

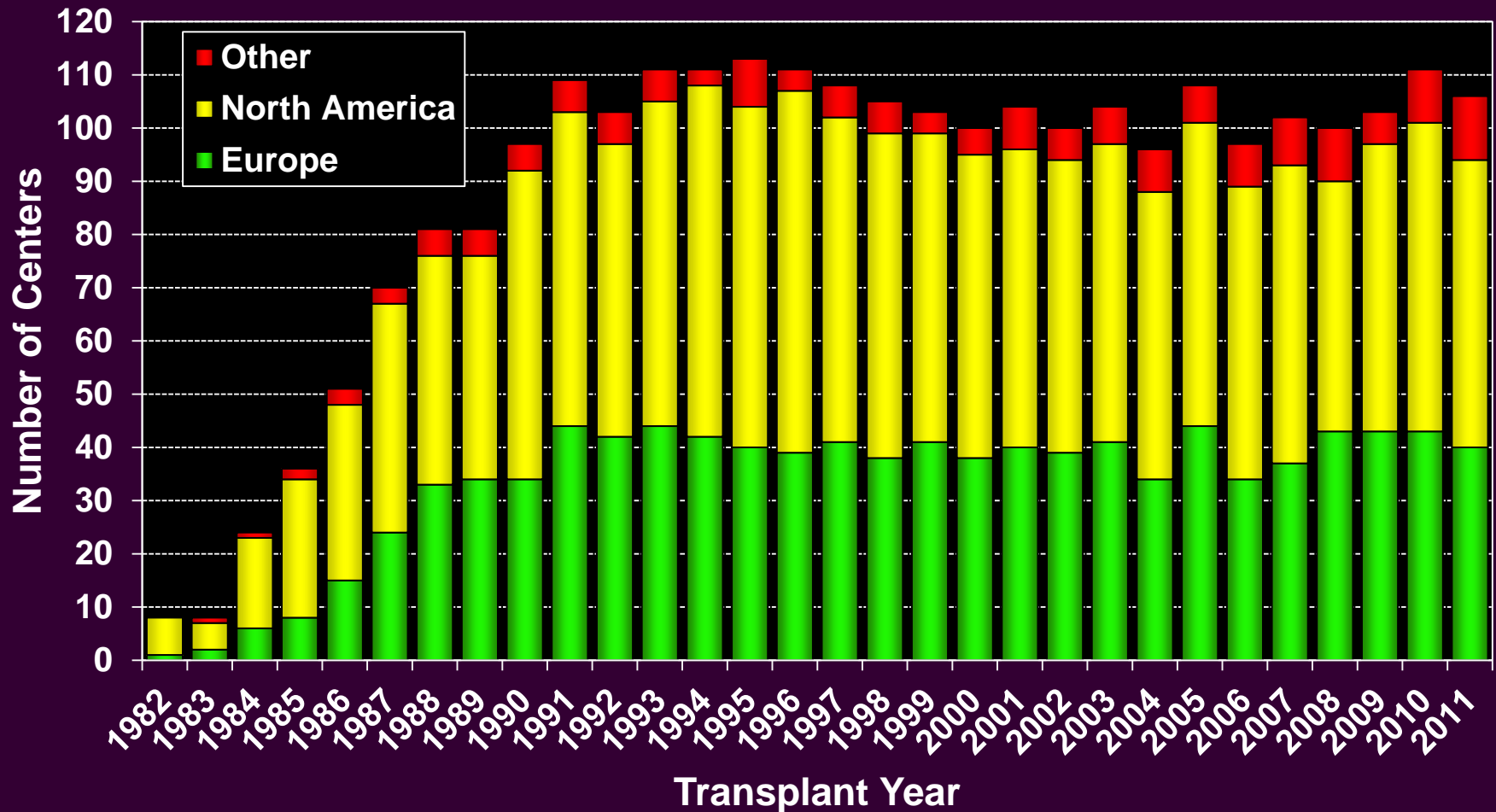
HEART TRANSPLANTATION

Pediatric Recipients

Donor, Recipient and Center Characteristics

Pediatric Heart Transplants

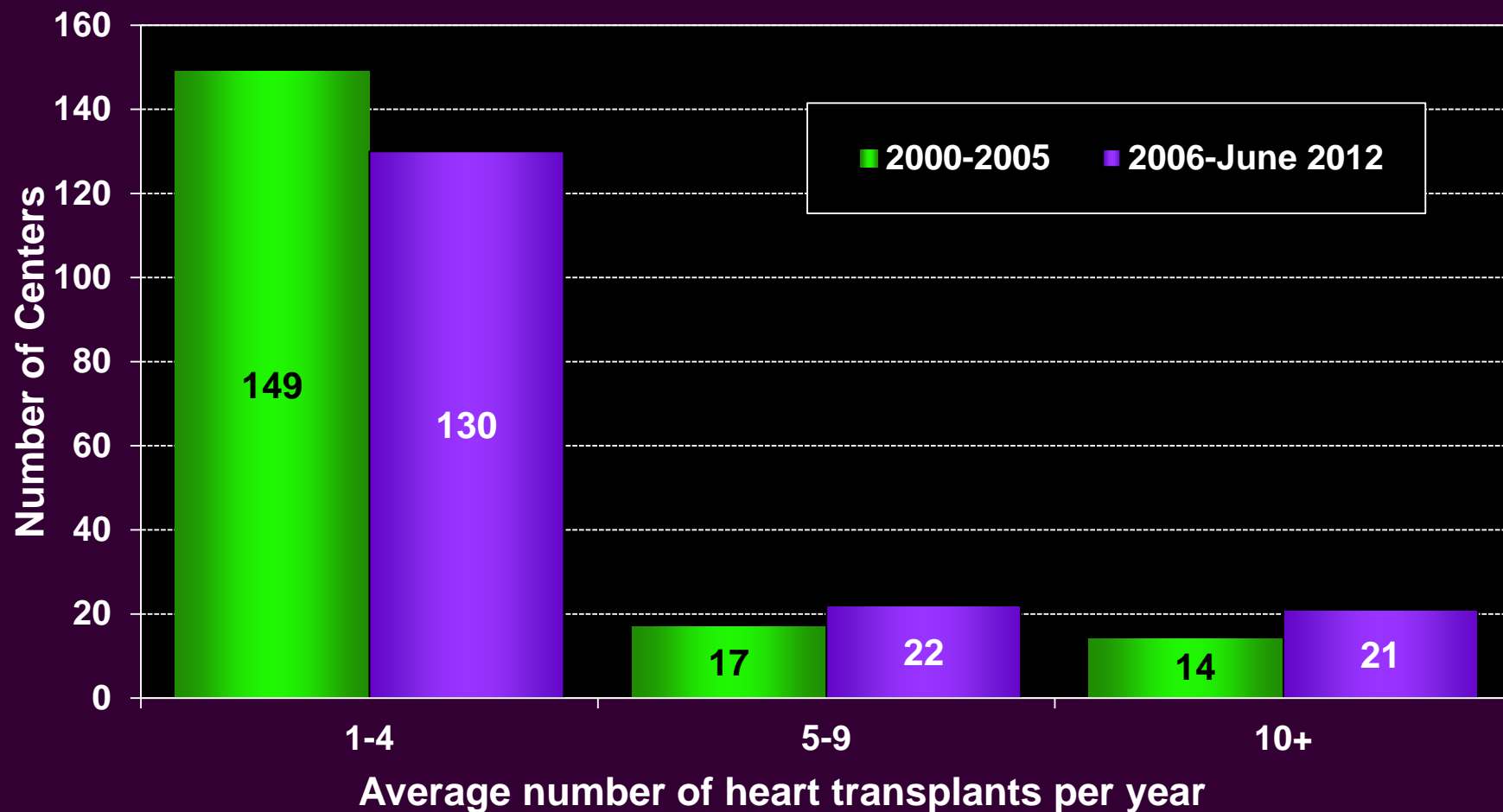
Number of Centers Reporting Transplants



Pediatric Heart Transplants

Number of Centers by Center Volume

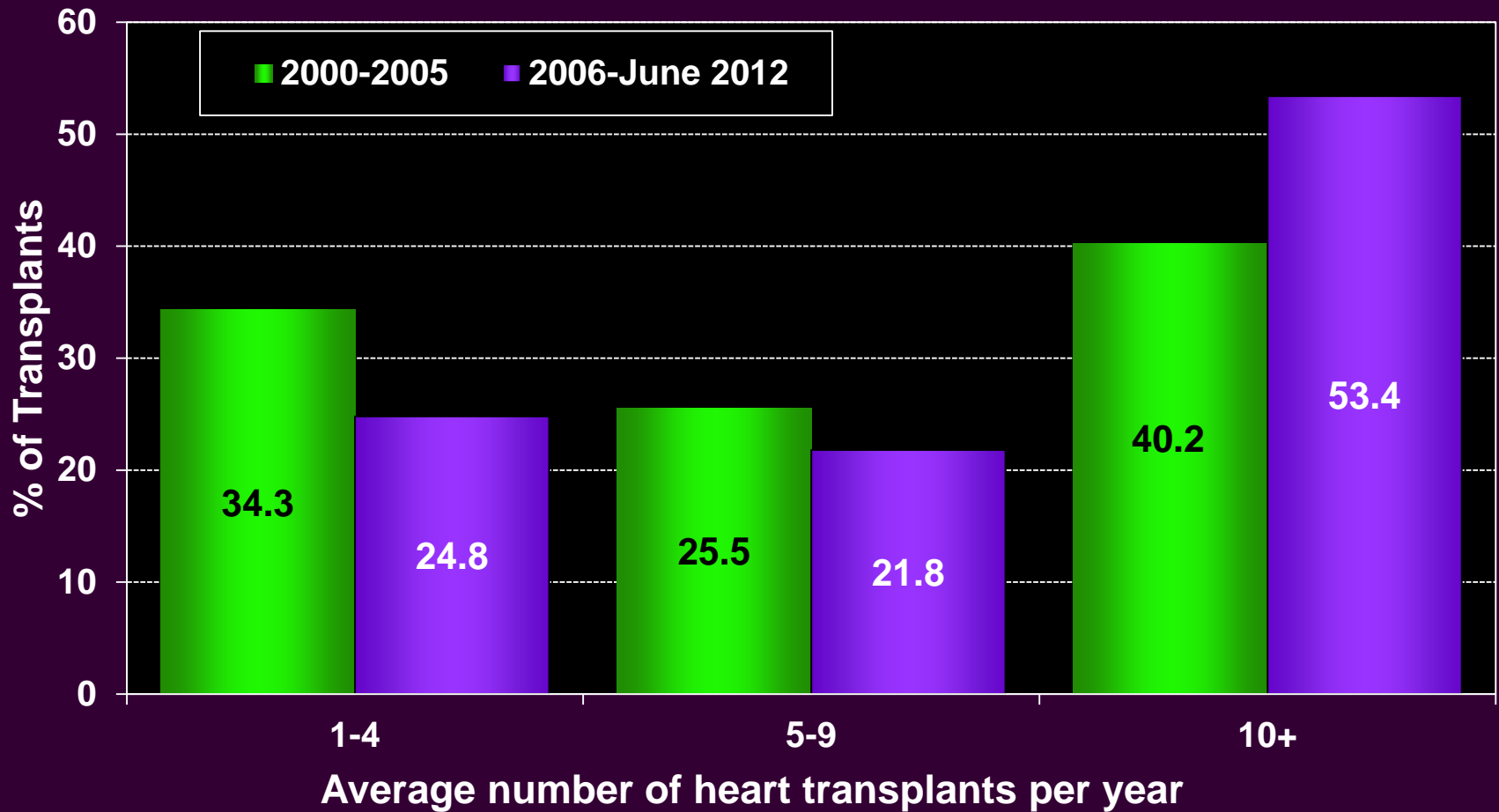
(Transplants: January 2000 – June 2012)



Pediatric Heart Transplants

Distribution of Transplants by Center Volume

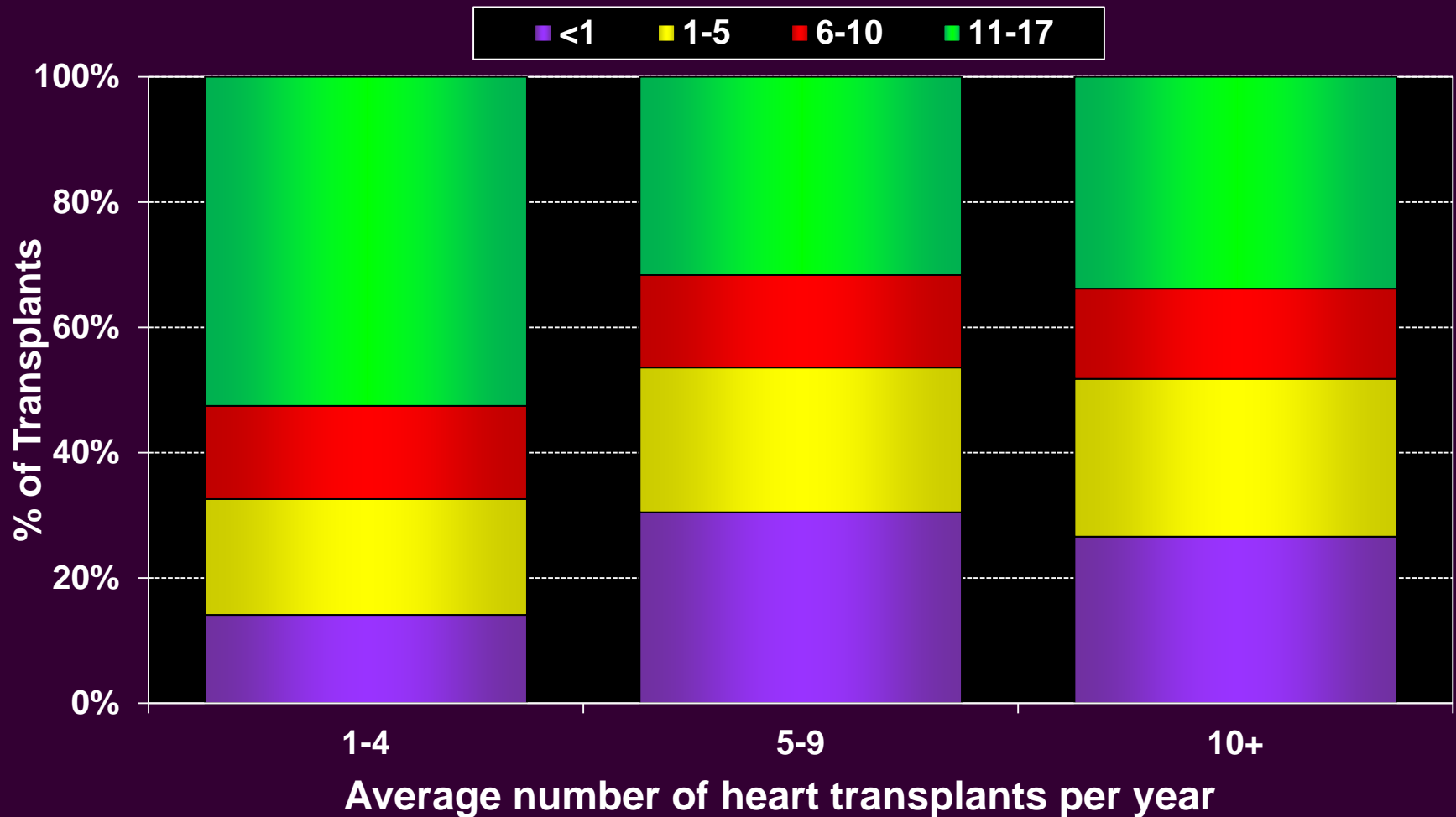
(Transplants: January 2000 – June 2012)



Pediatric Heart Transplants

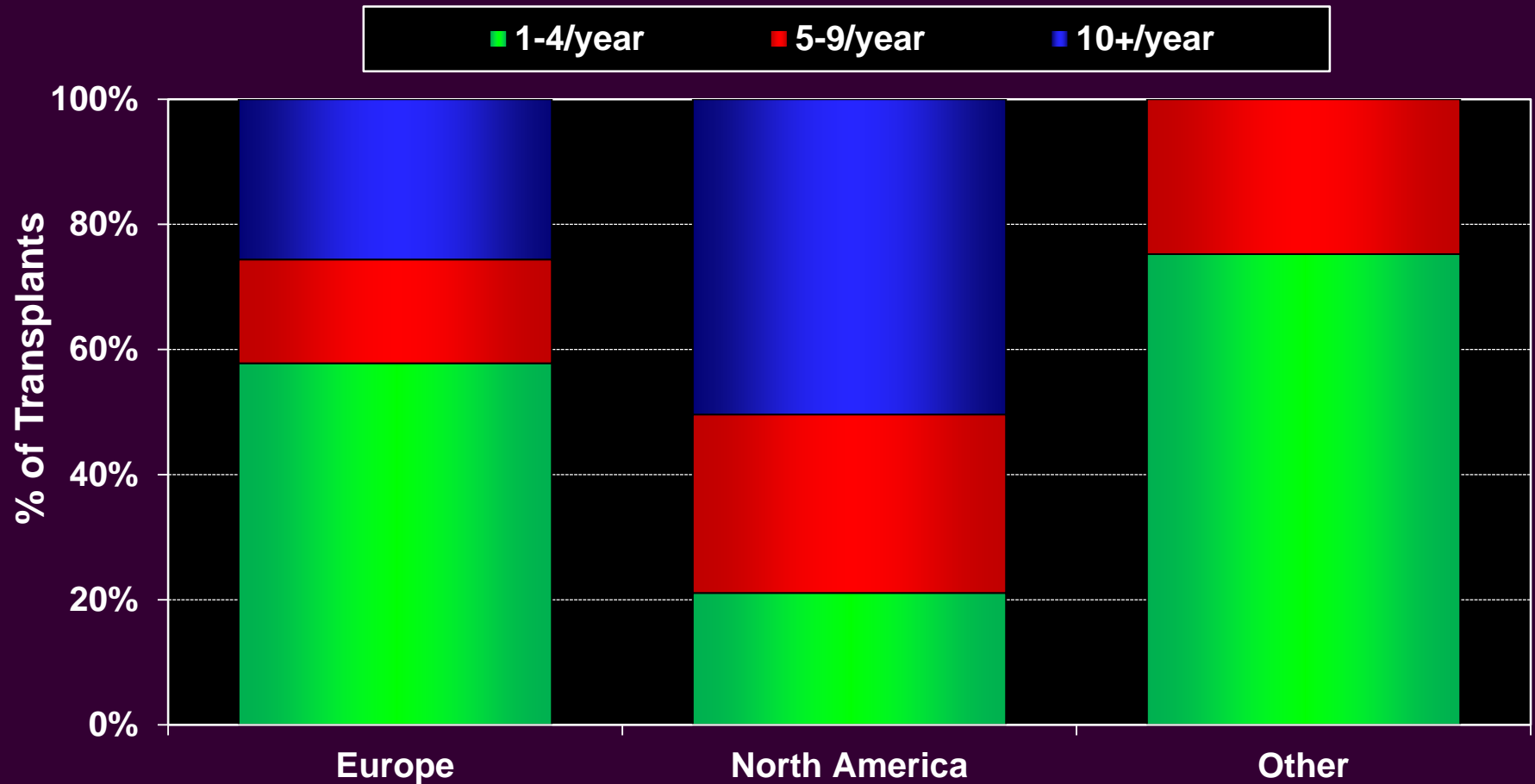
Age Distribution by Center Volume

(Transplants: January 2000 – June 2012)



