



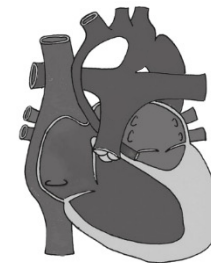
HLHS – Norwood Stage 1

Early postoperative management

Kris Borgmann

Pediatric cardiac ICU

Deutsches Herzzentrum München





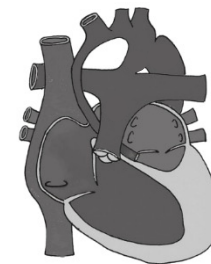
HLHS – Norwood Stage 1

Early postoperative management

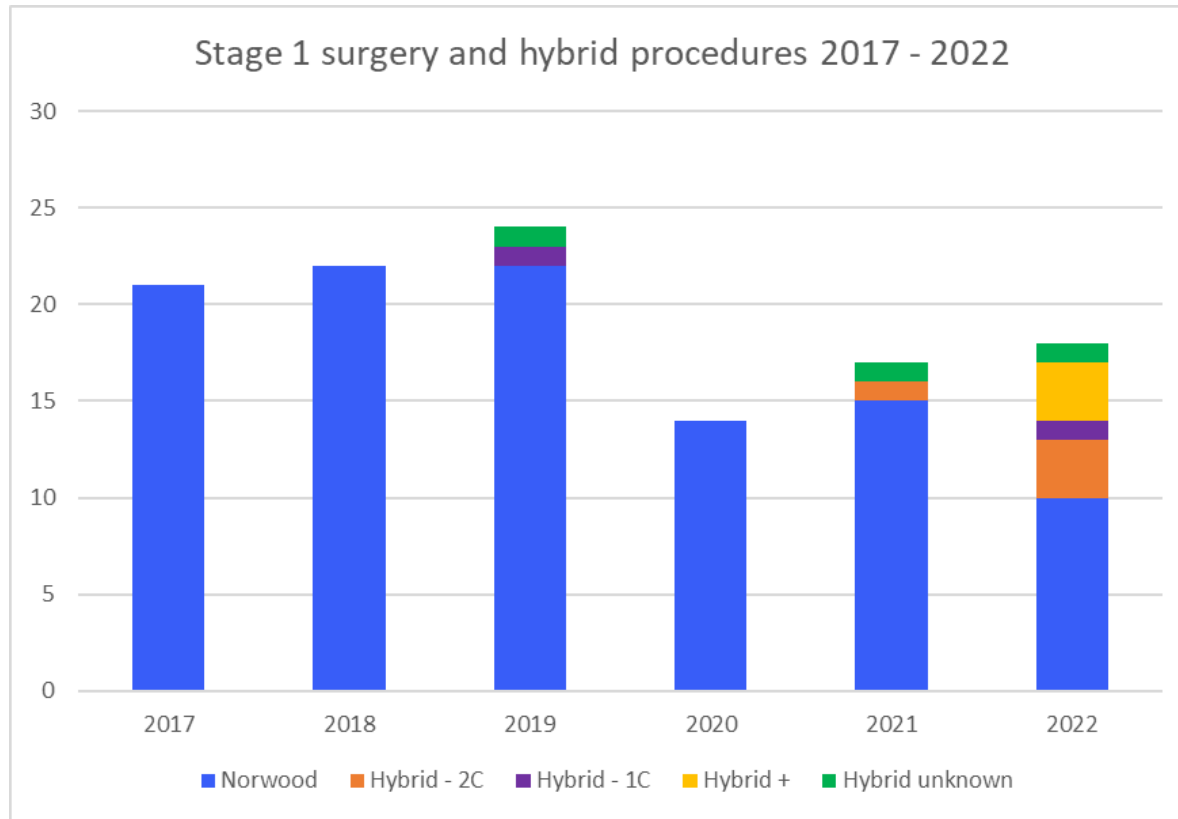
Kris Borgmann

Pediatric cardiac ICU

