10.201 | 4.014  | 16.388 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 11.252 | 4.547  | 17.957 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 10.041 | 3.665  | 16.417 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 6.761  | 0.697  | 12.826 | 0.016            |
| <u>Tetralogy of Fallot vs</u>                 |        |        |        |                  |
| ASD                                           | 0.391  | -5.775 | 6.557  | 1.000            |
| VSD                                           | 1.043  | -3.105 | 5.191  | 0.997            |
| Pulmonary stenosis                            | 2.904  | -3.752 | 9.560  | 0.912            |
| Aortic stenosis                               | 3.440  | -0.785 | 7.664  | 0.217            |
| Aortic Coarctation                            | 4.882  | -1.915 | 11.678 | 0.382            |
| Transposition of the great arteries           | 3.280  | -1.217 | 7.776  | 0.360            |
| <u>VSD vs</u>                                 |        |        |        |                  |
| ASD                                           | 1.434  | -4.802 | 7.670  | 0.999            |
| Pulmonary stenosis                            | 1.861  | -4.860 | 8.582  | 0.995            |
| Aortic stenosis                               | 2.396  | -1.928 | 6.721  | 0.729            |
| Aortic Coarctation                            | 3.448  | -1.590 | 8.485  | 0.452            |
| Transposition of the great arteries           | 2.237  | -2.354 | 6.828  | 0.847            |
| <u>ASD vs</u>                                 |        |        |        |                  |
| Pulmonary stenosis                            | 3.295  | -4.828 | 11.418 | 0.941            |
| Aortic stenosis                               | 3.830  | -2.456 | 10.117 | 0.615            |
| Aortic Coarctation                            | 4.882  | -1.915 | 11.678 | 0.382            |
| Transposition of the great arteries           | 3.671  | -2.802 | 10.143 | 0.704            |
| <u>Transposition of the great arteries vs</u> |        |        |        |                  |
| Pulmonary stenosis                            | 0.376  | -6.565 | 7.317  | 1.000            |
| Aortic stenosis                               | 0.160  | -4.500 | 4.819  | 1.000            |
| Aortic Coarctation                            | 1.211  | -4.118 | 6.539  | 0.999            |
| <u>Aortic Coarctation vs</u>                  |        |        |        |                  |
| Pulmonary stenosis                            | 1.587  | -5.658 | 8.831  | 0.999            |
| Aortic stenosis                               | 1.051  | -4.049 | 6.152  | 0.999            |
| <u>Pulmonary stenosis vs</u>                  |        |        |        |                  |
| Aortic stenosis                               | 0.536  | -6.232 | 7.303  | 1.000            |

