

## 論 文 要 旨

Prognostic predictors in patients with cardiopulmonary arrest: a novel equation  
for evaluating the 30-day mortality

氏 名 今村 春一

### Abstract

**Background:** Early prediction of outcomes after cardiopulmonary arrest (CPA) is important for considering the best support. Our purpose was to evaluate predictors of the 30-day mortality in patients with CPA after return of spontaneous circulation (ROSC) and to assess an equation for calculating the 30-day mortality using clinical parameters.

**Methods:** We retrospectively analyzed the data of 194 consecutive patients with CPA and ROSC in a derivation study (2015–2022). We compared clinical parameters between the survived ( $n = 78$ ) and dead ( $n = 116$ ) patients. We derived an equation for estimated probability of death based on clinical parameters, using multivariate logistic regression analysis. The reliability of the equation was validated in 80 additional patients with CPA.

**Results:** The 30-day mortality was associated with sex, witnessed cardiac arrest, bystander cardiopulmonary resuscitation (CPR), CPA due to acute myocardial infarction, pupil diameter, Glasgow Coma Scale score (GCS), presence of light reflex, arterial or venous pH, lactate levels, initial ventricular fibrillation (VF), CPA time and age. The derived logistic regression equation was as follows: Estimated probability of death =  $1 /$

$(1 + e^{-x})$ ,  $x = (0.25 \times \text{bystander CPR}) + (0.44 \times \text{pupil diameter}) - (0.14 \times \text{GCS}) + (0.09 \times \text{lactate}) - (1.87 \times \text{initial VF}) + (0.07 \times \text{CPA time}) + (0.05 \times \text{age}) - 7.03$ . The cut-off value for estimated probability of death calculated by this equation was 54.5%, yielding a sensitivity, specificity, and accuracy of 86.2%, 80.8%, and 84.5%, respectively. In the validation model, these values were 81.8%, 85.7%, and 82.5%, respectively.

**Conclusions:** The 30-day mortality may be calculated after ROSC in patients with CPA using simple clinical parameters. This equation may facilitate further best support for patients with CPA.