**Supplemental Digital Content**

Table 1: Results (temporal medians per recording) for normoxic and hypoxic studies, N and H, respectively. Please note that that the actual threshold value for Q is 1.385, corresponding to the Q value where the highest R2 value was found. The rounded off value of 1.4 is used for communication purposes.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Subject ID** | **gender (m/f), \*if skin fototype >III** | **Red AC/DC (x1000)** | **IR AC/DC (x1000)** | **RR [-]** | **Q [-]** | **Cam SpO2 (underlined if Q > 1.4)** | **SpO2 reference (%)** | **% of segments with Q > 1.4** |
| 1 | f | 1.1 | 2.5 | 0.43 | 1.716 | 98.2 | 98.8 | 94 |
| 2 | f | 0.8 | 1.8 | 0.44 | 1.607 | 97.5 | 97.0 | 50 |
| 3 | m | 0.6 | 1.6 | 0.40 | 1.954 | 99.4 | 97.8 | 100 |
| 4 | m | 1.3 | 2.9 | 0.46 | 2.390 | 96.6 | 96.8 | 100 |
| 5 | m | 1.3 | 2.7 | 0.49 | 2.481 | 95.4 | 97.5 | 100 |
| 6 | m | 1.8 | 3.8 | 0.48 | 2.214 | 95.6 | 96.7 | 72 |
| 7 | m\* | 0.5 | 1.5 | 0.37 | 1.702 | 100. | 101.4 | 65 |
| 8 | m | 1.0 | 2.3 | 0.43 | 2.084 | 98.1 | 98.0 | 100 |
| 9 | m | 1.3 | 3.1 | 0.43 | 2.139 | 98.2 | 98.3 | 100 |
| 10 | m | 0.9 | 2.4 | 0.38 | 1.261 | 100. | 98.9 | 33 |
| 11 | m | 1.2 | 2.3 | 0.51 | 0.953 | 94.3 | 99.6 | 11 |
| 12 | m | 1.3 | 2.8 | 0.45 | 1.275 | 97.4 | 96.9 | 44 |
| 13 | f | 1.0 | 2.3 | 0.43 | 1.718 | 98.0 | 98.2 | 80 |
| 14 | f | 0.4 | 0.9 | 0.40 | 1.927 | 99.6 | 99.9 | 90 |
| 15 | f | 0.3 | 0.8 | 0.36 | 1.253 | 101. | 100.2 | 40 |
| 16 | f | 0.5 | 1.1 | 0.45 | 1.115 | 97.2 | 99.9 | 19 |
| 17 | f | 0.4 | 1.0 | 0.43 | 1.450 | 97.9 | 97.5 | 60 |
| 18 | f | 0.7 | 1.5 | 0.44 | 1.389 | 97.7 | 97.5 | 53 |
| 19 | f | 0.9 | 2.2 | 0.42 | 2.121 | 98.7 | 97.2 | 100 |
| 20 | m | 0.8 | 1.9 | 0.43 | 2.291 | 98.0 | 98.2 | 97 |
| 21 | f | 0.5 | 1.3 | 0.42 | 1.523 | 98.7 | 98.2 | 67 |
| 22 | f | 0.5 | 1.4 | 0.39 | 1.743 | 99.8 | 99.2 | 97 |
| 23 | f | 0.7 | 1.5 | 0.44 | 1.545 | 97.6 | 99.2 | 61 |
| 24 | m | 2.2 | 4.6 | 0.48 | 2.070 | 96.0 | 97.9 | 80 |
| 25 | m | 0.6 | 1.4 | 0.45 | 1.466 | 97.3 | 97.1 | 50 |
| 20 | m | 1.0 | 1.8 | 0.54 | 1.143 | 92.9 | 95.1 | 24 |
| 26 | f | 0.8 | 1.2 | 0.62 | 1.946 | 89.6 | 91 | 77 |
| 27 | m | 0.7 | 0.9 | 0.76 | 1.322 | 82.9 | 88.95 | 41 |