**Supplemental table 5:** Tukey analysis of  $W_{peak}/kg$ 

|                                               | diff  | lwr    | upr    | p adj            |
|-----------------------------------------------|-------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |       |        |        |                  |
| ASD                                           | 0.538 | 0.245  | 0.831  | <b>&lt;0.001</b> |
| VSD                                           | 0.567 | 0.352  | 0.783  | <b>&lt;0.001</b> |
| AV valve abnormality                          | 0.321 | 0.040  | 0.603  | 0.012            |
| Pulmonary stenosis                            | 0.518 | 0.239  | 0.797  | <b>&lt;0.001</b> |
| Aortic stenosis                               | 0.719 | 0.506  | 0.933  | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 0.574 | 0.343  | 0.805  | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 0.677 | 0.463  | 0.892  | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 0.500 | 0.302  | 0.698  | <b>&lt;0.001</b> |
| <u>AV valve abnormality vs</u>                |       |        |        |                  |
| ASD                                           | 0.217 | -0.134 | 0.567  | 0.599            |
| VSD                                           | 0.067 | -0.140 | 0.275  | 0.985            |
| Pulmonary stenosis                            | 0.196 | -0.142 | 0.535  | 0.681            |
| Aortic stenosis                               | 0.220 | 0.014  | 0.425  | 0.026            |
| Aortic Coarctation                            | 0.075 | -0.149 | 0.299  | 0.982            |
| Transposition of the great arteries           | 0.178 | -0.029 | 0.385  | 0.160            |
| Tetralogy of Fallot                           | 0.178 | -0.098 | 0.454  | 0.538            |
| <u>Tetralogy of Fallot vs</u>                 |       |        |        |                  |
| ASD                                           | 0.391 | -5.775 | 6.557  | 1.000            |
| VSD                                           | 1.043 | -3.105 | 5.191  | 0.997            |
| Pulmonary stenosis                            | 2.904 | -3.752 | 9.560  | 0.912            |
| Aortic stenosis                               | 3.440 | -0.785 | 7.664  | 0.217            |
| Aortic Coarctation                            | 4.882 | -1.915 | 11.678 | 0.382            |
| Transposition of the great arteries           | 3.280 | -1.217 | 7.776  | 0.360            |
| <u>VSD vs</u>                                 |       |        |        |                  |
| ASD                                           | 0.029 | -0.271 | 0.329  | 1.000            |
| Pulmonary stenosis                            | 0.049 | -0.237 | 0.335  | 1.000            |
| Aortic stenosis                               | 0.152 | -0.070 | 0.375  | 0.454            |
| Aortic Coarctation                            | 0.007 | -0.232 | 0.247  | 1.000            |
| Transposition of the great arteries           | 0.110 | -0.113 | 0.334  | 0.840            |
| <u>ASD vs</u>                                 |       |        |        |                  |
| Pulmonary stenosis                            | 0.020 | -0.328 | 0.369  | 1.000            |
| Aortic stenosis                               | 0.181 | -0.117 | 0.479  | 0.622            |
| Aortic Coarctation                            | 0.036 | -0.275 | 0.347  | 1.000            |
| Transposition of the great arteries           | 0.139 | -0.160 | 0.439  | 0.880            |
| <u>Transposition of the great arteries vs</u> |       |        |        |                  |
| Pulmonary stenosis                            | 0.160 | -0.126 | 0.445  | 0.724            |
| Aortic stenosis                               | 0.042 | -0.180 | 0.264  | 1.000            |
| Aortic Coarctation                            | 0.103 | -0.136 | 0.342  | 0.919            |
| <u>Aortic Coarctation vs</u>                  |       |        |        |                  |
| Pulmonary stenosis                            | 0.056 | -0.241 | 0.354  | 1.000            |
| Aortic stenosis                               | 0.145 | -0.092 | 0.382  | 0.615            |
| <u>Pulmonary stenosis vs</u>                  |       |        |        |                  |
| Aortic stenosis                               | 0.202 | -0.083 | 0.486  | 0.405            |

**Supplemental table 6:** Tukey analysis of HR<sub>peak</sub>

|                                               | diff   | lwr    | upr    | p adj            |
|-----------------------------------------------|--------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |        |        |        |                  |
| ASD                                           | 13.199 | 6.195  | 20.203 | <b>&lt;0.001</b> |
| VSD                                           | 8.457  | 3.305  | 13.609 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 10.484 | 3.723  | 17.244 | <b>&lt;0.001</b> |
| Pulmonary stenosis                            | 10.134 | 3.437  | 16.832 | <b>&lt;0.001</b> |
| Aortic stenosis                               | 13.603 | 8.482  | 18.725 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 8.913  | 3.378  | 14.448 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 8.207  | 3.070  | 13.344 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 6.559  | 1.817  | 11.302 | 0.001            |
| <u>AV valve abnormality vs</u>                |        |        |        |                  |
| ASD                                           | 2.716  | -5.670 | 11.101 | 0.985            |
| VSD                                           | 2.026  | -4.888 | 8.941  | 0.992            |
| Pulmonary stenosis                            | 0.196  | -0.142 | 0.535  | 0.681            |
| Aortic stenosis                               | 3.120  | -3.772 | 10.012 | 0.896            |
| Aortic Coarctation                            | 0.349  | -7.782 | 8.481  | 1.000            |
| Transposition of the great arteries           | 2.277  | -4.626 | 9.180  | 0.984            |
| Tetralogy of Fallot                           | 3.924  | -2.691 | 10.539 | 0.653            |
| <u>Tetralogy of Fallot vs</u>                 |        |        |        |                  |
| ASD                                           | 6.640  | -0.223 | 13.503 | 0.067            |
| VSD                                           | 1.898  | -3.062 | 6.857  | 0.959            |
| Pulmonary stenosis                            | 3.575  | -2.976 | 10.125 | 0.749            |
| Aortic stenosis                               | 7.044  | 2.116  | 11.972 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 2.354  | -3.002 | 7.710  | 0.911            |
| Transposition of the great arteries           | 1.647  | -3.296 | 6.591  | 0.982            |
| <u>VSD vs</u>                                 |        |        |        |                  |
| ASD                                           | 4.742  | -2.410 | 11.894 | 0.502            |
| Pulmonary stenosis                            | 1.677  | -5.176 | 8.530  | 0.998            |
| Aortic stenosis                               | 5.146  | -0.177 | 10.469 | 0.067            |
| Aortic Coarctation                            | 0.456  | -5.266 | 6.178  | 1.000            |
| Transposition of the great arteries           | 0.250  | -5.087 | 5.588  | 1.000            |
| <u>ASD vs</u>                                 |        |        |        |                  |
| Pulmonary stenosis                            | 3.065  | -5.270 | 11.400 | 0.968            |
| Aortic stenosis                               | 0.404  | -6.726 | 7.535  | 1.000            |
| Aortic Coarctation                            | 4.286  | -3.147 | 11.719 | 0.688            |
| Transposition of the great arteries           | 4.992  | -2.149 | 12.134 | 0.425            |
| <u>Transposition of the great arteries vs</u> |        |        |        |                  |
| Pulmonary stenosis                            | 1.927  | -4.914 | 8.769  | 0.994            |
| Aortic stenosis                               | 5.397  | 0.088  | 10.705 | 0.043            |
| Aortic Coarctation                            | 0.707  | -5.002 | 6.415  | 1.000            |
| <u>Aortic Coarctation vs</u>                  |        |        |        |                  |
| Pulmonary stenosis                            | 1.221  | -5.924 | 8.366  | 1.000            |
| Aortic stenosis                               | 4.690  | -1.005 | 10.385 | 0.205            |
| <u>Pulmonary stenosis vs</u>                  |        |        |        |                  |
| Aortic stenosis                               | 3.469  | -3.361 | 10.299 | 0.817            |