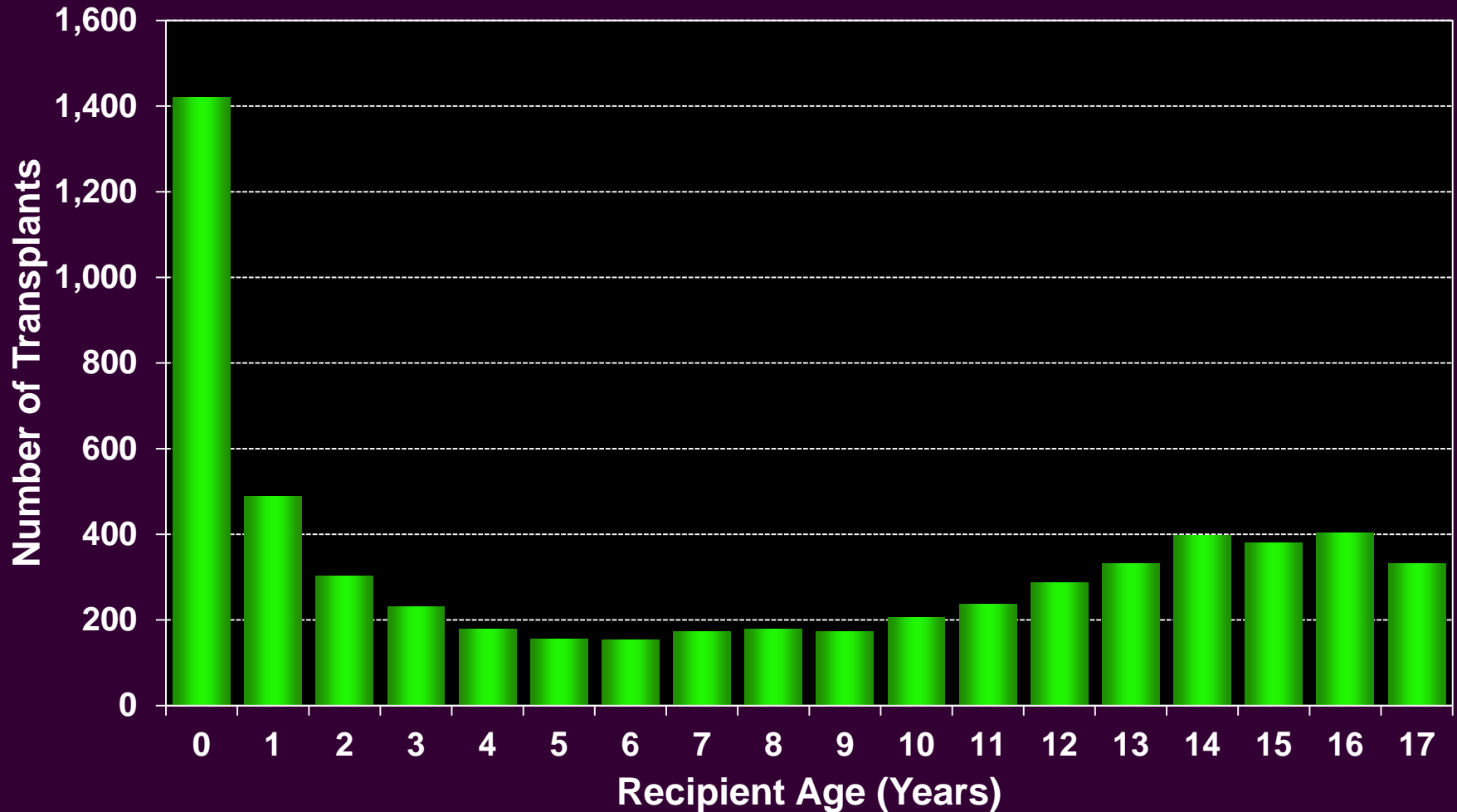
Pediatric Heart Transplants

Distribution of Transplants by Location and Average Center Volume (Transplants: January 2000 – June 2012)



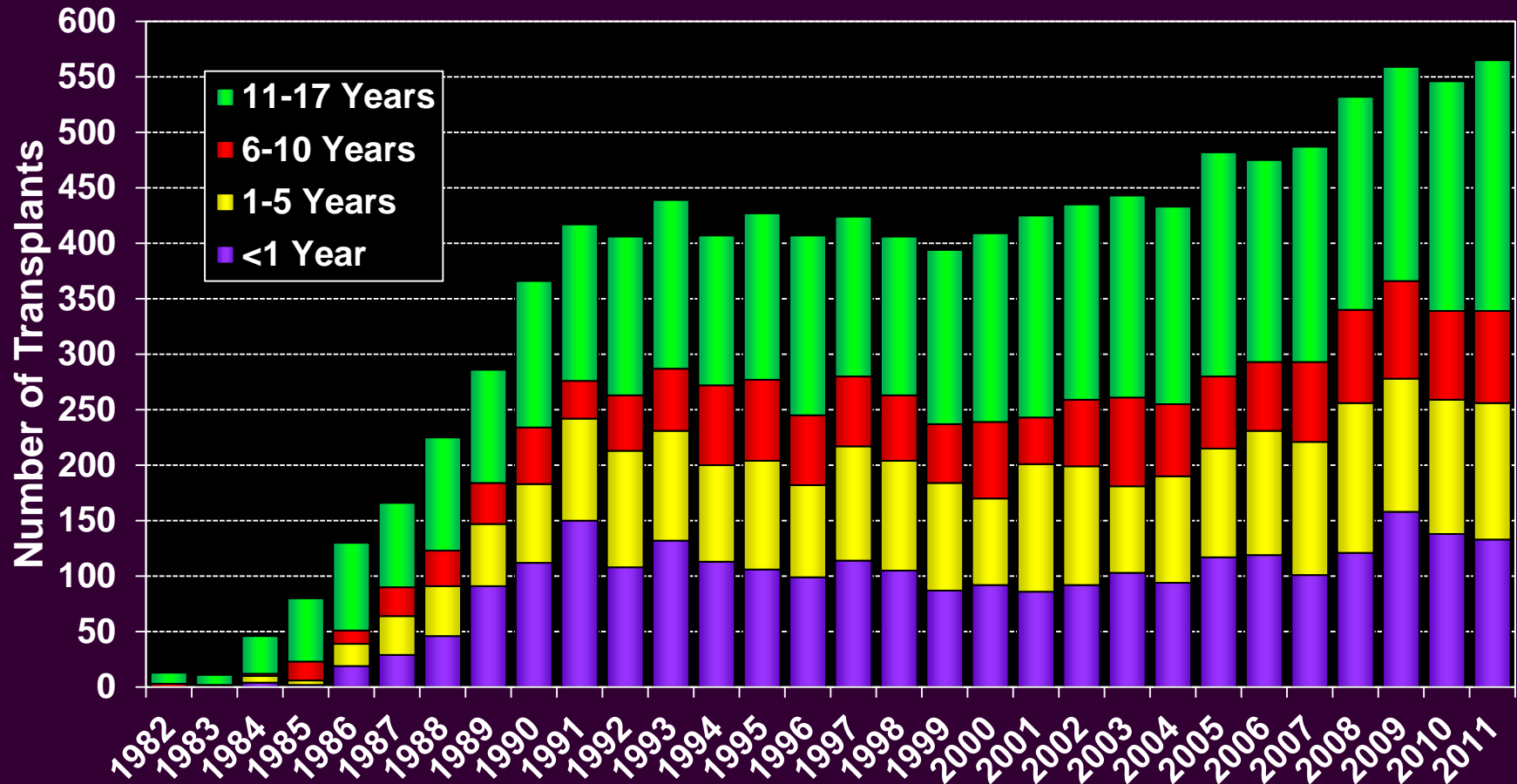
Pediatric Heart Transplants

Recipient Age Distribution (Transplants: January 2000 - June 2012)



Pediatric Heart Transplants

Recipient Age Distribution by Year of Transplant

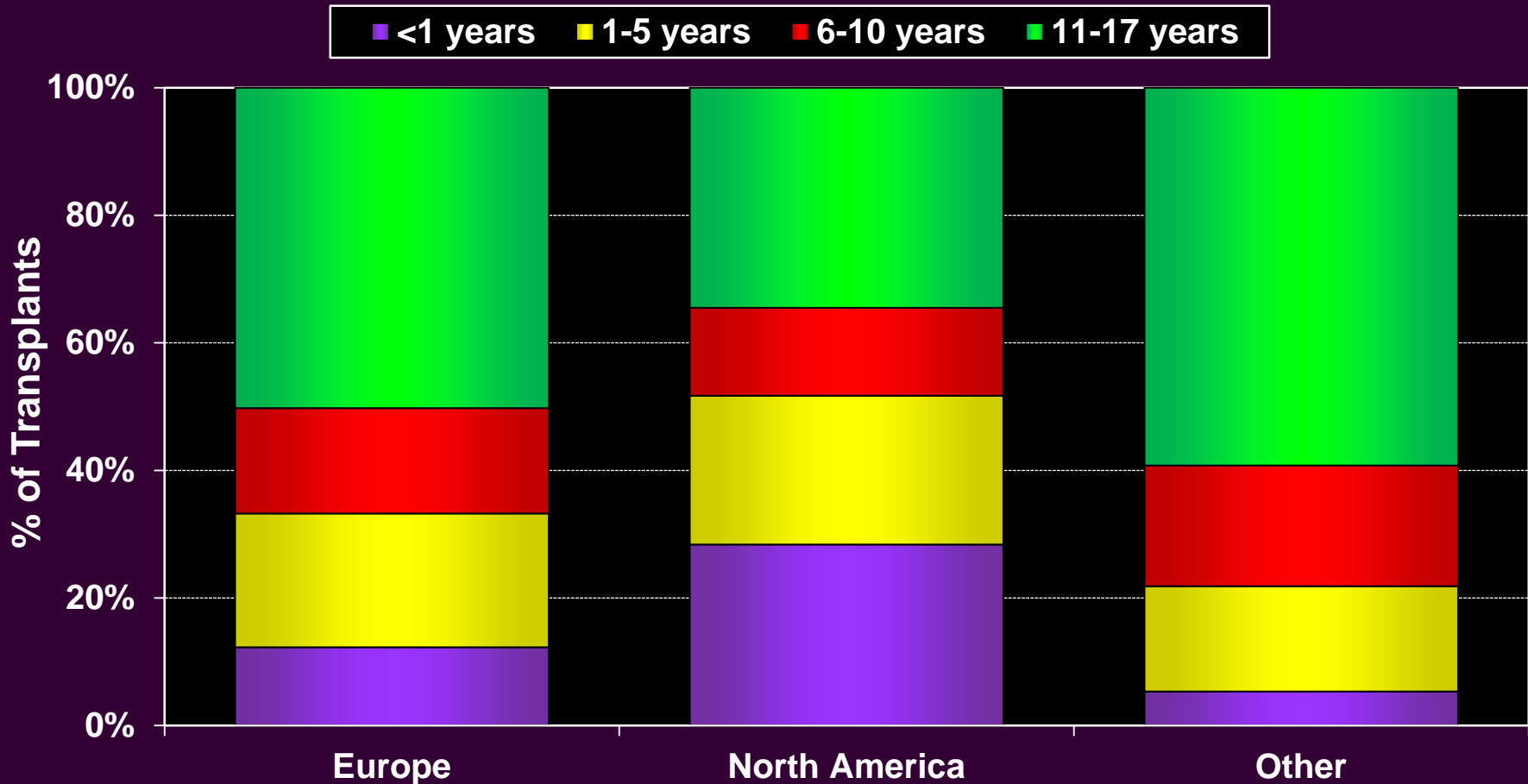


NOTE: This figure includes only the heart transplants that are reported to the ISHLT Transplant Registry. As such, this should not be construed as evidence that the number of hearts transplanted worldwide has increased and/or decreased in recent years.

Pediatric Heart Transplants

Recipient Age Distribution by Location

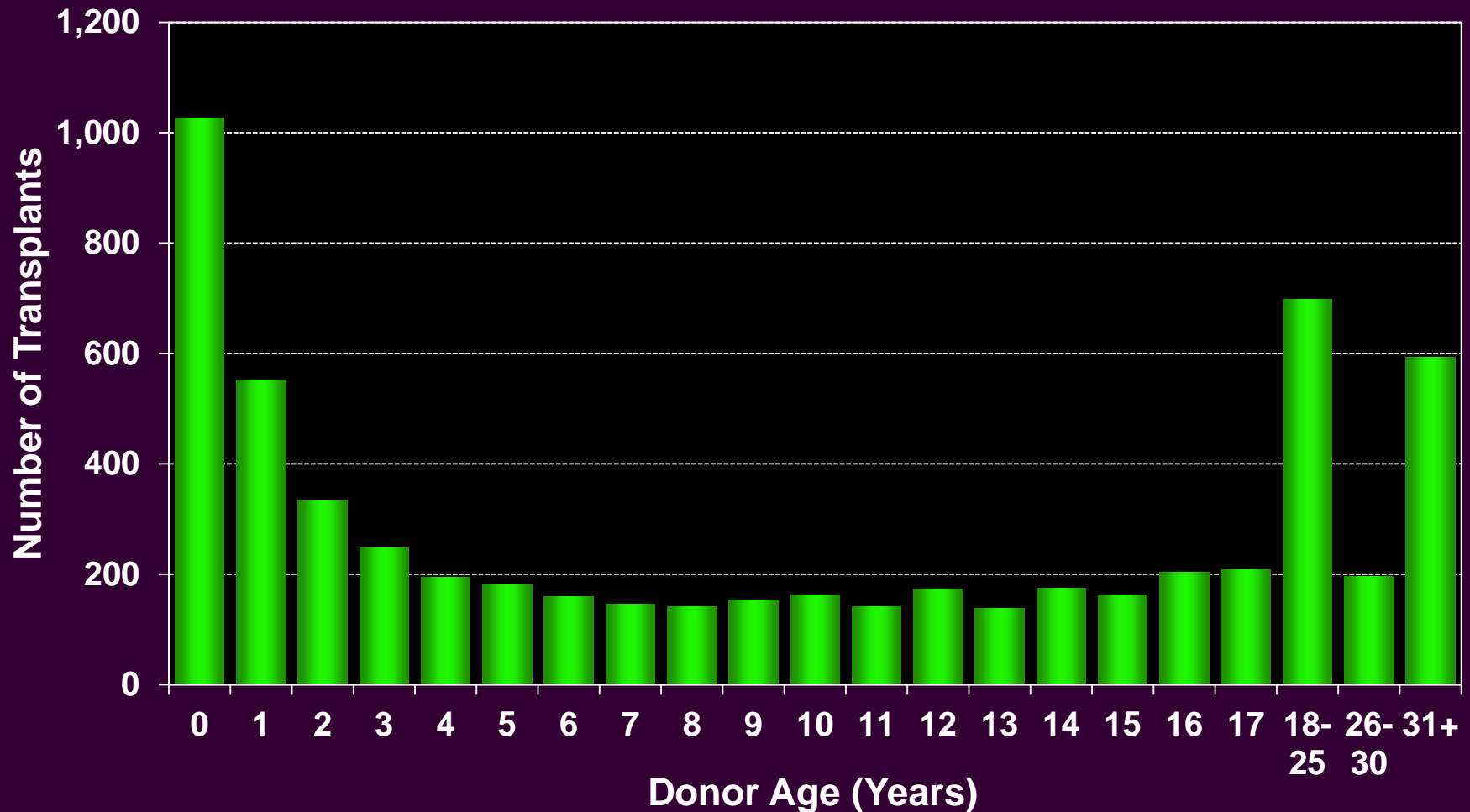
(Transplants: January 2000 – June 2012)





Pediatric Heart Transplants

Donor Age Distribution (Transplants: January 2000 – June 2012)



Pediatric Heart Transplants

Donor and Recipient Age

(Transplants: January 2000 – June 2012)