| 28 | m | 0.7 | 1.2 | 0.56 | 1.090 | 92.0 | 93.625 | 17 |
| 29 | m\* | 0.7 | 1.1 | 0.63 | 1.466 | 88.8 | 90.25 | 58 |
| 30 | m\* | 0.9 | 1.7 | 0.52 | 1.216 | 93.8 | 94.35 | 29 |
| 31 | m\* | 0.8 | 1.6 | 0.53 | 1.083 | 93.4 | 92.95 | 16 |
| 32 | f | 0.6 | 0.6 | 0.96 | 0.485 | 73.9 | 89.85 | 0 |
| 33 | m | 1.1 | 1.8 | 0.66 | 1.271 | 87.8 | 89.15 | 42 |
| 34 | m | 2.0 | 2.9 | 0.69 | 1.816 | 86.2 | 85.2 | 96 |
| 35 | m\* | 1.3 | 2.1 | 0.62 | 0.742 | 89.5 | 96.5 | 7.7 |
| 36 | m\* | 0.6 | 0.9 | 0.73 | 0.920 | 84.5 | 93.4 | 8.8 |
| 37 | m | 2.5 | 4.6 | 0.55 | 1.988 | 92.6 | 94.125 | 99 |
| 38 | m | 1.9 | 2.9 | 0.66 | 1.385 | 87.5 | 87.4 | 55 |
| 4 | m | 1.6 | 2.3 | 0.70 | 1.540 | 85.8 | 84.55 | 60 |
| 5 | m | 2.1 | 3.3 | 0.66 | 2.156 | 87.6 | 88.975 | 78 |
| 6 | m | 1.7 | 2.8 | 0.62 | 2.292 | 89.6 | 90.65 | 81 |
| 7 | m\* | 0.5 | 0.9 | 0.55 | 0.848 | 92.7 | 91.5 | 20 |
| 39 | m | 1.5 | 2.8 | 0.53 | 2.224 | 93.6 | 92.55 | 85 |
| 8 | m | 2.0 | 3.2 | 0.61 | 2.397 | 89.9 | 87.2 | 100 |
| 9 | m | 1.7 | 2.9 | 0.58 | 2.591 | 91.1 | 89.55 | 100 |

Table 2: Results (temporal medians per recording) for the climate room study C.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Session** | **Tempera-ture (room, medium, cold)** | **Sub-ject ID** | **Gen-der (m/f)** | **Red AC/DC (x1000)** | **IR AC/DC (x1000)** | **RR [-]** | **Q [-]** | **Cam SpO2 (%) (underlined if Q > 1.4)** | **SpO2 Reference (%)** | **% of segments with Q > 1.4** |
| 1 | R | 40 | m | 0.6 | 1.3 | 0.46 | 1.965 | 96.7 | 95.7 | 96 |
| 1 | M | 40 | m | 0.5 | 1.2 | 0.46 | 1.565 | 96.9 | 97.1 | 60 |
| 1 | C | 40 | m | 0.3 | 0.7 | 0.47 | 1.182 | 96.4 | 99.9 | 36 |
| 2 | R | 40 | m | 0.4 | 0.8 | 0.46 | 1.850 | 96.8 | 96.9 | 80 |
| 2 | M | 40 | m | 0.3 | 0.7 | 0.39 | 1.555 | 99.8 | 97.4 | 68 |
| 2 | C | 40 | m | 0.2 | 0.5 | 0.43 | 1.383 | 98.1 | 99.8 | 52 |
| 1 | R | 41 | m | 0.9 | 2.1 | 0.42 | 1.822 | 98.7 | 97.3 | 96 |
| 1 | M | 41 | m | 0.6 | 1.6 | 0.38 | 2.016 | 100.6 | 99.3 | 96 |
| 1 | C | 41 | m | 0.4 | 1.0 | 0.38 | 1.524 | 100.5 | 99.8 | 75 |
| 2 | R | 41 | m | 1.1 | 2.6 | 0.43 | 1.866 | 98.0 | 97.6 | 84 |
| 2 | M | 41 | m | 0.7 | 1.6 | 0.41 | 1.590 | 98.9 | 97.3 | 76 |
| 2 | C | 41 | m | 0.4 | 1.1 | 0.41 | 1.256 | 99.0 | 99.9 | 32 |