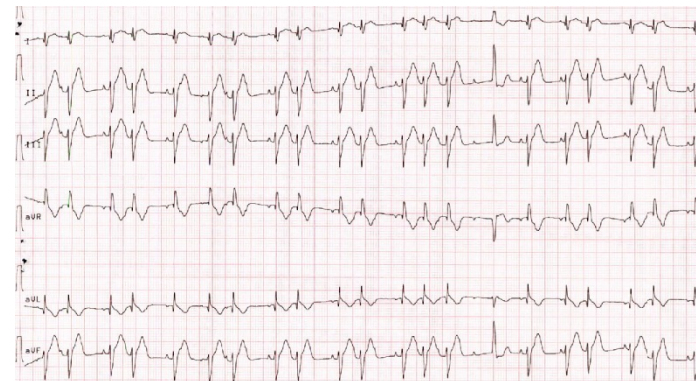
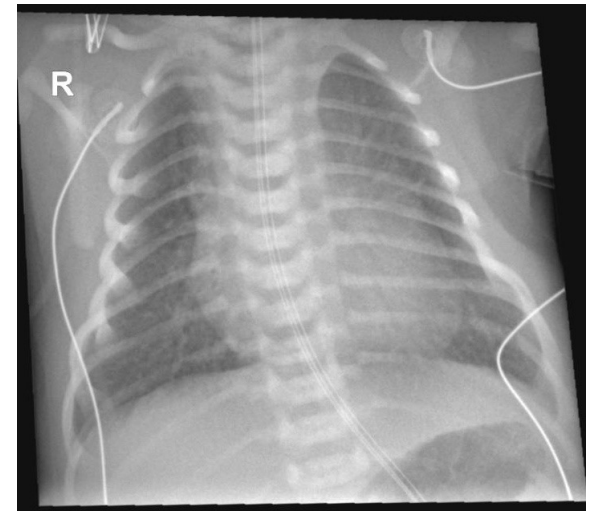
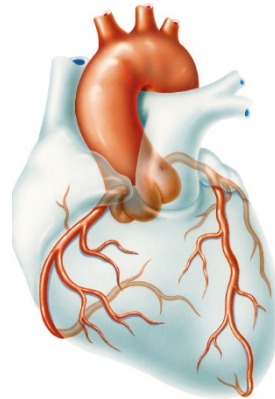
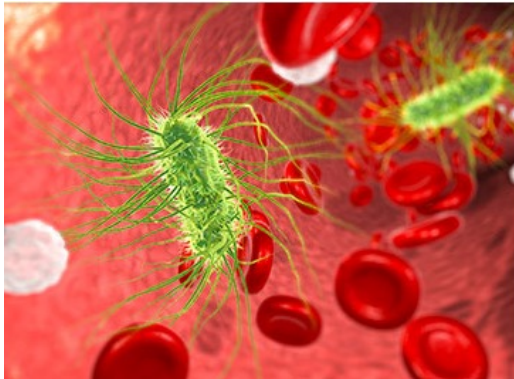
Deutsches Herzzentrum München



Stage 1 and Hybrid in HLHS



Factors influencing surgical outcome ...

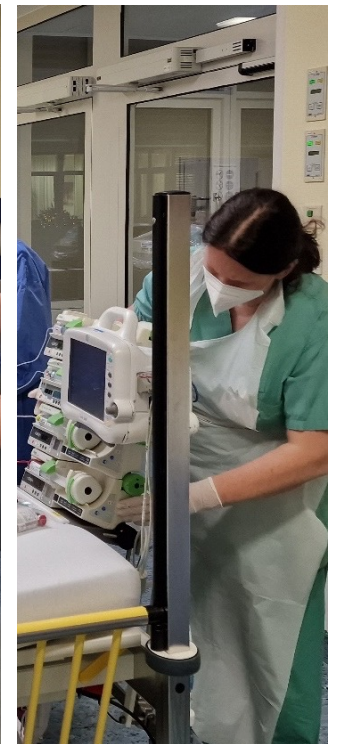


Operating room - transfer area

Be organized!

