

Critical Left Ventricular Outflow Tract Obstruction (LVOTO)

Fall Work Weekend
Nov. 2013

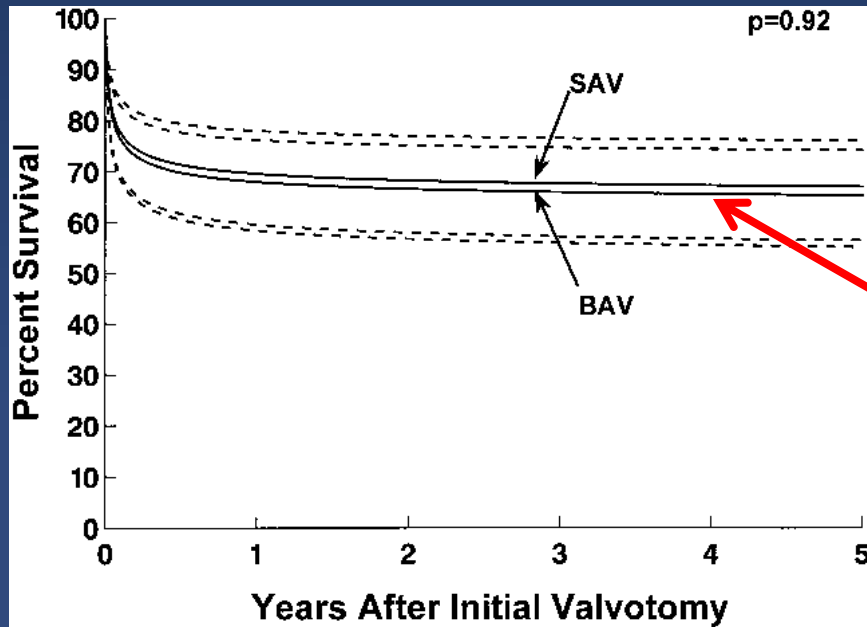
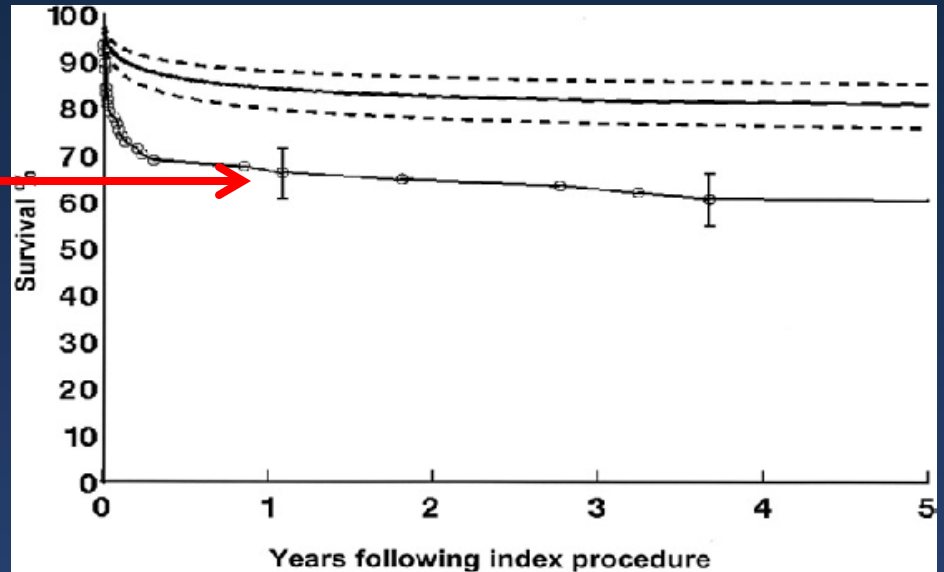


Work Weekend Objectives

- General overview of cohort
- Generate feasible research question based on current data – Early question
- Develop long term questions of interest
- Focused chart review and data entry
 - Indication for initial Hybrid procedure

Previous CHSS Work

**Discordant managed
BVR patients**



Survival SAV vs. BAV

Hickey et al., McCrindle et al., Ashburn et al.

Original Cohort Objectives

- Assess emerging management strategies
- Identify risk factors predictive of late outcomes
- Readjust the CHSS calculator

Entry Criteria

- 2005- Present
 - Age < 30 days at admission to CHSS institution
 - AV & VA concordance
 - Ductal dependent systemic circulation
 - Excludes patients with AVSD

General Profile

	N	% Total
Enrollment	675	100
Initial procedure	665	99%
Total deaths	214	32%
Deaths after intervention	204	30%
Deaths prior to intervention	10	1%

