

# Predictors of Prolonged Mechanical Ventilation in Paediatric Patients After Anatomical Correction of Simple Congenital Heart Disease

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## Abstract

**Abstract Background:** We aimed to use preoperative clinical data from paediatric patients with simple congenital heart disease to predict the risk of prolonged mechanical ventilation after surgery. **Methods:** The clinical data from paediatric patients with simple congenital heart disease who underwent anatomical correction under cardiopulmonary bypass in a single centre during a continuous period were retrospectively collected. Univariate and multivariate logistic regression analyses were performed to identify the risk factors for prolonged mechanical ventilation (>24 h) after surgery, and a mathematical model was established. Then, using data from another centre, we adopted an ROC curve to verify the scalability of the model. **Results:** A total of 585 paediatric patients were eligible for inclusion in this study. Multivariate logistic regression analysis showed that weight (kg), the size of the ventricular septal defect, the size of the atrial septal defect and the shunt direction of the defect site were significantly correlated with prolonged mechanical ventilation (>24 h) after surgery. The risk prediction model was established and the area under the curve of the model was 0.853 (ROC curve). A set of data from another heart centre, with equivalent inclusion criteria, was used to validate the scalability of the model, and the area under the curve of the accepted validated data was 0.841 (ROC curve). **Conclusions:** The risk of prolonged mechanical ventilation (>24 h) after surgery in paediatric patients with simple congenital heart disease with anatomical correction assisted by cardiopulmonary bypass can be well predicted by using preoperative clinical data.

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