Supplementary Online Content

Fink EL, Kochanek PM, Panigrahy A, et al; Personalizing Outcomes After Child Cardiac Arrest (POCCA) Investigators. Association of blood-based brain injury biomarker concentrations with outcomes after pediatric cardiac arrest. *JAMA Netw Open*. 2022;5(9):e2230518. doi:10.1001/jamanetworkopen.2022.30518

**eTable 1.** Postresuscitation Hospital Data Overall and by Favorable and Unfavorable Outcome Groups

**eTable 2.** Unadjusted Biomarker Concentrations on Days 1 to 3 Overall, by Outcome Group, and by Alive With Unfavorable Outcome and Death at 1 Year After Cardiac Arrest

**eTable 3.** Biomarker Area Under the Receiver Operating Characteristic Curves (AUROCs), Specificity, Threshold (pg/mL), and Sensitivity on Univariate Biomarker Models, With Set Specificity of 95% for Favorable vs Unfavorable Outcome

**eTable 4.** Univariate Logistic Regression Models for Favorable or Unfavorable Outcome at 1 Year by Blood-Based Brain Injury Biomarker on Post–Cardiac Arrest Days 1, 2, and 3

**eTable 5.** Multivariate Area Under the Receiver Operating Characteristic Curves (AUROCs) With and Without Individual Biomarkers on Days 1, 2, and 3

**eTable 6.** Comparison of Patient and Cardiac Arrest Characteristics Among Children With and Without Data Available on 1 Year Outcomes

This supplementary material has been provided by the authors to give readers additional information about their work.
eTable 1. Postresuscitation Hospital Data Overall and by Favorable and Unfavorable Outcome Groups

| Variables, n (%) | Overall N=120 | Favorable N=70 | Unfavorable N=50 | p-value |
|------------------|---------------|----------------|------------------|---------|
| Fever (> 38°C)   | 59 (49.2)     | 34 (48.6)      | 25 (50.0)        | 0.877   |
| Seizure occurrence | 33 (27.5)     | 12 (17.1)      | 21 (42.0)        | 0.003   |
| Arterial blood gas values, median (interquartile range [IQR]), day 1 | | | |
| Lowest PaO2, mmHg | 63.5 (48.0, 83.0) N=94 | 60.0 (46.5, 74.8) N=52 | 71.0 (55.0, 88.0) N=42 | 0.062 |
| Highest PaO2, mmHg | 193.5 (105.0, 283.7) N=94 | 235.5 (119.0, 325.0) N=52 | 169.8 (100.0, 239.0) N=42 | 0.048 |
| Lowest PaCO2, mmHg | 30.4 (27.0, 36.0) N=94 | 30.0 (27.7, 35.9) N=52 | 30.7 (26.0, 36.5) N=42 | 0.948 |
| Highest PaCO2, mmHg | 50.2 (42.5, 63.7) N=94 | 53.5 (43.5, 67.5) N=52 | 44.0 (38.7, 52.0) N=50 | 0.003 |
| Lowest systolic blood pressure, median (IQR), mmHg | 67.0 (55.5, 79.5) N=120 | 67.5 (58.0, 80.0) N=70 | 65.5 (52.0, 78.0) N=50 | 0.377 |
| Highest systolic blood pressure, median (IQR), mmHg | 124.0 (111.0, 141.5) N=120 | 122.0 (109.0, 140.0) N=70 | 125.5 (114.0, 144.0) N=50 | 0.583 |
| Invasive mechanical ventilation | 117 (97.5) | 67 (95.7) | 50 (100.0) | 0.138 |
| Invasive mechanical ventilation, median (IQR), days | 8.0 (4.0, 16.0) N=117 | 8.0 (4.0, 13.0) N=67 | 9.5 (4.0, 22.0) N=50 | 0.278 |
| Vasoactive infusions, day 1 | | | |
| Epinephrine | 76 (63.33) | 76 (63.33) | 76 (63.33) | 0.370 |
| Milrinone | 28 (23.33) | 17 (24.29) | 11 (22.00) | 0.770 |
| Norepinephrine | 22 (18.33) | 10 (14.29) | 12 (24.00) | 0.175 |
| Dopamine | 13 (10.83) | 5 (7.14) | 8 (16.00) | 0.124 |
| Vasopressin | 12 (10.00) | 5 (7.14) | 7 (14.00) | 0.217 |
| Phenylephrine | 6 (5.00) | 4 (5.71) | 2 (4.00) | 0.671 |
| Isoproterenol | 1 (0.83) | 1 (1.43) | 0 (0) | 0.396 |
| Dobutamine | 0 | 0 | 0 | NA |
| First lactate, median (IQR), mmol/L     | 5.8 (2.9, 10.9) N=107 | 4.8 (2.3, 8.9) N=62 | 8.6 (3.8, 13.2) N=45 | 0.014 |
|----------------------------------------|------------------------|---------------------|----------------------|-------|
| Pediatric Index of Mortality, median (IQR), % | 16 (7-31)              | 14 (5-18)           | 29 (15-88)           | <0.001|
| First Glasgow Coma Scale score in the ICU, median (IQR) | 4 (3, 9) N=88          | 7 (3, 11) N=48     | 3 (3, 7) N=40       | 0.016 |
| Extracorporeal membrane oxygenation    | 28 (23.3)              | 18 (25.7)           | 10 (20.0)            | 0.466 |
| Extracorporeal CPR                     | 22 (78.6)              | 15 (83.3)           | 7 (70.0)             | 0.410 |
| Target temperature management, prevention of fever | 31 (25.8)              | 12 (17.1)           | 18 (36.0)            | 0.032 |
| Target temperature management, therapeutic hypothermia | 15 (12.5)              | 12 (17.1)           | 3 (6.0)              | 0.069 |
| Duration at target temperature, median (IQR), h | 59 (40, 82)           | 59 (41, 82)         | 62 (19, 130)         | 0.942 |

