

Evaluation of the Congenital Heart Surgeons' Society Critical Aortic Stenosis Calculator in a New Patient Cohort

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SCIENTIFIC 20
SESSIONS 18



Background

- CHSS Critical AS Calculator

Predicts survival difference at 5 years

Univentricular (UVR) vs. Biventricular (BVR) Repair

Initial Echocardiographic Indices



Background

- CHSS Critical AS Calculator
 - 2007: Hickey et. al.
 - 362 neonates with critical AS (1994 – 2001)

chss score for neonatal critical aortic stenosis

calculator
for neonatal critical aortic stenosis

data collection

Weight (Kg):

Height (cm):

BSA:

Presence of moderate or severe tricuspid regurgitation :

Mitral valve annulus: (mm)

Presence of large ventriculo-septal defect:

Length of apex-forming ventricle (mm):

Minimum diameter of the left ventricular outflow tract(mm):

Presence of left ventricular dysfunction:

Grade of endocardial fibroelastosis:

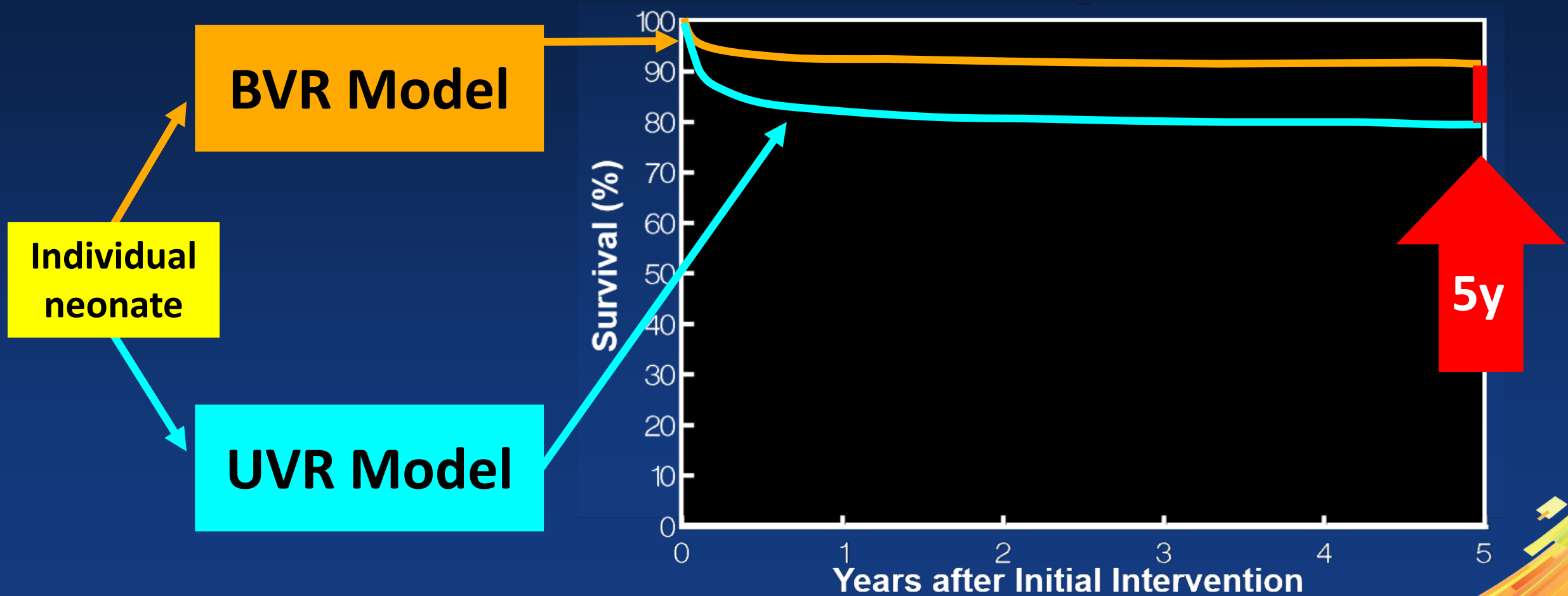
Diameter of the mid-aortic arch (mm):

CHSS Score:

[Click here to get score](#)