435 (65%) have had at least one subsequent procedure

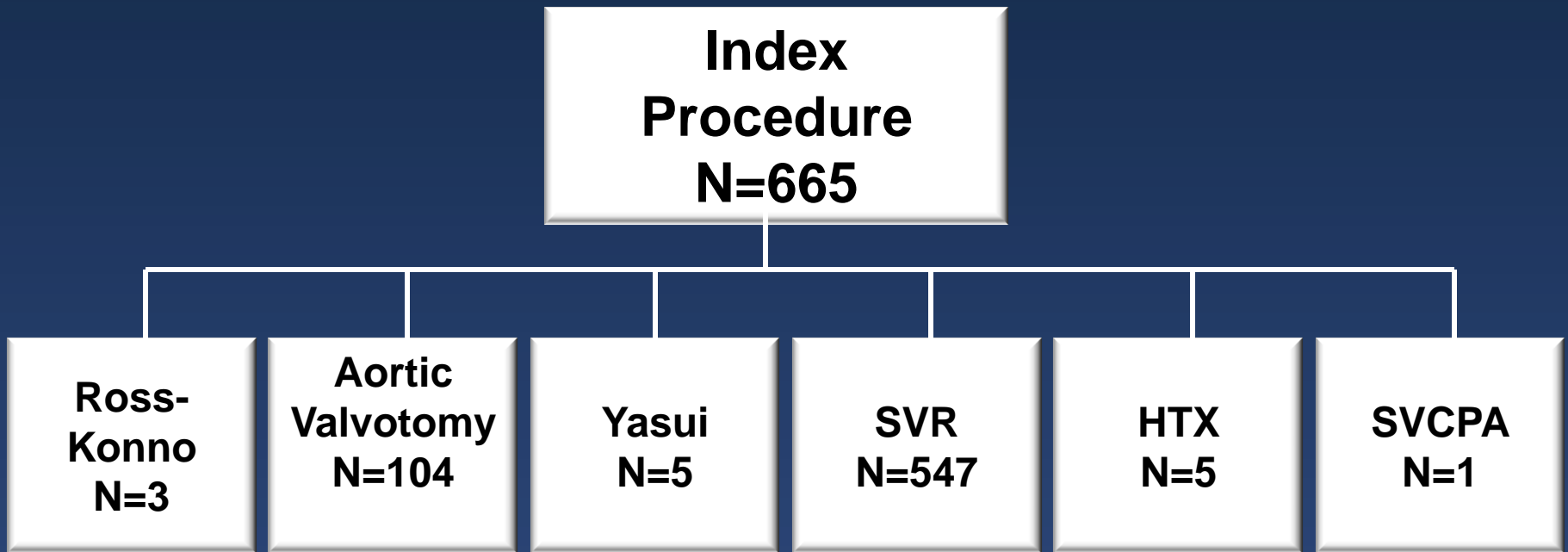
Morphology Based on Baseline Echo

Baseline echo morphology N=658				
Echos*	Yes	% yes	No	%No
Hypoplastic Left Ventricle **	512	78%	101	
Aortic Valve Stenosis	164	25%	404	
Aortic Valve Hypoplasia	66	10%	592	
Aortic Valve Atresia	314	48%	344	
Mitral Valve Stenosis	113	17%	70	
Mitral Valve Hypoplasia	196	30%	70	
Mitral Valve Atresia	222	34%	70	
Aortic Coarctation	182	28%	415	
Hypoplastic Aortic Arch	497	76%	100	
Interrupted Aortic Arch	15	2%	588	

***17 patients w/out baseline echo**

****135 (21%) with severe/atretic LV**

Index Procedure



Deaths prior to intervention=10

Surgical Description

Code	Description	N
SANO	Stage 1 Pallation- Norwood-RV-PA shunt	