ICU, intensive care unit; CPR, cardiopulmonary resuscitation. p-value are based on Chi-square test for categorical variables, Kruskal-Wallis test for continuous variables. Favorable outcome was Vineland Adaptive Behavioral Scale-III (VABS) score >=70 and Unfavorable outcome was VABS < 70 or died.
### eTable 2. Unadjusted Biomarker Concentrations on Days 1 to 3 Overall, by Outcome Group, and by Alive With Unfavorable Outcome and Death at 1 Year After Cardiac Arrest

#### A. Day 1

| Median (interquartile range) | Overall N=120 | Favorable N=70 | Unfavorable N=50 | Kruskal-Wallis p-value | VABS < 70 N=7 | Dead N=43 |
|-----------------------------|---------------|---------------|------------------|------------------------|---------------|-----------|
| **NFL**                     | n=118         | n=70          | n=48             | <0.001                 |               |           |
| 27.95 (9.88, 70.75)         |               |               | 50.54 (20.56, 169.00) |                       | 14.17 (9.88, 41.39) | 62.40 (28.70, 199.00) |
| **Tau**                     | n=118         | n=70          | n=48             | <0.001                 |               |           |
| 8.97 (2.85, 60.70)          |               |               | 50.10 (6.53, 149.30) |                       | 6.58 (3.30, 14.95) | 60.70 (8.87, 171.10) |
| **GFAP**                    | n=118         | n=70          | n=48             | 0.002                  |               |           |
| 212.51 (109.00, 816.76)     |               |               | 469.88 (137.70, 2780.48) |                       | 311.21 (159.02, 445.62) | 621.39 (136.06, 3009.46) |
| **UCH-L1**                  | n=118         | n=70          | n=48             | <0.001                 |               |           |
| 138.95 (40.04, 518.77)      |               |               | 310.40 (110.73, 848.36) |                       | 57.50 (19.73, 89.71) | 399.78 (171.22, 915.71) |