Take time!

Get information!



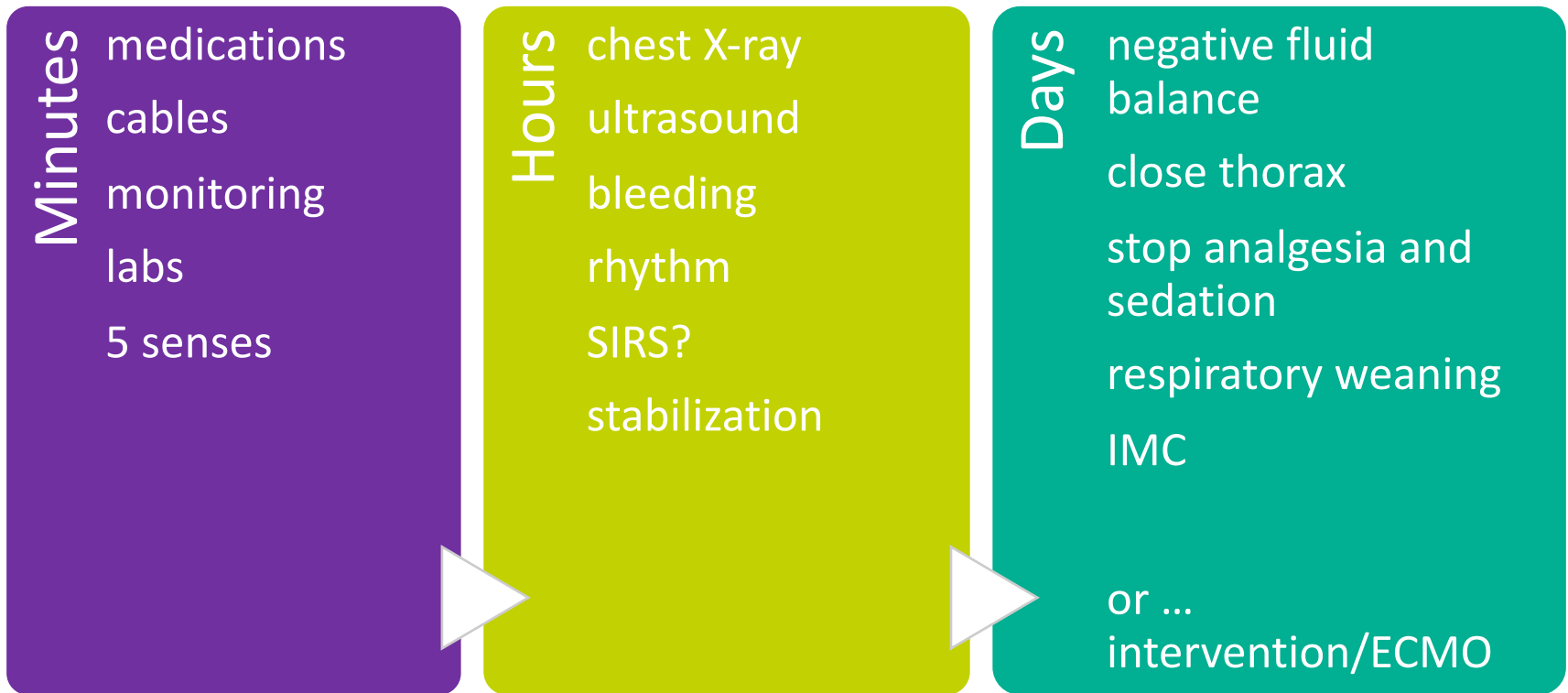
OR

ICU





Timeline



ICU

smooth transition

personnel
SOPs

preventive
and protective

brave and
considerate

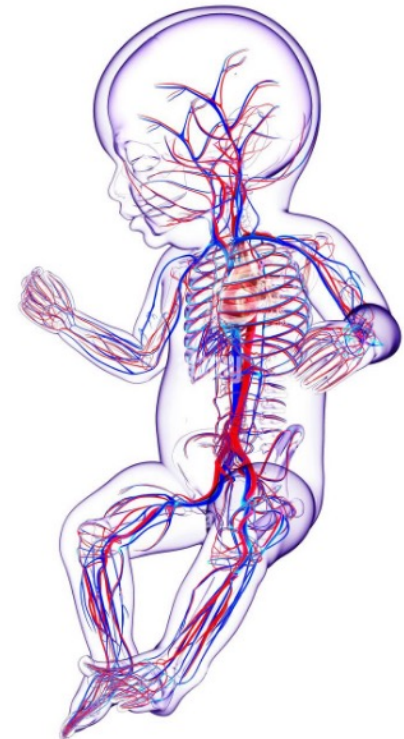


Open thorax



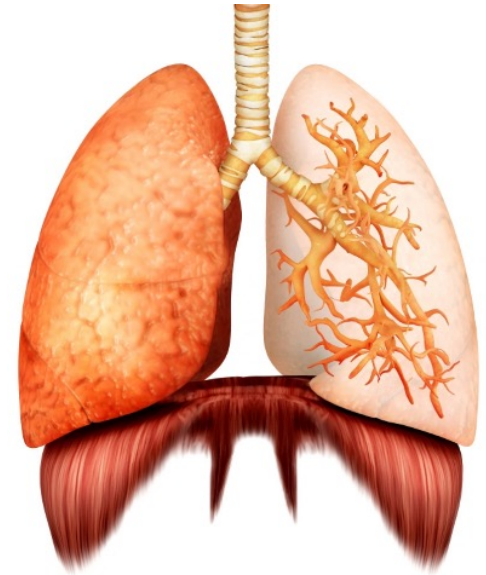
Hemodynamics, blood pressure and rhythm