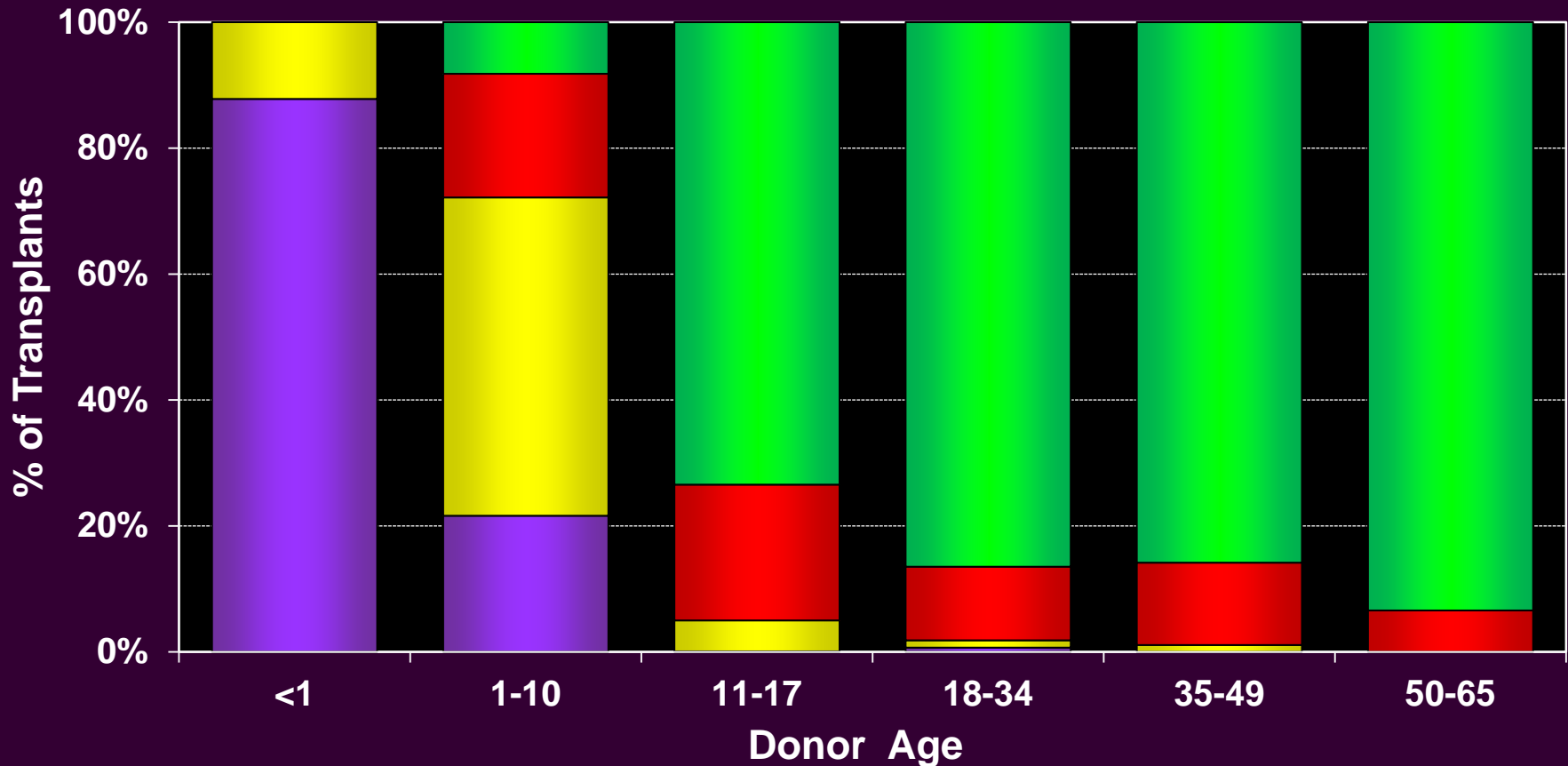
Recipient Age:

<1

1-5

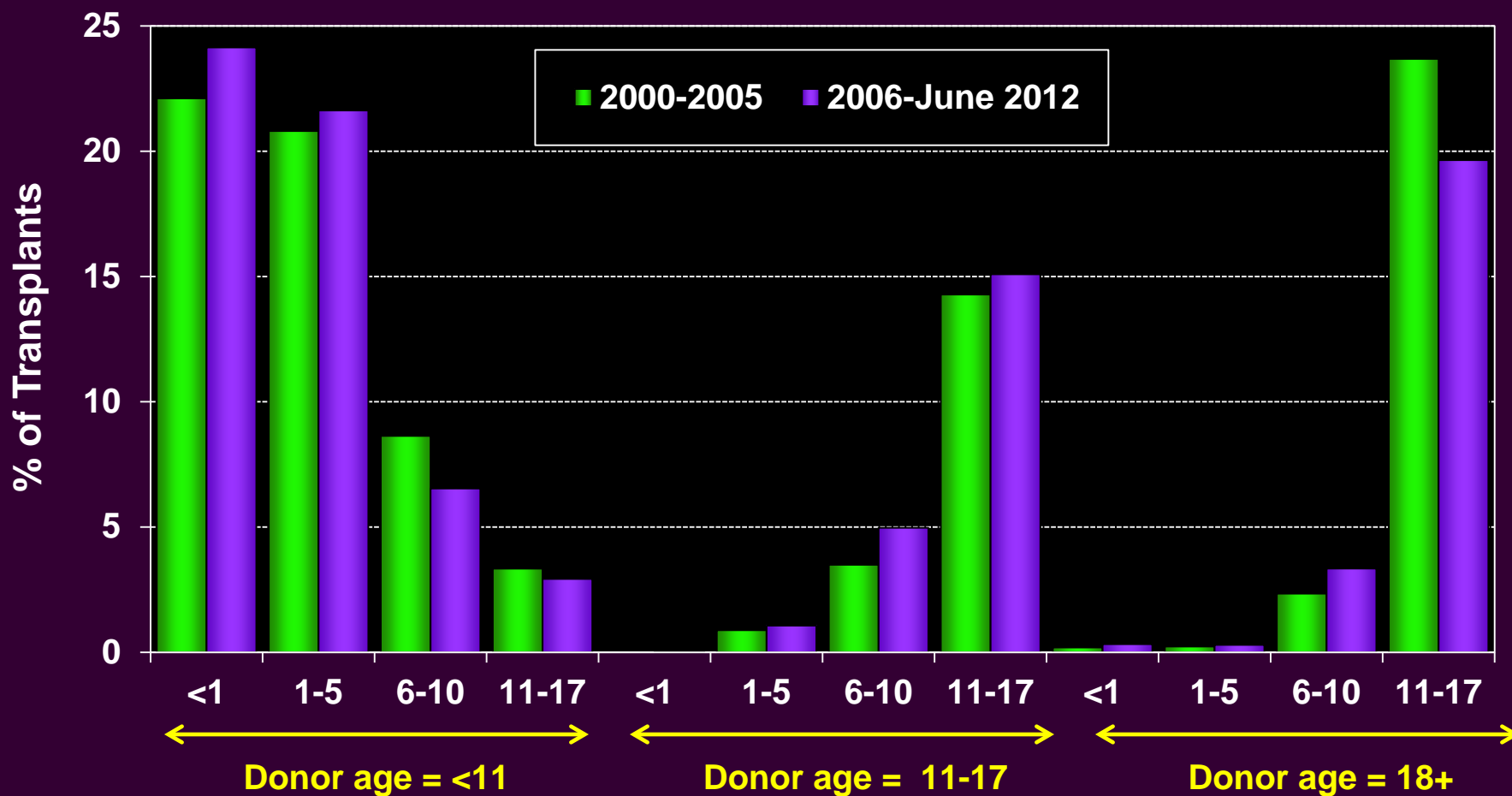
6-10

11-17



Pediatric Heart Transplants

Distribution of Transplants by Donor/Recipient Age (Transplants: January 2000 – June 2012)

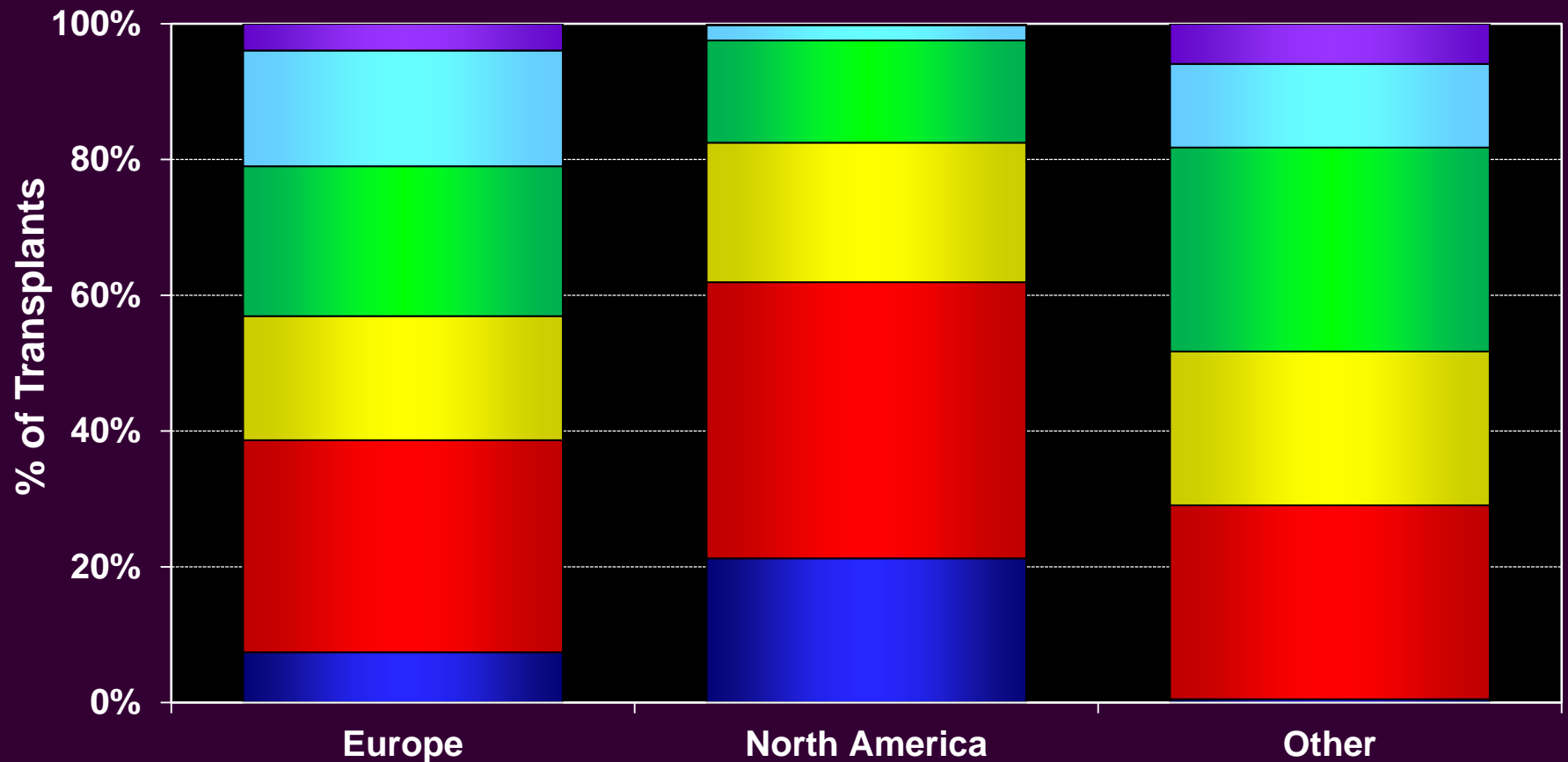


Pediatric Heart Transplants

Donor Age Distribution by Location

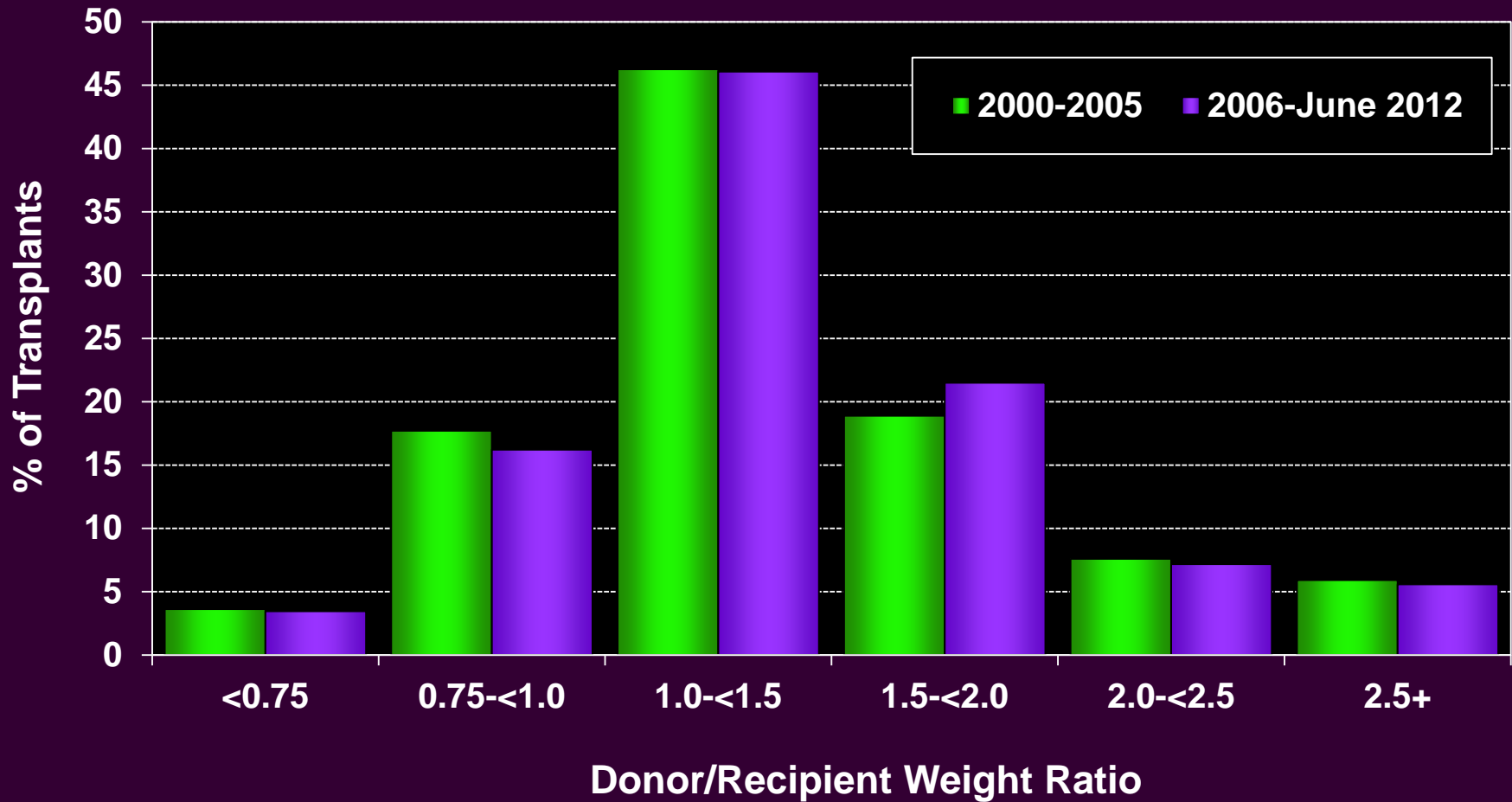
(Transplants: January 2000 – June 2012)

■ <1 ■ 1-10 ■ 11-17 ■ 18-34 ■ 35-49 ■ 50-65



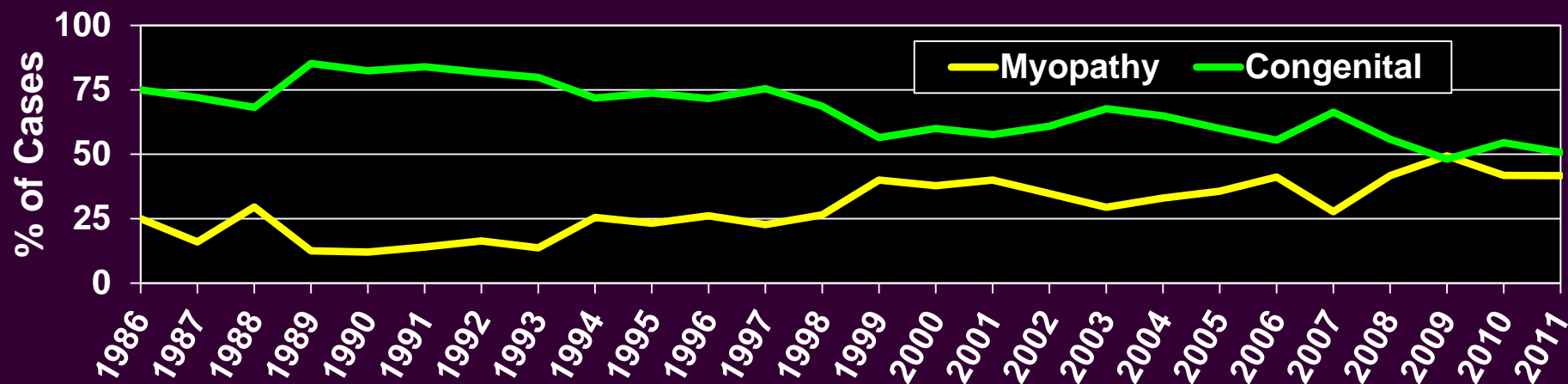
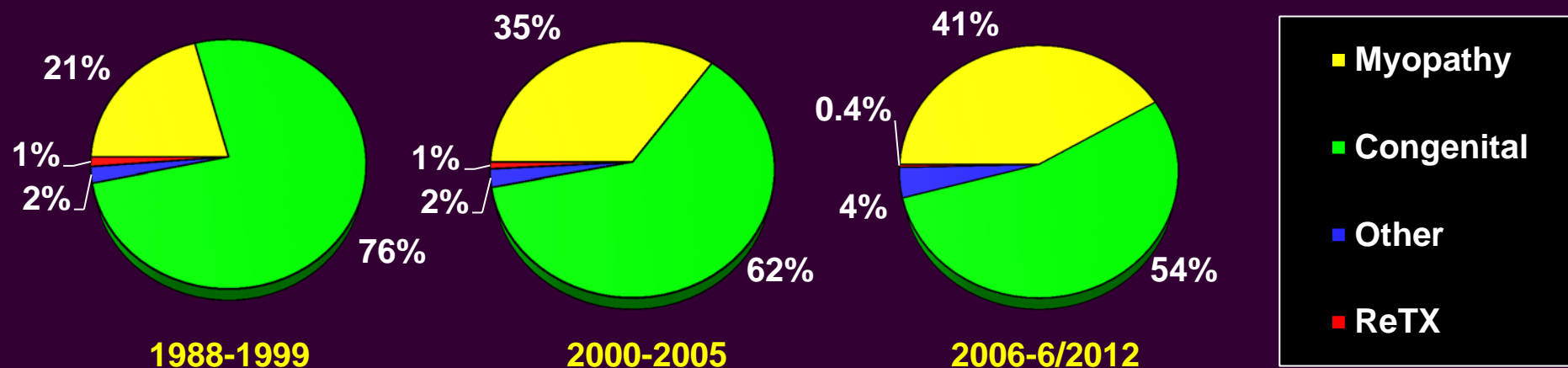
Pediatric Heart Transplants