All biomarker concentrations are in pg/ml. GFAP, Glial fibrillary acidic protein; UCH-L1, ubiquitin carboxyl-terminal esterase- L1; NFL, neurofilament light
### B. Day 2

|       | Overall N=120 | Favorable N=70 | Unfavorable N=50 | p-value | VABS < 70 N=7 | Dead N=43 |
|-------|---------------|----------------|------------------|---------|---------------|-----------|
| NFL   | n=104         | n=61           | n=43             | <0.001  |               |           |
|       | 75.45 (20.08, 299.66) | 31.17 (13.15, 88.67) | 287.26 (78.23, 898.47) |         | 147.04 (66.09, 1169.23) | 303.00 (126.50, 786.34) |
| Tau   | n=104         | n=61           | n=43             | <0.001  |               |           |
|       | 15.17 (2.40, 108.41) | 5.04 (1.34, 20.23) | 99.59 (10.09, 702.00) |         | 24.46 (1.83, 102.81) | 114.00 (10.15, 1296.00) |
| GFAP  | n=104         | n=61           | n=43             | <0.001  |               |           |
|       | 342.01 (139.43, 1912.20) | 162.39 (104.46, 361.89) | 1515.27 (386.16, 16470.00) |         | 407.60 (283.30, 8109.00) | 1575.70 (584.00, 16470.00) |
| UCH-L1| n=104         | n=61           | n=43             | <0.001  |               |           |
|       | 94.18 (32.80, 285.75) | 51.31 (22.85, 98.31) | 319.10 (163.24, 2129.17) |         | 194.52 (27.30, 292.52) | 410.87 (172.72, 3163.00) |

All biomarker concentrations are in pg/ml. GFAP, Glial fibrillary acidic protein; UCH-L1, ubiquitin carboxyl-terminal esterase-1; NFL, neurofilament light.
C. Day 3

| Median (interquartile range) | Overall N=120 | Favorable N=70 | Unfavorable N=50 | p-value | VABS < 70 N=7 | Dead N=43 |
|-----------------------------|---------------|----------------|------------------|---------|---------------|-----------|
| **NFL**                    |               |                |                  |         |               |           |
| n=94                       | n=55          | n=39           |                  | <0.001  | n=6           | n=33      |
| 177.60 (35.33, 469.38)     | 60.63 (23.59, 217.99) | 490.88 (136.52, 1512.99) |                   | 232.58 (95.99, 1359.43) | 528.00 (199.87, 1512.99) |
| **Tau**                    |               |                |                  |         |               |           |
| n=94                       | n=55          | n=39           |                  | <0.001  | n=6           | n=33      |
| 15.44 (2.63, 103.01)       | 6.92 (1.78, 29.16) | 97.65 (4.33, 964.00) |                   | 103.07 (2.12, 178.22) | 93.30 (8.32, 964.00) |
| **GFAP**                   |               |                |                  |         |               |           |
| n=93                       | n=55          | n=38           |                  | <0.001  | n=6           | n=32      |
| 334.30 (150.55, 5205.00)   | 166.21 (98.36, 404.55) | 2736.71 (368.75, 12812.05) |                   | 1599.75 (347.03, 7303.49) | 3543.37 (382.99, 17253.52) |
| **UCH-L1**                 |               |                |                  |         |               |           |
| n=93                       | n=55          | n=38           |                  | <0.001  | n=5           | n=33      |
| 117.72 (32.75, 344.54)     | 49.67 (21.43, 133.10) | 357.36 (188.96, 1737.00) |                   | 341.60 (16.57, 358.88) | 389.02 (192.96, 1737.00) |

All biomarker concentrations are in pg/ml. GFAP, Glial fibrillary acidic protein; UCH-L1, ubiquitin carboxyl-terminal esterase-L1; NFL, neurofilament light

P-value, Kruskal-Wallis test, Favorable vs. Unfavorable Outcome

VABS, Vineland Adaptive Behavior Scales
**eTable 3.** Biomarker Area Under the Receiver Operating Characteristic Curves (AUROCs), Specificity, Threshold (pg/mL), and Sensitivity on Univariate Biomarker Models, With Set Specificity of 95% for Favorable vs Unfavorable Outcome