**Supplemental table 7:** Tukey analysis of VO<sub>2peak</sub> as % of predicted

|                                               | diff   | lwr    | upr    | p adj            |
|-----------------------------------------------|--------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |        |        |        |                  |
| ASD                                           | 19.354 | 11.002 | 27.706 | <b>&lt;0.001</b> |
| VSD                                           | 16.446 | 10.308 | 22.584 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 7.539  | -0.485 | 15.562 | 0.085            |
| Pulmonary stenosis                            | 16.491 | 8.542  | 24.441 | <b>&lt;0.001</b> |
| Aortic stenosis                               | 21.995 | 15.919 | 28.070 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 20.485 | 13.904 | 27.067 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 17.053 | 10.933 | 23.172 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 12.549 | 6.907  | 18.192 | <b>&lt;0.001</b> |
| <u>AV valve abnormality vs</u>                |        |        |        |                  |
| ASD                                           | 11.816 | 1.835  | 21.797 | 0.008            |
| VSD                                           | 8.908  | 0.690  | 17.125 | 0.022            |
| Pulmonary stenosis                            | 8.953  | -0.694 | 18.599 | 0.094            |
| Aortic stenosis                               | 14.456 | 6.285  | 22.627 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 12.947 | 4.392  | 21.501 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 9.514  | 1.310  | 17.718 | 0.010            |
| Tetralogy of Fallot                           | 5.011  | -2.844 | 12.866 | 0.556            |
| <u>Tetralogy of Fallot vs</u>                 |        |        |        |                  |
| ASD                                           | 6.805  | -1.386 | 14.995 | 0.195            |
| VSD                                           | 3.897  | -2.019 | 9.813  | 0.511            |
| Pulmonary stenosis                            | 3.942  | -3.838 | 11.721 | 0.819            |
| Aortic stenosis                               | 9.445  | 3.594  | 15.296 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 7.936  | 1.560  | 14.311 | 0.004            |
| Transposition of the great arteries           | 4.503  | -1.394 | 10.400 | 0.300            |
| <u>VSD vs</u>                                 |        |        |        |                  |
| ASD                                           | 2.908  | -5.631 | 11.447 | 0.980            |
| Pulmonary stenosis                            | 0.045  | -8.101 | 8.191  | 1.000            |
| Aortic stenosis                               | 5.548  | -0.782 | 11.878 | 0.141            |
| Aortic Coarctation                            | 4.039  | -2.779 | 10.857 | 0.655            |
| Transposition of the great arteries           | 0.607  | -5.766 | 6.979  | 1.000            |
| <u>ASD vs</u>                                 |        |        |        |                  |
| Pulmonary stenosis                            | 2.863  | -7.058 | 12.785 | 0.993            |
| Aortic stenosis                               | 2.640  | -5.854 | 11.135 | 0.989            |
| Aortic Coarctation                            | 1.131  | -7.733 | 9.995  | 1.000            |
| Transposition of the great arteries           | 2.302  | -6.224 | 10.828 | 0.996            |
| <u>Transposition of the great arteries vs</u> |        |        |        |                  |
| Pulmonary stenosis                            | 0.562  | -7.570 | 8.694  | 1.000            |
| Aortic stenosis                               | 4.942  | -1.371 | 11.254 | 0.267            |
| Aortic Coarctation                            | 3.433  | -3.369 | 10.234 | 0.822            |
| <u>Aortic Coarctation vs</u>                  |        |        |        |                  |
| Pulmonary stenosis                            | 3.994  | -4.491 | 12.480 | 0.873            |
| Aortic stenosis                               | 1.509  | -5.252 | 8.271  | 0.999            |
| <u>Pulmonary stenosis vs</u>                  |        |        |        |                  |
| Aortic stenosis                               | 5.503  | -2.595 | 13.602 | 0.466            |