Background

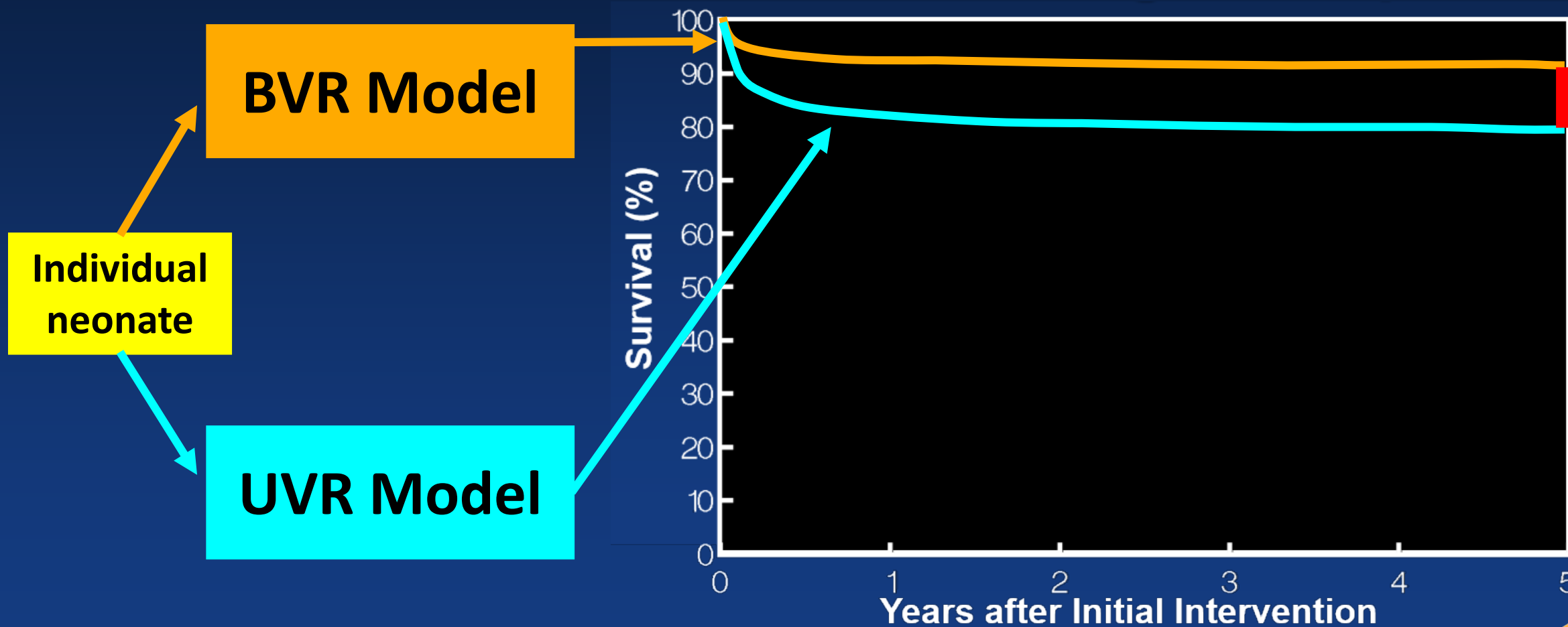


Purpose

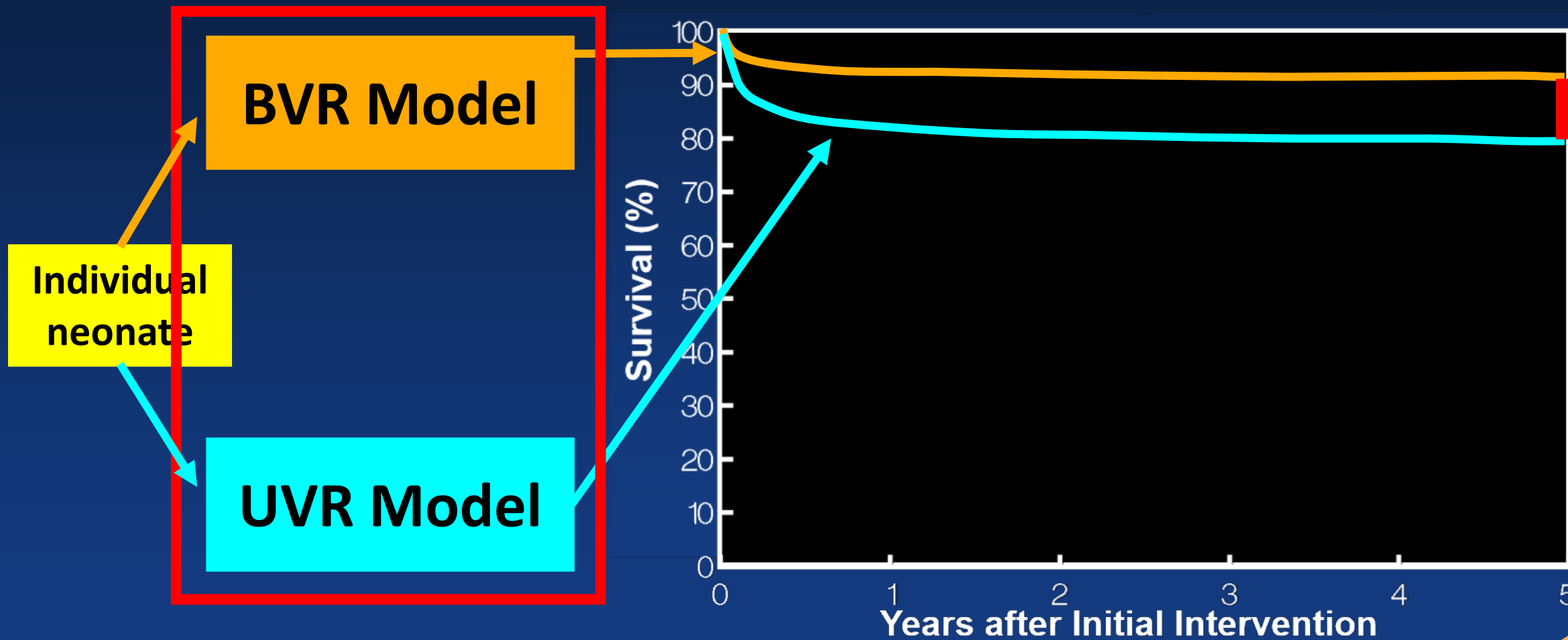
- To evaluate the performance of the CHSS critical aortic stenosis calculator in contemporary cohort (2005 – 2013)