### A. Day 1

| Model  | AUROC     | Specificity (95% CI) | Threshold level | Sensitivity (95% CI) | Patients, N (%) |
|--------|-----------|----------------------|-----------------|----------------------|-----------------|
|        |           |                      | (pg/mL)         |                      | True Positive   |
|        |           |                      | Base 10          |                      | False Negative  |
|        |           |                      | logarithm        |                      | False Positive  |
|        |           |                      |                 |                      | True Negative   |
|        |           |                      |                 |                      | Total           |
| NFL    | 0.731 (0.624, 0.820) | 0.957 (0.880, 0.991) | 184.00 2.26 | 0.250 (0.136, 0.396) | 12 (10.17) 36 (30.51) 3 (2.54) 67 (56.78) 118 |
| Tau    | 0.704 (0.646, 0.831) | 0.957 (0.880, 0.991) | 111.75 2.05 | 0.333 (0.204, 0.484) | 16 (13.56) 32 (27.12) 3 (2.54) 67 (56.78) 118 |
| GFAP   | 0.670 (0.571, 0.768) | 0.957 (0.880, 0.991) | 129544.00 5.11 | 0.043 (0.005, 0.143) | 2 (1.69) 46 (38.98) 3 (2.54) 67 (56.78) 118 |
| UCH-L1 | 0.708 (0.614, 0.803) | 0.957 (0.878, 0.991) | 2319.00 3.37 | 0.146 (0.061, 0.278) | 7 (5.98) 41 (35.04) 3 (2.56) 66 (56.41) 117 |

Biomarkers on base-10 logarithm scale.
B. Day 2

| Model | AUROC (95%CI) | Specificity (95%CI) | Threshold level | Sensitivity (95%CI) | Patients, N (%) |
|-------|-------------|----------------------|-----------------|--------------------|-----------------|
|       |             |                      | (pg/mL)         | Base 10 logarithm  | True Positive | False Negative | False Positive | True Negative | Total |
| NFL   | 0.857 (0.788, 0.926) | 0.951 (0.863, 0.990) | 389.01          | 2.59               | 0.442 (0.291, 0.601) | 19 (18.27) | 24 (23.08) | 3 (2.88) | 58 (55.77) | 104   |
| Tau   | 0.780 (0.687, 0.874) | 0.951 (0.863, 0.990) | 240.15          | 2.38               | 0.395 (0.259, 0.556) | 17 (16.35) | 26 (25.00) | 3 (2.88) | 58 (55.77) | 104   |
| GFAP  | 0.795 (0.707, 0.883) | 0.951 (0.863, 0.990) | 92690.00        | 4.97               | 0.12 (0.04, 0.25)   | 5 (4.81)  | 38 (36.54) | 3 (2.88) | 58 (55.77) | 104   |
| UCH-L1| 0.860 (0.785, 0.935) | 0.948 (0.856, 0.989) | 276.15          | 2.44               | 0.581 (0.421, 0.730) | 25 (24.75) | 18 (17.82) | 3 (2.97) | 55 (54.46) | 101   |

Biomarkers on base-10 logarithm scale.
C. Day 3

| Model    | AUROC     | Specificity (95%CI) | Threshold level | Sensitivity (95%CI) | Patients, N (%) |
|----------|-----------|---------------------|-----------------|---------------------|-----------------|
|          |           |                     | (pg/mL)         |                      | True Positive   |
|          |           |                     | Base 10         |                      | False Negative  |
|          |           |                     | logarithm       |                      | False Positive  |
|          |           |                     |                 |                      | True Negative   |
|          |           |                     |                 |                      | Total           |
| NFL      | 0.824     | 0.946 (0.849, 0.989)| 490.88          | 2.69                | 0.513 (0.348, 0.676)| 20 (21.28) | 19 (20.21) | 3 (3.19) | 52 (55.32) | 94 |
| Tau      | 0.752     | 0.946 (0.849, 0.989)| 108.48          | 2.04                | 0.487 (0.324, 0.652)| 19 (20.21) | 20 (21.28) | 3 (3.19) | 52 (55.32) | 94 |
| GFAP     | 0.807     | 0.946 (0.849, 0.989)| 40040.00        | 4.60                | 0.211 (0.096, 0.373)| 8 (8.60)  | 30 (32.26) | 3 (3.23) | 52 (55.91) | 93 |
| UCH-L1   | 0.837     | 0.962 (0.870, 0.995)| 341.60          | 2.53                | 0.605 (0.434, 0.760)| 23 (25.27) | 15 (16.48) | 2 (2.20) | 51 (56.04) | 91 |