**Supplemental table 8:** Tukey analysis of  $W_{peak}$  as % of predicted

|                                               | diff   | lwr    | upr    | p adj            |
|-----------------------------------------------|--------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |        |        |        |                  |
| ASD                                           | 23.574 | 15.412 | 31.736 | <b>&lt;0.001</b> |
| VSD                                           | 20.671 | 14.673 | 26.669 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 9.639  | 1.799  | 17.480 | 0.004            |
| Pulmonary stenosis                            | 16.536 | 8.768  | 24.305 | <b>&lt;0.001</b> |
| Aortic stenosis                               | 22.785 | 16.849 | 28.722 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 20.672 | 14.240 | 27.104 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 21.004 | 15.024 | 26.984 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 15.201 | 9.687  | 20.715 | <b>&lt;0.001</b> |
| <u>AV valve abnormality vs</u>                |        |        |        |                  |
| ASD                                           | 13.934 | 4.180  | 23.688 | <b>&lt;0.001</b> |
| VSD                                           | 11.031 | 3.001  | 19.062 | 0.001            |
| Pulmonary stenosis                            | 6.897  | -2.530 | 16.324 | 0.359            |
| Aortic stenosis                               | 13.146 | 5.161  | 21.131 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 11.033 | 2.673  | 19.393 | 0.001            |
| Transposition of the great arteries           | 11.365 | 3.347  | 19.382 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 5.561  | -2.115 | 13.238 | 0.373            |
| <u>Tetralogy of Fallot vs</u>                 |        |        |        |                  |
| ASD                                           | 8.373  | 0.369  | 16.377 | 0.032            |
| VSD                                           | 5.470  | -0.311 | 11.252 | 0.080            |
| Pulmonary stenosis                            | 1.335  | -6.267 | 8.938  | 1.000            |
| Aortic stenosis                               | 7.585  | 1.866  | 13.303 | 0.001            |
| Aortic Coarctation                            | 5.472  | -0.759 | 11.702 | 0.139            |
| Transposition of the great arteries           | 5.803  | 0.040  | 11.566 | 0.047            |
| <u>VSD vs</u>                                 |        |        |        |                  |
| ASD                                           | 2.903  | -5.442 | 11.248 | 0.977            |
| Pulmonary stenosis                            | 4.135  | -3.826 | 12.095 | 0.797            |
| Aortic stenosis                               | 2.114  | -4.072 | 8.301  | 0.979            |
| Aortic Coarctation                            | 0.001  | -6.661 | 6.664  | 1.000            |
| Transposition of the great arteries           | 0.333  | -5.894 | 6.561  | 1.000            |
| <u>ASD vs</u>                                 |        |        |        |                  |
| Pulmonary stenosis                            | 7.038  | -2.658 | 16.733 | 0.371            |
| Aortic stenosis                               | 0.788  | -7.513 | 9.089  | 1.000            |
| Aortic Coarctation                            | 2.901  | -5.761 | 11.563 | 0.982            |
| Transposition of the great arteries           | 2.569  | -5.763 | 10.902 | 0.989            |
| <u>Transposition of the great arteries vs</u> |        |        |        |                  |
| Pulmonary stenosis                            | 4.468  | -3.479 | 12.415 | 0.717            |
| Aortic stenosis                               | 1.781  | -4.387 | 7.950  | 0.993            |
| Aortic Coarctation                            | 0.332  | -6.315 | 6.978  | 1.000            |
| <u>Aortic Coarctation vs</u>                  |        |        |        |                  |
| Pulmonary stenosis                            | 4.136  | -4.156 | 12.429 | 0.832            |
| Aortic stenosis                               | 1.509  | -5.252 | 8.271  | 0.999            |
| <u>Pulmonary stenosis vs</u>                  |        |        |        |                  |
| Aortic stenosis                               | 6.249  | -1.665 | 14.164 | 0.256            |