MBT	Stage 1 Pallation- Norwood-Systemic to PA shunt	
HYBR	Stage 1 Palliation- Hybrid	
HYBNR	Hybrid to Norwood Cross-over	
SVCPA	Stage 2 SVC-PA Anastomosis	
HYBSV	Stage 2-Hybrid Single V	
SVBVCO	Single V to Biventricular Cross Over	
FONTAN	Stage 3 Fontan	
HTX	Heart Transplant	
SVALV	Outflow tract and Arch Repairs	
YASUI	Yasui	
AVR	Aortic Valve replacement	

AORTIC VALVOTOMY N=104

CATH
N=73

SVALV
N=31



Dead = 20 (3%)

Norwood
N=440

SANO
N=217

MBT
223

SVCPA 152
YASUI 4
HYBV 1
HTX 3
FONT 1
ANFS 17
DIED 39

SVCPA 143
SVAL 1
HTX 6
FONT 1
ANFS 9
DIED 63

SVCPA 1
SVAL 1
HTX 9
FONT 78
DIED 11
ANFS 52
ANFS 4
ANFS 1
ANFS 2
ANFS 2

HYBV 1
HTX 2
FONT 70
DIED 18
ANFS 52
ANFS 1
DIED 2
ANFS 2
ANFS 2

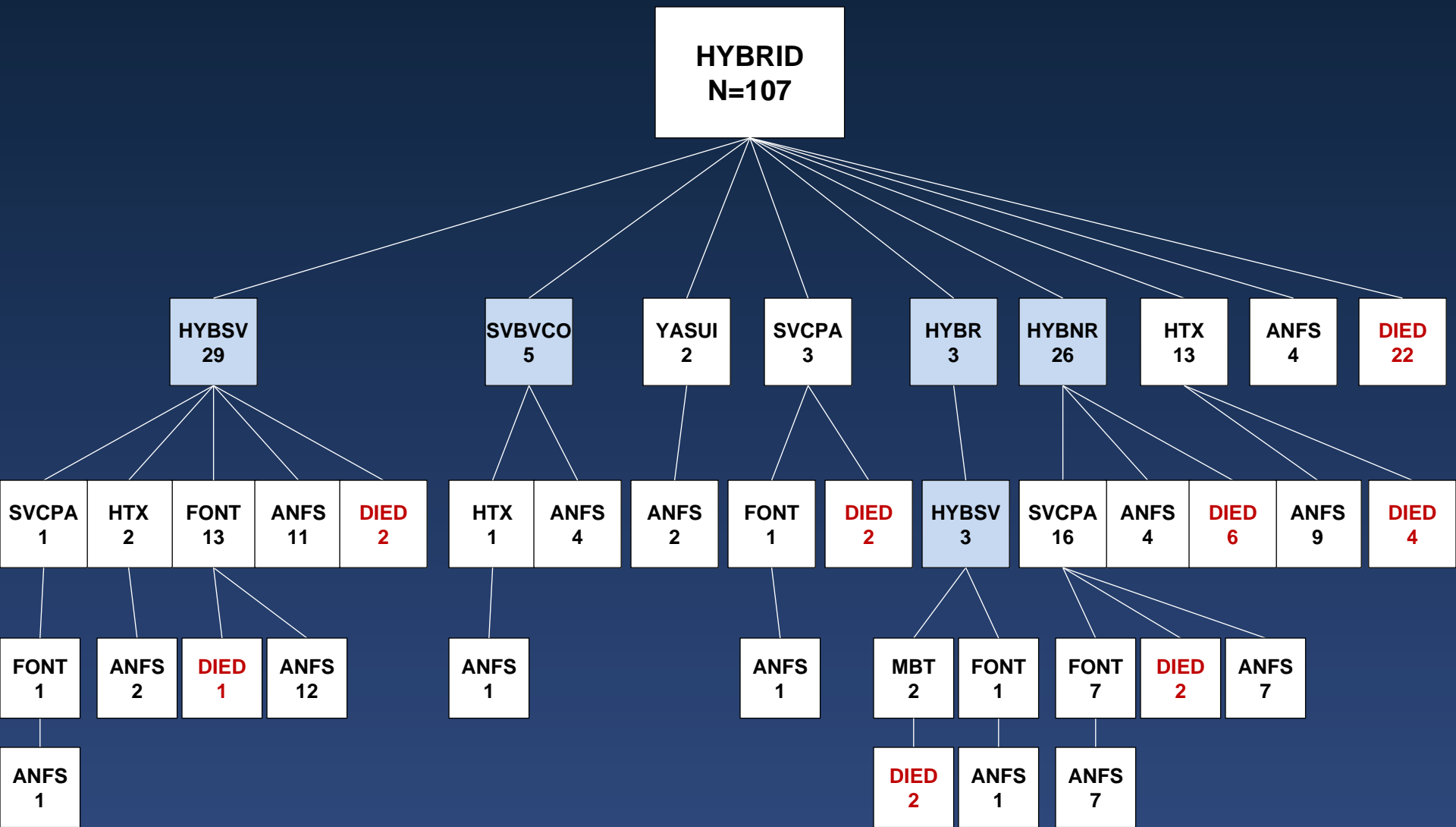
FONT 1
FONT 1
DIED 1
ANFS 8
DIED 6
ANFS 71
HTX 1

