Risk assessment in late detected atrio-ventricular septal defect.

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Krakow, Poland, 2024

Disclosures

- I have NO disclosures

Delayed Diagnosis of Critical Congenital Heart Defects: Trends and Associated Factors

- Pediatrics, 134,2; 20219:e373-e381

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KEY WORDS
critical congenital heart defects, delayed diagnosis, neonatal, prenatal diagnosis, infant, newborn, neonatal screening

WHAT'S KNOWN ON THIS SUBJECT: Delayed diagnosis of critical congenital heart defects (CCHDs) is associated with increased morbidity and mortality.

TABLE 3 Timing of Diagnosis by CCHD Type

CCHD Type	Total *N*	Prenatal, *N* (%)	In-hospital,[a] *N* (%)	Delayed, *N* (%)
Tetralogy of Fallot[b]	191	110 (57.6)	61 (31.9)	20 (10.5)
Coarctation	179	67 (37.4)	58 (32.4)	54 (30.2)
Complete atrioventricular septal defect	134	94 (70.2)	34 (25.4)	6 (4.5)
Pulmonary valve stenosis	134	42 (31.3)	63 (47.0)	29 (21.6)
dextro-Transposition of the great arteries[b]	108	65 (60.2)	43 (39.8)	0
Hypoplastic left heart syndrome[b]	66	58 (87.9)	8 (12.1)	0
Double outlet right ventricle	57	47 (82.5)	9 (15.8)	1 (1.8)
Aortic stenosis, valvar	50	19 (38.0)	18 (36.0)	13 (26.0)
Pulmonary atresia[b]	44	34 (77.3)	10 (22.7)	0
Total anomalous pulmonary venous return[b]	44	11 (25.0)	23 (52.3)	10 (22.7)
Tricuspid atresia[b]	26	23 (88.5)	3 (11.5)	0
Single ventricle	25	23 (92.0)	2 (8.0)	0
Interrupted aortic arch	22	13 (59.1)	8 (36.4)	1 (4.6)
Truncus arteriosus[b]	13	7 (53.8)	5 (38.5)	1 (7.7)
Ebstein anomaly	10	8 (80.0)	2 (20.0)	0
Aortic arch atresia or hypoplasia	1	1 (100)	0	0
Total	1104	622	347	135

- Data concerning 460 467 live births over 5 years
- 10% - delayed diagnosis
- 4.5% AVSD late diagnosed

Categories of Delayed AVSD diagnosis

- Complete AVSD >5 months of age
- AVSD with palliative pulmonary artery band
- Partial AVSD >5 years of age

- PAB:
  - Hypotrophic patients
  - Neonates not responding to conventional pharmacotherapy
  - Infants below 3.5 kg

STS Public Reporting

The Society of Thoracic Surgeons

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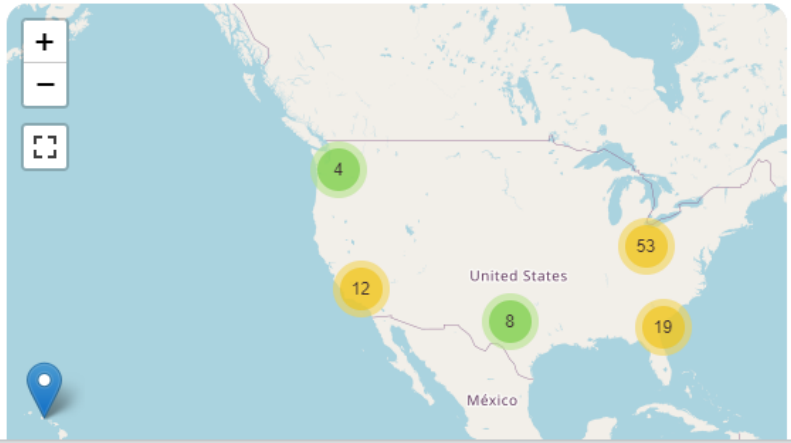
Congenital Heart Surgery Public Reporting

The STS Congenital Heart Surgery Database (CHSD) contains information on surgical procedures submitted by participants—most often a hospital cardiothoracic surgery department or cardiothoracic surgery group at one or more hospitals; in some instances, a participant may be an individual surgeon.

STS publicly reports outcomes that are based on the STS Congenital Heart Surgery Database (CHSD) mortality risk model. STS Public Reporting is limited to participants in the US and Canada.

NOTE: Results are based on a participant's unique group of patients (known as case mix) and the number of surgical procedures in each category. Results published are specific to the participant listed and are not intended for direct comparison to other participants.

STS Public Reporting is voluntary, meaning that all participants listed on this website have allowed STS to publish their ratings. You can search for results by participant surgery group name and/or location.

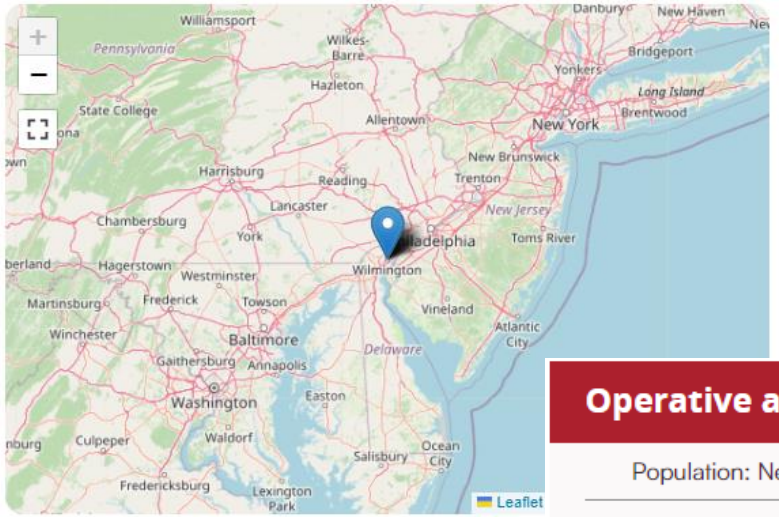


Alfred I. duPont Hospital for Children

Wilmington, Delaware

NOTE: Results are based on a participant's unique group of patients (known as case mix) and the number of surgical procedures in each category. Results published are specific to the participant listed and are not intended for direct comparison to other participants.

For this Congenital Heart Surgery Database (CHSD) participant, rating is based on the overall observed-to-expected operative mortality ratio for all patients undergoing pediatric and/or congenital cardiac surgery.



Operative and Adjusted Operative Mortality (January 2019-December 2022)

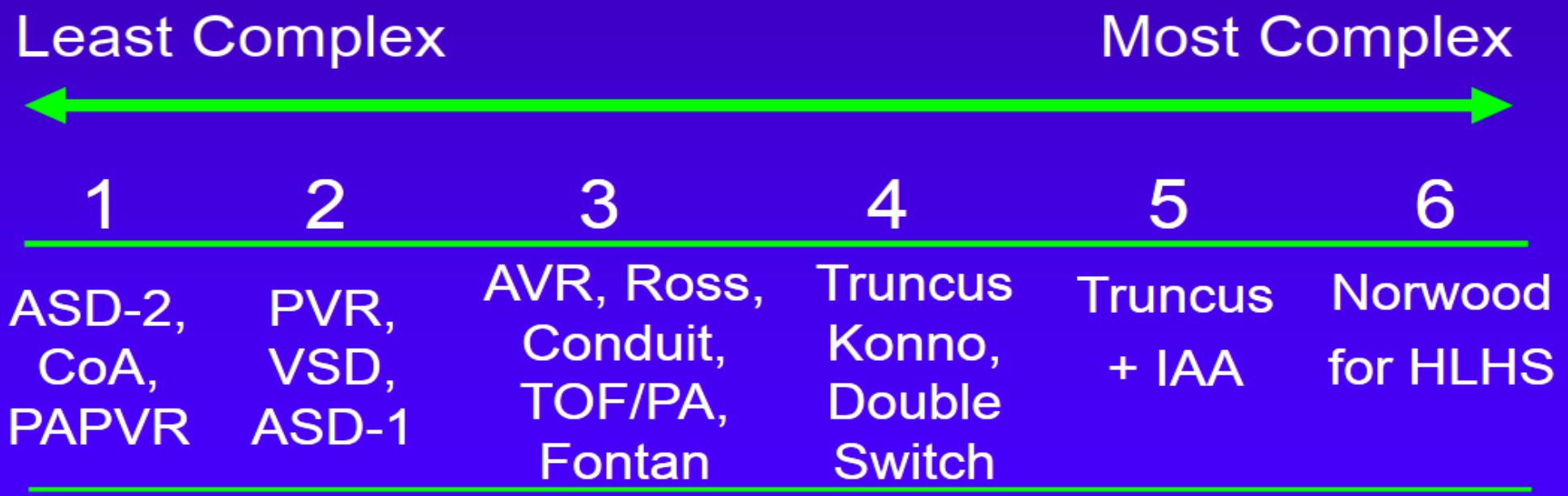
Population: Neonates, Infants, Children & Adults	# / Eligible	Observed	Expected	O/E Ratio (95% CI)	Adj. Rate (95% CI)
Overall	21 / 672	3.13%	3.94%	0.79 (0.49, 1.2)	2.09 (1.3, 3.17)
STAT Mortality Category 1	2 / 329	0.61%	0.84%	0.73 (0.09, 2.6)	0.47 (0.06, 1.67)
STAT Mortality Category 2	2 / 121	1.65%	2.55%	0.65 (0.08, 2.29)	1.24 (0.15, 4.37)
STAT Mortality Category 3	2 / 120	1.67%	4.08%	0.41 (0.05, 1.45)	1.43 (0.17, 5.06)
STAT Mortality Category 4	7 / 79	8.86%	12.39%	0.72 (0.29, 1.41)	5.58 (2.29, 10.96)
STAT Mortality Category 5	8 / 23	34.78%	25.94%	1.34 (0.63, 2.21)	19.75 (9.3, 32.52)

Risk Scores

- Risk Adjustment for Congenital Heart Surgery (RACHS) score,
- Aristotle Basic Complexity (ABC) Score,
- Society of Thoracic Surgeons Score,
- The Society of Thoracic Surgeons and the European Association for Cardiothoracic Surgery Mortality score (STS-EACTS score)
- Etc. ….