**Supplemental table 9:** Tukey analysis of HR<sub>peak</sub> as % of predicted

|                                               | diff  | lwr    | upr    | p adj            |
|-----------------------------------------------|-------|--------|--------|------------------|
| <u>Univentricular Heart vs</u>                |       |        |        |                  |
| ASD                                           | 6.992 | 3.312  | 10.672 | <b>&lt;0.001</b> |
| VSD                                           | 4.485 | 1.778  | 7.192  | <b>&lt;0.001</b> |
| AV valve abnormality                          | 5.453 | 1.901  | 9.006  | <b>&lt;0.001</b> |
| Pulmonary stenosis                            | 5.160 | 1.640  | 8.679  | <b>&lt;0.001</b> |
| Aortic stenosis                               | 7.111 | 4.420  | 9.802  | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 4.641 | 1.732  | 7.549  | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 4.211 | 1.512  | 6.910  | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 3.399 | 0.907  | 5.891  | 0.001            |
| <u>AV valve abnormality vs</u>                |       |        |        |                  |
| ASD                                           | 1.539 | -2.868 | 5.945  | 0.976            |
| VSD                                           | 0.968 | -2.665 | 4.602  | 0.996            |
| Pulmonary stenosis                            | 0.294 | -3.979 | 4.567  | 1.000            |
| Aortic stenosis                               | 1.658 | -1.964 | 5.279  | 0.889            |
| Aortic Coarctation                            | 0.812 | -2.973 | 4.598  | 0.999            |
| Transposition of the great arteries           | 1.242 | -2.385 | 4.870  | 0.979            |
| Tetralogy of Fallot                           | 2.054 | -1.421 | 5.530  | 0.658            |
| <u>Tetralogy of Fallot vs</u>                 |       |        |        |                  |
| ASD                                           | 3.593 | -0.013 | 7.200  | 0.052            |
| VSD                                           | 1.086 | -1.520 | 3.692  | 0.933            |
| Pulmonary stenosis                            | 1.761 | -1.681 | 5.203  | 0.811            |
| Aortic stenosis                               | 3.712 | 1.123  | 6.302  | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 1.242 | -1.572 | 4.057  | 0.909            |
| Transposition of the great arteries           | 0.812 | -1.786 | 3.410  | 0.988            |
| <u>VSD vs</u>                                 |       |        |        |                  |
| ASD                                           | 2.507 | -1.251 | 6.265  | 0.493            |
| Pulmonary stenosis                            | 0.675 | -2.926 | 4.276  | 1.000            |
| Aortic stenosis                               | 2.626 | -0.171 | 5.423  | 0.086            |
| Aortic Coarctation                            | 0.156 | -2.851 | 3.163  | 1.000            |
| Transposition of the great arteries           | 0.274 | -2.531 | 3.079  | 1.000            |
| <u>ASD vs</u>                                 |       |        |        |                  |
| Pulmonary stenosis                            | 1.832 | -2.547 | 6.212  | 0.932            |
| Aortic stenosis                               | 0.119 | -3.628 | 3.866  | 1.000            |
| Aortic Coarctation                            | 2.351 | -1.555 | 6.257  | 0.635            |
| Transposition of the great arteries           | 2.781 | -0.971 | 6.534  | 0.341            |
| <u>Transposition of the great arteries vs</u> |       |        |        |                  |
| Pulmonary stenosis                            | 0.949 | -2.646 | 4.544  | 0.996            |
| Aortic stenosis                               | 2.900 | 0.111  | 5.689  | 0.034            |
| Aortic Coarctation                            | 0.430 | -2.569 | 3.429  | 1.000            |
| <u>Aortic Coarctation vs</u>                  |       |        |        |                  |
| Pulmonary stenosis                            | 0.519 | -3.236 | 4.273  | 1.000            |
| Aortic stenosis                               | 2.470 | -0.522 | 5.462  | 0.203            |
| <u>Pulmonary stenosis vs</u>                  |       |        |        |                  |
| Aortic stenosis                               | 1.951 | -1.638 | 5.540  | 0.753            |