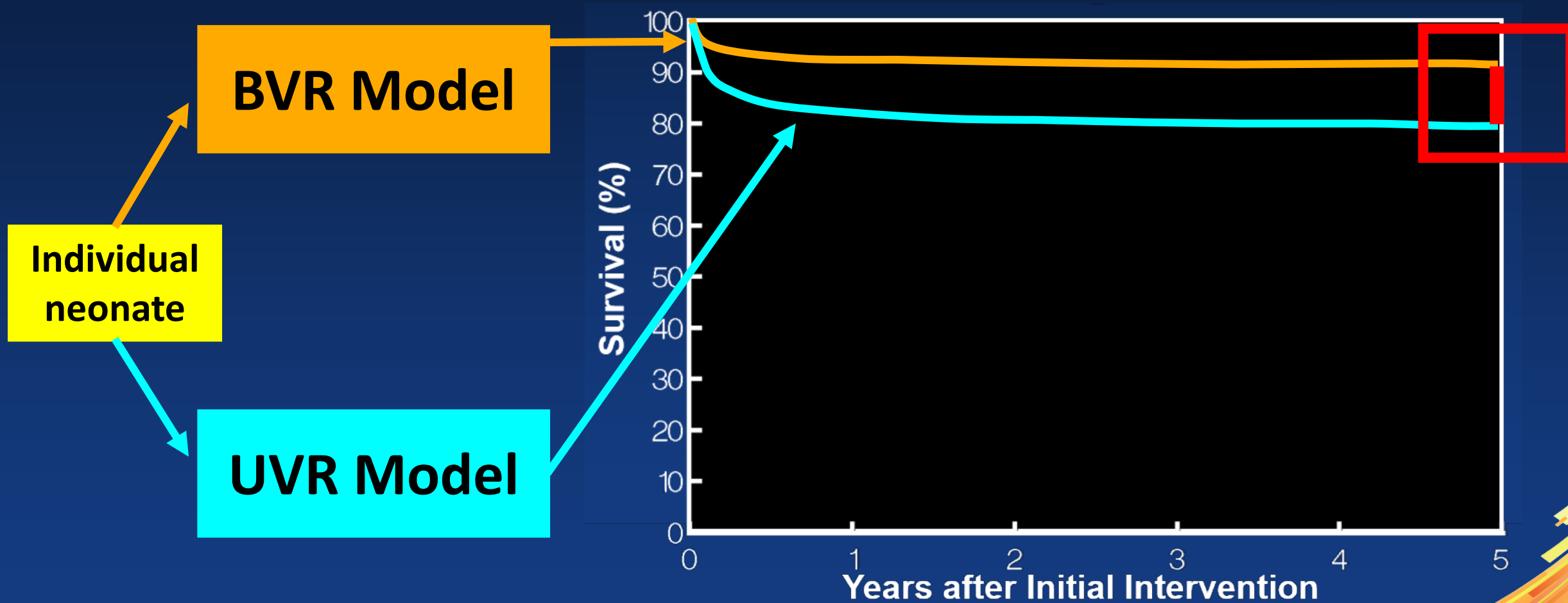
Two Analyses



Two Analyses



Two Analyses



Critical Aortic Stenosis Evaluation Cohort

- 2005 – 2013
- Inclusion Criteria:
 - Critical aortic stenosis
 - Complete baseline echocardiogram evaluated by Image Core Lab
 - ≤ 30 days old at admission
 - AV, VA concordance