Distribution of Transplants by Donor/Recipient Weight Ratio (Transplants: January 2000 – June 2012)



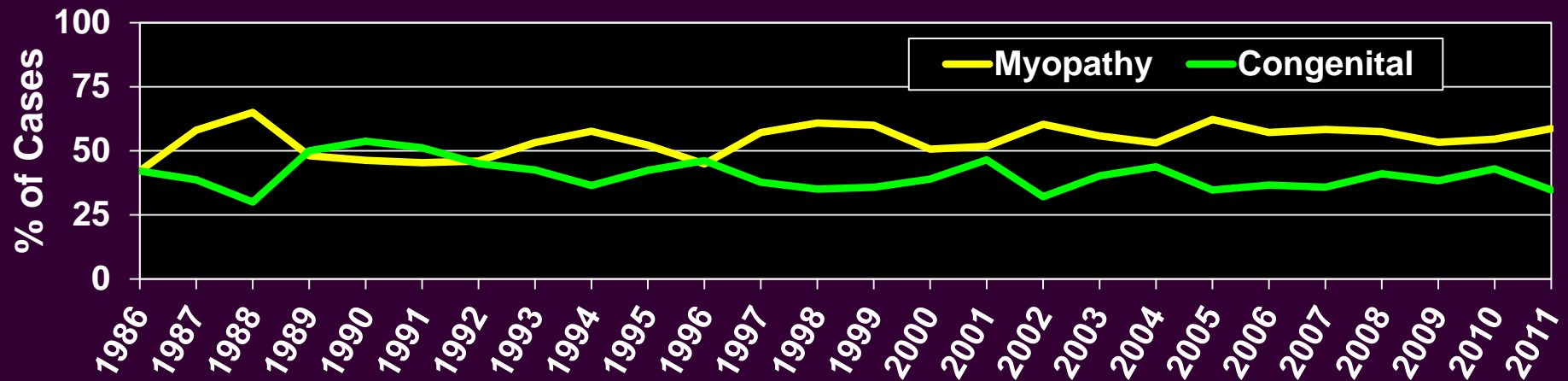
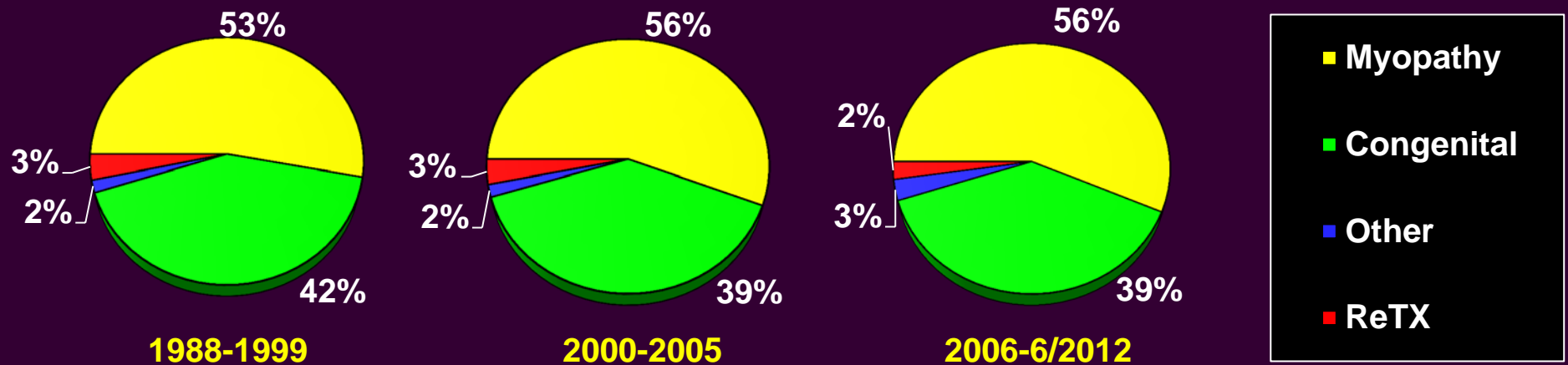
Pediatric Heart Transplants

Recipient Diagnosis (Age: < 1 Year)



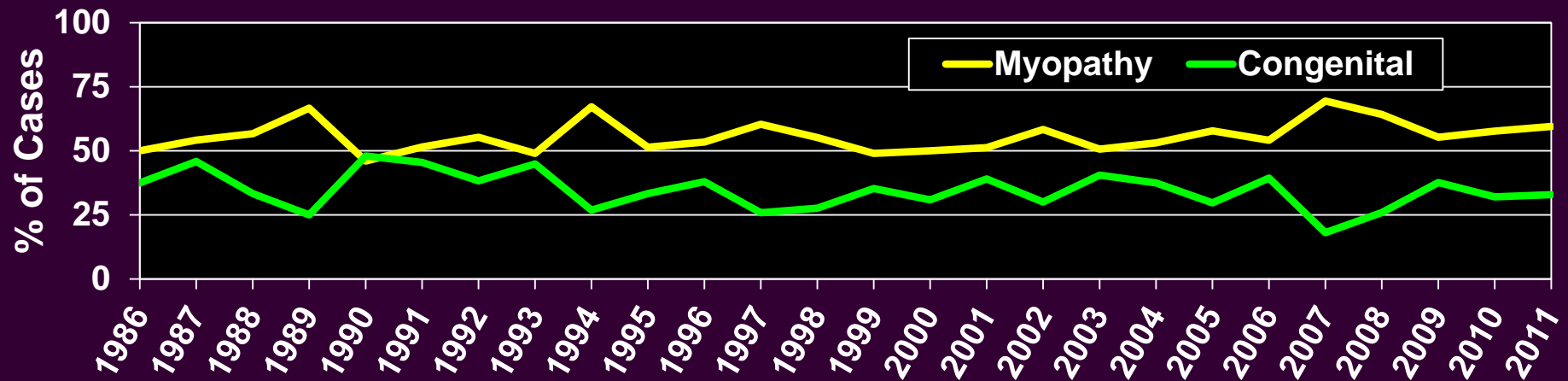
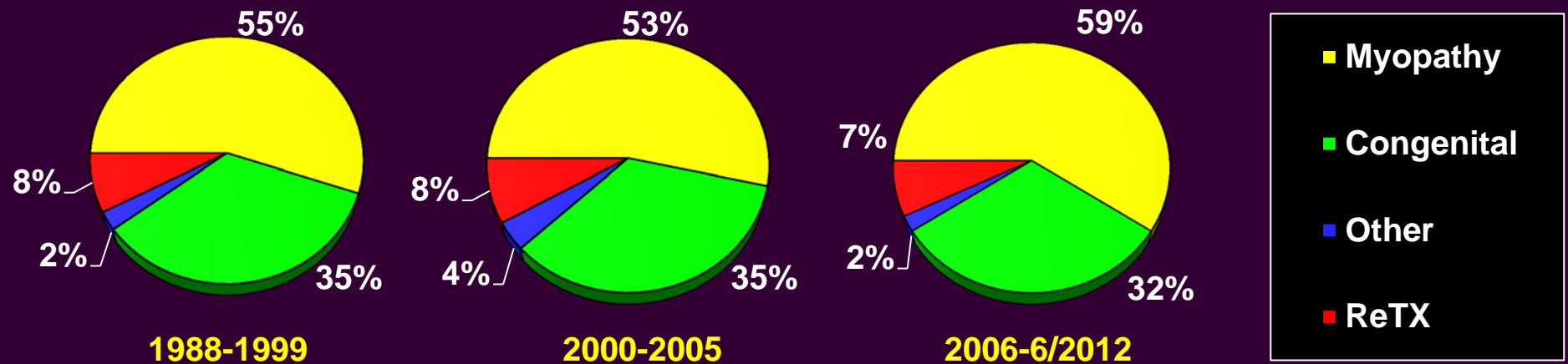
Pediatric Heart Transplants

Recipient Diagnosis (Age: 1-5 Years)



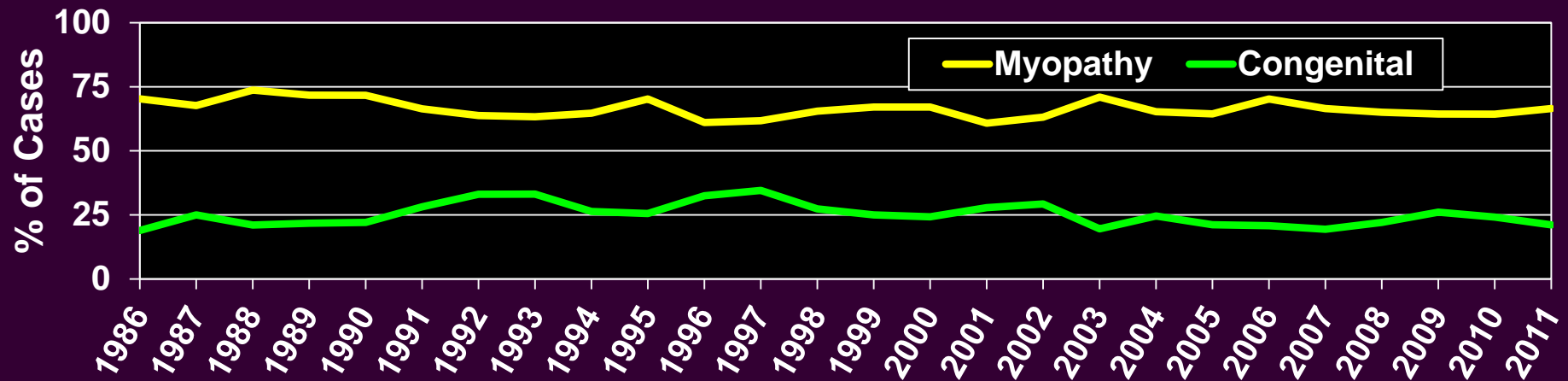
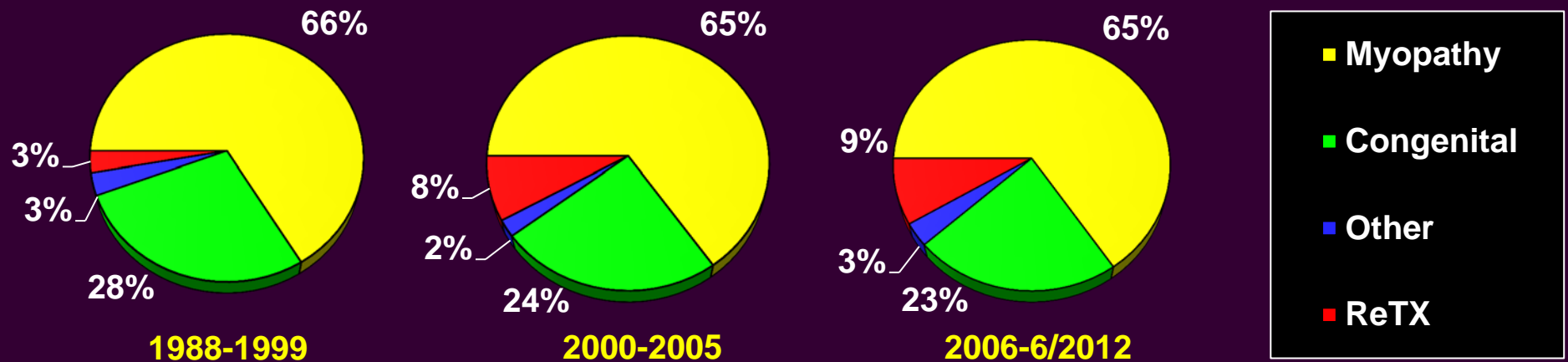
Pediatric Heart Transplants

Recipient Diagnosis (Age: 6-10 Years)



Pediatric Heart Transplants

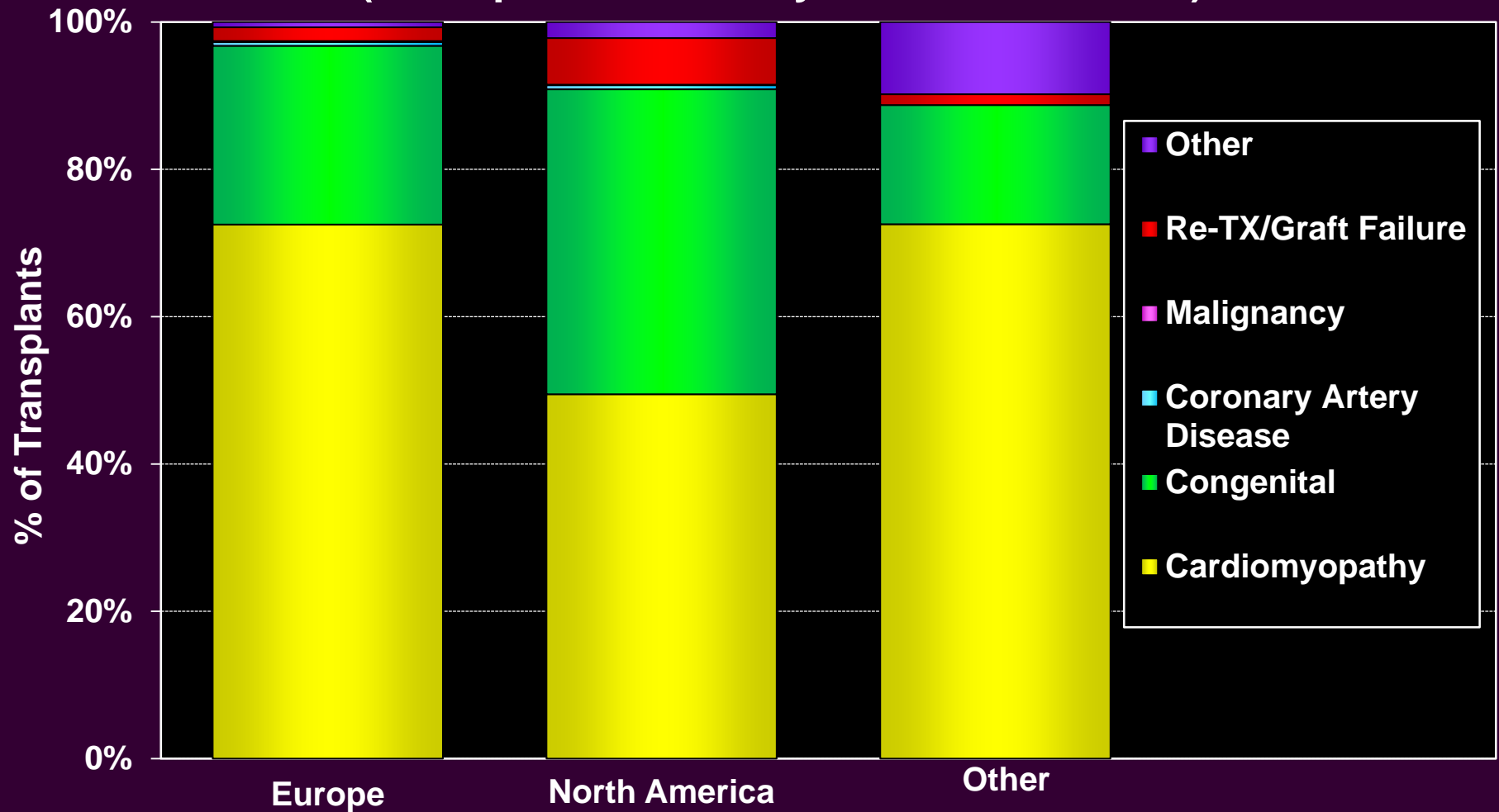
Recipient Diagnosis (Age: 11-17 Years)



Pediatric Heart Transplants

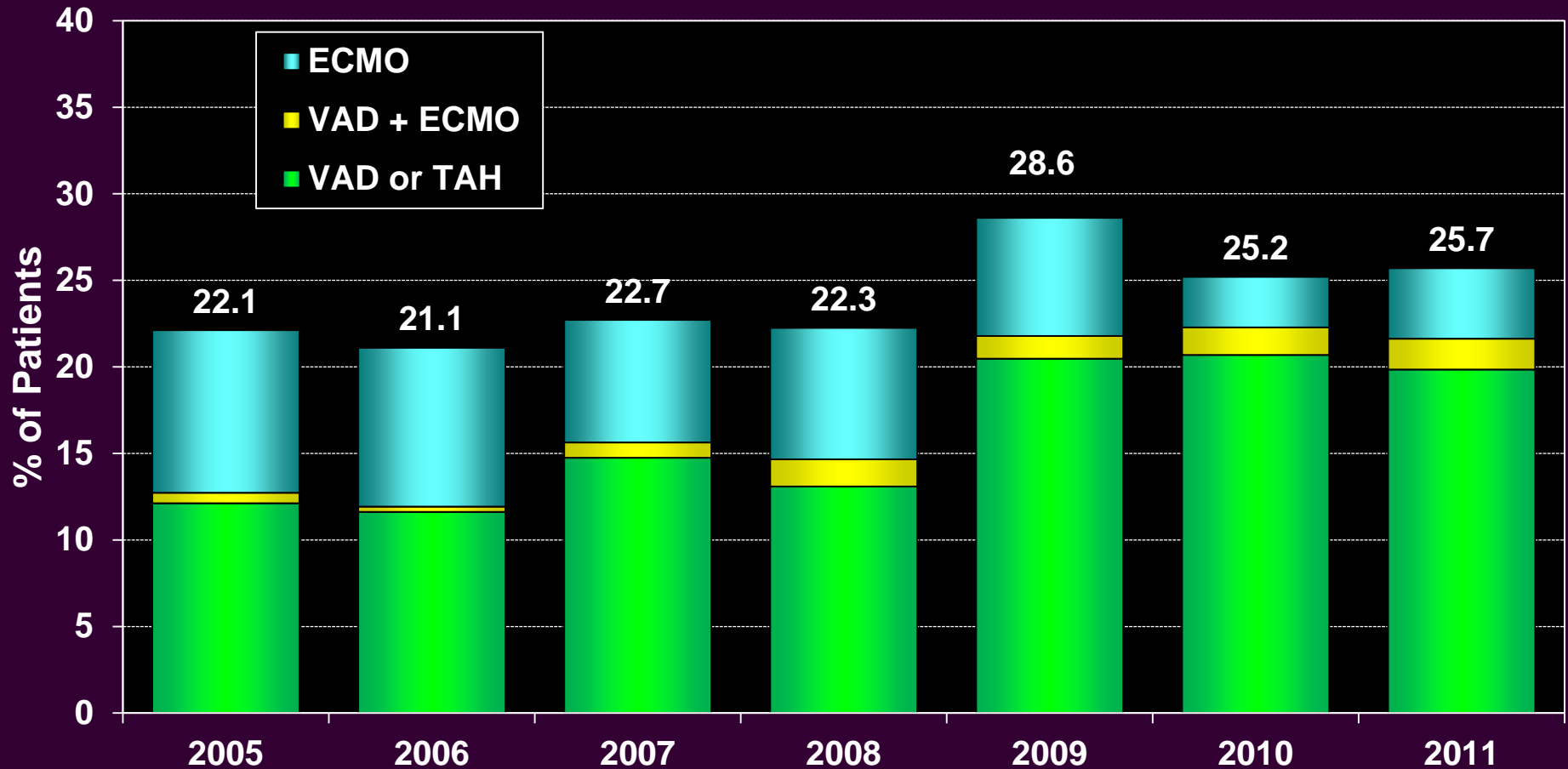
Diagnosis Distribution By Location

(Transplants: January 2000 – June 2012)