Biomarkers on base-10 logarithm scale.
eTable 4. Univariate Logistic Regression Models for Favorable or Unfavorable Outcome at 1 Year by Blood-Based Brain Injury Biomarker on Post–Cardiac Arrest Days 1, 2, and 3

A. Neurofilament light

|                                      | Day 1         | Day 2         | Day 3         |
|--------------------------------------|---------------|---------------|---------------|
|                                      | Odds Ratio    | 95% Wald Cl   | Odds Ratio    | 95% Wald Cl   | Odds Ratio    | 95% Wald Cl   |
| Neurofilament light, log pg/ml       | 4.23          | 2.12, 8.45    | 11.55         | 4.52, 29.54   | 7.76          | 3.22, 18.69   |
| Age, years                           | 0.98          | 0.92, 1.04    | 0.98          | 0.92, 1.04    | 0.98          | 0.92, 1.04    |
| Male vs Female sex                   | 0.92          | 0.44, 1.93    | 0.92          | 0.44, 1.93    | 0.92          | 0.44, 1.93    |
| Non-White vs White Race              | 0.82          | 0.38, 1.79    | 0.82          | 0.38, 1.79    | 0.82          | 0.38, 1.79    |
| Cardiac vs Asphyxia etiology         | 0.89          | 0.38, 2.07    | 0.89          | 0.38, 2.07    | 0.89          | 0.38, 2.07    |
| In-hospital vs Out of hospital event | 0.24          | 0.11, 0.52    | 0.24          | 0.11, 0.52    | 0.24          | 0.11, 0.52    |
| Witnessed                            | 0.09          | 0.03, 0.26    | 0.09          | 0.03, 0.26    | 0.09          | 0.03, 0.26    |
| Bystander resuscitation              | 3.38          | 1.54, 7.41    | 3.38          | 1.54, 7.41    | 3.38          | 1.54, 7.41    |
| Extracorporeal membrane oxygenation  | 0.72          | 0.30, 1.73    | 0.72          | 0.30, 1.73    | 0.72          | 0.30, 1.73    |
| Pediatric Index of Mortality score   | 2.10          | 1.53, 2.89    | 2.10          | 1.53, 2.89    | 2.10          | 1.53, 2.89    |
| TTM used for prevention of fever     | 2.47          | 1.07, 5.68    | 2.47          | 1.07, 5.68    | 2.47          | 1.07, 5.68    |
| TTM used for therapeutic hypothermia | 0.31          | 0.08, 1.16    | 0.31          | 0.08, 1.16    | 0.31          | 0.08, 1.16    |

TTM, targeted temperature management; CI, confidence interval; NA, not applicable
### B. Ubiquitin carboxyl-terminal esterase- L1

|                                | Day 1               | Day 2               | Day 3               |
|--------------------------------|---------------------|---------------------|---------------------|
|                                | Odds Ratio          | 95% Wald CI         | Odds Ratio          | 95% Wald CI         | Odds Ratio          | 95% Wald CI         |
| Ubiquitin carboxyl-terminal esterase- L1, log pg/ml | 2.85                | 1.61, 5.05          | 16.32               | 5.13, 51.92         | 7.14                | 2.90, 17.60          |
| Age, years                     | 0.98                | 0.92, 1.04          | 0.98                | 0.92, 1.04          | 0.98                | 0.92, 1.04          |
| Male vs Female sex             | 0.92                | 0.44, 1.93          | 0.92                | 0.44, 1.93          | 0.92                | 0.44, 1.93          |
| Non-White vs White Race        | 0.82                | 0.38, 1.79          | 0.82                | 0.38, 1.79          | 0.82                | 0.38, 1.79          |
| Cardiac vs Asphyxia etiology   | 0.89                | 0.38, 2.07          | 0.89                | 0.38, 2.07          | 0.89                | 0.38, 2.07          |
| In-hospital vs Out of hospital event | 0.24             | 0.11, 0.52          | 0.24                | 0.11, 0.52          | 0.24                | 0.11, 0.52          |
| Witnessed                      | 0.09                | 0.03, 0.26          | 0.09                | 0.03, 0.26          | 0.09                | 0.03, 0.26          |
| Bystander resuscitation        | 3.38                | 1.54, 7.41          | 3.38                | 1.54, 7.41          | 3.38                | 1.54, 7.41          |
| Extracorporeal membrane oxygenation | 0.72              | 0.30, 1.73          | 0.72                | 0.30, 1.73          | 0.72                | 0.30, 1.73          |
| Pediatric Index of Mortality score | 2.10              | 1.53, 2.89          | 2.10                | 1.53, 2.89          | 2.10                | 1.53, 2.89          |
| TTM used for prevention of fever | 2.47               | 1.07, 5.68          | 2.47                | 1.07, 5.68          | 2.47                | 1.07, 5.68          |
| TTM used for therapeutic hypothermia | 0.31              | 0.08, 1.16          | 0.31                | 0.08, 1.16          | 0.31                | 0.08, 1.16          |

