Introduction:
Local chain-of-survival improvements affect P-OHCA survival. Also initial rhythm in P-OHCA is an important predictor of survival. Little is known about the relationship between initial rhythm in P-OHCA and long-term outcome. Our aim was to establish the relation between shockable rhythm and favorable long-term outcome in P-OHCA.

Methods:
All children aged 1 day-18 years who experienced non-traumatic OHCA between 2002-2017 and were admitted to the Sophia Children’s Hospital in Rotterdam were included. Long-term outcome was determined using a Pediatric Cerebral Performance Category score at the longest available follow-up interval. The primary outcome measure was survival with favorable neurologic outcome, defined as PCPC 1-2 or no difference between pre- and post-arrest PCPC. The association between shockable rhythm and the primary outcome measure was calculated in a multivariable regression model, adjusted for the pre-defined variables.

Results:
From the 329 patients included in the 16 year study period 126 (38%) patients survived to hospital discharge of which 99 patients (30%) had favorable neurologic outcome (median follow-up duration of 24 months). The rate of favorable neurologic outcome rose from 17% in 2002 to 52% in 2017 (p < 0.001 for trend). In adjusted analysis initial shockable rhythm (OR 7.2 [95%CI 2.2-23.7]), initial unknown rhythm (OR 10.2 [95%CI 3.5-29.2]) and the year of event (OR 1.2 [95%CI 1.2-1.4]) were associated with favorable long-term neurologic outcome.

Conclusion:
The odds of favorable neurologic outcome at the longest follow-up duration were significantly higher after a shockable initial and unknown rhythm. Secondly, trend analysis showed an increase in AED defibrillation and shorter CPR duration. This was followed, finally, by a rise in ROSC, survival to hospital discharge and favorable neurologic outcome rate.

References:
Fukuda Resuscitation 2017
Naim JAMA Pediatr 2017
Tijssen Resuscitation 2015
Cummins Circulation 1991
Kitamura Lancet 2010
Atkins Circulation 2009

Image:
Patient and arrest characteristics over time. A The total amount of mortality as a stacked bar: in light-red the number of patients who deceased at scene, in green the number of patients deceased during admission, in red patients who died after discharge. The grey line are the total number of inclusions. B The rate of bystander AED use, rate of initial shockable rhythm, rate of less than 15 minutes of CPR and rate of favorable neurologic outcome over time. P for trend significant for bystander AED use, less than 15 minutes of CPR and favorable neurologic outcome. Trend analysis performed using binary logistic regression for dichotomous data (and a Kruskal-Wallis test for non-normally distributed continuous data).