Supplemental table 2 – Exploratory multivariable analyses of ICU-acquired hypernatremia

| Multivariable logistic regression | MIMIC-III \((n = 23,445)\) |  |  | eICU \((n = 88,160)\) |  |  |
|----------------------------------|-----------------------------|---|---|-----------------------------|---|---|
| Age (numeric, per 10 years)      | 1.04 (1.04-1.04) <0.001     | 1.00 (1.00-1.00) | 0.001 |                       | 1.00 (1.00-1.00) | 0.001 |
| Male (binary)                    | 1.00 (0.99-1.01) 0.952      | 1.00 (1.00-1.01) | 0.549 |                       | 1.00 (1.00-1.01) | 0.549 |
| **Hypernatremia** (binary)       | **1.15 (1.13-1.17) <0.001** | 1.11 (1.10-1.12) | **<0.001** |                       | **1.11 (1.10-1.12) <0.001** | **<0.001** |
| APS III (numeric, per 10 points) | 1.05 (1.05-1.06) <0.001     | -             | -             |                       | -             | -             |
| APACHE IV (numeric, per 10 points)| -               | 1.04 (1.04-1.04) | **<0.001** |                       | -             | -             |
| Number of samples (numeric, per 10 samples) | 1.00 (0.99-1.00) 0.125 | 0.99 (0.98-0.99) | **<0.001** |                       | 0.99 (0.98-0.99) | **<0.001** |
| Administration of Hypertonic saline or sodium bicarbonate (binary) | 1.06 (1.04-1.09) <0.001 | -             | -             |                       | -             | -             |
| Neurological Ward (binary)       | -               | 1.02 (1.01-1.03) | **<0.001** |                       | 1.02 (1.01-1.03) | **<0.001** |

| Multivariable Cox regression     | HR (95% CI) p-value | HR (95% CI) p-value |
|----------------------------------|---------------------|---------------------|
| Age (numeric, per 10 years)      | 1.30 (1.27-1.32) <0.001 | 1.12 (1.09-1.14) <0.001 |
| Male (binary)                    | 1.00 (0.95-1.06) 0.862  | 0.99 (0.94-1.05) 0.862  |
| **Hypernatremia** (binary)       | **1.59 (1.46-1.73) <0.001** | **1.85 (1.71-1.99) <0.001** |
| APS III (numeric, per 10 points) | 1.27 (1.25-1.29) <0.001  | -             | -             |
| APACHE IV (numeric, per 10 points)| -               | 1.46 (1.45-1.47) <0.001  |                       | -             | -             |
| Number of samples (numeric, per 10 samples) | 0.90 (0.88-0.93) | <0.001  | 0.82 (0.79-0.85) | <0.001  |                       | -             | -             |
| Administration of Hypertonic saline or sodium bicarbonate (binary) | 1.40 (1.28-1.53) <0.001  | -             | -             |                       | -             | -             |
| Neurological Ward (binary)       | -               | 1.35 (1.22-1.50) <0.001  |                       | -             | -             |

APS III: Acute Physiology Score 3; APACHE IV: Acute Physiology And Chronic Health Evaluation IV; LOS: Length of stay; OR: Odds ratio; HR: Hazard ratio.