- reducing oxygen consumption
- catecholamines
- rhythm control – landiolol, amiodarone, ...
- temporary pacemaker

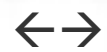


Ventilation

- avoid hyperperfusion
- PEEP 8 or 10 mmHg
- oxygen, NO?



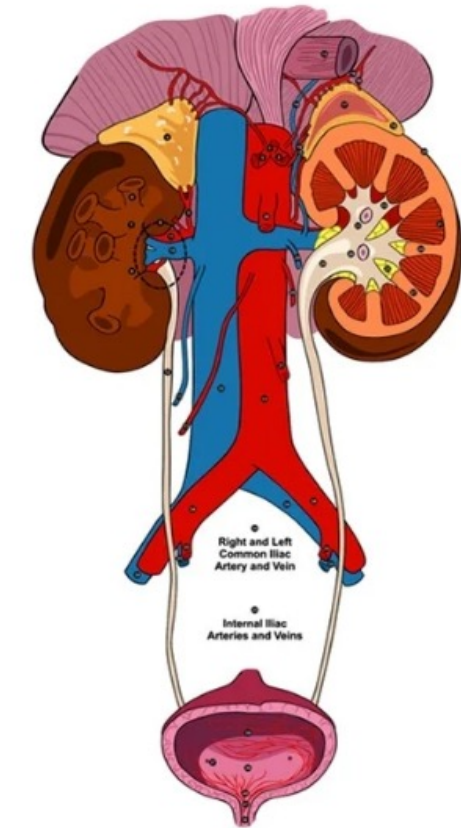
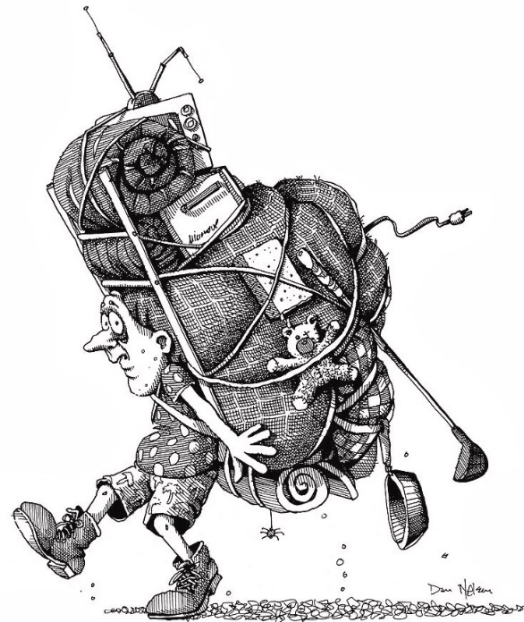
oxygenation