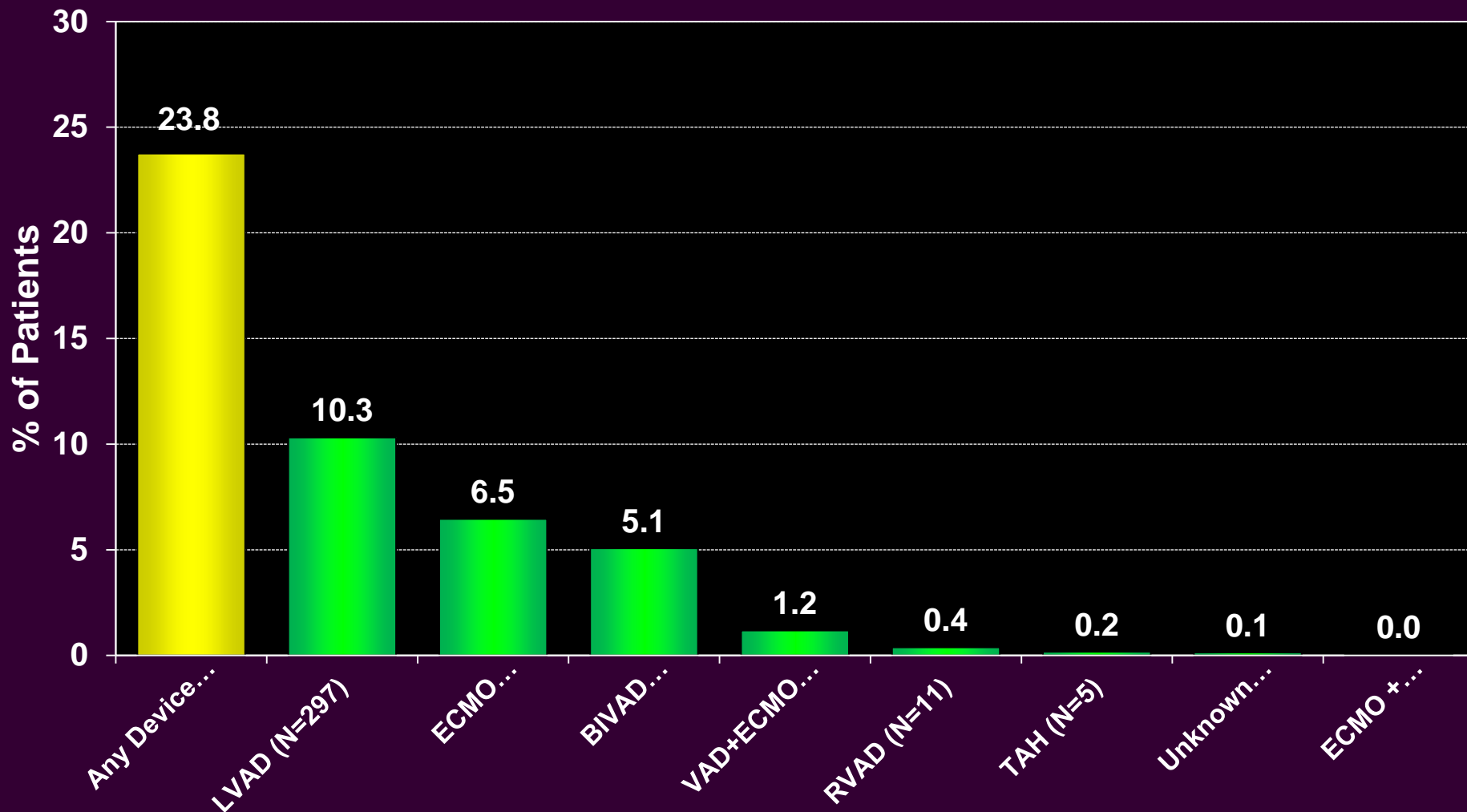
Pediatric Heart Transplants

% of Patients Bridged with Mechanical Circulatory Support*
by Year (Transplants: January 2005 – December 2011)



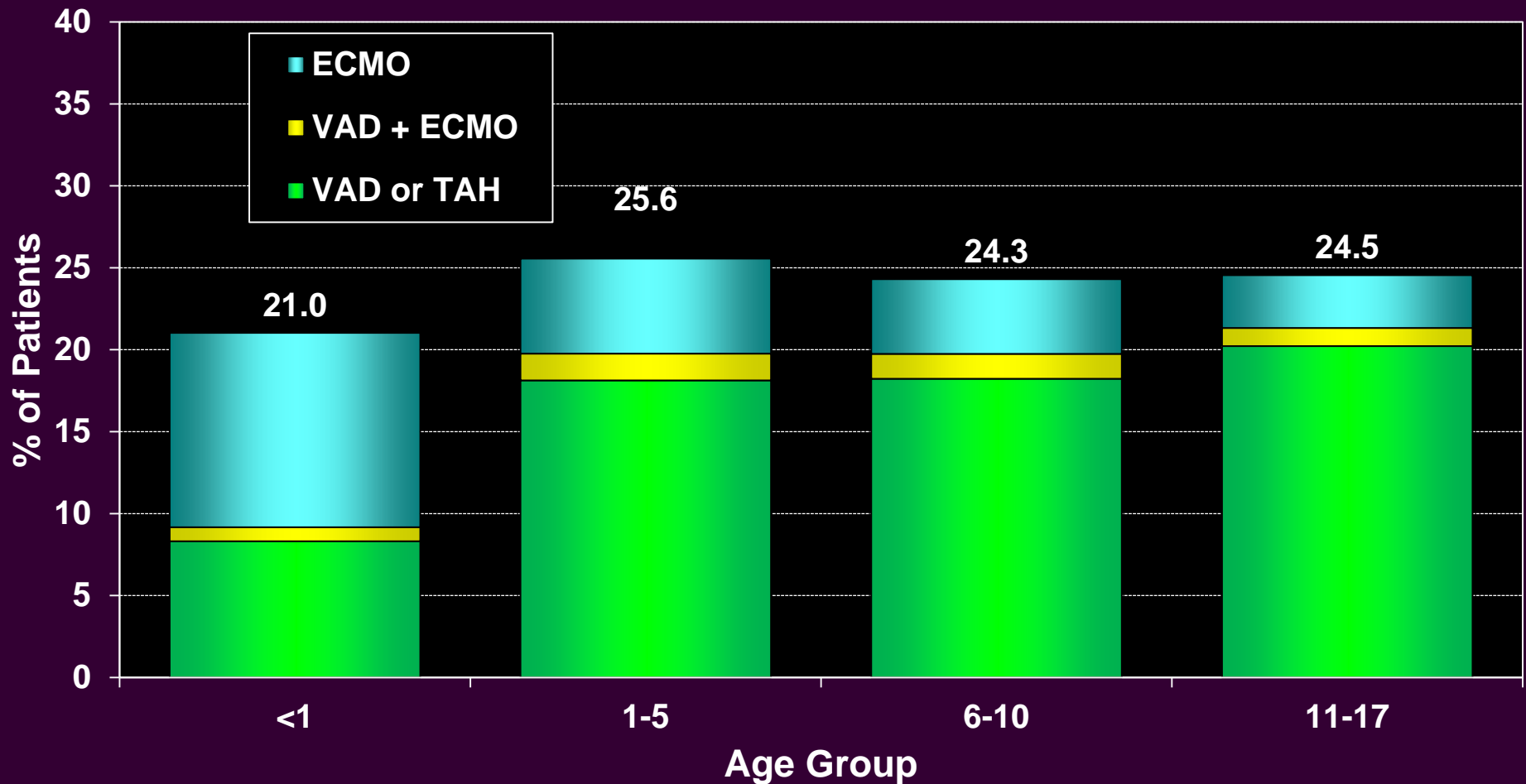
Pediatric Heart Transplants

% of Patients Bridged with Mechanical Circulatory Support*
(Transplants: July 2004 – June 2012)



Pediatric Heart Transplants

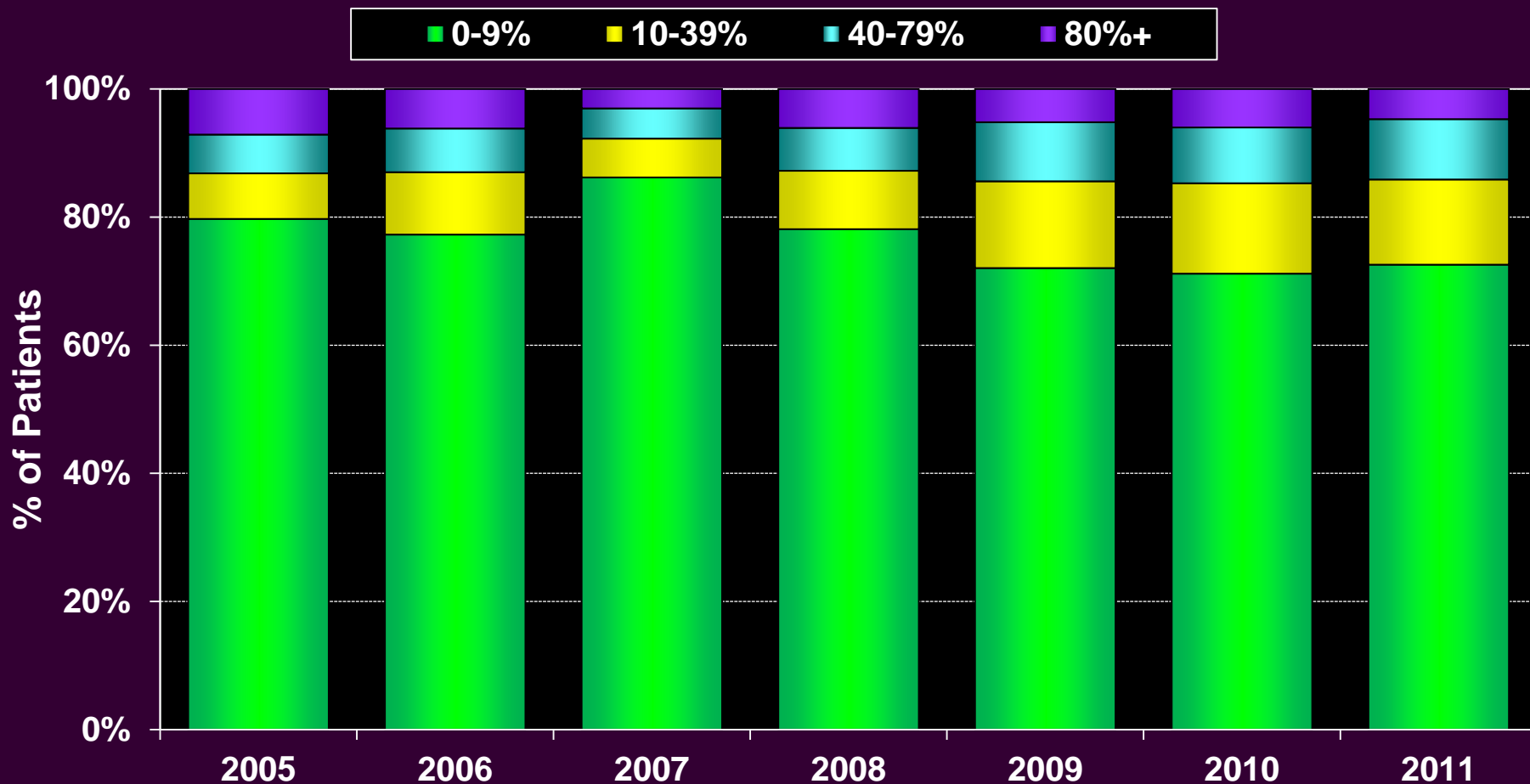
% of Patients Bridged with Mechanical Circulatory Support*
by Age Group (Transplants: July 2004 – June 2012)



Pediatric Heart Transplants

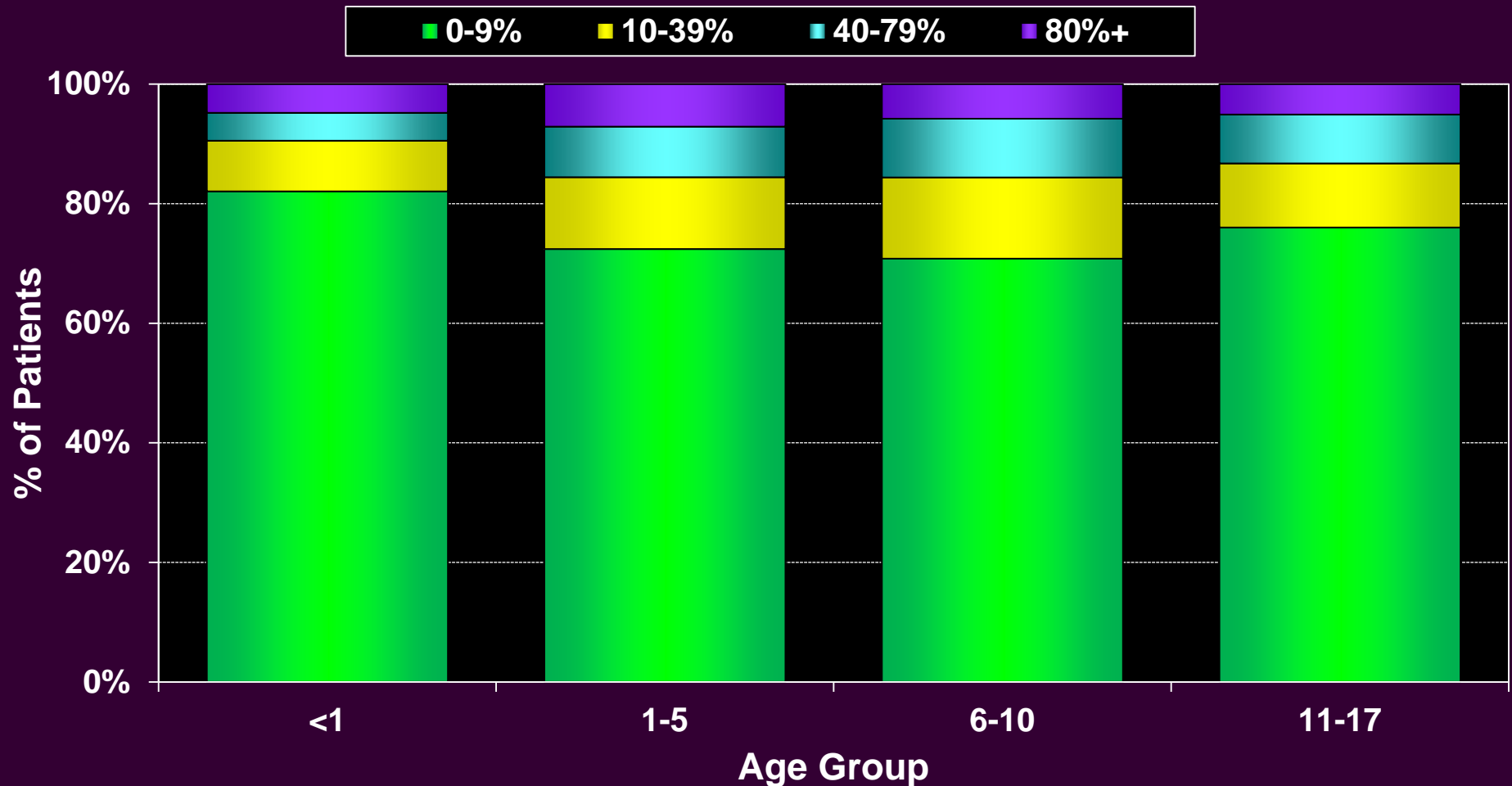
PRA Distribution by Year

(Transplants: January 2005 – December 2011)



Pediatric Heart Transplants

PRA Distribution by Age Group (Transplants: July 2004 – June 2012)