TTM, targeted temperature management; CI, confidence interval; NA, not applicable
### C. Glial fibrillary acidic protein

|                                | Day 1          | Day 2          | Day 3          |
|--------------------------------|----------------|----------------|----------------|
|                                | Odds Ratio     | 95% Wald CI    | Odds Ratio     | 95% Wald CI    | Odds Ratio     | 95% Wald CI    |
| Glial fibrillary acidic protein, log pg/ml | 1.69, 1.11, 2.57 | 2.57, 1.60, 4.14 | 2.74, 1.66, 4.50 |
| Age, years                     | 0.98, 0.92, 1.04 | 0.98, 0.92, 1.04 | 0.98, 0.92, 1.04 |
| Male vs Female sex             | 0.92, 0.44, 1.93 | 0.92, 0.44, 1.93 | 0.92, 0.44, 1.93 |
| Non-White vs White Race        | 0.82, 0.38, 1.79 | 0.82, 0.38, 1.79 | 0.82, 0.38, 1.79 |
| Cardiac vs Asphyxia etiology   | 0.89, 0.38, 2.07 | 0.89, 0.38, 2.07 | 0.89, 0.38, 2.07 |
| In-hospital vs Out of hospital event | 0.24, 0.11, 0.52 | 0.24, 0.11, 0.52 | 0.24, 0.11, 0.52 |
| Witnessed                      | 0.09, 0.03, 0.26 | 0.09, 0.03, 0.26 | 0.09, 0.03, 0.26 |
| Bystander resuscitation        | 3.38, 1.54, 7.41 | 3.38, 1.54, 7.41 | 3.38, 1.54, 7.41 |
| Extracorporeal membrane oxygenation | 0.72, 0.30, 1.73 | 0.72, 0.30, 1.73 | 0.72, 0.30, 1.73 |
| Pediatric Index of Mortality score | 2.10, 1.53, 2.89 | 2.10, 1.53, 2.89 | 2.10, 1.53, 2.89 |
| TTM used for prevention of fever | 2.47, 1.07, 5.68 | 2.47, 1.07, 5.68 | 2.47, 1.07, 5.68 |
| TTM used for therapeutic hypothermia | 0.31, 0.08, 1.16 | 0.31, 0.08, 1.16 | 0.31, 0.08, 1.16 |

TTM, targeted temperature management; CI, confidence interval; NA, not applicable
### D. Tau