Case complexity: RACHS-1

- Risk Adjustment for Congenital Heart Surgery-1
- Consensus-based risk adjustment tool



Jenkins KJ et al. *J Thorac Cardiovasc Surg* 2002;123:110-118

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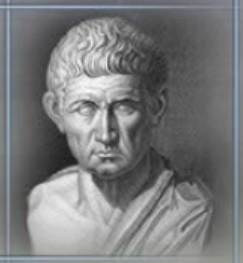
Aristotle Institute Procedure Complexity Scores
STS V3.22 Procedure Code Tables



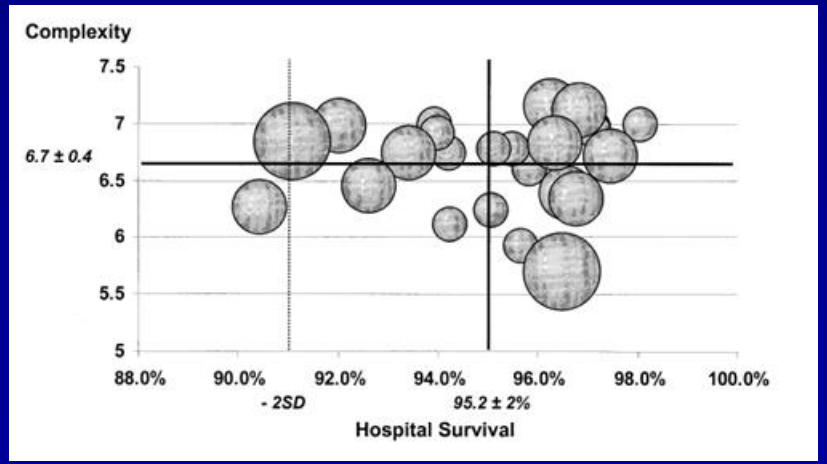
BASIC PROCEDURE SCORE
Maximum 15 Points

Procedures	Basic Score
1 1/2 ventricular repair 3.2	9.0
Aneurysm, Pulmonary artery, Repair	8.0
Aneurysm, Ventricular, Left, Repair	9.0
Aneurysm, Ventricular, Right, Repair	8.0
Anomalous origin of coronary artery from pulmonary artery repair	10.0
Anomalous systemic venous connection repair	7.0
Aortic aneurysm repair	8.8
Aortic arch repair	7.0
Aortic arch repair + VSD repair	10.0
Aortic dissection repair	11.0
Aortic root replacement, Bioprosthetic	9.5
Aortic root replacement, Homograft	9.5
Aortic root replacement, Mechanical	8.8
Aortic root replacement, Valve sparing	8.5
Aortic stenosis, Subvalvar, Repair	6.3
Aortic stenosis, Supravalvar, Repair	5.5
Aortopexy	4.0
AP window repair	6.0
Arrythmia surgery - atrial, Surgical ablation	8.0
Arrythmia surgery - ventricular, Surgical ablation	8.0
Arterial switch operation (ASO) and VSD repair	11.0
Arterial switch opertaion (ASO)	10.0
Arterial switch procedure + Aortic arch repair	11.5
Arterial switch procedure and VSD repair + Aortic arch repair	13.0
ASD creation/enlargement	5.0
ASD partial closure	3.0
ASD repair, Patch	3.0
ASD repair, Primary closure	3.0
ASD, Common atrium (Single atrium), Septation	3.8
Atrial baffle procedure (non-Mustard, non-Senning)	7.8
Atrial baffle procedure, Mustard or Senning revision	7.0
Atrial fenestration closure	3.0
Atrial septal fenestration	5.0
AVC (AVSD) repair, Complete (CAVSD)	9.0
AVC (AVSD) repair, Intermediate (transitional)	5.0
AVC (AVSD) repair, Partial (Incomplete) (PAVSD)	4.0

The Aristotle Score for Congenital Heart Surgery

Francois Lacour-Gayet, David Clarke, Jeffrey Jacobs, William Gaynor, Leslie Hamilton, Marshall Jacobs, Bohdan Maruszewski, Marco Pozzi, Thomas Spray, Christo Tchervenkov, Constantine Mavroudis, and the Aristotle Committee

- **Technical difficulty**
- **Risk of mortality**
- **Potential for morbidity**



The STS – EACTS Congenital Heart Surgery Mortality Score (STAT Mortality Score)

Ann Thorac Surg
2012;94:564–72

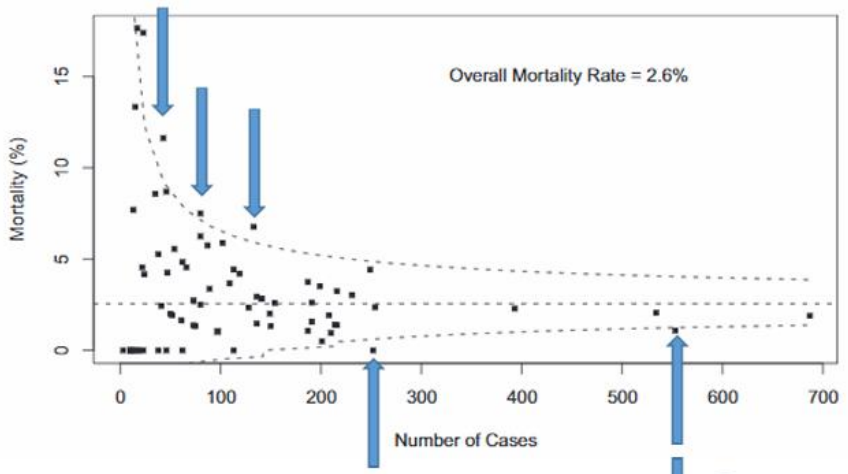
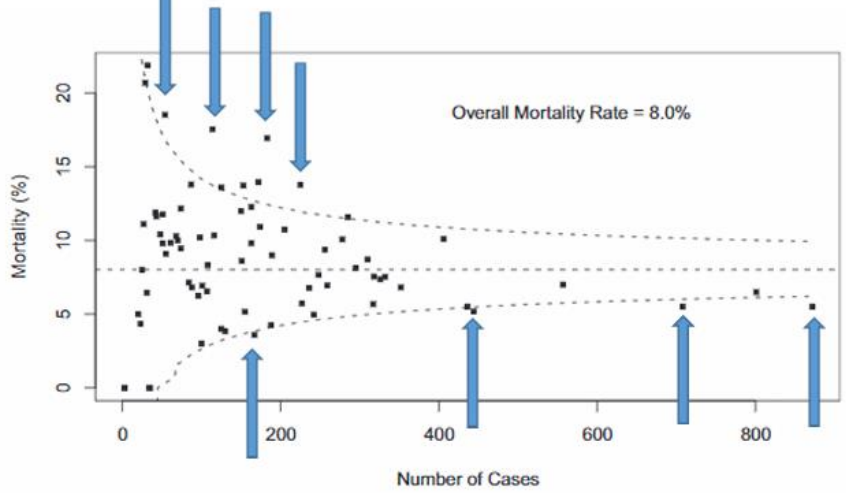


Fig 3. Mortality data displayed as a funnel plot for STAT Category 3 operations. The horizontal dashed line depicts aggregate STS mortality before discharge. Dashed lines depicting exact 95% binomial prediction limits were overlaid to make a funnel plot. Squares represent the number of cases and mortality before discharge for individual STS Congenital Heart Surgery Database participants (centers). (STAT = The Society of Thoracic Surgeons [STS]–European Association for Cardio-Thoracic Surgery [EACTS] Congenital Heart Surgery Mortality Categories.)

Fig 4. Mortality data displayed as a funnel plot for STAT Category 4 operations. The horizontal dashed line depicts aggregate STS mortality before discharge. Dashed lines depicting exact 95% binomial prediction limits were overlaid to make a funnel plot. Squares represent the number of cases and mortality before discharge for individual STS Congenital Heart Surgery Database participants (centers). (STAT = The Society of Thoracic Surgeons [STS]–European Association for Cardio-Thoracic Surgery [EACTS] Congenital Heart Surgery Mortality Categories.)