**Supplemental table 10:** Tukey analysis of O<sub>2</sub> pulse<sub>peak</sub>

|                                               | diff  | lwr    | upr   | p adj            |
|-----------------------------------------------|-------|--------|-------|------------------|
| <u>Univentricular Heart vs</u>                |       |        |       |                  |
| ASD                                           | 1.728 | 0.319  | 3.138 | 0.005            |
| VSD                                           | 1.537 | 0.501  | 2.573 | <b>&lt;0.001</b> |
| AV valve abnormality                          | 0.565 | -0.795 | 1.925 | 0.934            |
| Pulmonary stenosis                            | 2.359 | 1.012  | 3.707 | <b>&lt;0.001</b> |
| Aortic stenosis                               | 2.627 | 1.600  | 3.654 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 2.533 | 1.422  | 3.644 | <b>&lt;0.001</b> |
| Transposition of the great arteries           | 2.384 | 1.351  | 3.417 | <b>&lt;0.001</b> |
| Tetralogy of Fallot                           | 3.399 | 0.907  | 5.891 | 0.001            |
| <u>AV valve abnormality vs</u>                |       |        |       |                  |
| ASD                                           | 1.163 | -0.525 | 2.851 | 0.446            |
| VSD                                           | 0.968 | -2.665 | 4.602 | 0.996            |
| Pulmonary stenosis                            | 1.794 | 0.157  | 3.431 | 0.020            |
| Aortic stenosis                               | 2.062 | 0.676  | 3.447 | <b>&lt;0.001</b> |
| Aortic Coarctation                            | 1.968 | 0.520  | 3.417 | 0.001            |
| Transposition of the great arteries           | 1.819 | 0.429  | 3.209 | 0.002            |
| Tetralogy of Fallot                           | 0.952 | -0.380 | 2.284 | 0.393            |
| <u>Tetralogy of Fallot vs</u>                 |       |        |       |                  |
| ASD                                           | 0.211 | -1.170 | 1.593 | 1.000            |
| VSD                                           | 0.020 | -0.978 | 1.018 | <0.001           |
| Pulmonary stenosis                            | 0.842 | -0.477 | 2.161 | 0.555            |
| Aortic stenosis                               | 1.110 | 0.121  | 2.099 | 0.015            |
| Aortic Coarctation                            | 1.016 | -0.060 | 2.092 | 0.082            |
| Transposition of the great arteries           | 0.867 | -0.128 | 1.863 | 0.146            |
| <u>VSD vs</u>                                 |       |        |       |                  |
| ASD                                           | 0.191 | -1.249 | 1.631 | 1.000            |
| Pulmonary stenosis                            | 0.822 | -0.558 | 2.202 | 0.648            |
| Aortic stenosis                               | 1.090 | 0.021  | 2.159 | 0.042            |
| Aortic Coarctation                            | 0.996 | -0.153 | 2.146 | 0.151            |
| Transposition of the great arteries           | 0.847 | -0.227 | 1.922 | 0.258            |
| <u>ASD vs</u>                                 |       |        |       |                  |
| Pulmonary stenosis                            | 0.631 | -1.047 | 2.309 | 0.963            |
| Aortic stenosis                               | 0.899 | -0.535 | 2.332 | 0.581            |
| Aortic Coarctation                            | 0.805 | -0.690 | 2.300 | 0.763            |
| Transposition of the great arteries           | 0.656 | -0.782 | 2.094 | 0.891            |
| <u>Transposition of the great arteries vs</u> |       |        |       |                  |
| Pulmonary stenosis                            | 0.025 | -1.352 | 1.402 | <0.001           |
| Aortic stenosis                               | 0.243 | -0.823 | 1.308 | 0.999            |
| Aortic Coarctation                            | 0.149 | -0.998 | 1.296 | 1.000            |
| <u>Aortic Coarctation vs</u>                  |       |        |       |                  |
| Pulmonary stenosis                            | 0.174 | -1.263 | 1.611 | 1.000            |
| Aortic stenosis                               | 0.094 | -1.048 | 1.235 | 1.000            |
| <u>Pulmonary stenosis vs</u>                  |       |        |       |                  |
| Aortic stenosis                               | 0.268 | -1.105 | 1.641 | 1.000            |