| 1 | R | 4 | m | 0.5 | 1.3 | 0.44 | 1.919 | 97.7 | 96.2 | 83 |
| 1 | M | 4 | m | 0.4 | 1.1 | 0.41 | 1.919 | 99.2 | 97.0 | 84 |
| 1 | C | 4 | m | 0.3 | 0.8 | 0.42 | 1.225 | 98.8 | 98.6 | 28 |
| 2 | R | 4 | m | 1.0 | 2.3 | 0.45 | 2.722 | 97.1 | 95.7 | 96 |
| 2 | M | 4 | m | 0.8 | 1.9 | 0.42 | 2.212 | 98.7 | 96.2 | 100 |
| 2 | C | 4 | m | 0.3 | 0.9 | 0.37 | 1.462 | 100.9 | 98.6 | 62 |
| 1 | R | 5 | m | 1.2 | 2.6 | 0.47 | 2.047 | 96.3 | 97.2 | 100 |
| 1 | M | 5 | m | 0.6 | 1.3 | 0.48 | 1.480 | 95.8 | 97.2 | 56 |
| 1 | C | 5 | m | 0.5 | 1.0 | 0.49 | 1.366 | 95.5 | 99.3 | 48 |
| 2 | R | 5 | m | 1.1 | 2.4 | 0.44 | 2.361 | 97.7 | 97.0 | 96 |
| 2 | M | 5 | m | 0.9 | 1.9 | 0.44 | 2.302 | 97.7 | 96.7 | 100 |
| 2 | C | 5 | m | 0.5 | 1.0 | 0.45 | 1.654 | 97.3 | 98.3 | 75 |
| 1 | R | 8 | m | 0.6 | 1.4 | 0.43 | 2.067 | 98.3 | 97.4 | 100 |
| 1 | M | 8 | m | 0.5 | 1.0 | 0.46 | 1.788 | 97.0 | 97.9 | 92 |
| 1 | C | 8 | m | 0.4 | 0.7 | 0.55 | 1.299 | 92.7 | 100.2 | 32 |
| 2 | R | 8 | m | 0.7 | 1.6 | 0.42 | 2.164 | 98.5 | 97.4 | 100 |
| 2 | M | 8 | m | 0.6 | 1.1 | 0.49 | 1.850 | 95.2 | 99.0 | 76 |
| 2 | C | 8 | m | 0.5 | 0.8 | 0.60 | 1.240 | 90.2 | 100.1 | 32 |

Table 3: Inclusion and exclusion criteria for studies N, H and C.

|  |  |  |
| --- | --- | --- |
| Study | Inclusion criteria | Exclusion criteria |
| N | Healthy, age range 18-65 years | Known heart disease, e,.g. arythmia. chronic obstructive pulmonary disease (COPD), pregnant, pacemaker |
| H | Healthy, age range 18-65 years. Has been on intercontinental flight and walk through isle without any problems such as dizziness, short of breath, drowsiness. Together with experimentor, walked up one flight of stairs without shortness of breath or dizziness | History of vascular diseases, COPD, pulmonary hypertension, bronchitis, emphysema, neurological diseases (epilepsy etc.), migraines, allergies. Possibility of pregnancy. Pacemaker. Experienced dizziness at high altitudes. Cold or infections within past two weeks. History of haemoglobin deficiency or anaemia. Took any medicine (including aspirine, anti-biotics) in past two weeks. Experiences shortness of breath when vacuuming, walking stairs, exercise in general. Ever felt claustrofobia. |
| C | As in study N | As in study N |