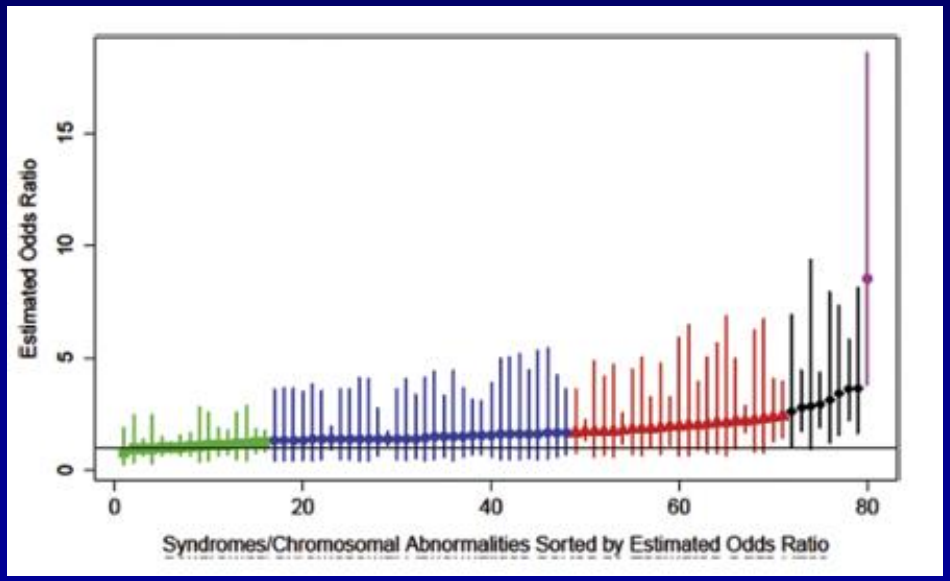
The Annals of Thoracic Surgery
Volume 108, Issue 2, August 2019, Pages 558-566

Refining The Society of Thoracic Surgeons Congenital Heart Surgery Database Mortality Risk Model With Enhanced Risk Adjustment for Chromosomal Abnormalities, Syndromes, and Noncardiac Congenital Anatomic Abnormalities

Jeffrey P. Jacobs, MD,* Sean M. O'Brien, PhD, Kevin D. Hill, MD, MS, S. Ram Kumar, MD, PhD, Erle H. Austin, III, MD, J. William Gaynor, MD, Peter J. Gruber, MD, Richard A. Jonas, MD, Sara K. Pasquali, MD, MHS, Christian Pizarro, MD, James D. St. Louis, MD, James Meza, MD, MSc, Dylan Thibault, MS, David M. Shahian, MD, John E. Mayer, Jr, MD, and Marshall L. Jacobs, MD

Table 3. Adjusted Odds Ratio for Five Categories of Chromosomal Abnormalities/Syndromes and Seven Individual Noncardiac Congenital Anatomic Abnormalities

Effect	Adjusted OR (95% CI)	*p* Value	Examples
Chromosomal abnormalities/syndromes			
Highest risk group 5	21.1 (10.34–43.03)	<0.0001	Trisomy 21/Down syndrome and Glenn or Fontan operation (neonates and infants)
Risk group 4	4.27 (3.35–5.45)	<0.0001	(1) Trisomy 18/Edwards syndrome
			(2) Trisomy 13/Patau syndrome
			(3) Trisomy 21/Down syndrome and Glenn or Fontan operation (children and adults)
			(4) Heterotaxy syndrome, asplenia syndrome (children and adults)
			(5) Noonan syndrome
Risk group 3	2.27 (1.91–2.70)	<0.0001	(1) Alagille syndrome (intrahepatic biliary duct agenesis)
			(2) Williams syndrome (Williams-Beuren syndrome)/7q11.23
			(3) Heterotaxy syndrome, asplenia syndrome (neonates and infants)
Risk group 2	1.71 (1.48–1.98)	<0.0001	(1) Goldenhar syndrome
			(2) Jacobsen syndrome
Lowest risk group 1	0.98 (0.85–1.14)	0.8025	(1) DiGeorge syndrome/22q11 deletion (neonates and infants)
			(2) Trisomy 21/Down syndrome and CAVSD repair
Noncardiac congenital anatomic abnormalities			
Omphalocele	3.43 (2.20–5.36)	<0.0001	
Gastroschisis	3.14 (1.03–9.54)	0.0439	
Congenital diaphragmatic hernia	2.61 (1.69–4.03)	<0.0001	
Tracheoesophageal fistula	1.64 (1.18–2.27)	0.0032	
Anal Atresia (imperforate anus)	1.16 (0.84–1.60)	0.3812	
Intestinal malrotation	0.99 (0.79–1.25)	0.9613	
Hirschsprung disease (congenital aganglionic megacolon)	0.80 (0.36–1.78)	0.5780	



The Quest for Precision Medicine: Unmeasured Patient Factors and Mortality After Congenital Heart Surgery

Sara K. Pasquali, MD, MHS, Michael Gaies, MD, MPH, Mousumi Banerjee, PhD, Wenying Zhang, MS, Janet Donohue, MPH, Mark Russell, MD, J. William Gaynor, MD

The Annals of Thoracic Surgery
Volume 108, Issue 6, December 2019, Pages 1889-1894

- only 30% of the total between-patient variation in mortality was explained by the patient factors included in the model
- 95% of unexplained variation was attributable to unmeasured patient factors

Table 2. Results of the Variance Partitioning Analysis: Explained and Unexplained Mortality Variation in the Cohort

Mortality Variation	Percentage
Explained	
By patient factors included in the model	30
By hospital	4
Unexplained	66[a]

[a]95% related to unmeasured patient factors, 5% to hospital.

Table 3. Proportion of Variation in Mortality Explained by Individual Patient Factors Included in the Model

Patient Factor	Variation Explained (%)
Age/prematurity status	17.5
STAT score	13.4
Preoperative mechanical ventilation	12.0
Other preoperative factors	6.8
Weight at surgery	4.2
Preoperative shock	4.2
Any chromosomal abnormality/syndrome	2.7
Preoperative mechanical circulatory support	2.6

Risk scores

Advantages:

1. Standardization
2. Clinical Decision Making
3. Risk Communication
4. Quality and Outcome Assessment

Limitations:

1. Generalization
2. Dynamic Factors
3. Surgical and Institutional Variability
4. Data Limitations
5. Lack of Holistic View

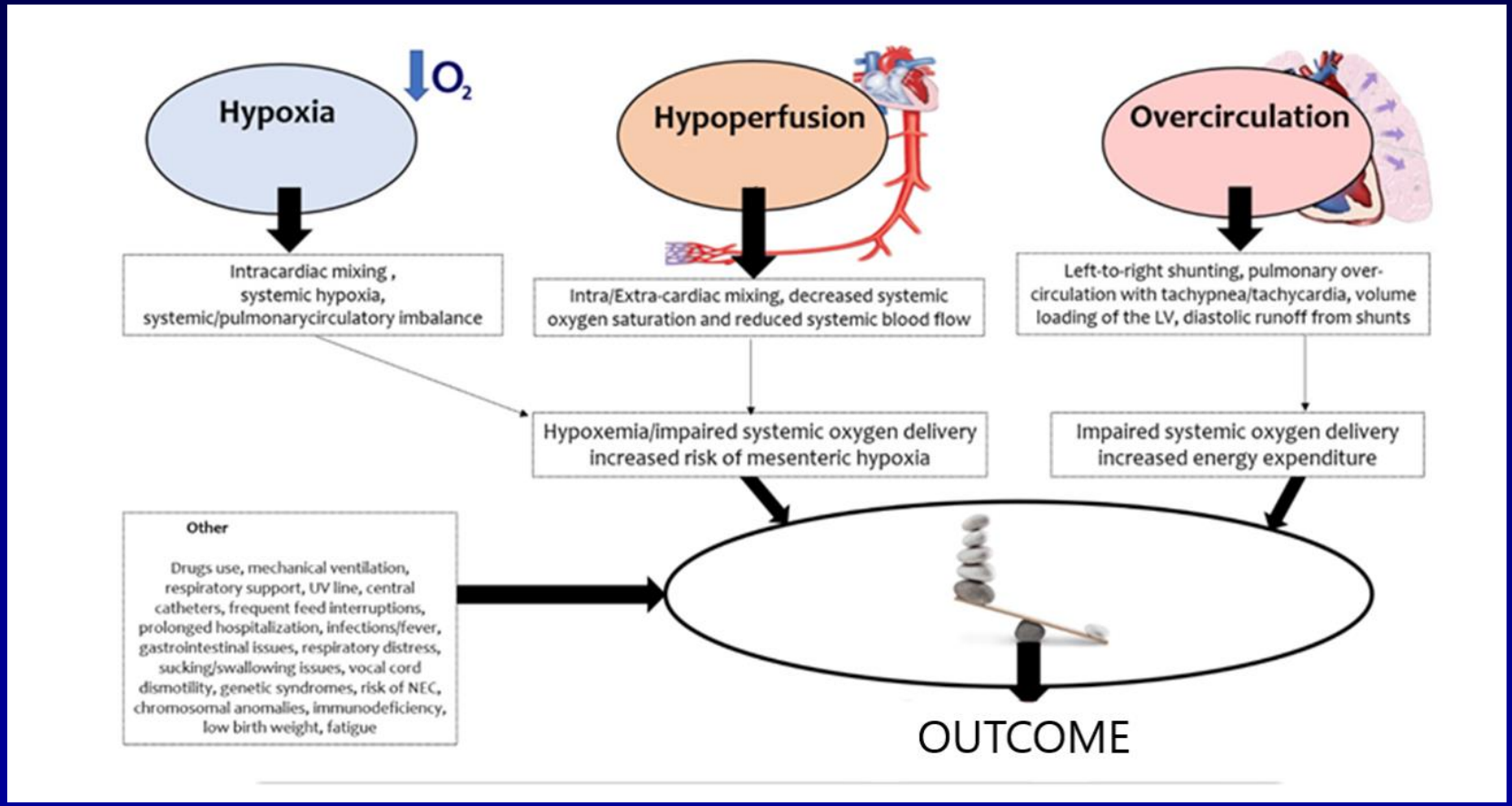
The Journal of Thoracic and Cardiovascular Surgery
JTCVS

What predicts risk and what defines outcomes in congenital heart disease?