hemodynamics

Negative fluid balance - diuresis

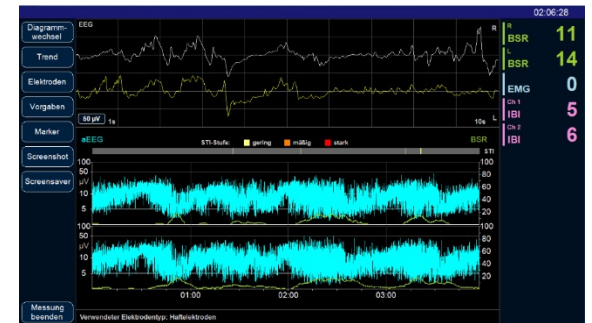
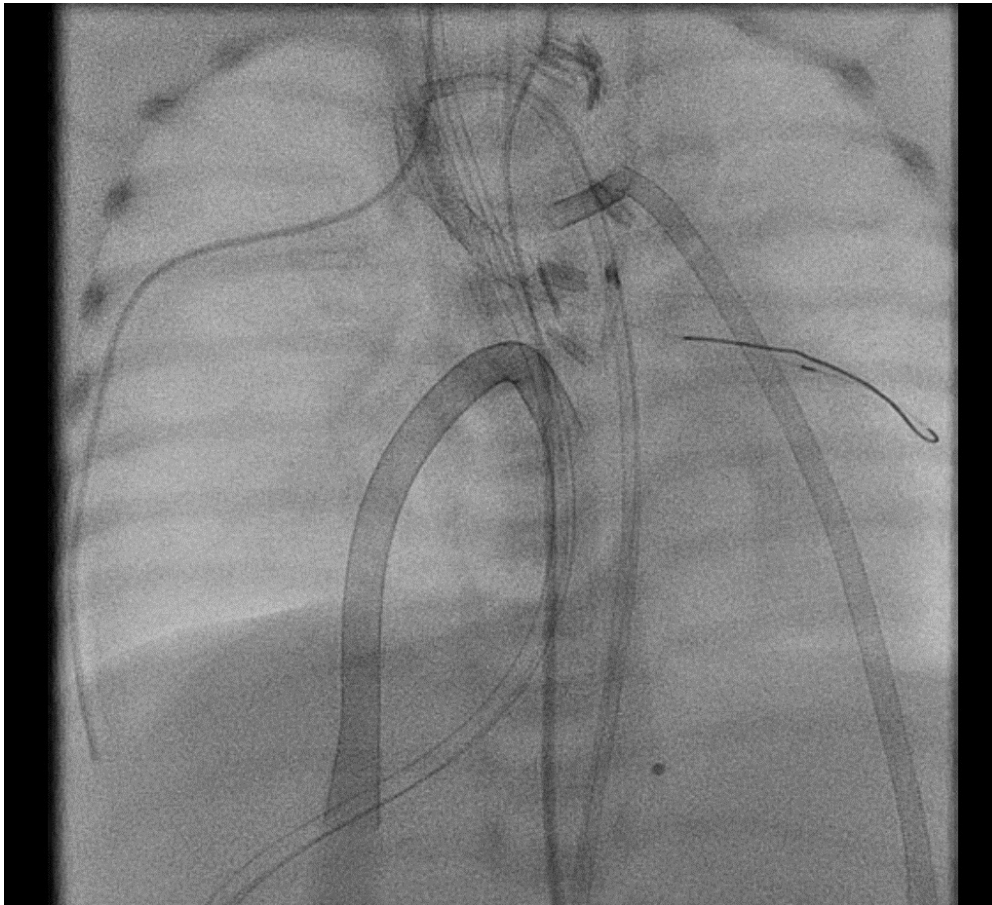
- furosemide, theophylline
- peritoneal dialysis – OR?
- continuous veno-venous hemodiafiltration



Does it work?