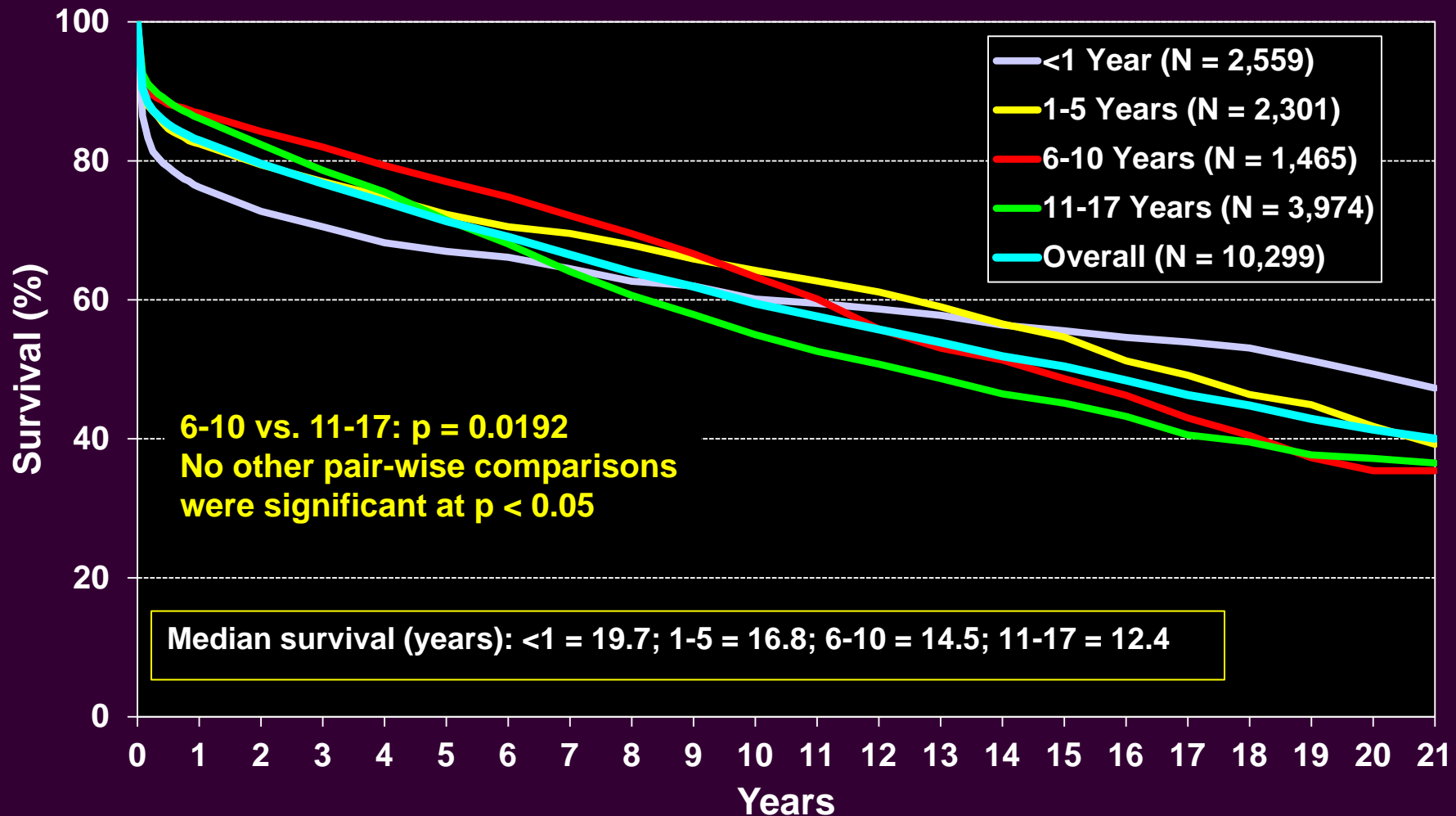
p-value = 0.0011

Post Transplant: Survival and Other Outcomes



Pediatric Heart Transplants

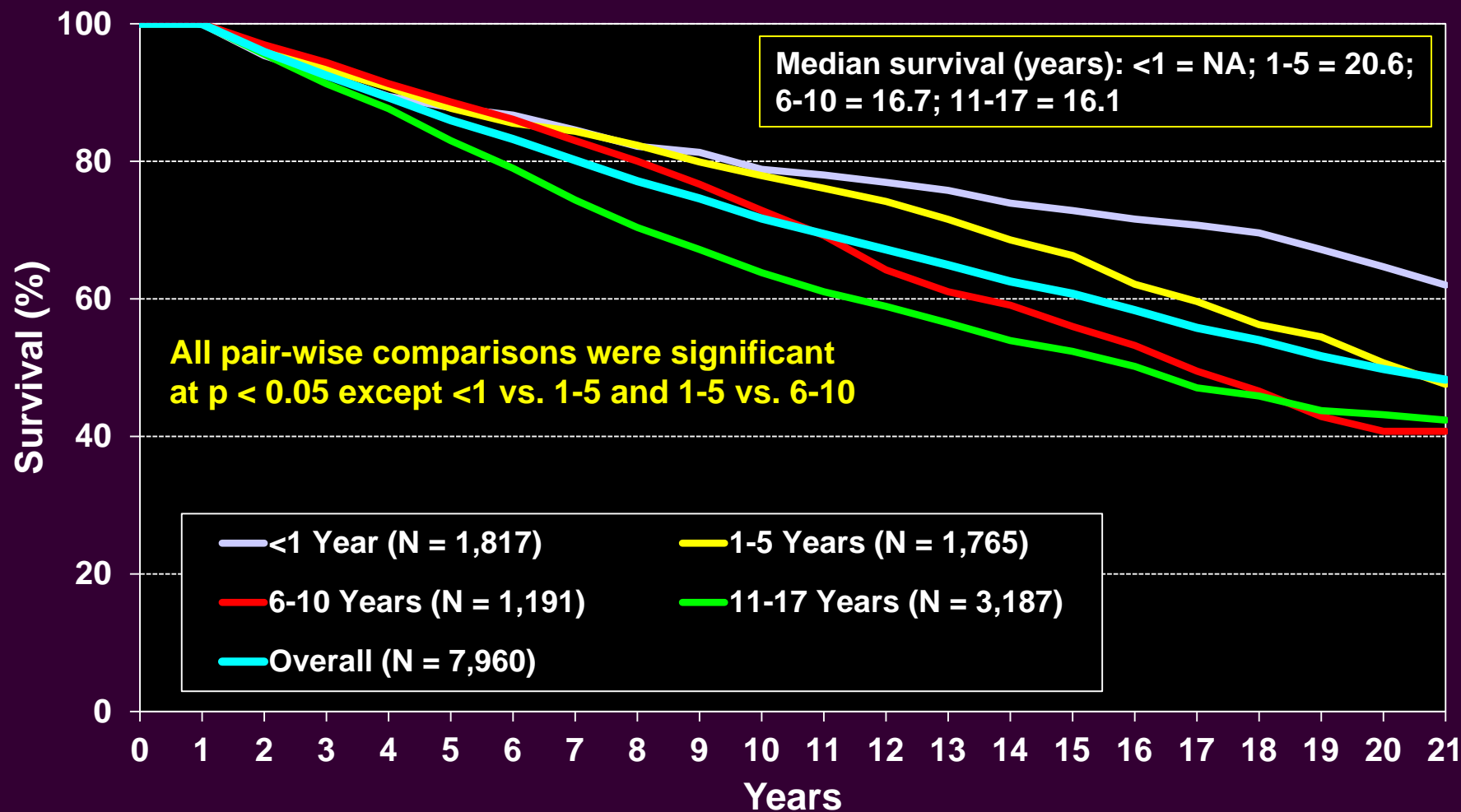
Kaplan-Meier Survival (Transplants: January 1982 – June 2011)





Pediatric Heart Transplants

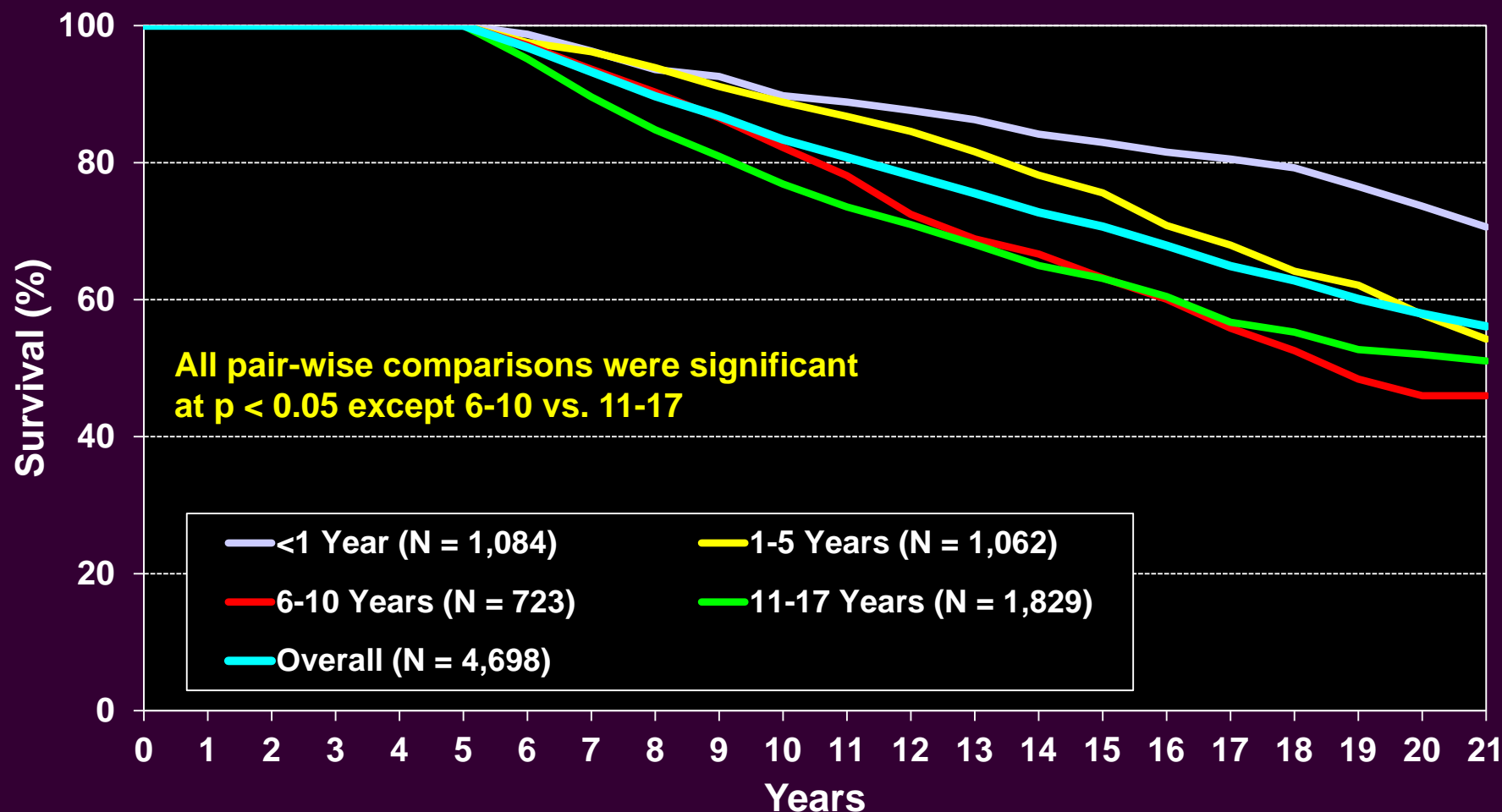
Kaplan-Meier Survival Conditional on Survival to 1 Year (Transplants: January 1982 – June 2011)





Pediatric Heart Transplants

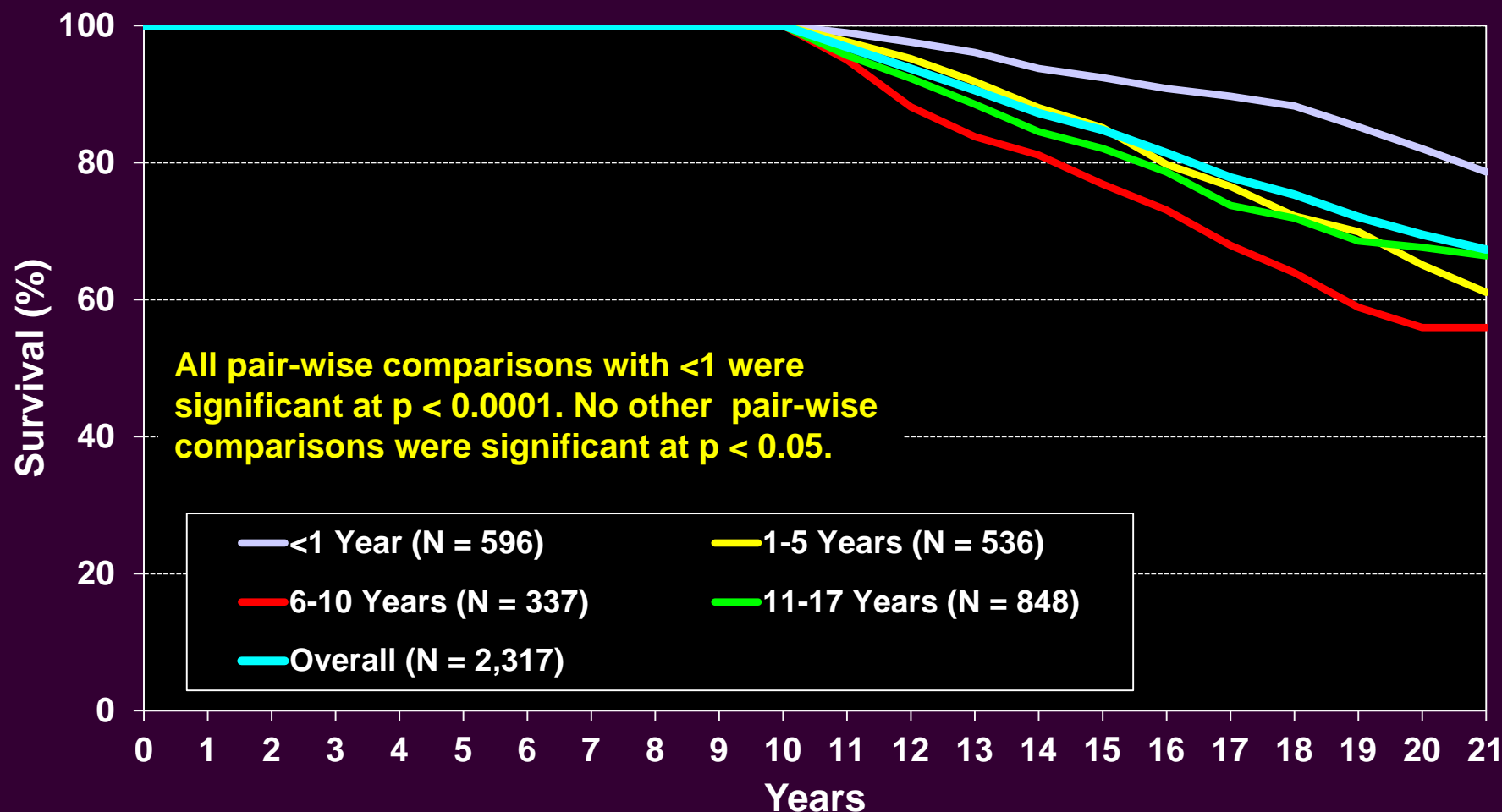
Kaplan-Meier Survival Conditional on Survival to 5 Years (Transplants: January 1982 – June 2007)





Pediatric Heart Transplants

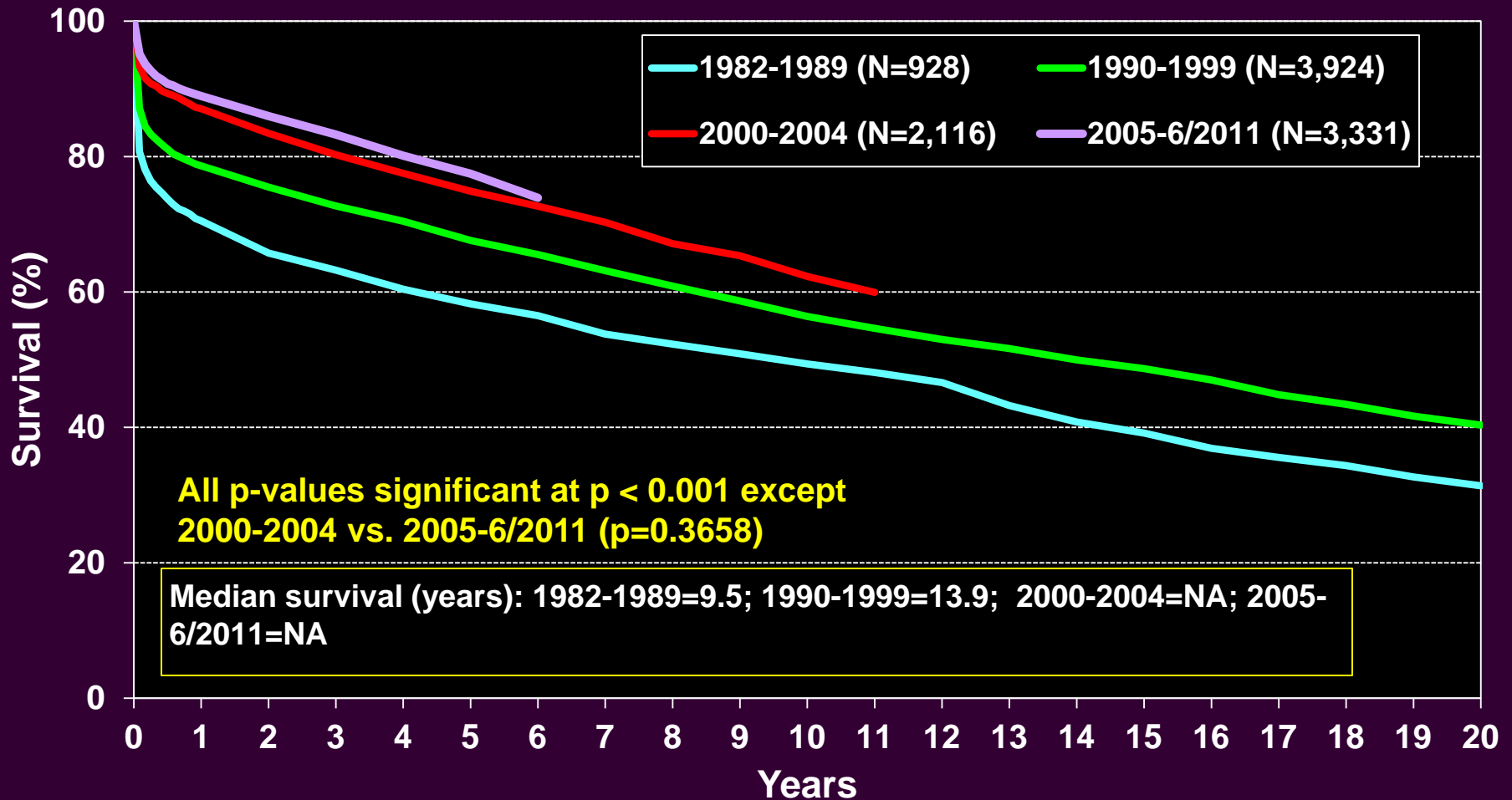
Kaplan-Meier Survival Conditional on Survival to 10 Years (Transplants: January 1982 – June 2002)