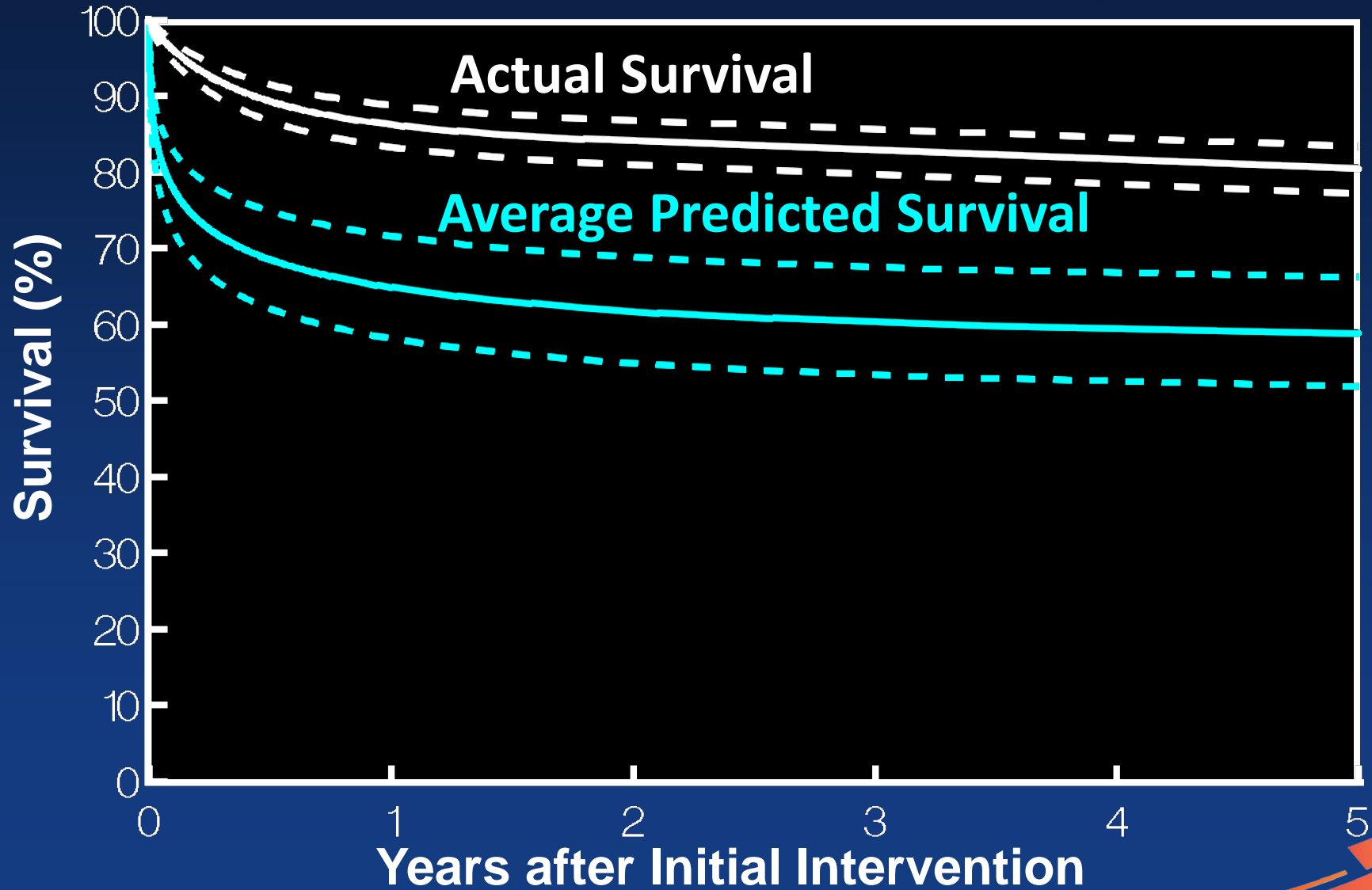


Critical Aortic Stenosis Evaluation Cohort

- 246 patients from 19 institutions
 - UVR: 153
 - BVR: 93
- Median follow up: 5.8 years



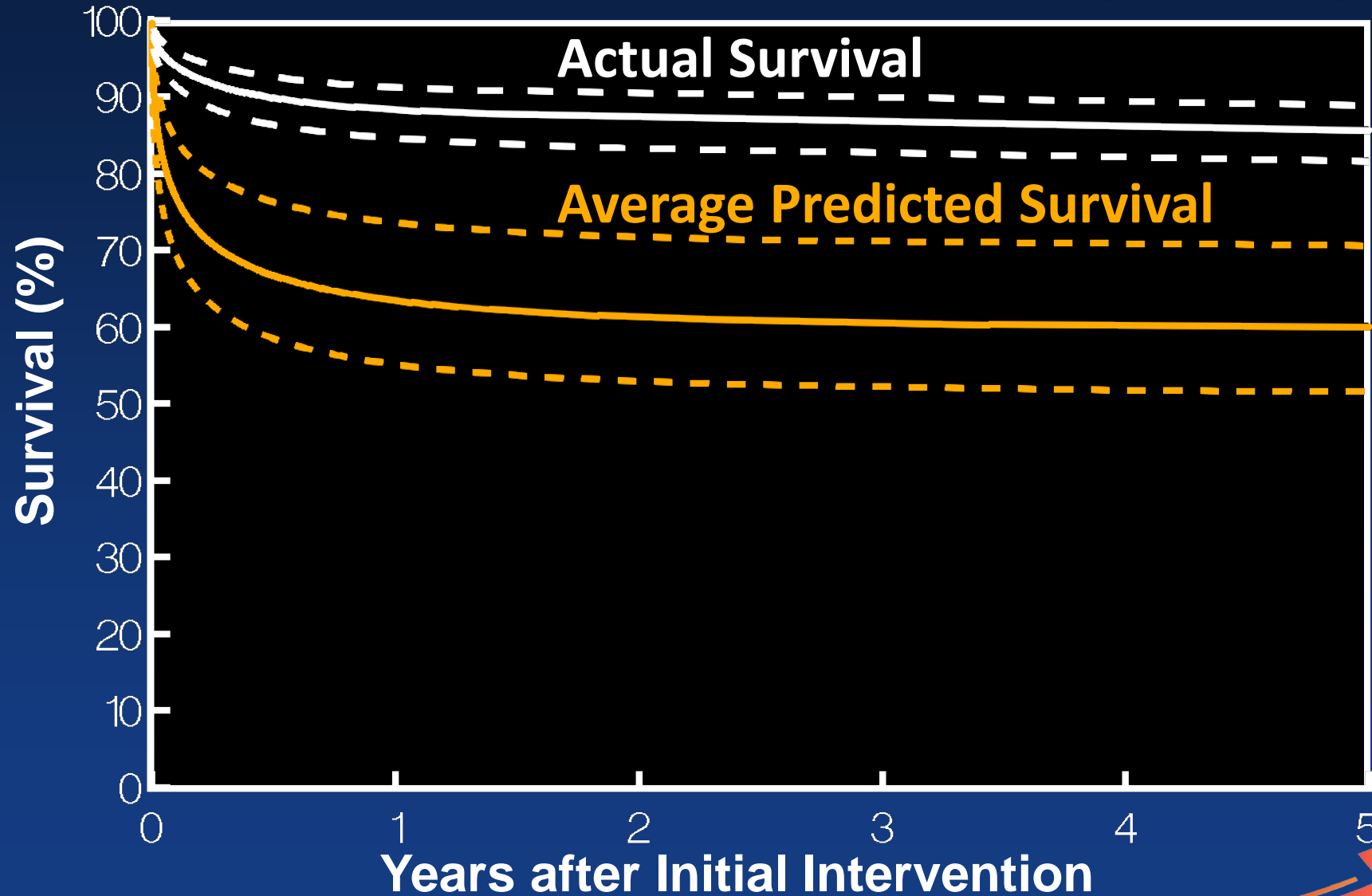
Underestimated UVR Survival (n=153)