Steven M. Schwartz, MD, MS, FRCPC, FAHA

Open Archive • Published: February 13, 2017 • DOI: https://doi.org/10.1016/j.jtcvs.2017.02.005 •

1. Preoperative factors
2. Intraoperative performance
3. Postoperative course
4. Undesirable events



Individual preoperative risk

Preoperative factors

- Demographics: Age and Weight
- Cardiac Anatomy and Physiology
- Cardiac Function
- Presence of Comorbidities
- Previous Cardiac Surgeries or Interventions
- Pulmonary Hypertension
- Nutritional Status
- Social factors

Anesthetic Risk

- Organ function (kidney, liver, lungs)
- Hematological and coagulation factors
- Infectional status (asymptomatic carrier)
- Allergies and drug reactions
- Expirience and skills of the anesthesia team

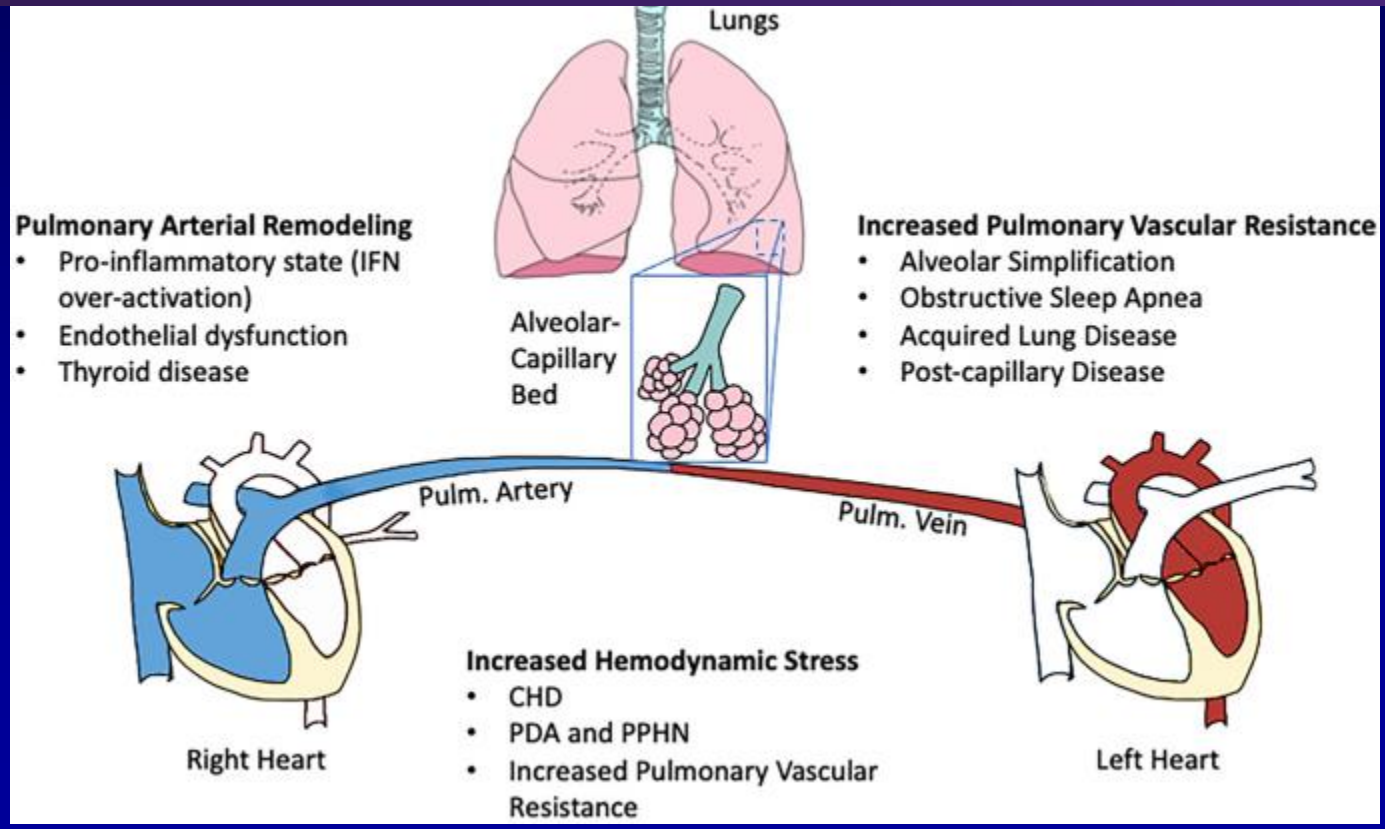
Assessing Operability of AVSD

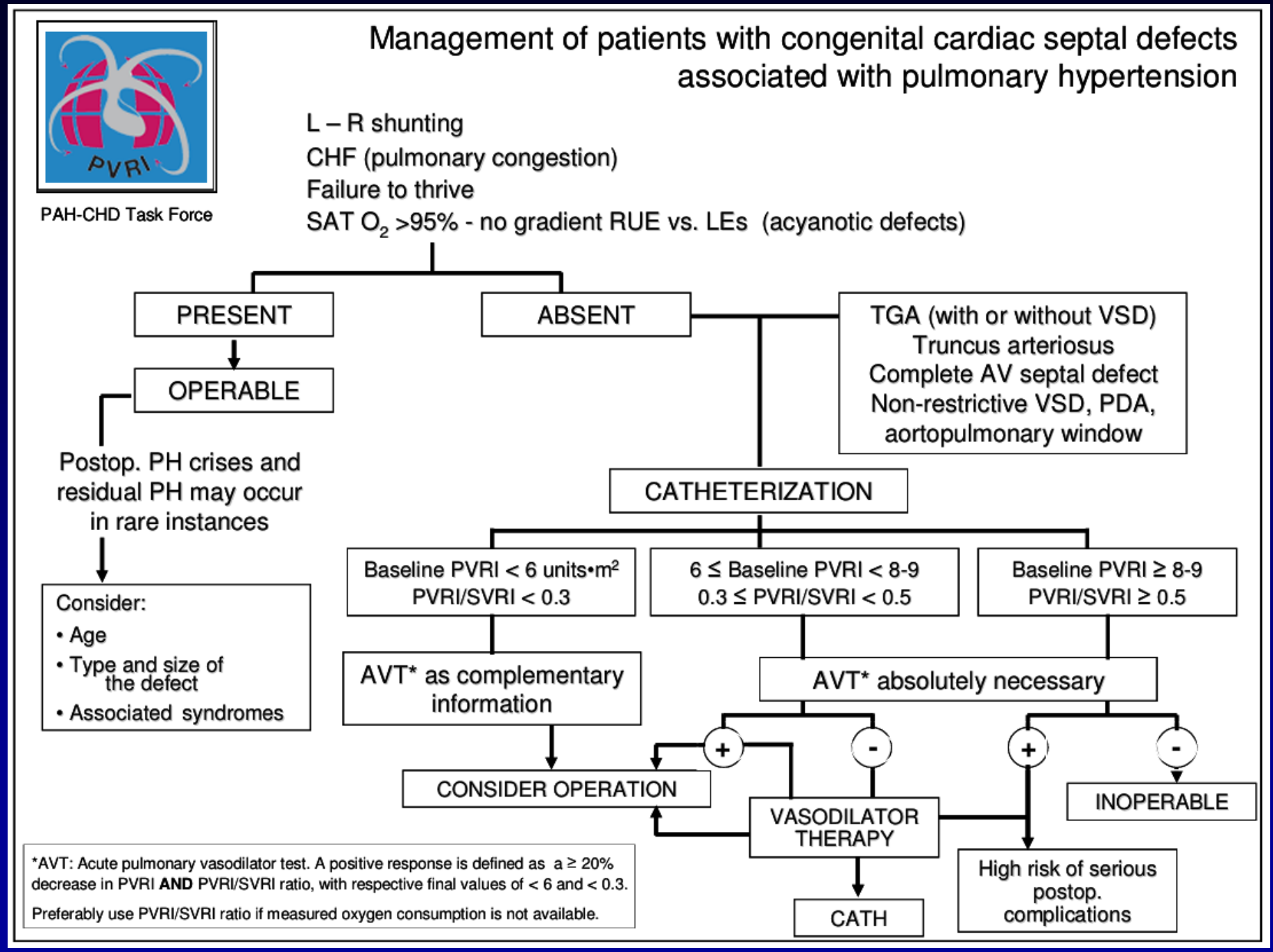
- Clinical examination
- RTG
- Echocardiography
- MR study
- CT scans
- Cardiac catetherisation

Pulmonary Hypertension in the Population with Down Syndrome

Review | Open access | Published: 16 January 2022
Volume 11, pages 33–47, (2022) Cite this article

Douglas S. Bush & D. Dunbar Ivy




PAH-CHD Task Force
Management of patients with congenital cardiac septal defects associated with pulmonary hypertension
L – R shunting
CHF (pulmonary congestion)
Failure to thrive
SAT O_2 >95% - no gradient RUE vs. LEs (acyanotic defects)
PRESENT
ABSENT
OPERABLE
TGA (with or without VSD)
Truncus arteriosus
Complete AV septal defect
Non-restrictive VSD, PDA, aortopulmonary window
Postop. PH crises and residual PH may occur in rare instances
CATHETERIZATION
Consider:
• Age
• Type and size of the defect
• Associated syndromes
Baseline PVRI < 6 units•m²
PVRI/SVRI < 0.3
6 ≤ Baseline PVRI < 8-9
0.3 ≤ PVRI/SVRI < 0.5
Baseline PVRI ≥ 8-9
PVRI/SVRI ≥ 0.5
AVT* as complementary information
AVT* absolutely necessary
+
-
+
-
CONSIDER OPERATION
VASODILATOR THERAPY
INOPERABLE
CATH
High risk of serious postop. complications
*AVT: Acute pulmonary vasodilator test. A positive response is defined as a ≥ 20% decrease in PVRI AND PVRI/SVRI ratio, with respective final values of < 6 and < 0.3.
Preferably use PVRI/SVRI ratio if measured oxygen consumption is not available.