ANFS 1
ANFS 2
DIED 1
ANFS 67

ANFS 1
ANFS 1

ANFS 1

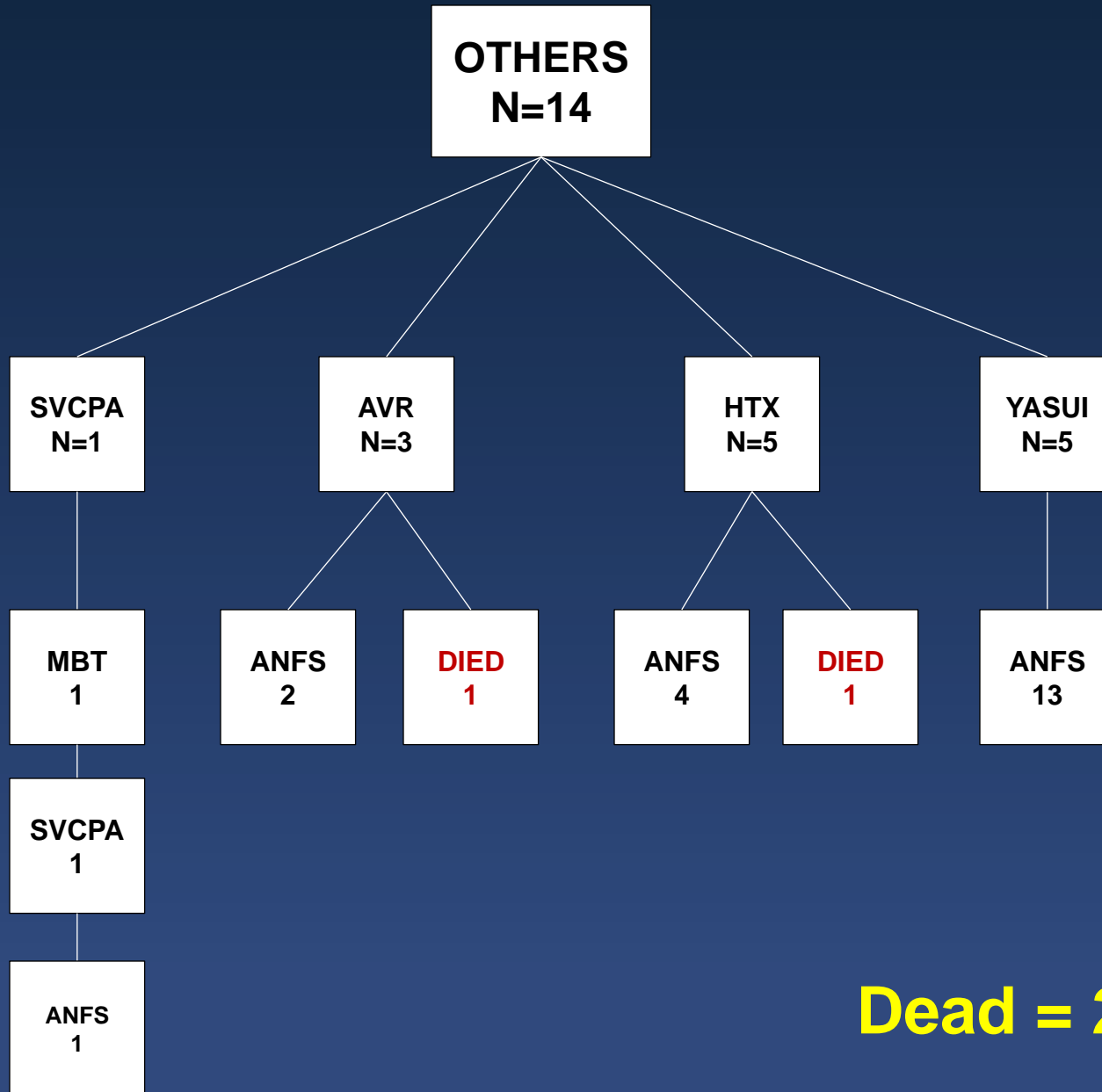
MBT Dead = 84 (12%)
SANO Dead = 57 (8%)



Dead = 41 (6%)