**UVR
Model**



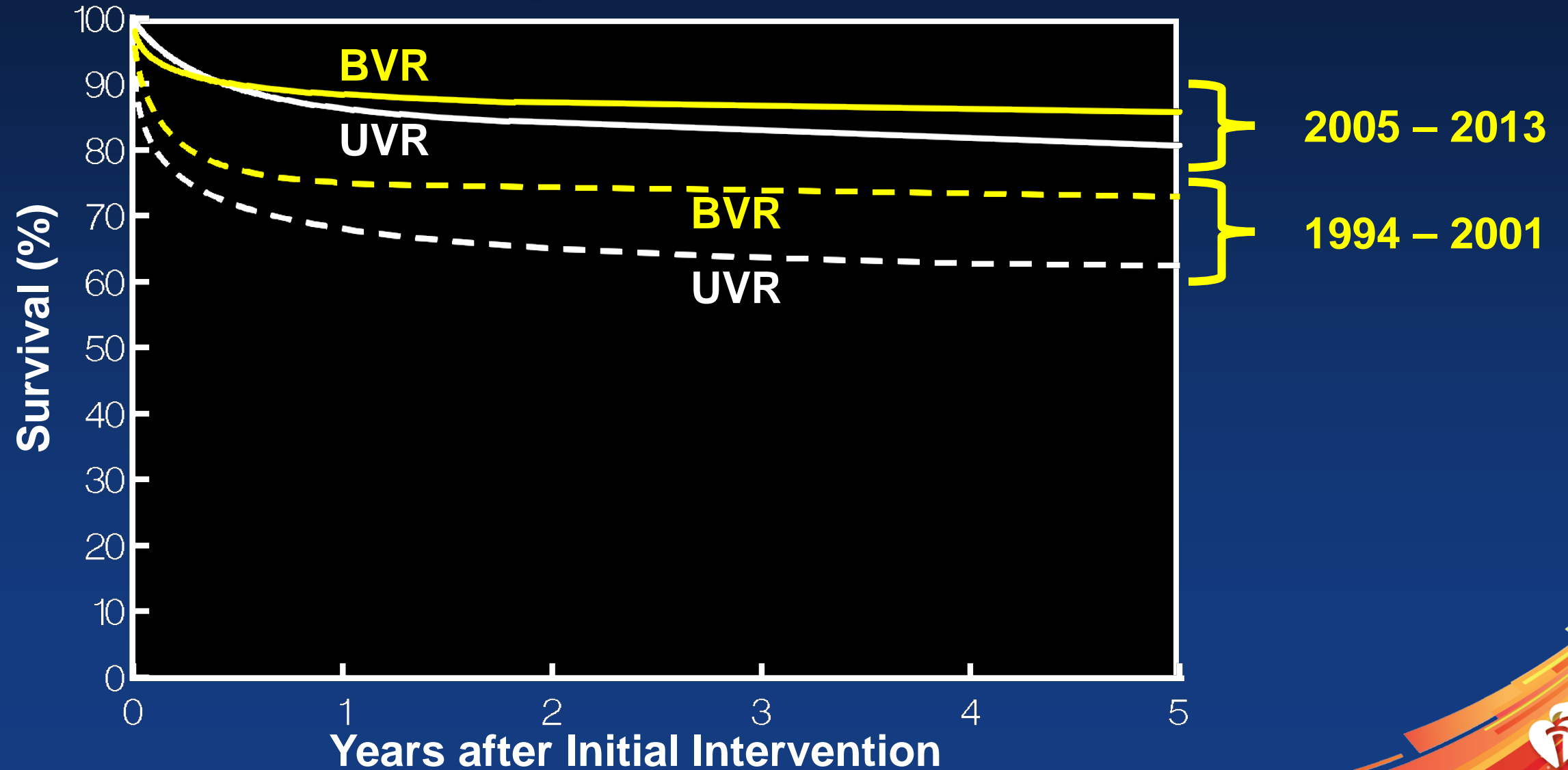
Underestimated BVR Survival (n=93)