Assessment of reversibility

- In patient's with a baseline PVRI between 6-9 u/m^2 and a PVRI/SVRI ratio between 0.3-0.5, a positive response is defined as :

↓

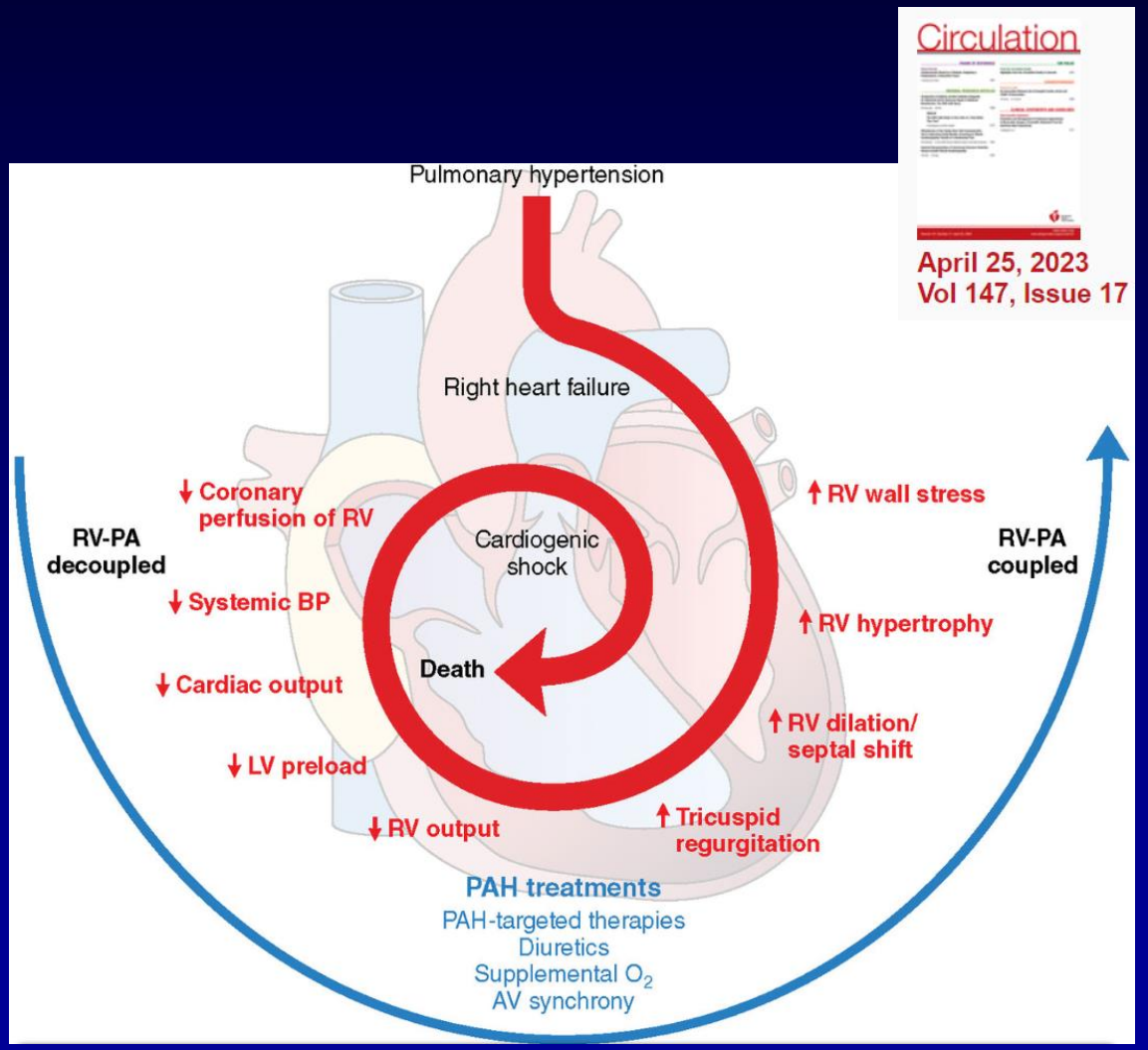
20% decrease in PVRI **AND** PVRI/SVRI ratio, **with respective final (lowest) values** of < 6 units/m^2 and < 0.3

Using either O2 or iNO or a combination of both

Lopes AA, O'Leary PW.Cardiol Young. 2009;19:431-5.

High PVR – factors to consider

- A-V valve regurgitation
- Low cardiac output
- Pulmonary issues (parenchyma, airways)
- Genetic predispositions



Pulmonary vascular resistance guidelines

- Elevated pulmonary vascular resistance is a significant risk factor in selected preoperative patients, and earlier repair is generally advantageous in younger children due to the responsiveness of their pulmonary vascular bed (Class I, Level of Evidence B).
- In selected patients with preoperative pulmonary vascular disease, non-CPB interventions may be a reasonable alternative; however, definitive preoperative parameters for outcome prediction are not clearly established (Class IIa, Level of Evidence B).
- While postoperative vasodilators are crucial in therapy, the exact level of preoperative pulmonary vascular resistance that would necessitate separate circulatory support is not clearly defined (Level of Evidence C).

The Journal of Thoracic and Cardiovascular Surgery • August 2007

CHD

The presence of Down syndrome is not a risk factor in complete atrioventricular septal defect repair

Ruediger Lange, MD, PhD,[a] Thomas Guenther, MD,[a] Raymonde Busch, MS,[c] John Hess, MD, PhD,[b] and Christian Schreiber, MD[a]

Objective: Down syndrome is frequently associated with complete atrioventricular septal defect. The aim of this retrospective study was to evaluate the impact of Down syndrome on morphologic features, surgical management, and perioperative and long-term mortality in patients with complete atrioventricular septal defect.

- 40% of children with Down Syndrome have CHD
  - 40% of the defects are AV canal
  - fare better than non-Down Syndrome AVC

Trisomy 21 (Down Syndrome)

Considerations with Trisomy 21

- **Pulmonary hypertension**
- **Thyroid disorders**
- **GI tract abnormalities (12%)**
  - TE fistula
  - Duodenal atresia
  - Omphalocele
  - Hirschprung disease
- **Difficulty with vascular access**

  Sulemanji et al. Anaesthesiol Scand 2009
- **Airway abnormalities**
  - Tracheal stenosis

    Loukanov et al. JTCVS 2005
  - Laryngo/Tracheomalacia
- **CNS abnormalities**
  - Hypotonia
  - Seizures (<9%)
- **Difficulty with sedation**
  - Use of Precedex