Pediatric Heart Transplants

Kaplan-Meier Survival by Era

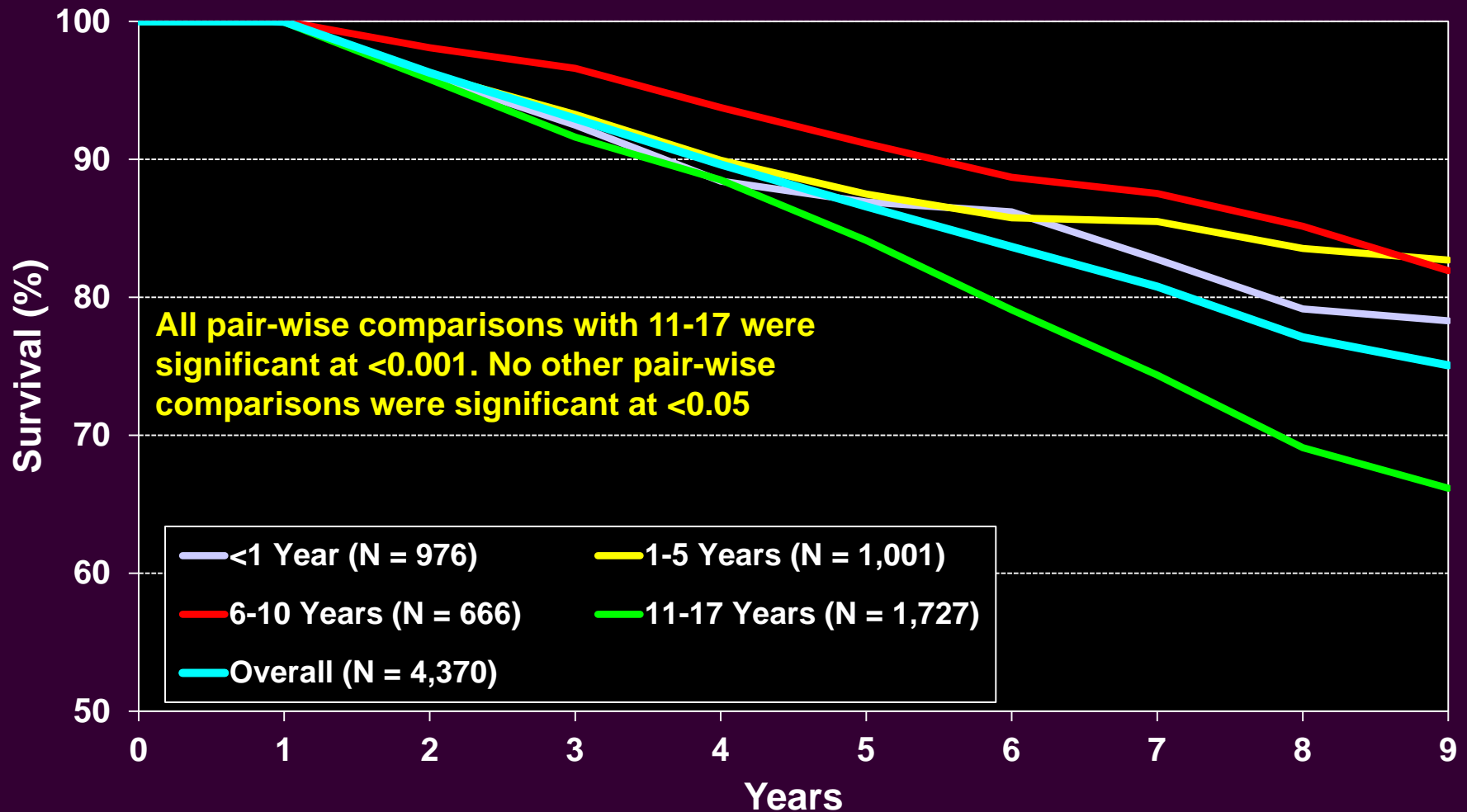
(Transplants: January 1982 – June 2011)





Pediatric Heart Transplants

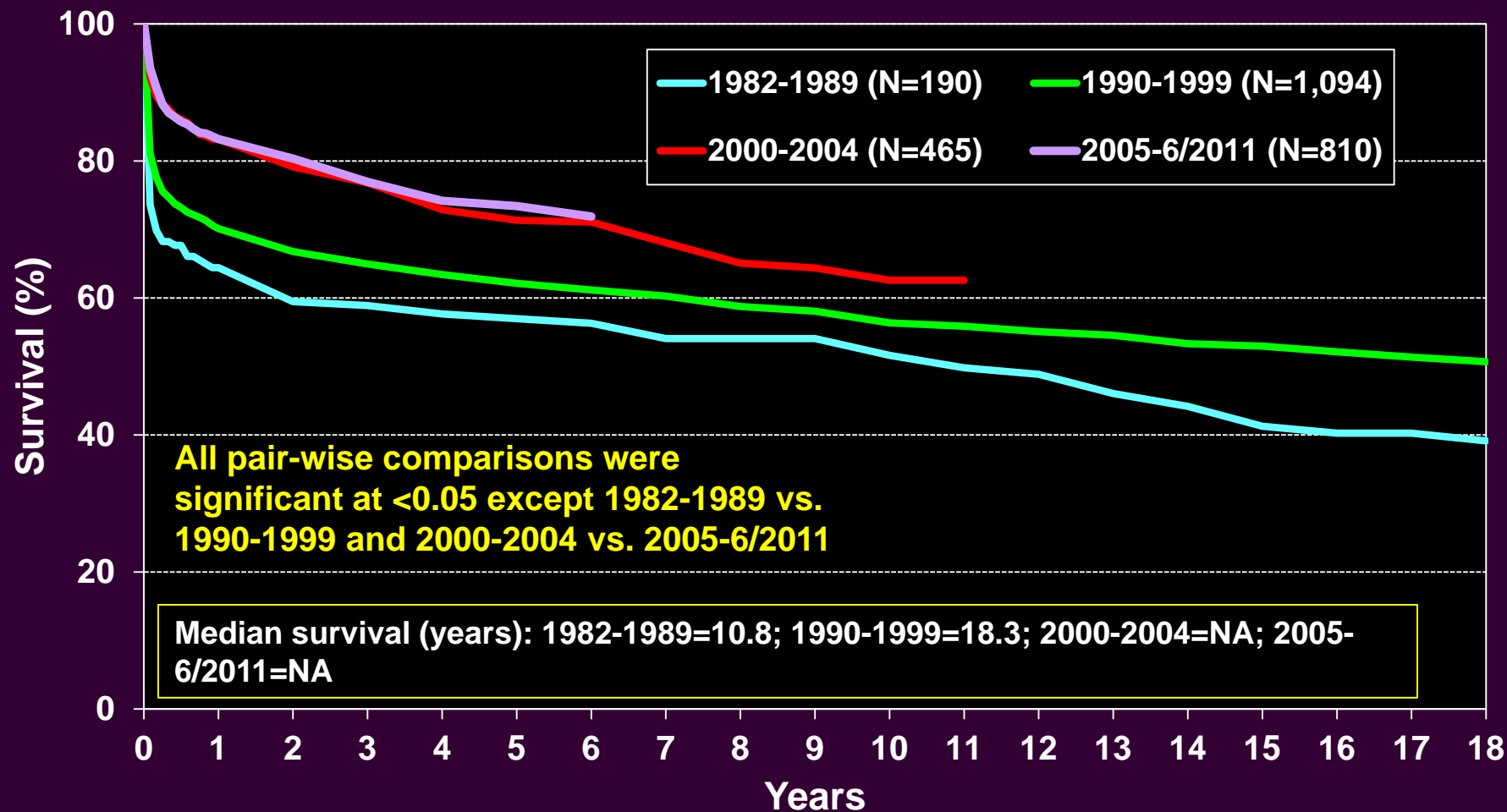
Conditional Kaplan-Meier Survival for Recent Era (Transplants: January 2000 – June 2011)



Pediatric Heart Transplants

Kaplan-Meier Survival by Era

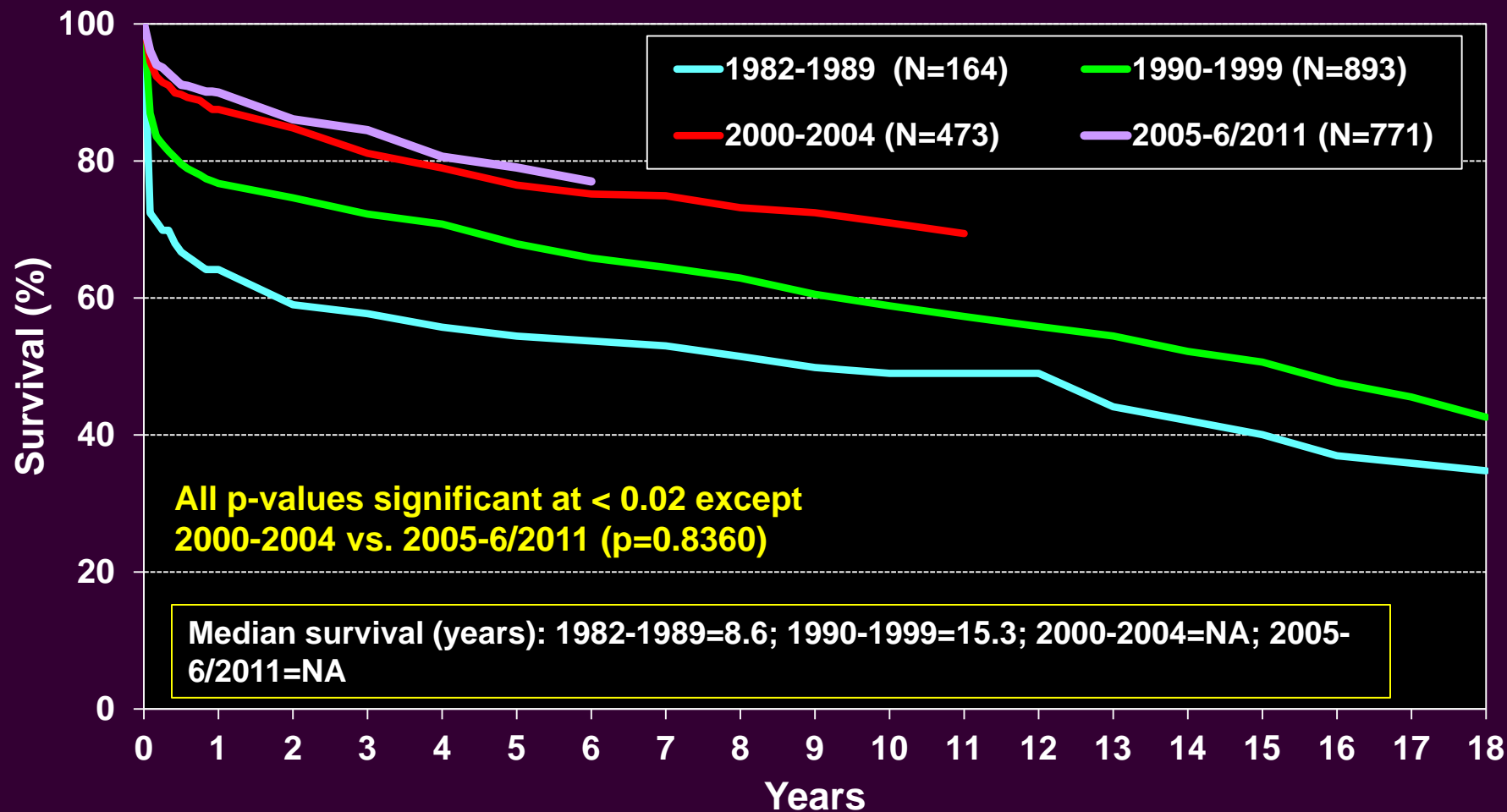
Age: < 1 Year (Transplants: January 1982 – June 2011)



Pediatric Heart Transplants

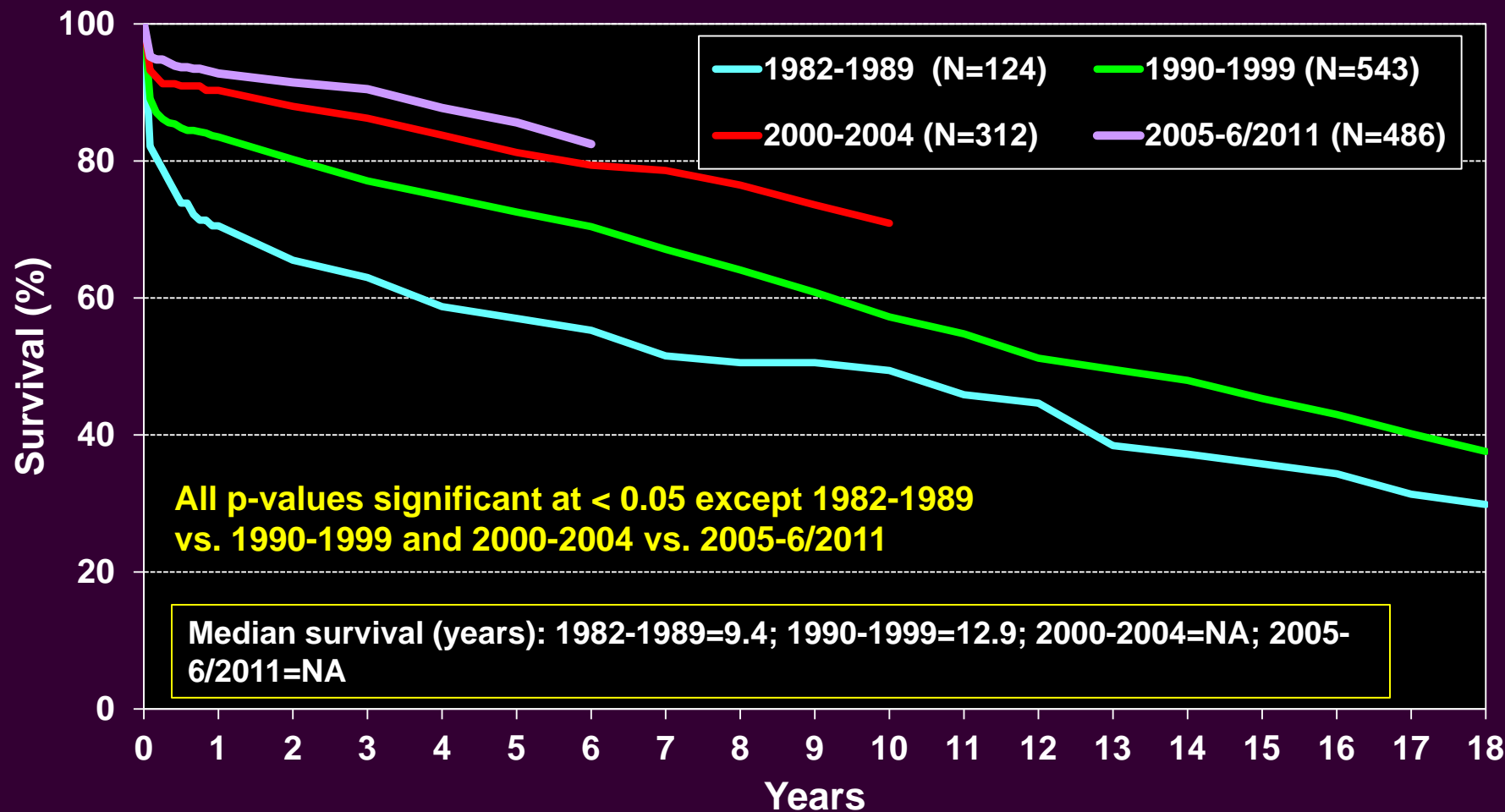
Kaplan-Meier Survival by Era

Age: 1-5 Years (Transplants: January 1982 – June 2011)