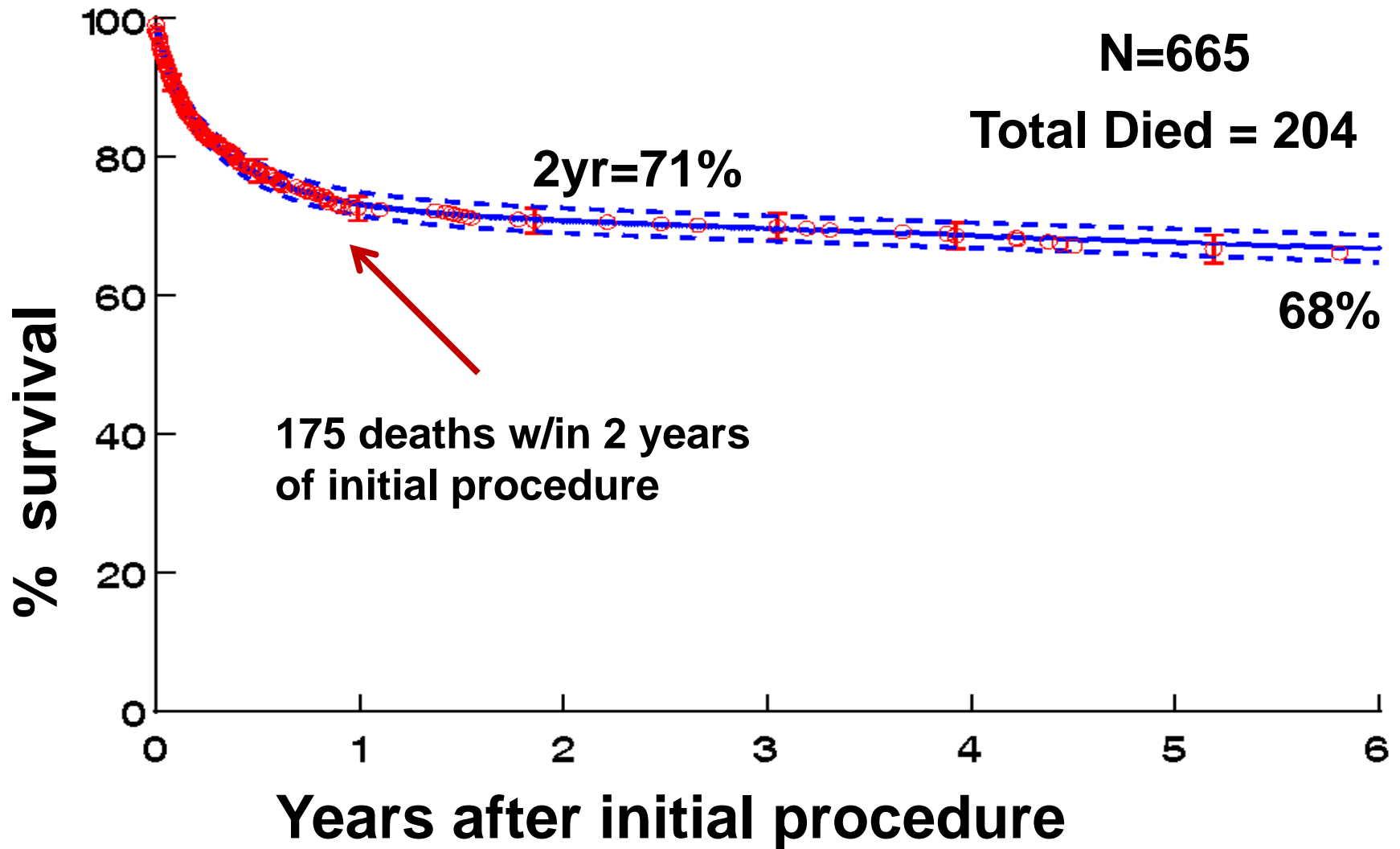
Initial Hybrid Procedure

- N=107
 - 37 = Bilateral PA band alone
 - 67 = Ductal stent + Bilateral PA band
 - 3 = Ductal stent alone
- 5 SVBVC, 2 Yasui
- 26 with subsequent Norwood procedure
 - 10 RV-PA shunts
 - 8 MBT shunts
 - 8 Unknown

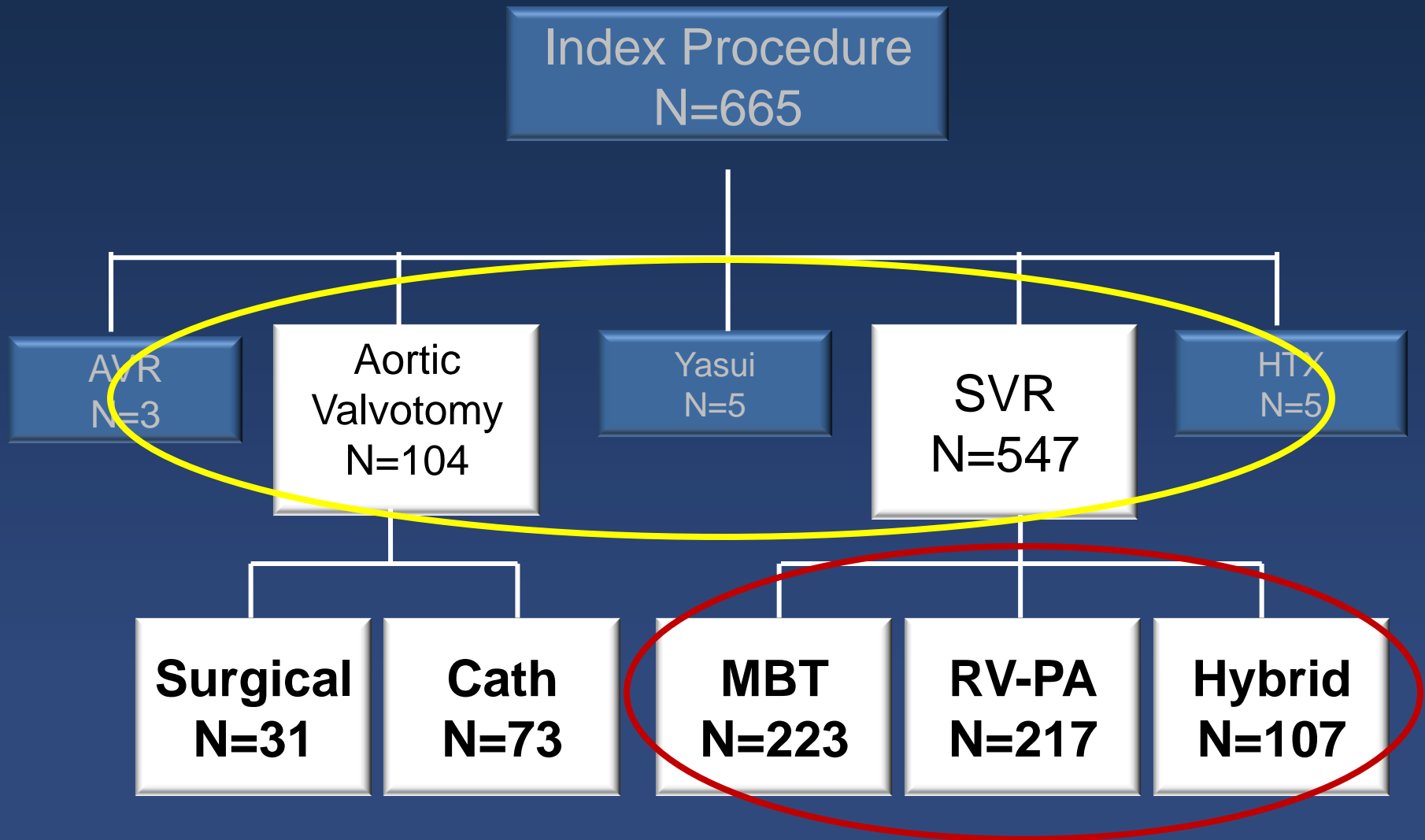


Dead = 2 (%)

