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The relationship of pH esteems during the first 24 h with neurological status at medical clinic release and worthlessness among patients with out-of-clinic heart failure

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Study objective
Post-resuscitation prognostic biomarkers for out-of-hospital cardiac arrest (OHCA) outcomes have not been fully elucidated. We examined the association of acid-base blood values (pH) with patient outcomes and calculated the pH test performance to predict prognosis.

Methods
This was a post-hoc analysis of data from the continuous chest compression trial, which enrolled non-traumatic adult emergency medical system-treated OHCA in Canada and the United States. We examined cases who survived a minimum of 24 h post hospital arrival. The independent variables of interest were initial pH, final pH, and the change in pH (δpH). The primary outcome was neurological status at hospital discharge, with favorable status defined as modified Rankin Scale (mRS) ≤ 3. We reported adjusted odds ratios for favorable neurological outcome using multivariable logistic regression models. We calculated the test performance of increasing pH thresholds in 0.1 increments to predict unfavorable neurological status (defined as mRS >3) at hospital discharge.

Results
We included 4189 patients. 32% survived to hospital discharge with favorable neurological status. In the adjusted analysis, higher initial pH (OR 6.82; 95% CI 3.71–12.52) and higher final pH (OR 7.99; 95% CI 3.26−19.62) were associated with higher odds of favorable neurological status. pH thresholds with highest positive predictive values were initial pH < 6.8 (92.5%; 95% CI 86.2 %–98.8%) and final pH < 7.0 (100%; 95% CI 95.2 %–100%).

Conclusion
In patients with OHCA, pH values were associated with patients' subsequent neurological status at hospital discharge. Final pH may be clinically useful to predict unfavorable neurological status at hospital discharge.