|                        | Day 1   | Day 2       | Day 3       |
|------------------------|---------|-------------|-------------|
|                        | Odds Ratio | 95% Wald CI | Odds Ratio | 95% Wald CI | Odds Ratio | 95% Wald CI |
| Tau, log pg/ml         | 2.97    | 1.78, 4.96  | 3.03       | 1.88, 4.90  | 2.59       | 1.63, 4.12  |
| Age, years             | 0.98    | 0.92, 1.04  | 0.98       | 0.92, 1.04  | 0.98       | 0.92, 1.04  |
| Male vs Female sex     | 0.92    | 0.44, 1.93  | 0.92       | 0.44, 1.93  | 0.92       | 0.44, 1.93  |
| Non-White vs White Race| 0.82    | 0.38, 1.79  | 0.82       | 0.38, 1.79  | 0.82       | 0.38, 1.79  |
| Cardiac vs Asphyxia etiology | 0.89   | 0.38, 2.0)  | 0.89       | 0.38, 2.07  | 0.89       | 0.38, 2.07  |
| In-hospital vs Out of hospital event | 0.24 | 0.11, 0.52  | 0.24       | 0.11, 0.52  | 0.24       | 0.11, 0.52  |
| Witnessed              | 0.09    | 0.03, 0.26  | 0.09       | 0.03, 0.26  | 0.09       | 0.03, 0.26  |
| Bystander resuscitation| 3.38    | 1.54, 7.41  | 3.38       | 1.54, 7.41  | 3.38       | 1.54, 7.41  |
| Extracorporeal membrane oxygenation | 0.72 | 0.30, 1.73  | 0.72       | 0.30, 1.73  | 0.72       | 0.30, 1.73  |
| Pediatric Index of Mortality score | 2.10 | 1.53, 2.89  | 2.10       | 1.53, 2.89  | 2.10       | 1.53, 2.89  |
| TTM used for prevention of fever | 2.47 | 1.07, 5.68  | 2.47       | 1.07, 5.68  | 2.47       | 1.07, 5.68  |
| TTM used for therapeutic hypothermia | 0.31 | 0.08, 1.16  | 0.31       | 0.08, 1.16  | 0.31       | 0.08, 1.16  |

TTM, targeted temperature management; CI, confidence interval; NA, not applicable
**eTable 5.** Multivariate Area Under the Receiver Operating Characteristic Curves (AUROCs) With and Without Individual Biomarkers on Days 1, 2, and 3

| Day post-cardiac arrest, biomarker | AUROC with biomarker $^a$ | AUROC without biomarker $^a$ | p-value $^b$ |
|-----------------------------------|---------------------------|-------------------------------|-------------|
| Day 1, NfL                        | 0.912                     | 0.886                        | 0.162       |
| Day 1, UCH-L1                     | 0.894                     | 0.886                        | 0.496       |
| Day 1, GFAP                       | 0.893                     | 0.886                        | 0.338       |
| Day 1, Tau                        | 0.895                     | 0.886                        | 0.579       |
| Day 2, NfL                        | 0.932                     | 0.871                        | 0.017       |
| Day 2, UCH-L1                     | 0.918                     | 0.875                        | 0.055       |
| Day 2, GFAP                       | 0.890                     | 0.871                        | 0.250       |
| Day 2, Tau                        | 0.895                     | 0.871                        | 0.248       |
| Day 3, NfL                        | 0.921                     | 0.870                        | 0.034       |
| Day 3, UCH-L1                     | 0.904                     | 0.867                        | 0.165       |
| Day 3, GFAP                       | 0.899                     | 0.865                        | 0.069       |
| Day 3, Tau                        | 0.881                     | 0.870                        | 0.534       |

NfL, Neurofilament light; UCH-L1, Ubiquitin carboxyl-terminal esterase-L1; GFAP, Glial fibrillary acidic protein

$^a$ p<.2, after adjusting for age, sex, race, etiology, location, witnessed, bystander status, ECMO, severity of illness (PIM3), TTM for fever or hypothermia

$^b$ Chi-square analysis of AUROC between models with and without biomarker
### eTable 6. Comparison of Patient and Cardiac Arrest Characteristics Among Children With and Without Data Available on 1 Year Outcomes

