**Supplemental Table 1. Patient Characteristic and Management Variable Comparisons Between Patients Extubated to High Flow Nasal Cannula Who Were or Were Not Escalated to Positive Airway Pressure (Rescue PAP)**

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|  | Extubation Group |
| Characteristics | **No Rescue PAP****(*n* = 123)** | **Rescue PAP****(*n* = 35)** | ***pa*** |
| Preoperative |  |  |  |
|  Male gender | 68 (55) | 23 (66) | 0.334 |
|  Age at surgery, days | 108 (31, 132) | 16 (6, 115) | 0.001 |
|  Gestational age, weeks | 38 (37, 39) | 38 (37, 39) | 0.670 |
|  Admission weight, kg | 4.9 (3.8, 5.8) | 3.7 (3, 4.4) | <0.001 |
|  Admission weight-for-age z score | -1.3 (-2.4, -0.3) | -1.3 (-2.5, 0) | 0.768 |
|  Genetic or congenital anomaly | 45 (37) | 13 (37) | 0.952 |
|  Airway anomaly | 8 (6) | 8 (23) | 0.009 |
|  Intubated prior to surgery | 5 (4) | 4 (11) | 0.110 |
|  Single ventricle physiology | 35 (29) | 14 (40) | 0.193 |
| Operative |  |  |  |
|  STAT category |  |  | 0.012 |
|  1-3 | 97 (79) | 18 (51) |  |
|  4-5 | 26 (21) | 17 (49) |  |
|  CPB time, minutes | 77 (56, 104) | 120 (85, 144) | <0.001 |
| Postoperative |  |  |  |
|  Postoperative MV duration, hours | 16 (8, 25) | 24 (15, 89) | <0.001 |
|  Diaphragm paresis | 0 (0) | 2 (6) | 0.048 |
|  Vocal cord paresis | 9 (7) | 4 (11) | 0.487 |
|  VIS at extubation  | 7.5 (5, 7.5) | 7.5 (5, 7.5) | 0.440 |
|  iNO treatment at extubation | 8 (6) | 4 (11) | 0.304 |
|  Sedation at extubation | 35 (29) | 12 (34) | 0.506 |
|  Dexamethasone at extubation | 47 (38) | 12 (34) | 0.672 |

CPB = cardiopulmonary bypass, iNO = inhaled nitric oxide, MV = invasive mechanical ventilation, STAT = Society of Thoracic Surgeons-European Association for Cardiothoracic Surgery cardiac surgery mortality category, VIS = vasoactive inotropic score.

*a*Statistical comparisons performed using Chi-square, Fisher Exact, or Mann Whitney U test, as appropriate, for categorical/ordinal or continuous data.

Data presented as *n* (%) or median (interquartile range) as appropriate.