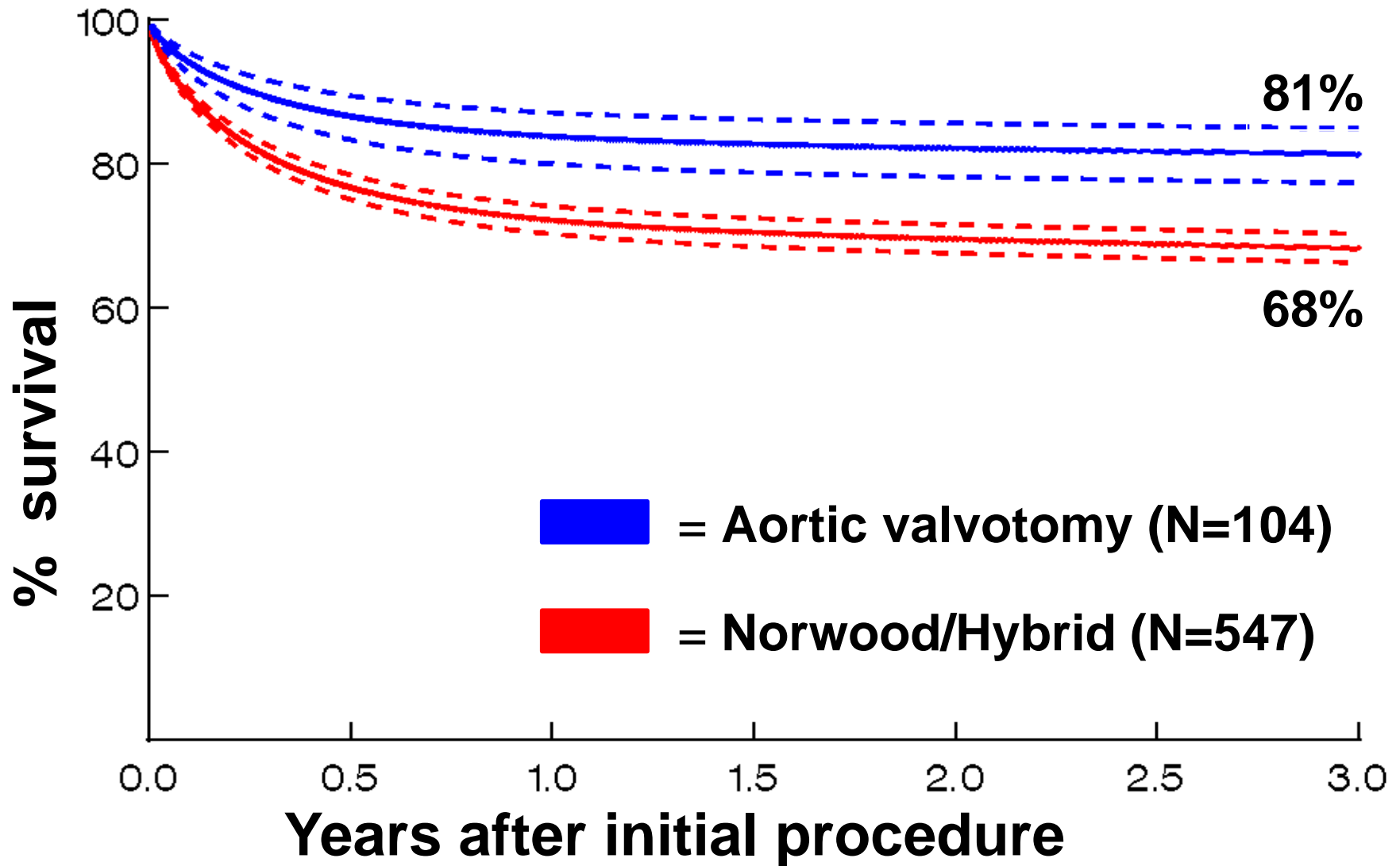
Survival After Initial Procedure



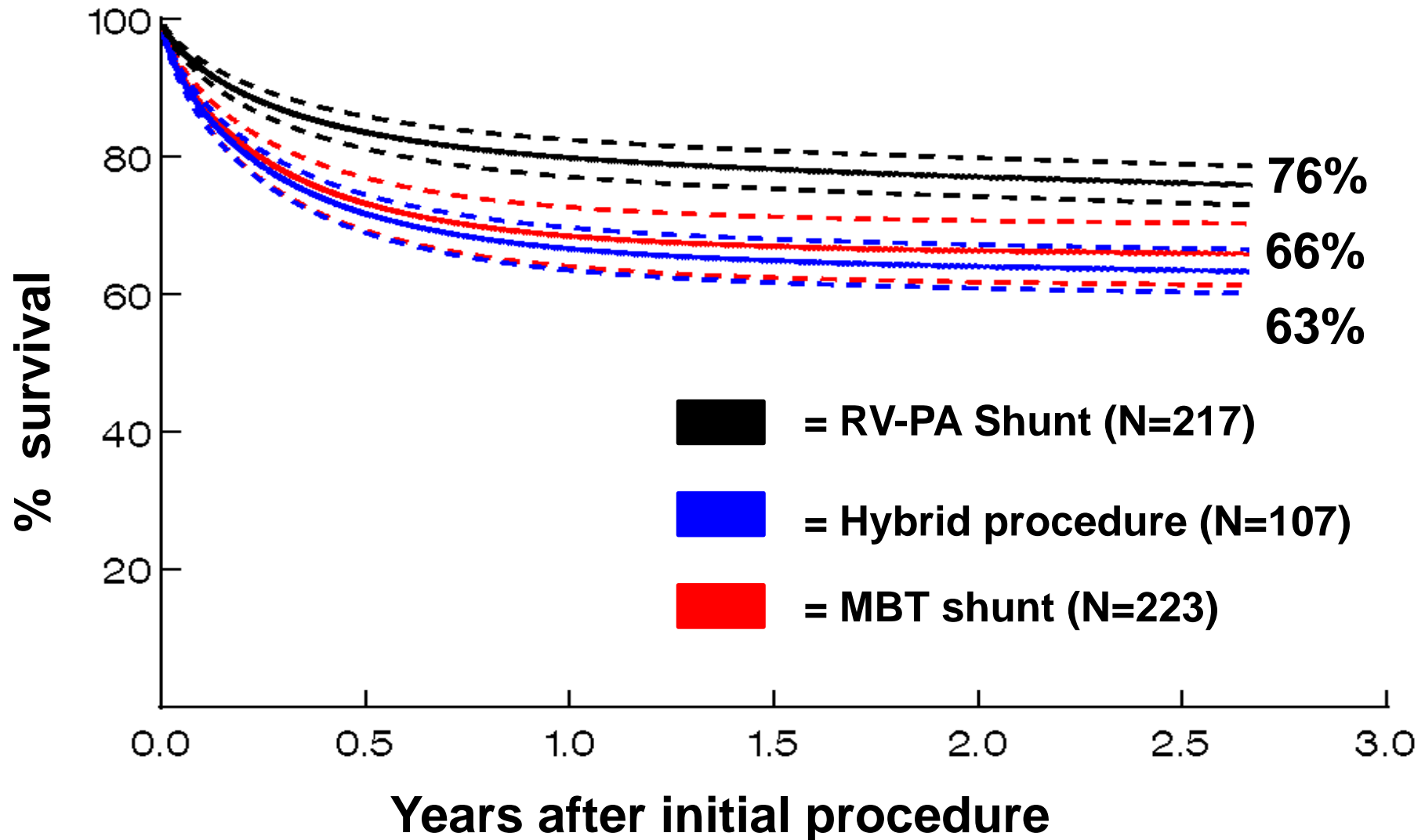
Unadjusted Comparison: Based on Index Procedure