| N (%) or Median (interquartile range) | One year outcome obtained N=120 | One year outcome not obtained N=43 | p-value |
|--------------------------------------|---------------------------------|-----------------------------------|---------|
| **Age, y**                           | 1.0 (0.0, 8.5)                  | 3.0 (1.0, 10.0)                  | 0.039   |
| **Sex**                              |                                 |                                   | 0.590   |
| Female                               | 49 (40.8)                       | 20 (46.5)                        |         |
| Male                                 | 71 (59.2)                       | 33 (53.5)                        |         |
| **Race**                             |                                 |                                   |         |
| Asian                                | n=120                            | n=43                              | <.001   |
| Black                                | 19 (15.8)                       | 17 (39.5)                        |         |
| White                                | 81 (67.5)                       | 23 (53.5)                        |         |
| Unknown                              | 15 (12.5)                       | 3 (7.0)                          |         |
| **Hispanic Ethnicity**               | 11 (10.0), n=110                | 3 (7.1), n=42                    | 0.759   |
| **Pre-existing conditions**          |                                 |                                   | 0.450   |
| Cardiovascular                       | 77 (68.1), n=113                 | 26 (60.5), n=43                  |         |
| Pulmonary disease                    | 45 (37.8), n=119                 | 6 (14.0), n=43                   | 0.004   |
| Premature birth                      | 25 (20.8), n=120                 | 10 (23.3), n=43                  | 0.829   |
| Congenital syndrome                 | 24 (21.8), n=110                 | 6 (15.4), n=39                   | 0.489   |
| Neurologic                           | 14 (11.8), n=119                 | 4 (9.3), n=43                    | 0.783   |
| Oncologic syndrome                  | 11 (9.2), n=120                  | 4 (9.3), n=43                    | 1.000   |
| Organ or cellular transplant         | 3 (2.5), n=120                   | 1 (2.3), n=43                    | 1.000   |
| **Primary etiology**                |                                 |                                   | 0.091   |
| Asphyxia                             | 74 (69.2)                       | 34 (82.9)                        |         |
| Cardiac                              | 33 (30.8)                       | 7 (17.1)                         |         |
| **Location, out of hospital**        | 60 (50.0)                       | 30 (69.8)                        | 0.032   |
| **Duration of cardiopulmonary resuscitation, minutes** | 7.00 (3.00, 20.00), n=99         | 7.00 (2.00, 17.00), n=33         | 0.596   |
| **Total number of epinephrine doses** | 1.0 (0.0, 3.0), n=100            | 0.0 (0.0, 2.0), n=37             | 0.031   |
| **Defibrillated**                    | 18 (17.8), n=101                 | 7 (18.4), n=38                   | 1.000   |
| **First monitored rhythm**           |                                 |                                   | 0.030   |
| Sinus bradycardia                    | 33 (34.4)                       | 11 (39.3)                        |         |
| Pulseless electrical activity        | 23 (24.0)                       | 6 (21.4)                         |         |
| Condition                                      | Group 1 (n=120) | Group 2 (n=42) | p-value |
|-----------------------------------------------|-----------------|----------------|---------|
| Asystole                                      | 19 (19.8)       | 1 (3.6)        |         |
| Ventricular tachycardia or fibrillation       | 15 (15.6)       | 3 (10.7)       |         |
| Sinus tachycardia/Junctional ectopic tachycardia | 4 (4.2)         | 3 (10.7)       |         |
| Normal sinus rhythm                           | 2 (2.1)         | 4 (14.3)       |         |
| **Witnessed**                                 | 92 (76.7)       | 29 (67.4)      | 0.309   |
| **Bystander resuscitation**                   | 42 (35.0)       | 23 (53.5)      | 0.045   |
| **Hospital length of stay, d**                | 18.0 (6.5, 35.5), n=120 | 10.0 (6.0, 20.0), n=42 | 0.033   |
| **Intensive care unit length of stay, d**     | 12.0 (5.0, 25.0), n=117 | 8.0 (2.5, 11.0), n=40 | 0.002   |
| **Disposition at hospital discharge**         | n=120           | n=42           | <.001   |
| Home                                          | 55 (45.8)       | 33 (78.6)      |         |
| Died                                          | 41 (34.2)       | 0 (0)          |         |
| Inpatient rehabilitation                      | 17 (14.2)       | 6 (14.3)       |         |
| Transfer to other hospital                    | 2 (1.7)         | 3 (7.1)        |         |
| Long-term care facility                       | 5 (4.2)         | 0 (0)          |         |
| **Days from cardiac arrest event to death**   | 10 (3, 25), n=43 | NA             |         |
| **Cause of death**                            | n=43            | n=0            |         |
| Multiple Organ Failure                        | 13 (30.2)       | NA             |         |
| Brain death                                   | 11 (25.6)       | NA             |         |
| Neurologic injury                             | 11 (25.6)       | NA             |         |
| Cardiovascular                                | 8 (18.6)        | NA             |         |

1 Children may have more than one pre-existing condition

p-value are based on Chi-square test for categorical variables, Kruskal-Wallis test for median