**BVR
Model**



Survival Comparison Between Cohorts



Cohort Comparison

	2003 (n=362)	2013 (n=246)
EFE Grade 2 or 3	10%	57%
Mitral Stenosis	38%	61%
LV Dysfunction	51%	78%
Hybrid Procedure	0% of SVR	22% of SVR
Heart Transplantation	2%	9%
UVR → BVR Crossover	0.2%	2%

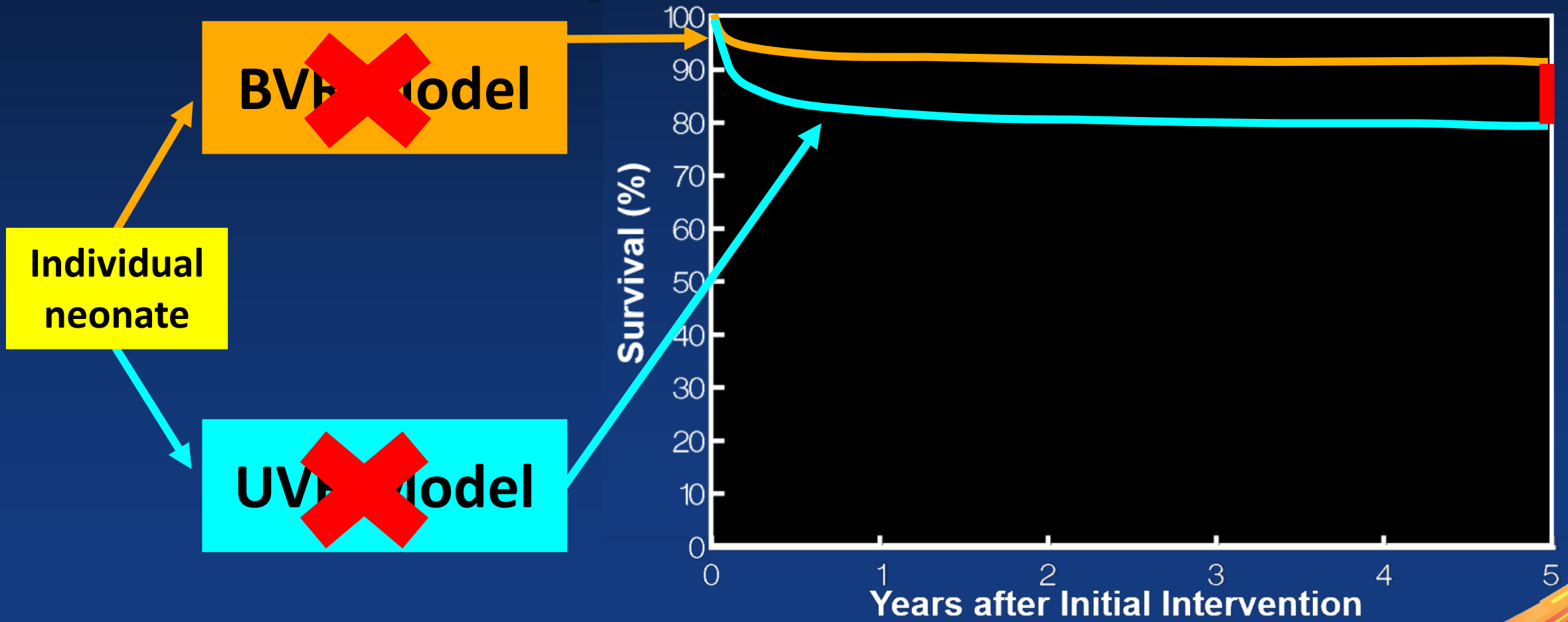


Cohort Comparison

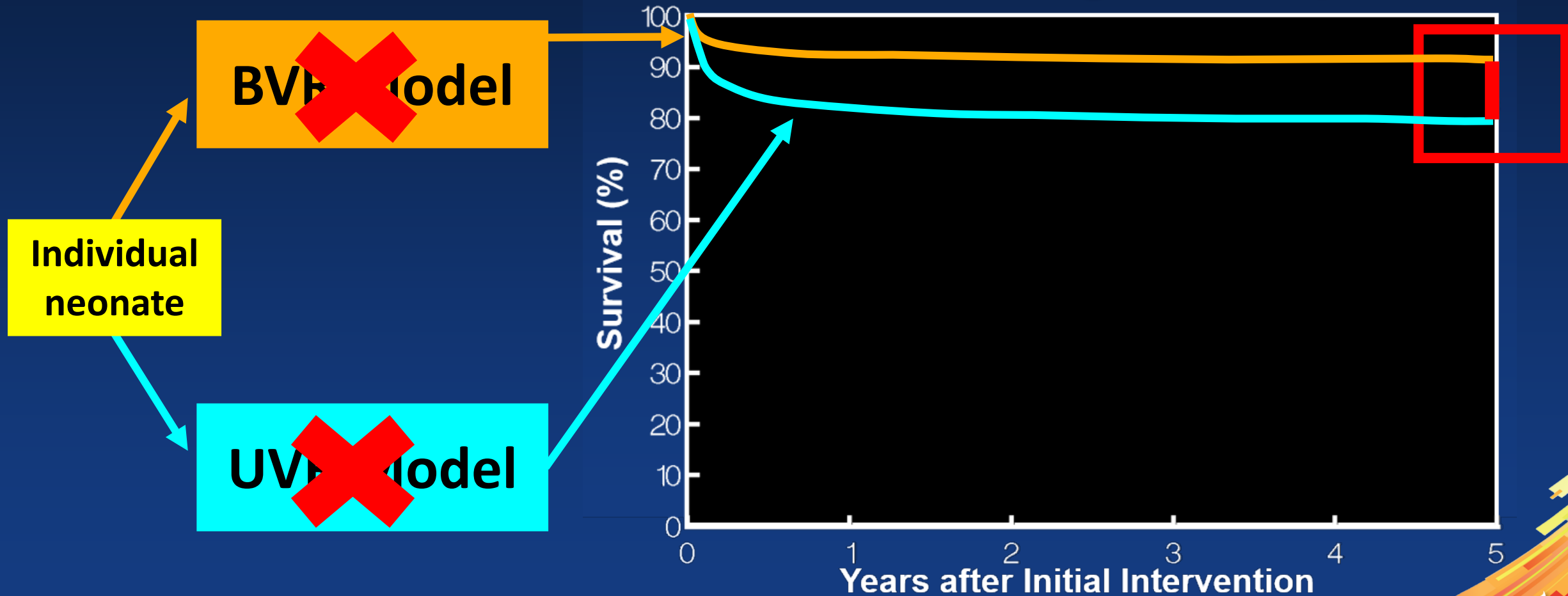
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UVR and BVR models do not accurately predict survival