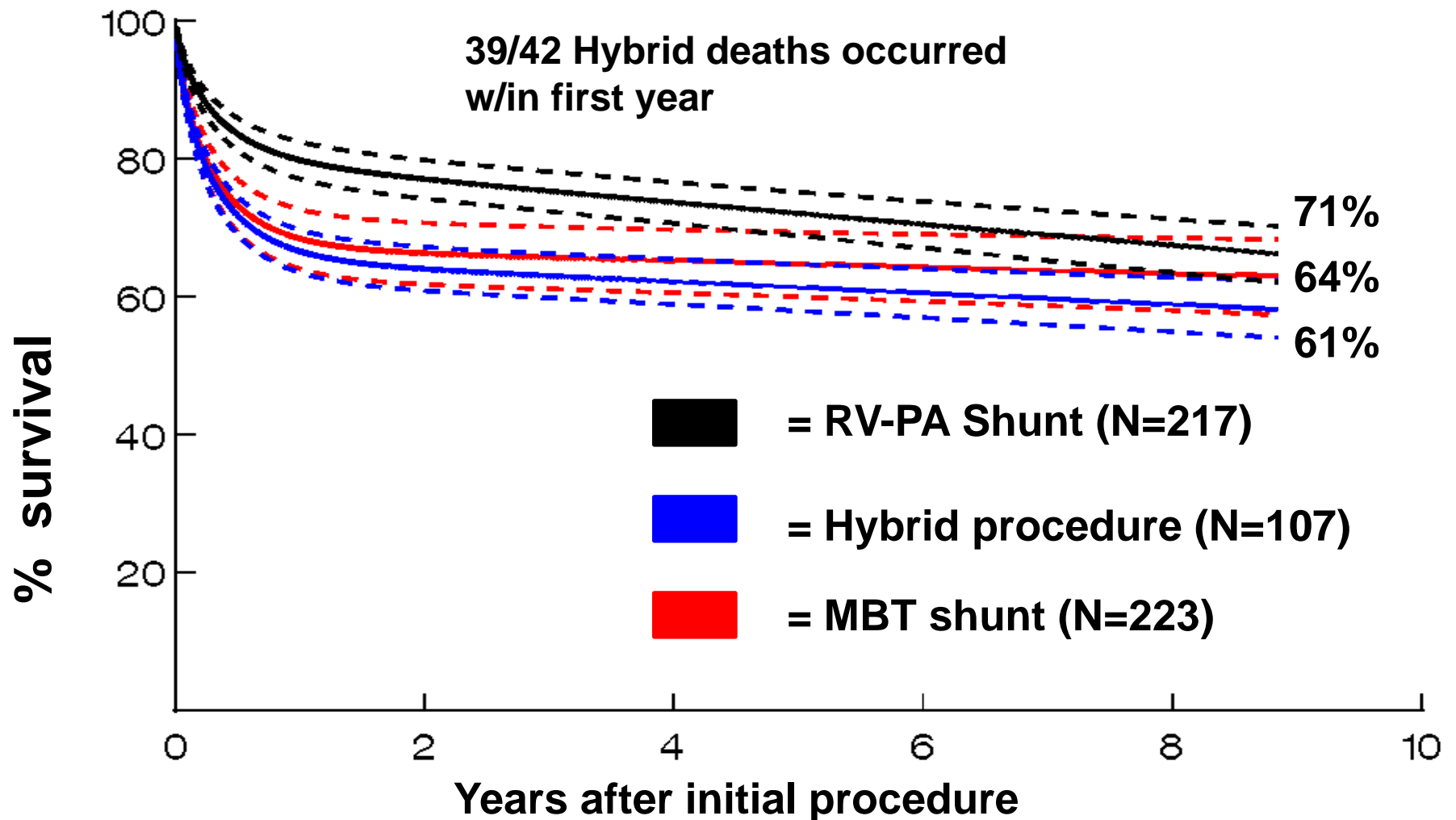
Survival: Aortic Valvotomy vs. SVR



Survival after SVR: 3 years



Survival after SVR: 6 years



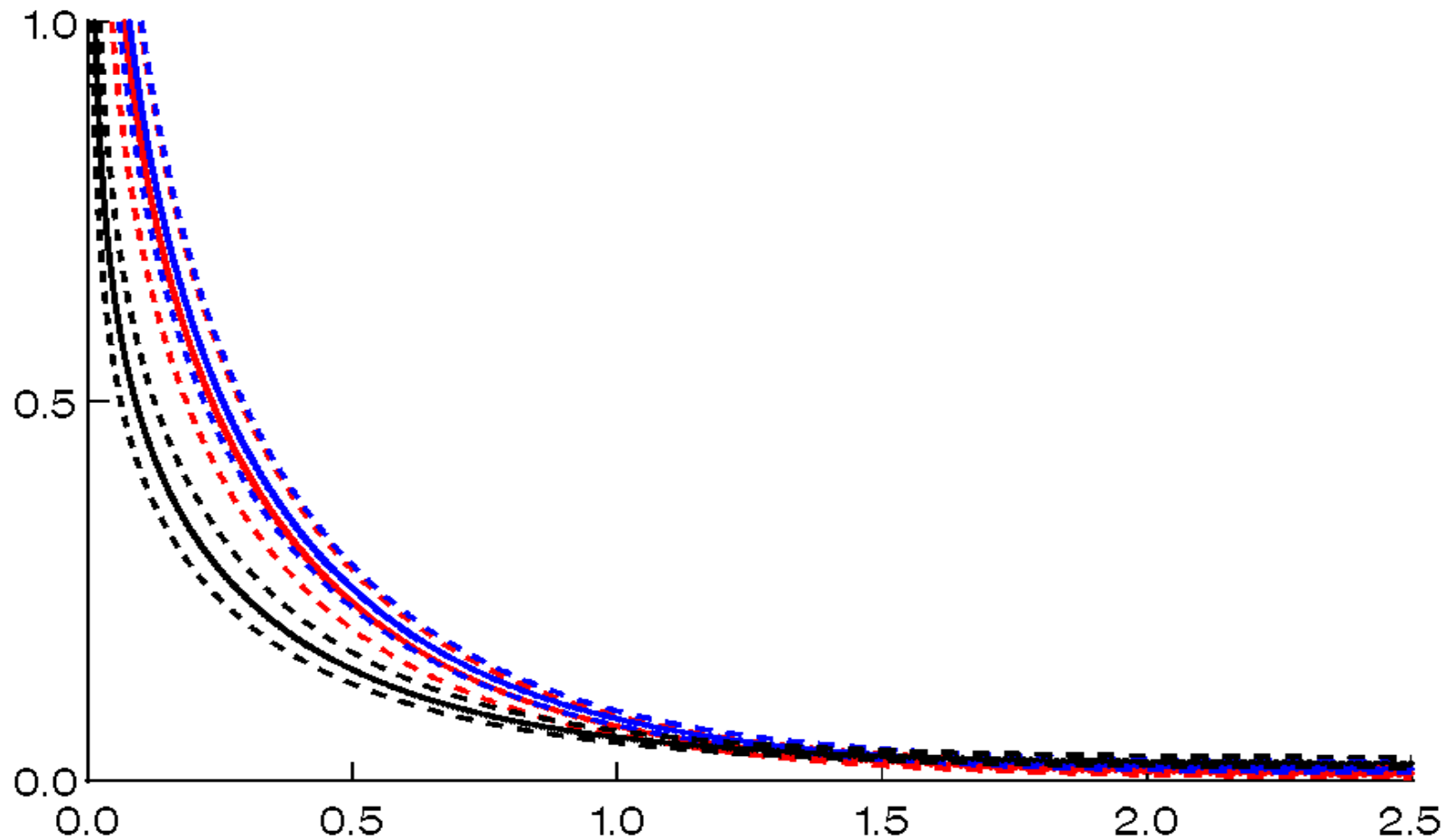
Moving Forward

- Define succinct research question
 - Baseline data entry is complete (demographic, 1st, 2nd procedures, baseline echo)
- Allocate resources for focused data entry
- Chart Review: Indications for Hybrid
 - Norwood Alternative
 - 1V-2V decision deferral
 - Salvage
 - Pre-transplant palliation