Supportive monitoring



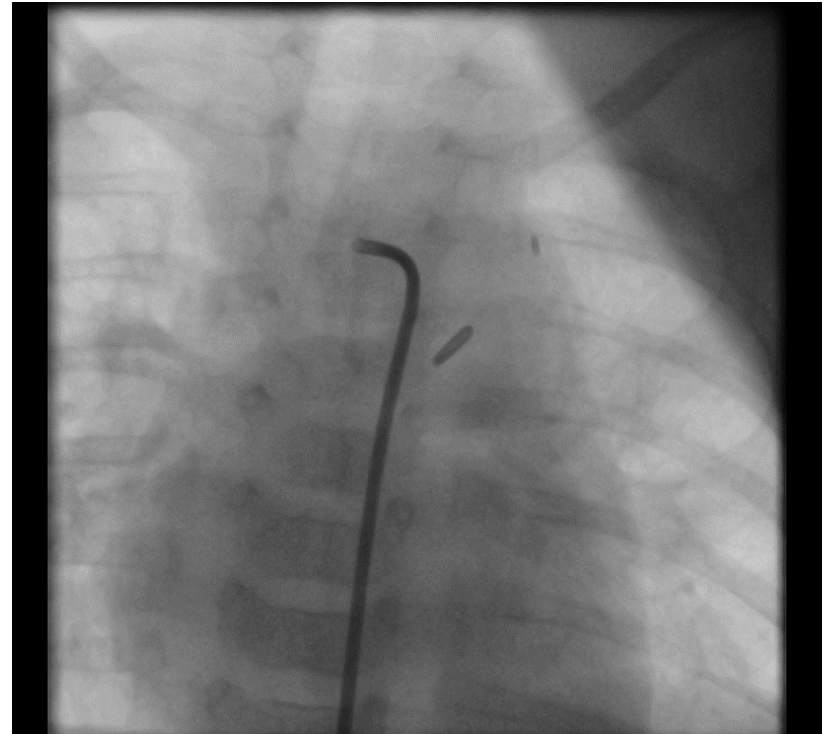
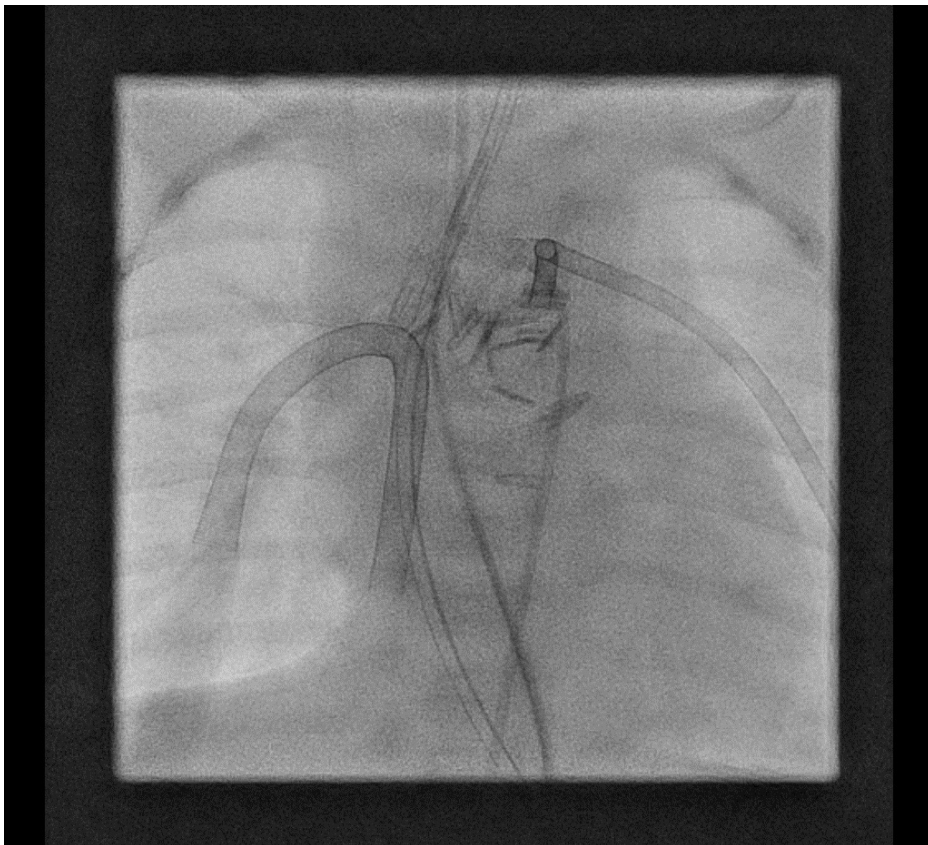
Surgical closure of thorax