    Kalyanaraman et al. Pediatr Cardiol 2007
  - PCICS Post-op Guideline

CAVC - Intraoperative factors

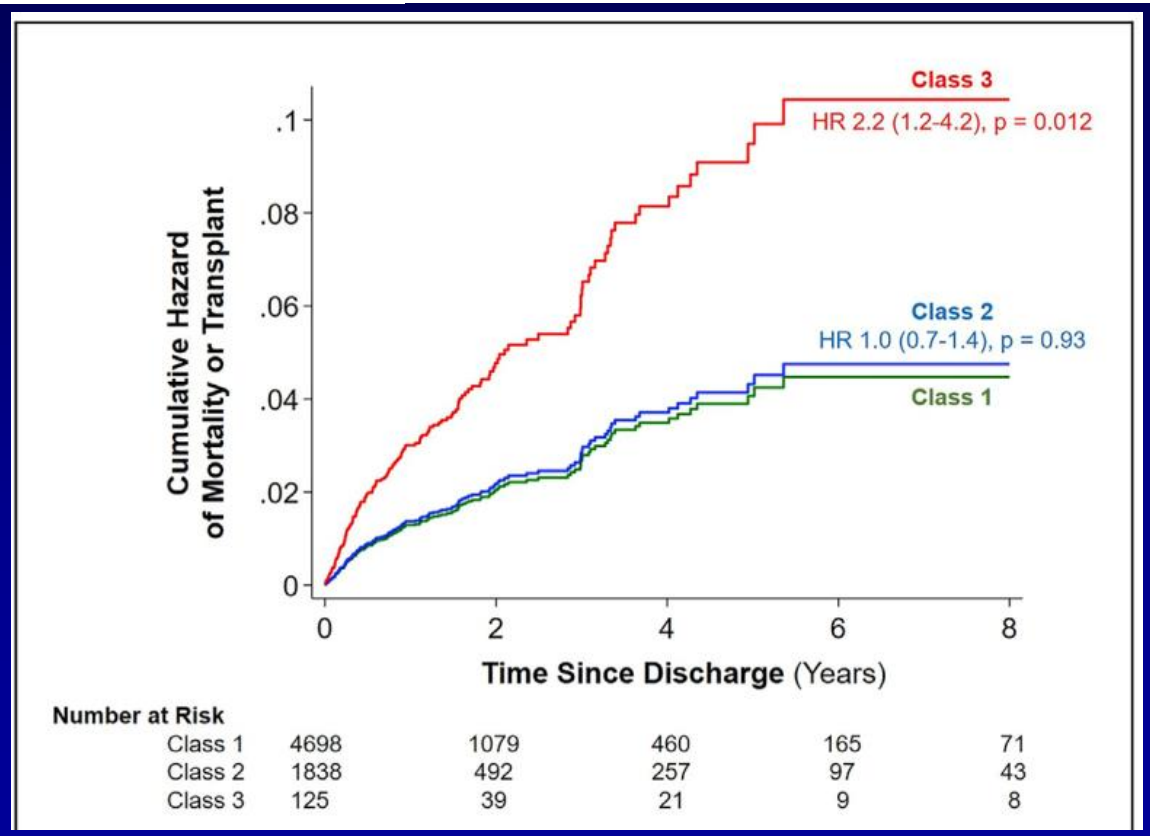
Morphological Changes With Age

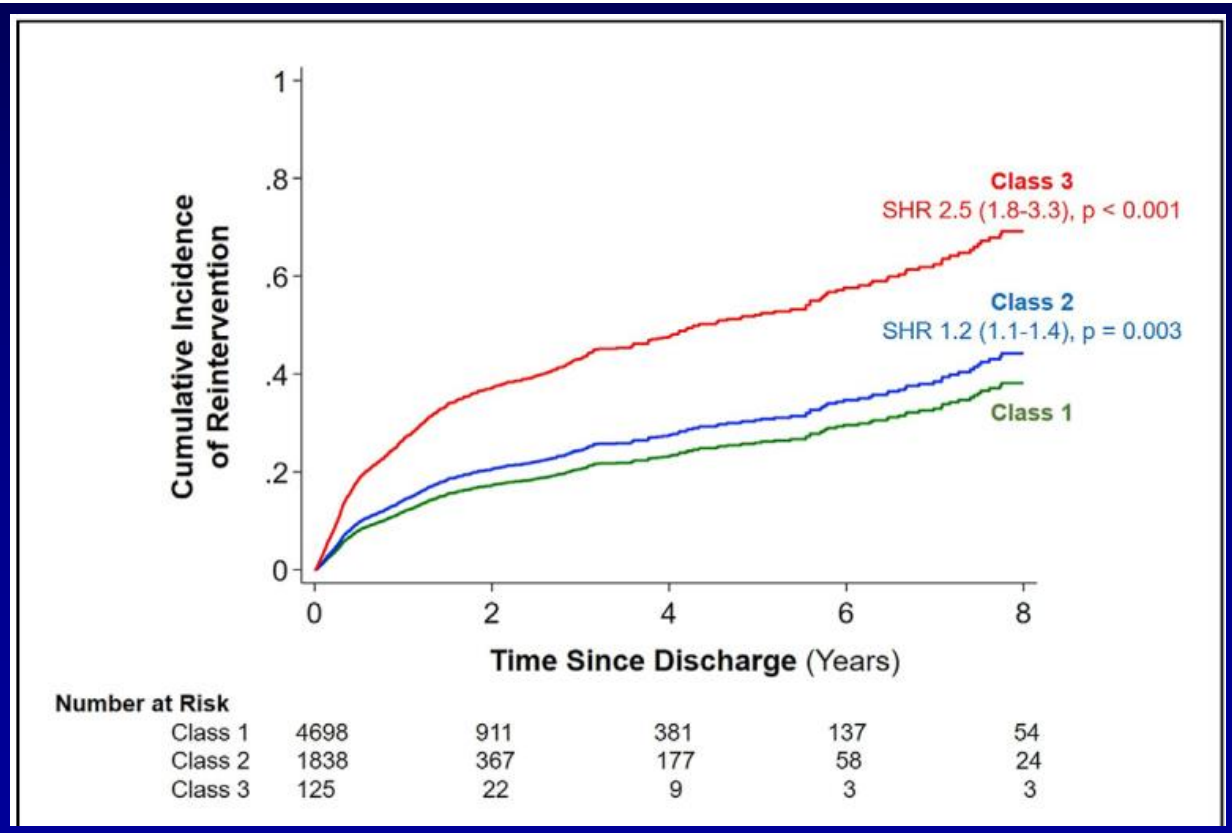
- Bigger structures,
- Better exposure,
- Ease of cannulation,
- No requirement of total circulatory arrest
- Thickening of the opposing edges of the ‘‘cleft’’ in the AV valves - the closure of the cleft and the suturing of the leaflet to the patch are more secure.
- Annular dilatation, and this may need additional procedures (annuloplasty) for satisfactory repair.

Intraoperative Technical Performance Score Predicts Outcomes After Congenital Cardiac Surgery

(Ann Thorac Surg 2023;115:471-8)

Aditya Sengupta, MD, Kimberlee Gauvreau, ScD, Katherine Kohlsaat, BS, Steven D. Colan, MD, Jane W. Newburger, MD, MPH, Pedro J. del Nido, MD, and Meena Nathan, MD, MPH



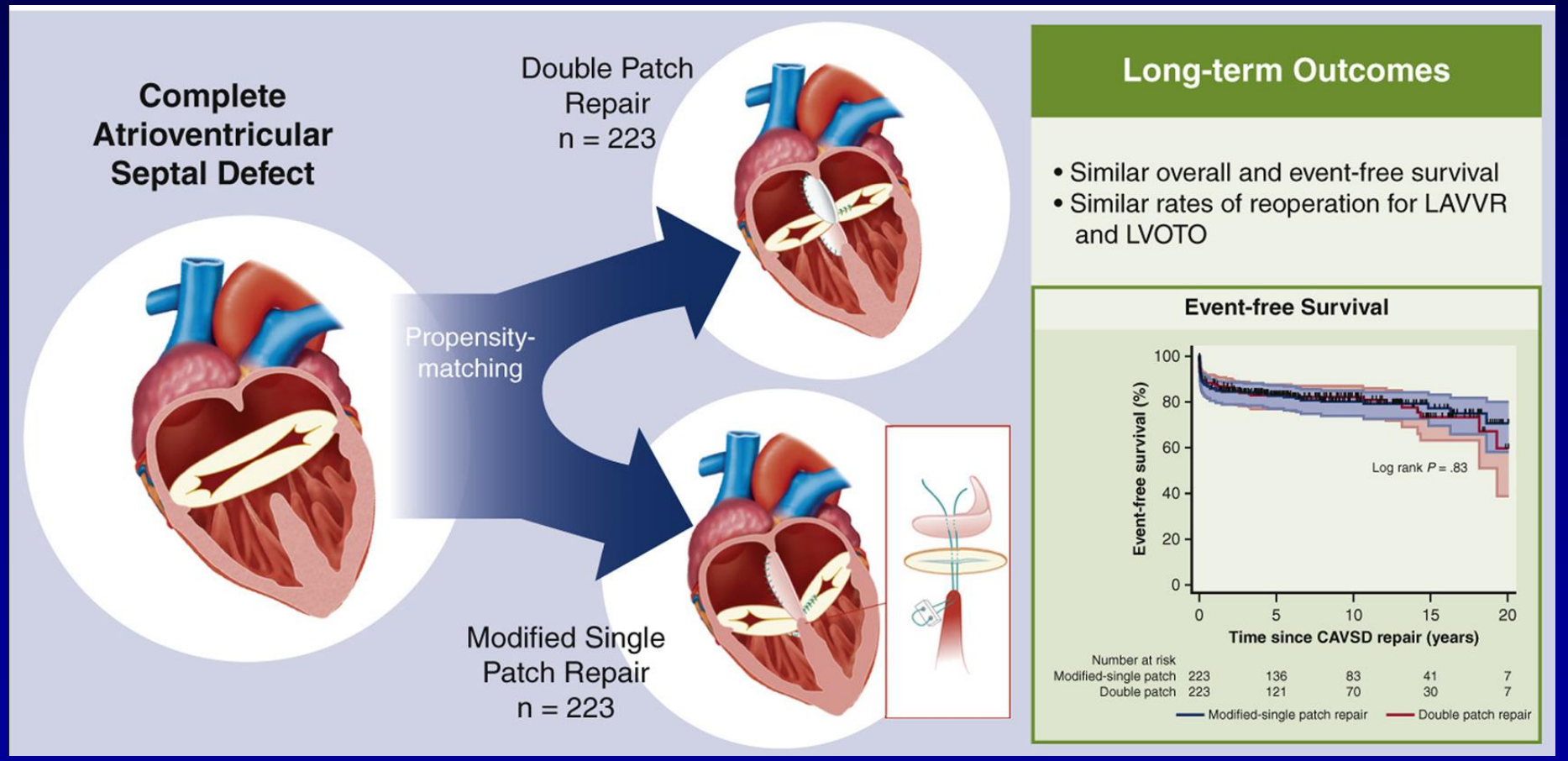


The Journal of Thoracic and Cardiovascular Surgery
JTCVS

Complete atrioventricular septal defect repair in Australia: Results over 25 years

Laura S. Fong, MBBS, MS,[a,b] Kim Betts, PhD, MBiostats,[c] Douglas Bell, MBBS,[d] Igor E. Konstantinov, PhD, FRACS,[e] Ian A. Nicholson, FRACS,[a,b] David S. Winlaw, PhD, FRACS,[a,b] and Yishay Orr, PhD, FRACS,[a,b] the Australian CAVSD Study Group

The Journal of Thoracic and Cardiovascular Surgery • March 2020



The Journal of Thoracic and Cardiovascular Surgery
JTCVS

Repair of complete atrioventricular septal defect between 2 and 3.5 kilograms: Defining the limits of safe repair

Charlotte S. Goutallier, BBiomed • Edward Buratto, MBBS, PhD, FRACS • Antonia Schulz, MD • ...
Ben Davies, BMBS, PhD, FRCS • Igor E. Konstantinov, MD, PhD, FRACS •
Christian P. Brizard, MD, MS • Show all authors

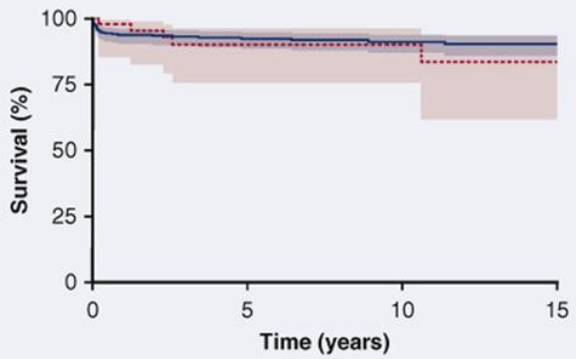
Published: February 24, 2022

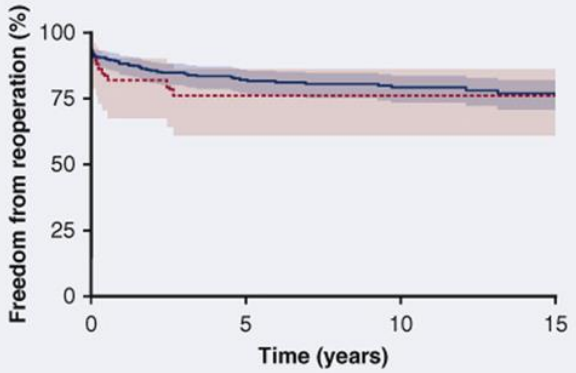
Repair of complete atrioventricular septal defect under 3.5 kilograms: defining the limits of safe repair

Methods:

- All patients (n = 456) who underwent cAVSD repair from 1990 to 2019 at a single institution were included in the study
- Patients were divided in two groups: those ≤ 3.5kg at time of repair (12.9%, 59/456) and those > 3.5kg (87.1%, 397/456)