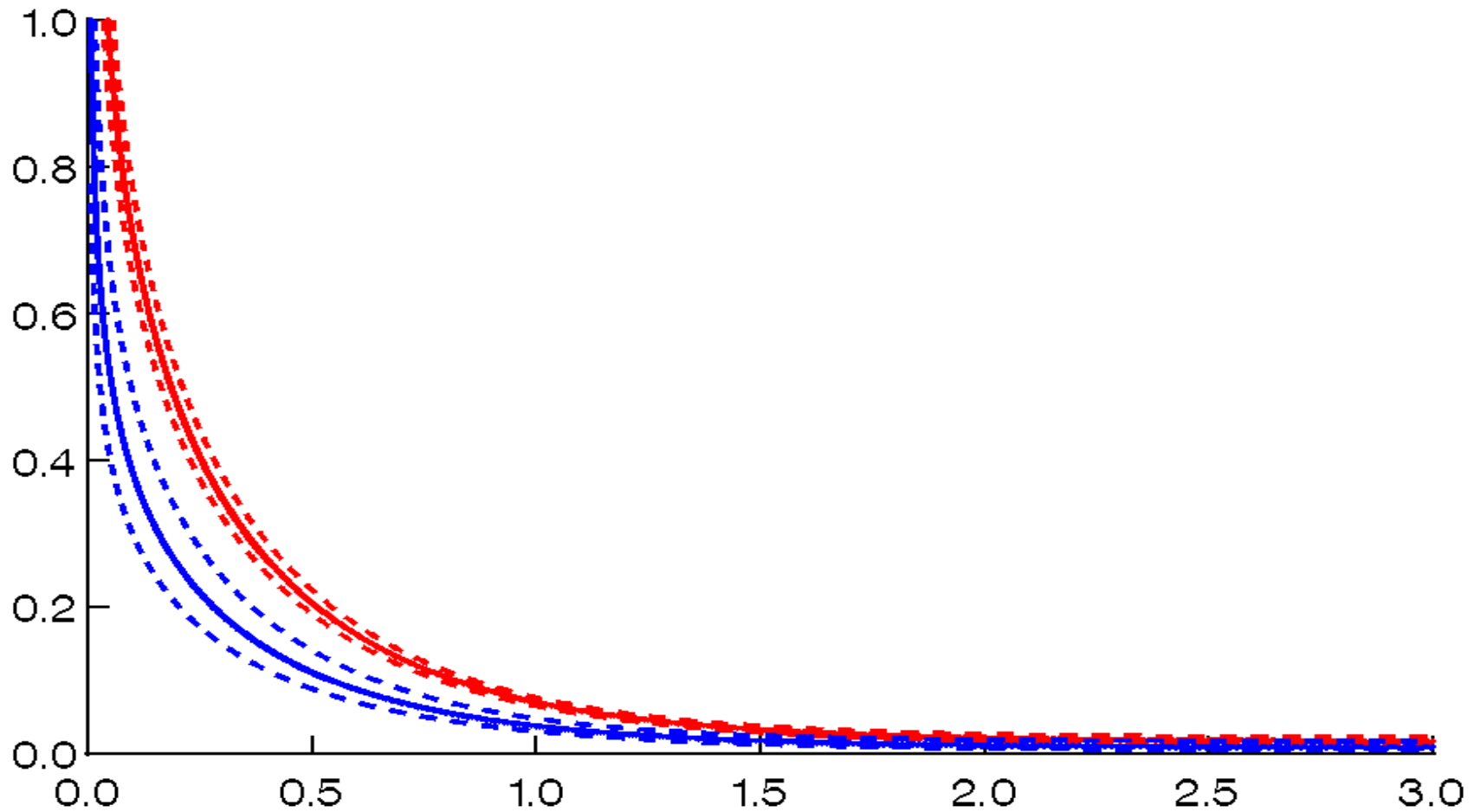
Potential Questions

- What are early risk factors for survival after hybrid?
 - What is driving selection of this population?
- What are the differences among 3 subsets of stage I single ventricular repair?
- Should the aortic stenosis calculator be re-evaluated?

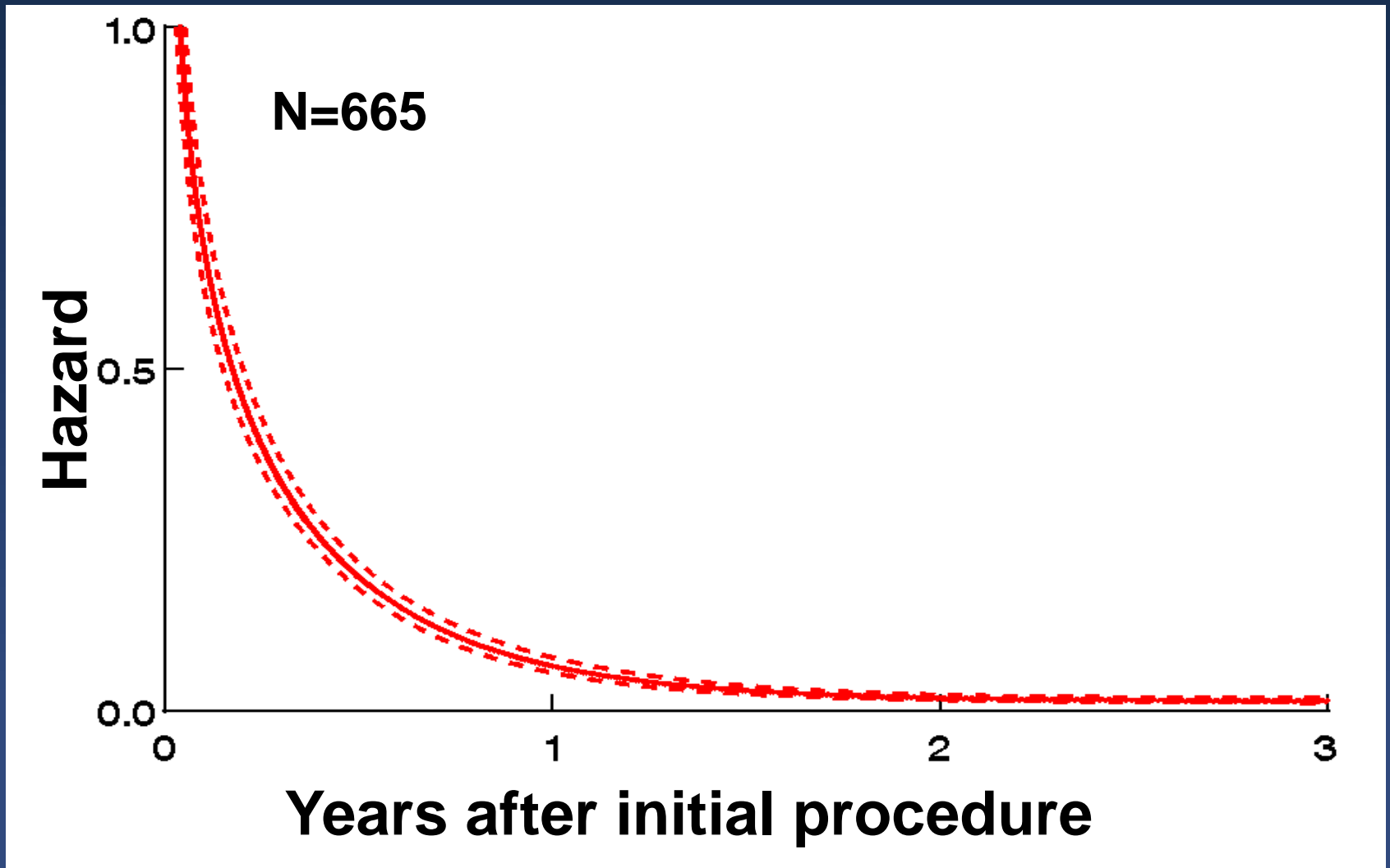
Hazard: Sano, MBT, Hybrid



HAZARD: SVR BVR



Hazard for death after initial procedure



Background

- Wide spectrum of morphology
- Evolving surgical techniques
 - New tools at our disposal
- Individualized management strategies not well defined

Gaps in Knowledge

- Optimal management
 - Single ventricular repair
 - Biventricular repair
- Borderline population
- Late outcomes

General Profile

- 675 patients
- 665 index procedures
- Initial procedure
 - 82% represent single ventricular repair
 - 15% represent biventricular repair