What if ...?



Complications



Comparison of shunt types in the neonatal Norwood procedure for single ventricle

Masamichi Ono, Takashi Kido, et al; European Journal of Cardio-Thoracic Surgery 60 (2021) 1084–1091; doi:10.1093/ejcts/ezab163

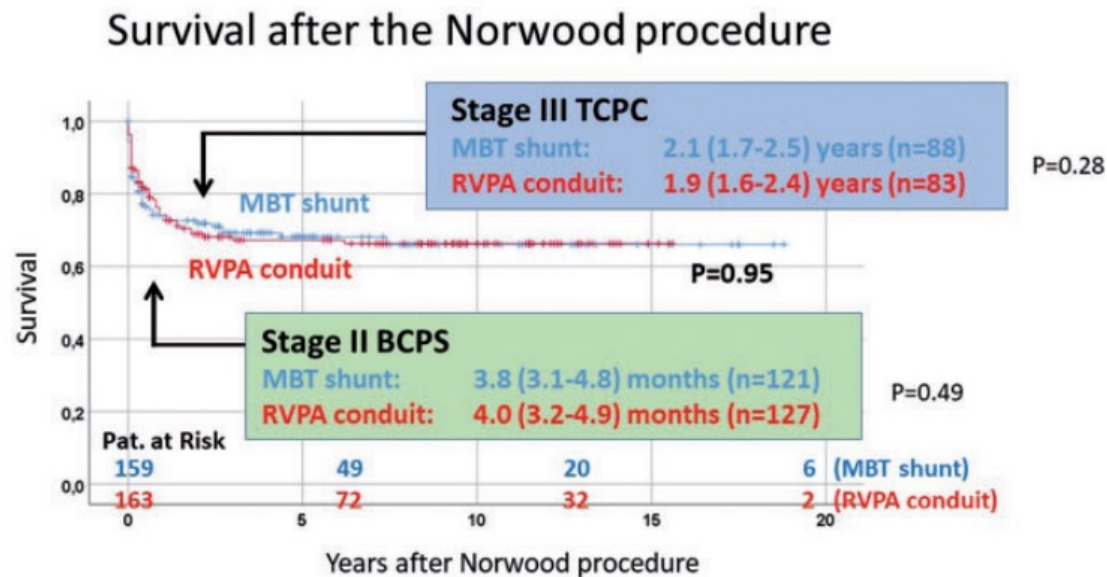
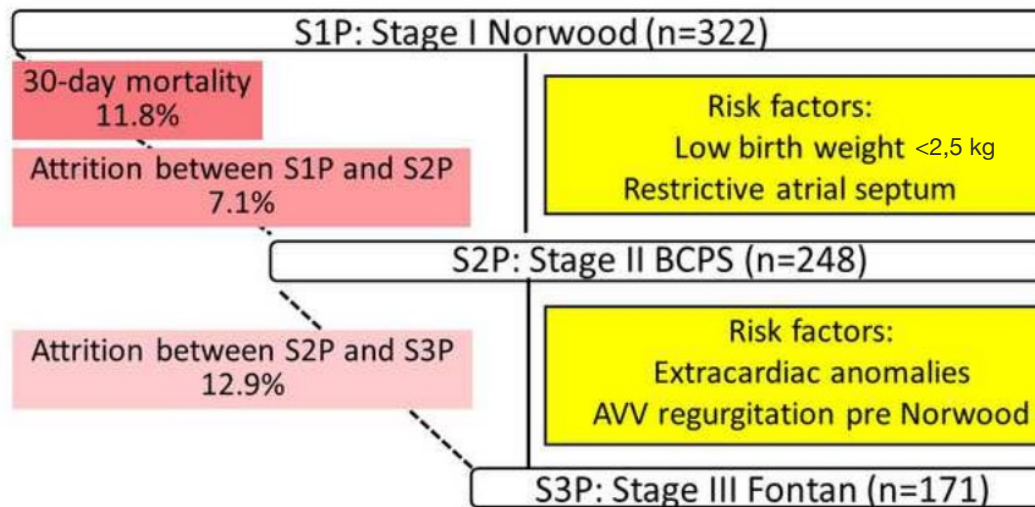