Results





Number at risk

> 3.5 kg	397	206	131	76
≤ 3.5 kg	59	28	14	9

— > 3.5 kg 95% CI ····· ≤ 3.5 kg 95% CI

Number at risk

> 3.5 kg	397	172	102	58
≤ 3.5 kg	59	23	12	7

— > 3.5 kg 95% CI ····· ≤ 3.5 kg 95% CI

Conclusions:

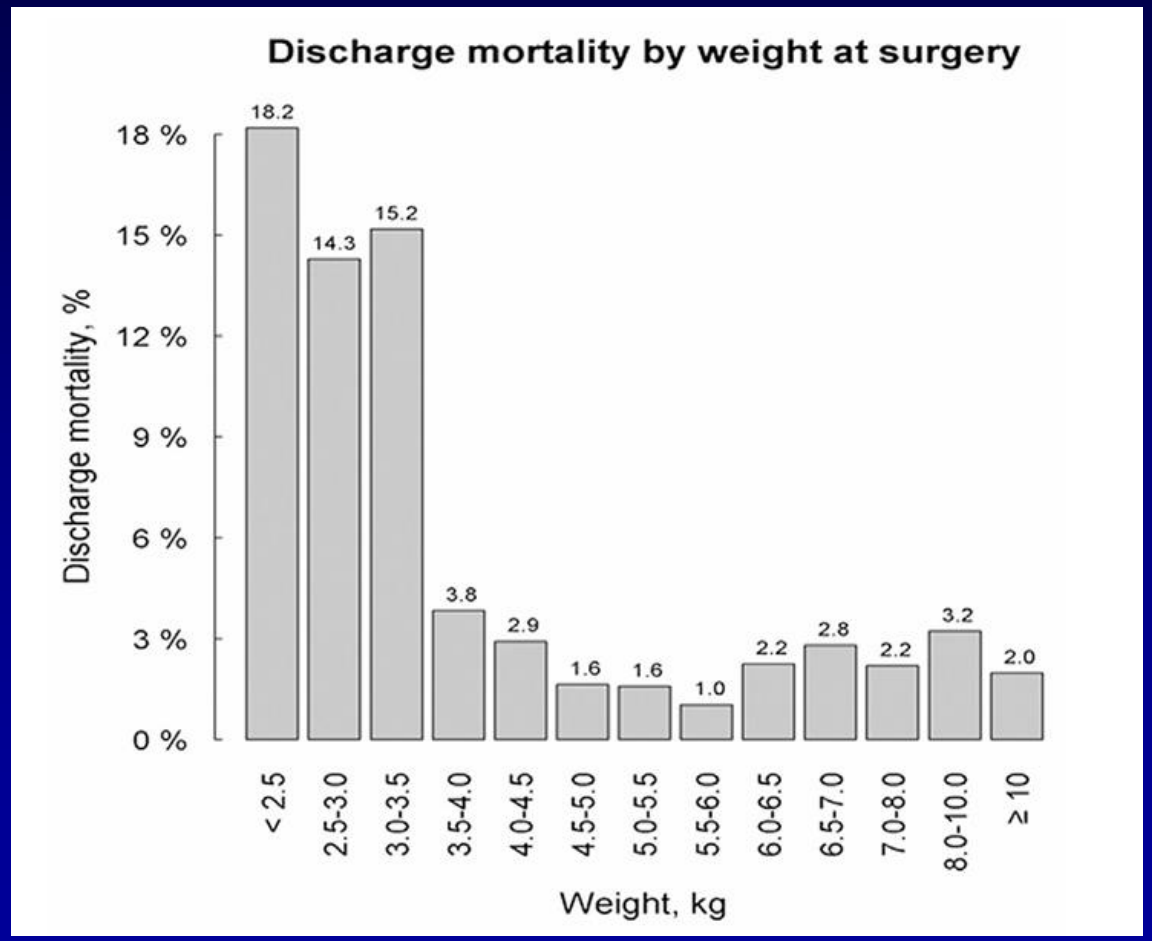
- Repair of cAVSD ≤ 3.5kg is safe, with similar overall survival and freedom from reoperation compared to those > 3.5kg
- These findings add further support to an approach of early complete repair for symptomatic children between 2.5 and 3.5kg

- Early mortality 1.7% vs. 3.0%
- Survival sfter 20 years – no difference
- Freedom from left AV – valve reoperation – no difference

The Journal of Thoracic and Cardiovascular Surgery JTCVS

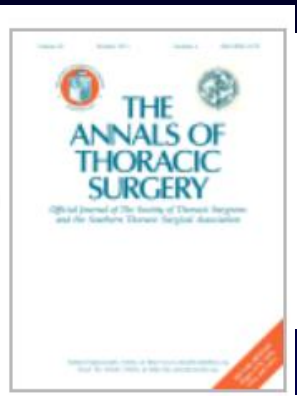
Contemporary outcomes of complete atrioventricular septal defect repair: Analysis of the Society of Thoracic Surgeons Congenital Heart Surgery Database

James D. St. Louis, MD,[a] Upinder Jodhka, MD, MHS,[b] Jeffrey P. Jacobs, MD,[c] Xia He, MS,[d] Kevin D. Hill, MD,[d] Sara K. Pasquali, MD, MHS,[e] and Marshall L. Jacobs, MD[c]



- < 3.5 kg mortality = 15.2%
- <2.5 Kg mortality = 18.2%

- < 2.5 kg more likely to have:
  - Preoperative circulatory suport
  - Preoperative mechanical ventilation
  - Less common Down's syndrome



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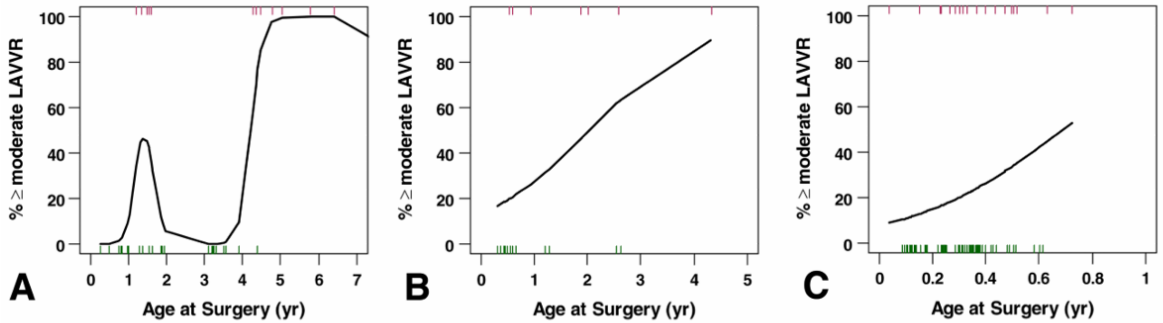
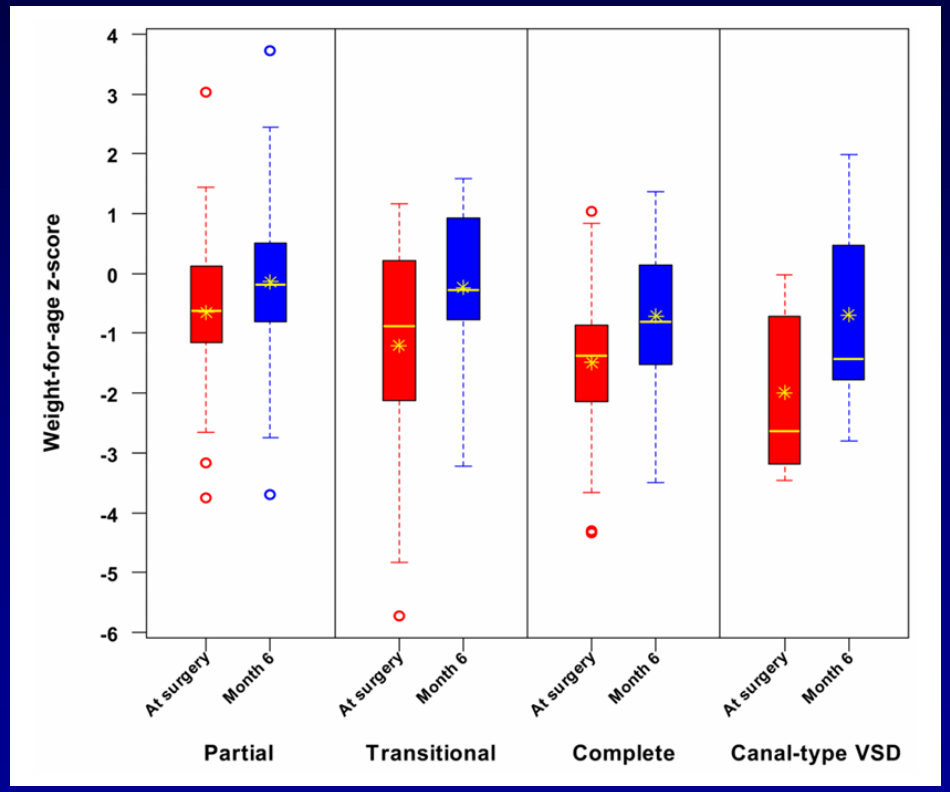
Surgical Interventions for Atrioventricular Septal Defect Subtypes: The Pediatric Heart Network Experience





- Hospital mortality 2.5%
- In patients below 2 months of age:
  - Longer ICU stay
  - Longer respiratory suport
  - Longer hospital stay
- < 2.5 kg mortality = 12 %