Evaluating projected survival difference



Calculator Discordant Management

- Surgical decision is opposite of the calculator-predicted optimal pathway



Calculator Discordant Management

- Surgical decision is opposite of the calculator-predicted optimal pathway

1994 – 2001 Cohort:

UVR: 21% discordant

BVR: 56% discordant

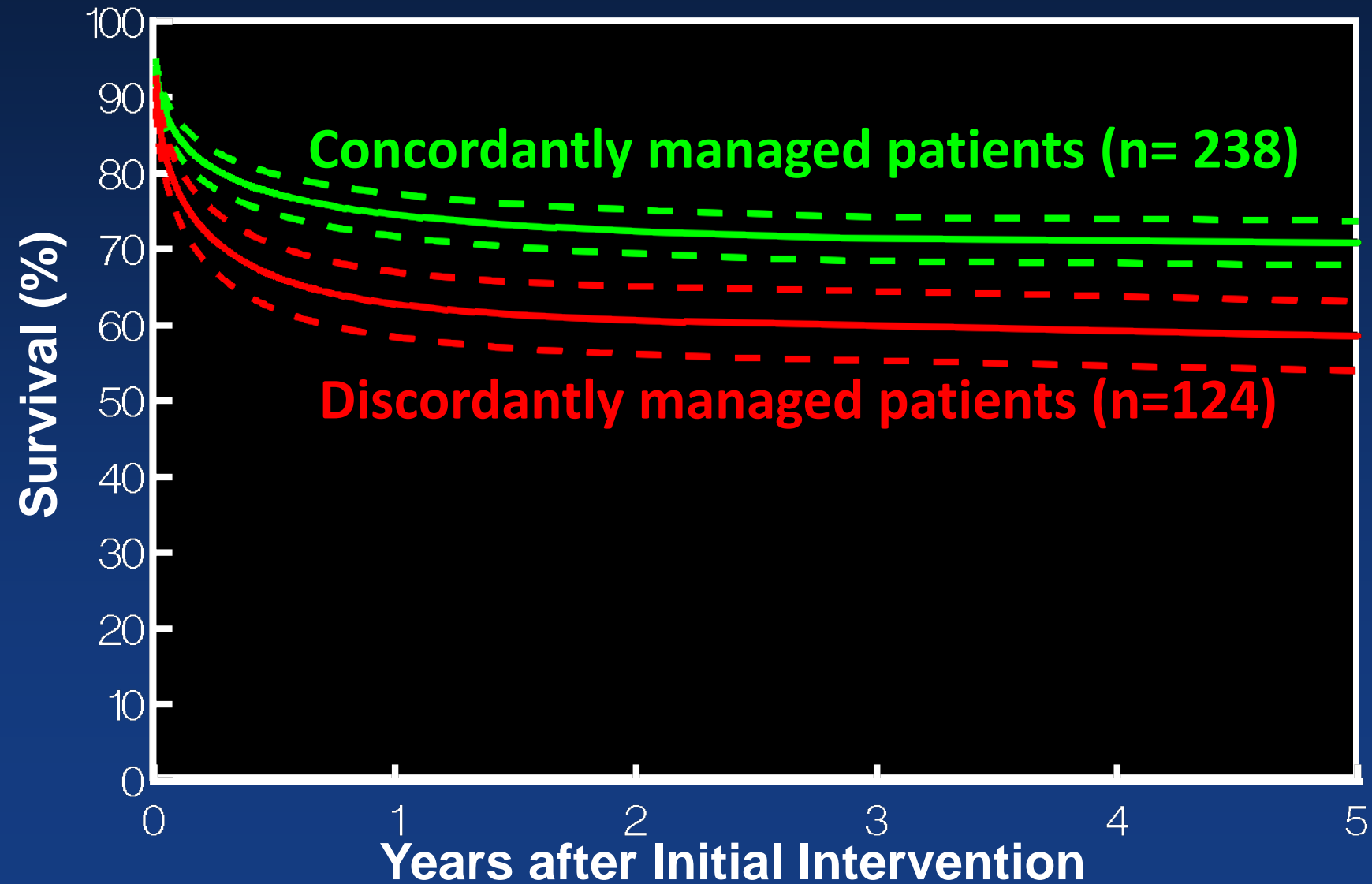
2005 – 2013 Cohort:

