NIGERIAN CARDIAC SOCIETY (NCS)
55th Annual General Meeting & Scientific Conference (NCS EKO 2026)
September 22–24, 2026 • Eko Hotel Convention Centre, Lagos, Nigeria

PD008

Paediatric Cardiology & Congenital Heart Disease • Poster Presentation

PREDICTORS OF PROLONGED INTENSIVE CARE UNIT STAY POST CARDIAC SURGERY

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Stand: POSTER #PD008 | **Venue:** Poster Exhibition Hall & Gallery - Eko Convention Centre |**Online Ref:** https://nigeriancardiacsociety.com/abstracts/PD008

Background: Prolonged PICU stay following congenital cardiac surgery is associated with increased morbidity, healthcare costs, and resource utilisation. However, predictors of prolonged PICU admission remain poorly defined. The aim of this studfy is to identify predictors of prolonged PICU stay following paediatric cardiac surgery requiring CPB and to develop an exploratory early risk prediction model.

Methodology: A retrospective observational cohort study was conducted at the East Midlands Congenital Heart Centre, University Hospitals of Leicester NHS Trust. Clinical data from 165 children undergoing CPB surgery between January and December 2025 were analysed. Prolonged PICU stay was defined as admission exceeding the 75th percentile (>8 days). Demographic, pre-operative, intra-operative and postoperative variables were analysed using univariable and multivariable logistic regression. Model performance was evaluated using receiver operating characteristic analysis.

Results: Thirty-seven children (22.4%) experienced prolonged PICU stay. Independent predictors in the early model were cyanotic congenital heart disease, longer CPB duration, and delayed sternal closure. In the full model, postoperative infection and reintubation were the strongest predictors. The early model demonstrated good discrimination (AUC 0.821), while the full model showed excellent discrimination (AUC 0.947). An exploratory bedside risk score also demonstrated good predictive performance (AUC 0.802).

Conclusion: Prolonged PICU stay is influenced by patient complexity, operative factors, and postoperative complications. The exploratory prediction model demonstrated good predictive performance and may support early risk stratification, peri-operative planning, and resource allocation. External multicentre validation is required before clinical implementation.

Keywords: congenital heart disease; paediatric cardiac surgery; paediatric intensive care unit; prolonged length of stay; cardiopulmonary bypass; prediction model; risk stratification.