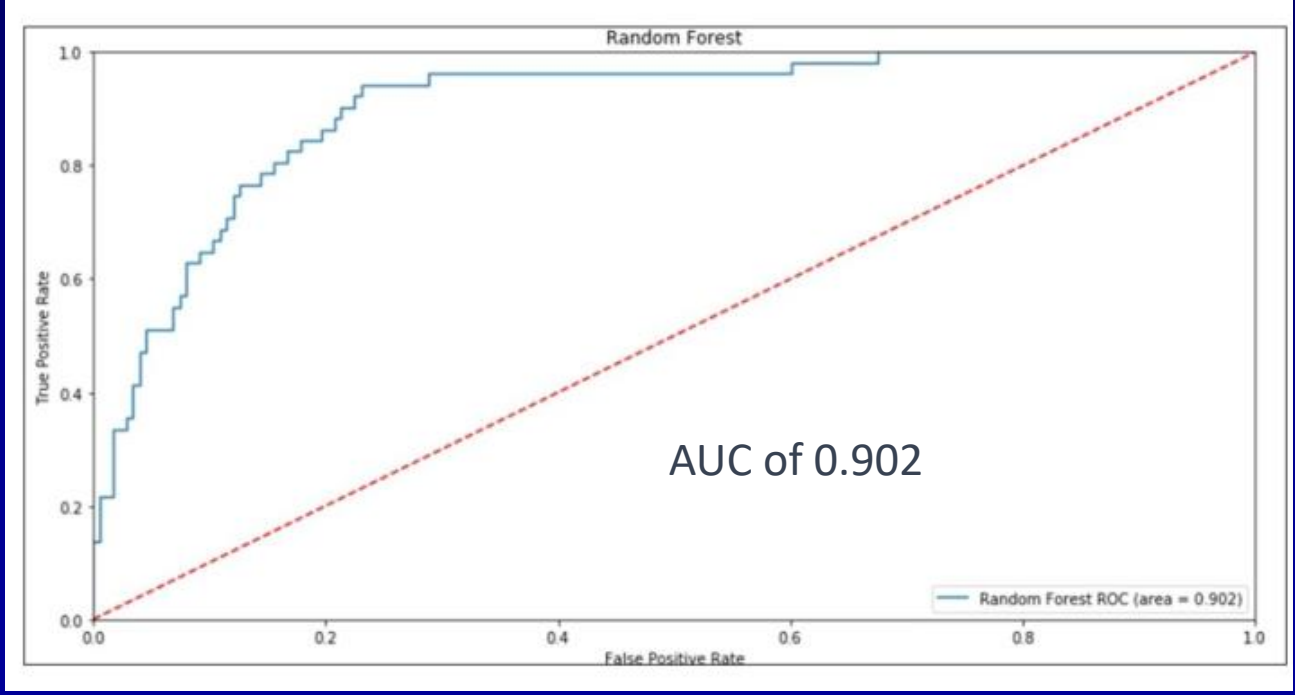
RESEARCH ARTICLE

PLOS ONE

September 4, 2020

Improving preoperative risk-of-death prediction in surgery congenital heart defects using artificial intelligence model: A pilot study

João Chang Junior[1,2,3]*, Fábio Binuesa[1], Luiz Fernando Caneo[1], Aida Luiza Ribeiro Turquetto[1,4], Elisandra Cristina Trevisan Calvo Arita[1], Aline Cristina Barbosa[1], Alfredo Manoel da Silva Fernandes[1], Evelinda Marramon Trindade[1,4,5], Fábio Biscegli Jatene[1], Paul-Eric Dossou[6], Marcelo Biscegli Jatene[1]



AUC of 0.902

- 2240 patients
- 6 most popular and widely used AI models for risk prediction:
  - Multilayer Perceptron (MLP),
  - Random Forest (RF),
  - Extra Trees (ET),
  - Stochastic Gradient Boosting (SGB),
  - AdaBoost Classification (ABC),
  - Bag Decision Trees (BDT)

Adverse Outcomes Prediction for Congenital Heart Surgery: A Machine Learning Approach

World Journal for Pediatric and Congenital Heart Surgery
2021, Vol. 12(4) 453-460

DOI: 10.1177/2150135121007106
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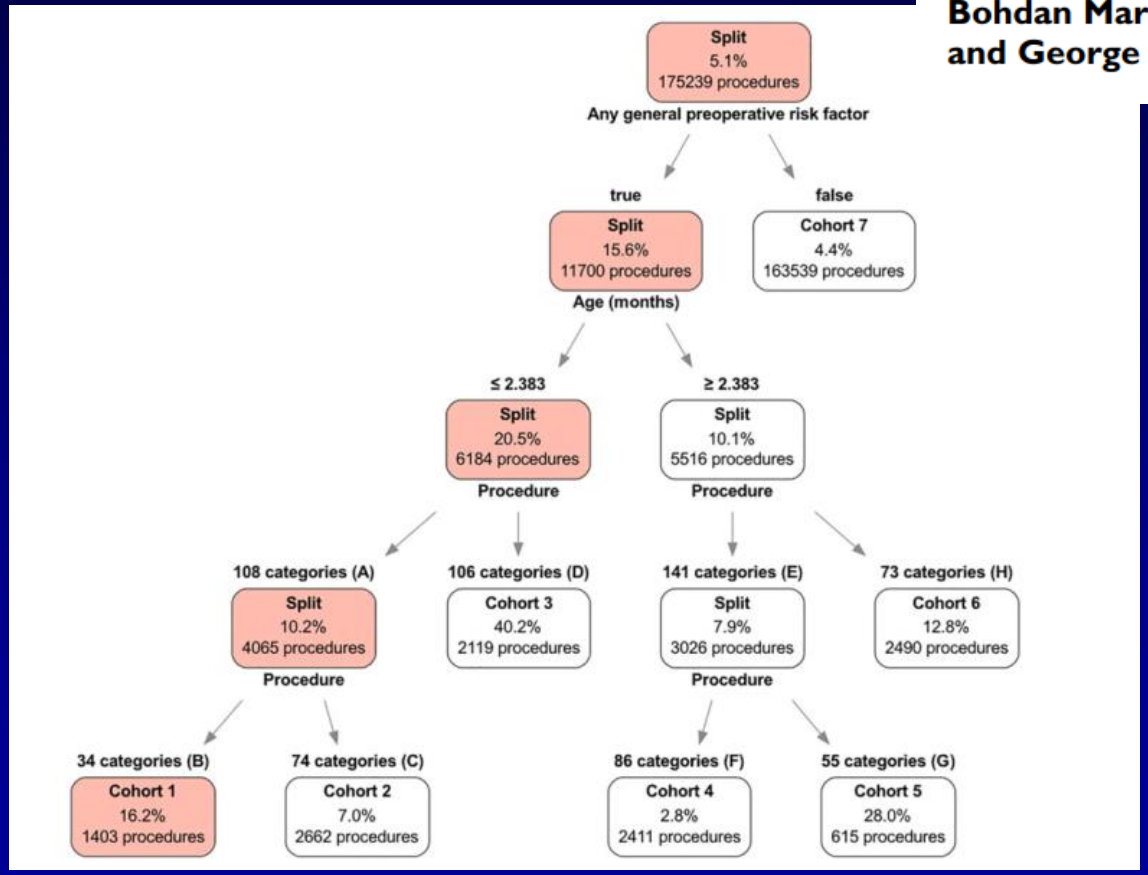
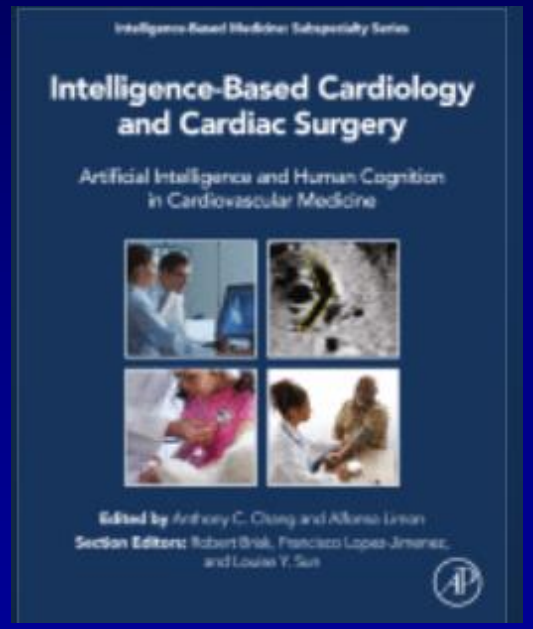
Dimitris Bertsimas, PhD[1], Daisy Zhuo, PhD[2,3], Jack Dunn, PhD[2,3], Jordan Levine, MEng[2,3], Eugenio Zuccarelli, MBAn, MSc[1], Nikos Smyrnakis[4], Zdzislaw Tobota, MD[5], Bohdan Maruszewski, MD, PhD[5], Jose Fragata, MD, PhD[6], and George E. Sarris, MD, PhD[7]



- Analysis of :
  - 235 000 patients
  - 295 00 procedures
- More accurate and personalized risk assesment



The Role of Artificial Intelligence in Prediction, Risk Stratification, and Personalized Treatment Planning for Congenital Heart Diseases

Syed Naveed Mohsin [1], Abubakar Gapizov [2], Chukwuyem Ekhator [3], Noor U. Ain [4, 5], Saeed Ahmad [4], Mavra Khan [6], Chad Barker [7], Muqaddas Hussain [8], Jahnavi Malineni [9], Afif Ramadhan [10, 11], Raghu Halappa Nagaraj [12]

(August 30, 2023) Cureus 15(8): e44374. DOI 10.7759/cureus.44374

- Transformative Potential of AI
- Improving Diagnostic Accuracy
- Risk Stratification
- Personalized Treatment Planning

Conclusions

- Unique patient characteristics can impact disease manifestation and response to therapy, supporting “precision medicine” approaches and more individualized and targeted therapeutic strategies.
- The pulmonary hypertension remains an important issue that may preclude treatment as an independent factor in AVSD patients.
- There is no good model for children with AVSD to precisely predict personalized risk
- Artificial intelligence models represent a huge potential and opportunity to develop a system that takes into account a countless number of factors affecting perioperative risk.

Thank you for your attention.