UVR: 16% discordant

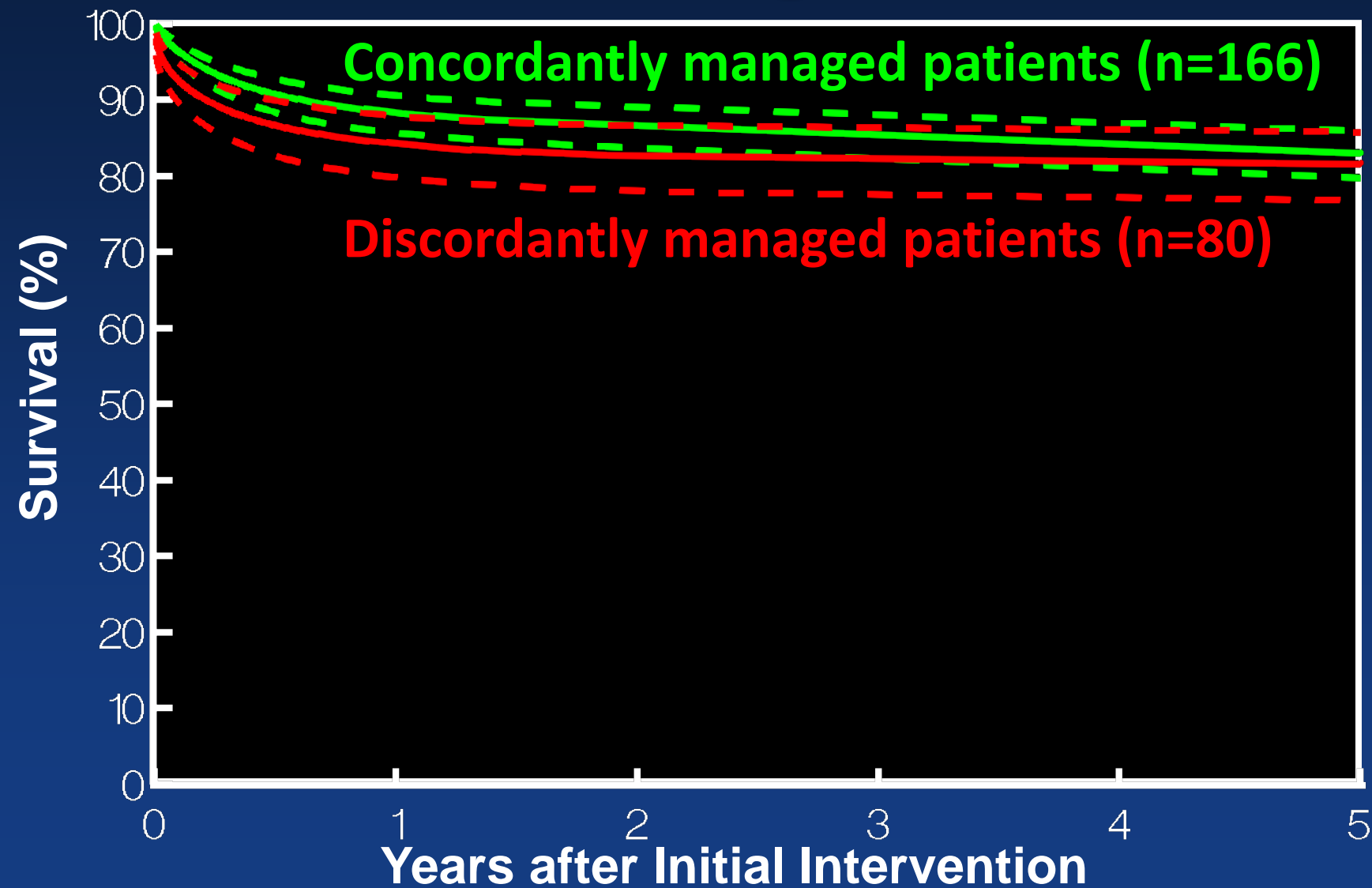
BVR: 60% discordant



Discordant Management 1994 – 2001



Discordant Management 2005 – 2013



Conclusions

- **CHSS Critical Aortic Stenosis calculator does not accurately predict optimal surgical pathway in a contemporary cohort**
- **Survival has improved after UVR and BVR in critical aortic stenosis**
- **The revised calculator will account for changed patient variables and management strategies**