Figure 3: Survivals of 322 patients after Norwood procedure in patients with right ventricular–pulmonary artery conduit or modified Blalock–Taussig shunt. Because no patient underwent heart transplantation, survival is the same as transplant-free survival. BCPS: bidirectional cavopulmonary shunt; MBT: modified Blalock–Taussig; RVPA: right ventricular–pulmonary artery; TCPC: total cavopulmonary connection.

Preoperative risk factors influencing inter-stage mortality after the Norwood procedure

Masamichi Ono et al (2021)



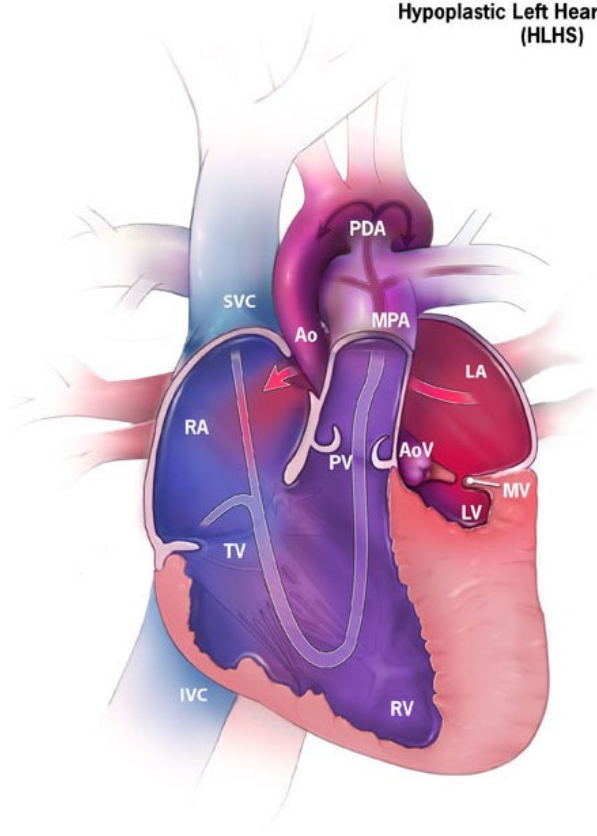
271 HLHS, 51 Varianten

Median 9d, 3200g

CPB-Time 137min

mBTS vs Sano 49:51%

Hypoplastic Left Heart Syndrome (HLHS)



Thank you!

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