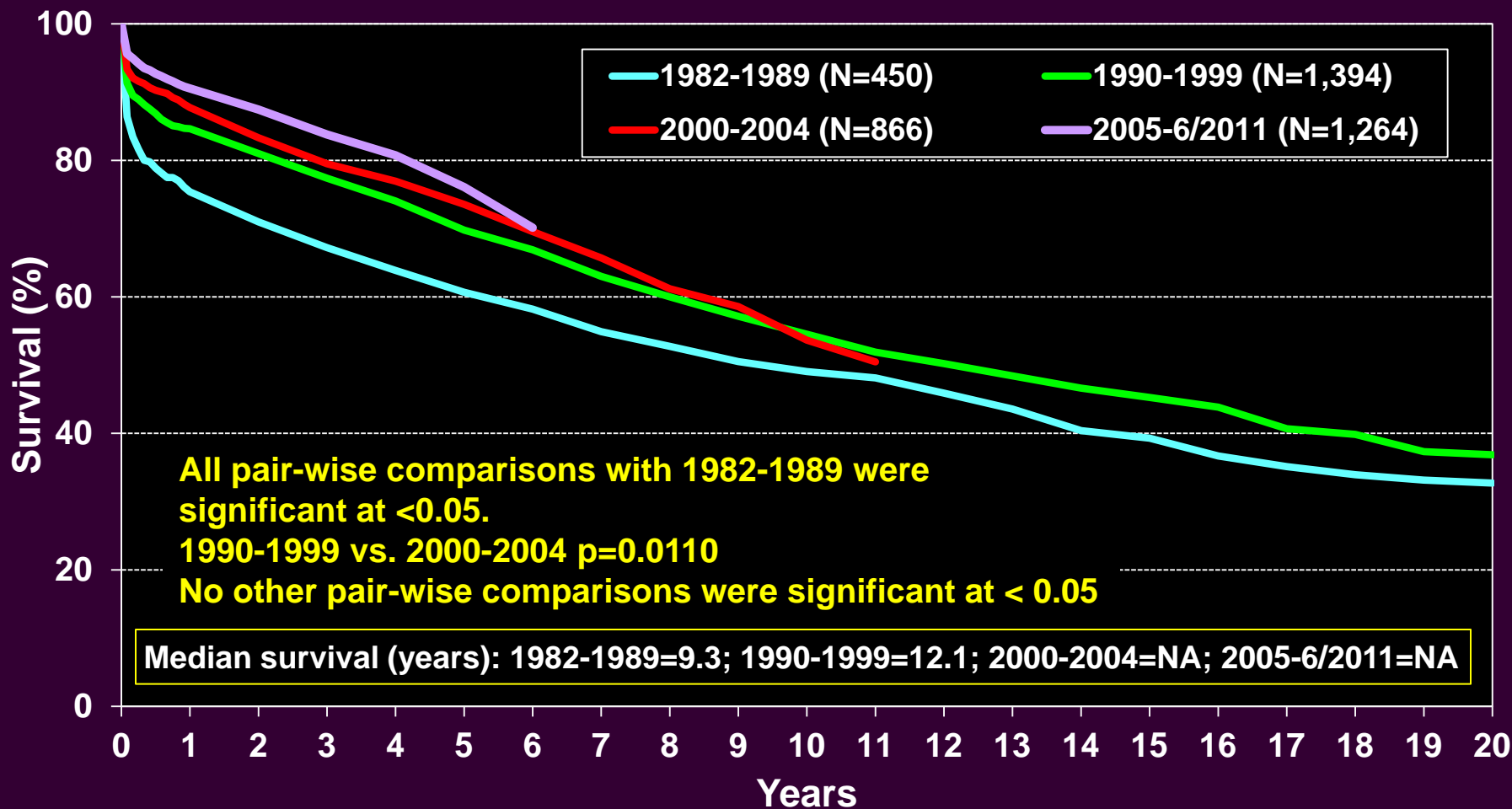
Pediatric Heart Transplants Kaplan-Meier Survival by Era

Age: 6-10 Years (Transplants: January 1982 – June 2011)



Pediatric Heart Transplants Kaplan-Meier Survival by Era

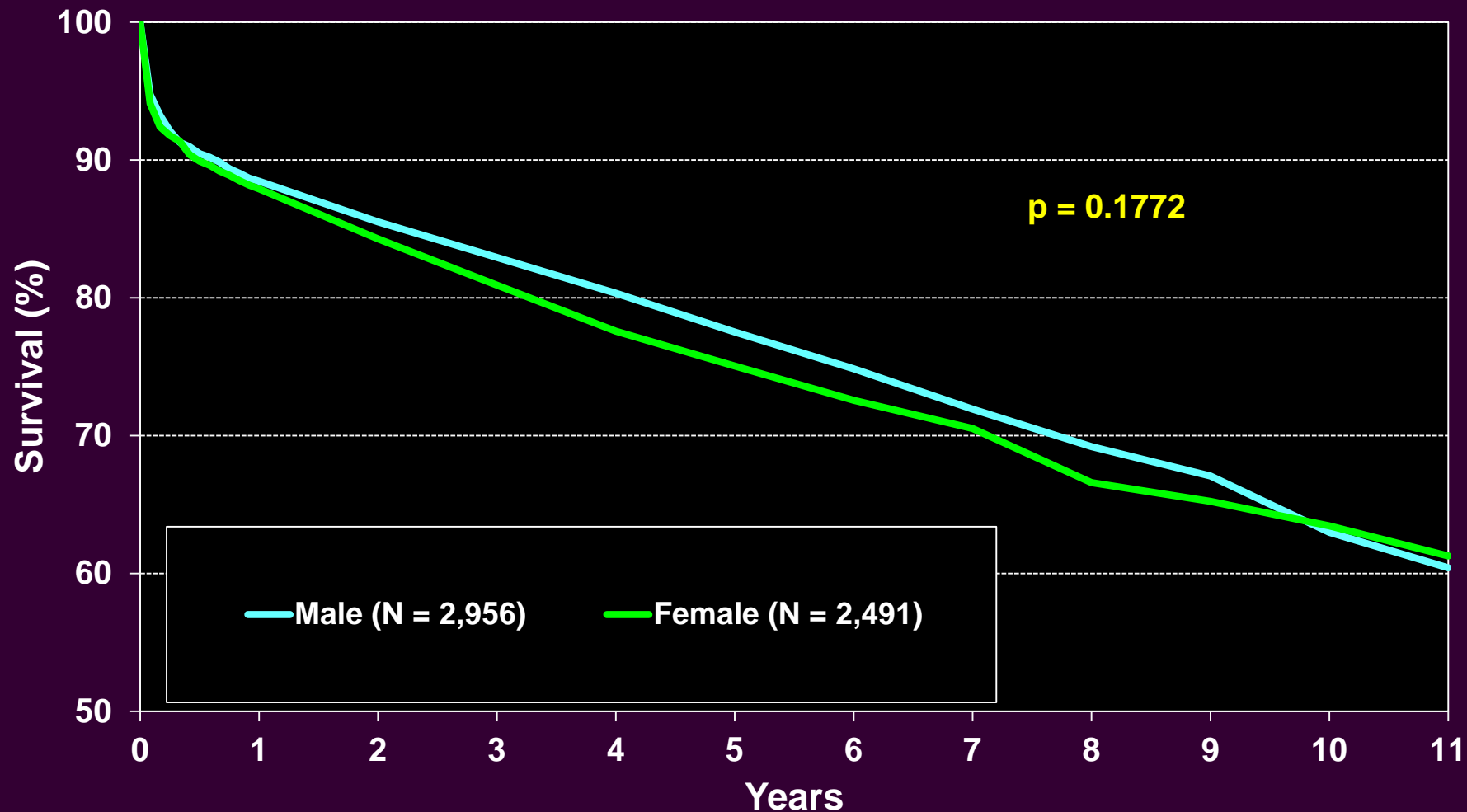
Age: 11-17 Years (Transplants: January 1982 – June 2011)



Pediatric Heart Transplants

Kaplan-Meier Survival by Recipient Gender

(Transplants: January 2000 – June 2011)

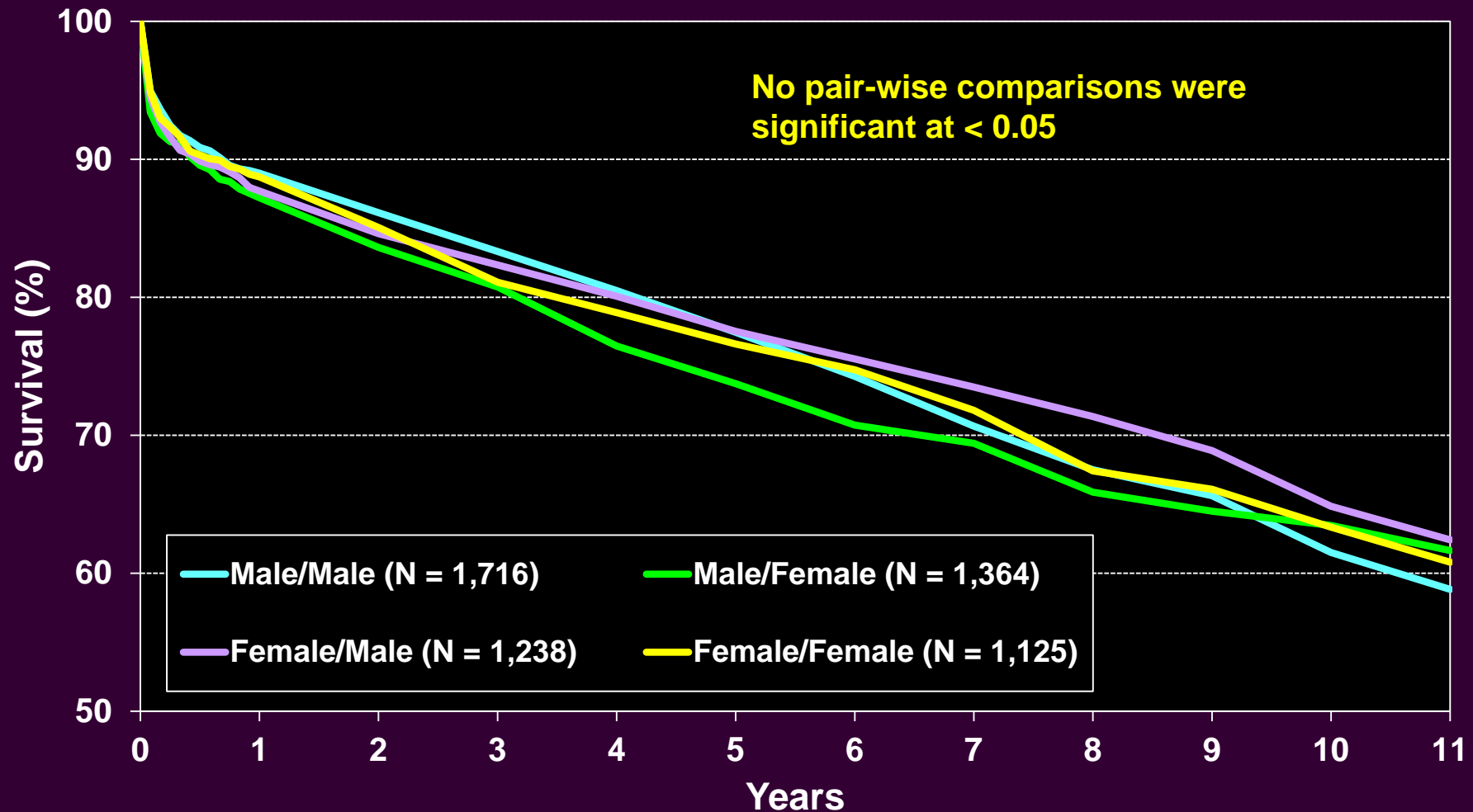




Pediatric Heart Transplants

Kaplan-Meier Survival by Donor/Recipient Gender

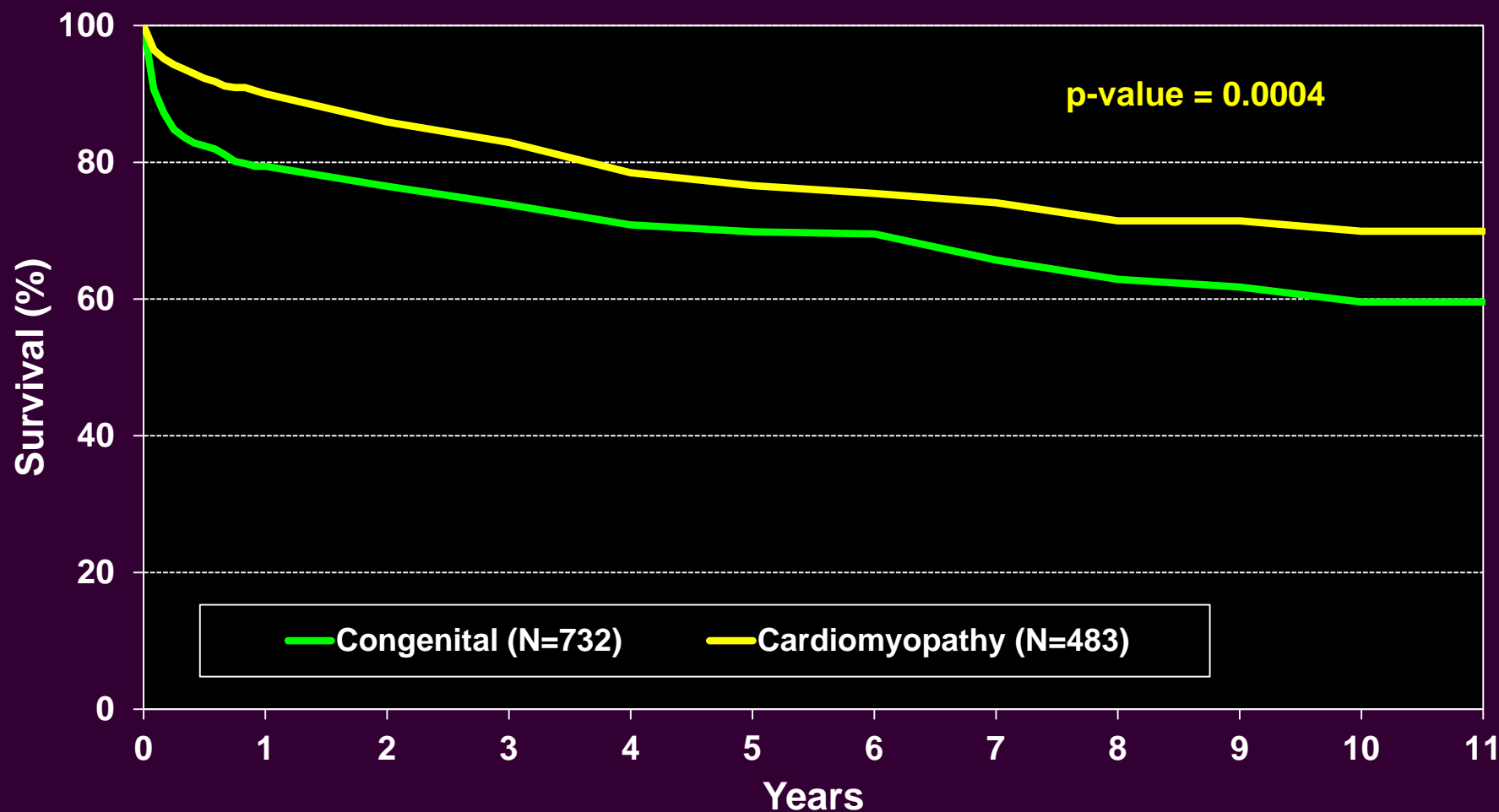
(Transplants: January 2000 – June 2011)



Pediatric Heart Transplants

Kaplan-Meier Survival by Diagnosis

Age: < 1 Year (Transplants: January 2000 – June 2011)

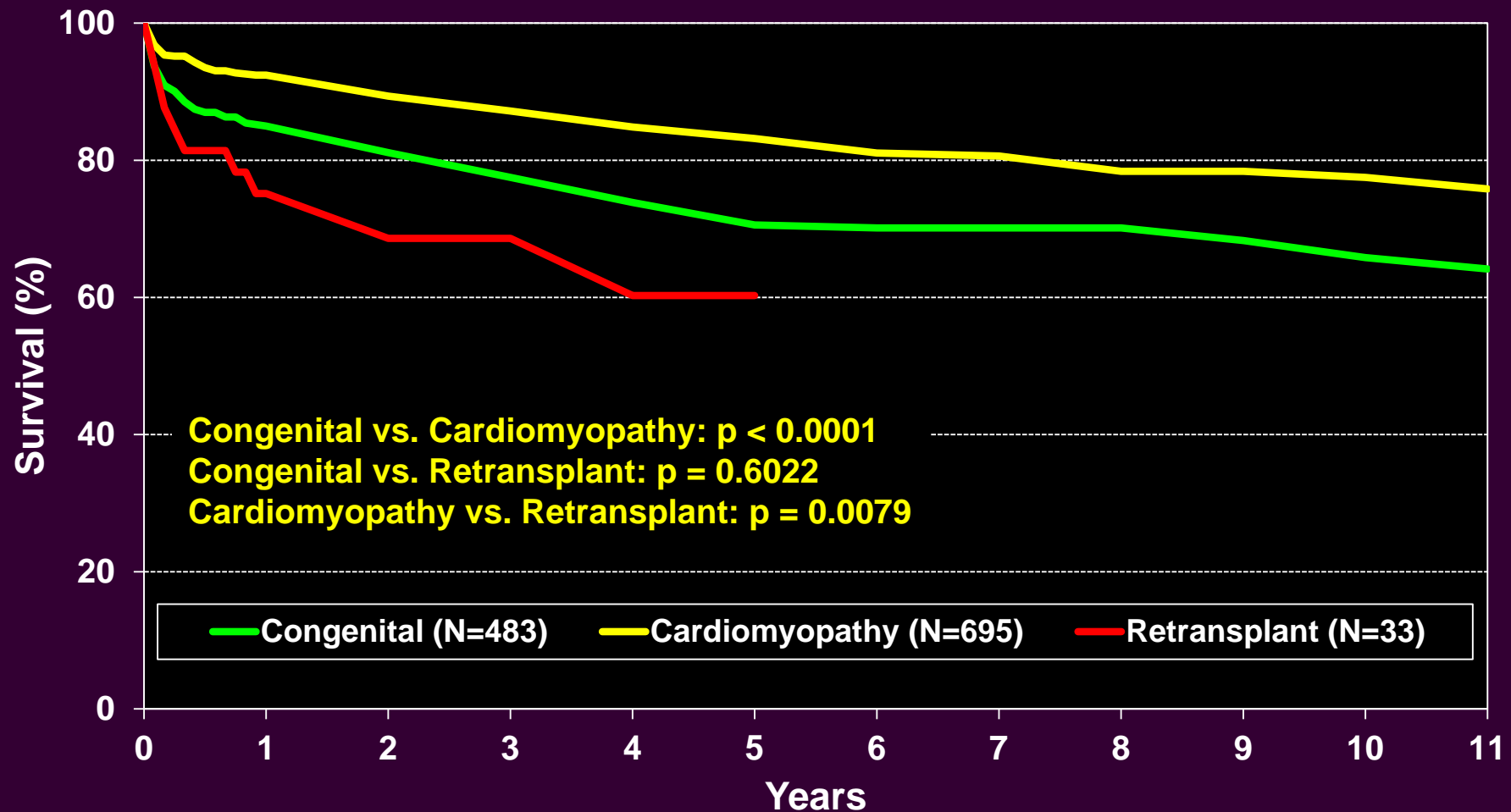




Pediatric Heart Transplants

Kaplan-Meier Survival by Diagnosis

Age: 1-5 Years (Transplants: January 2000 – June 2011)

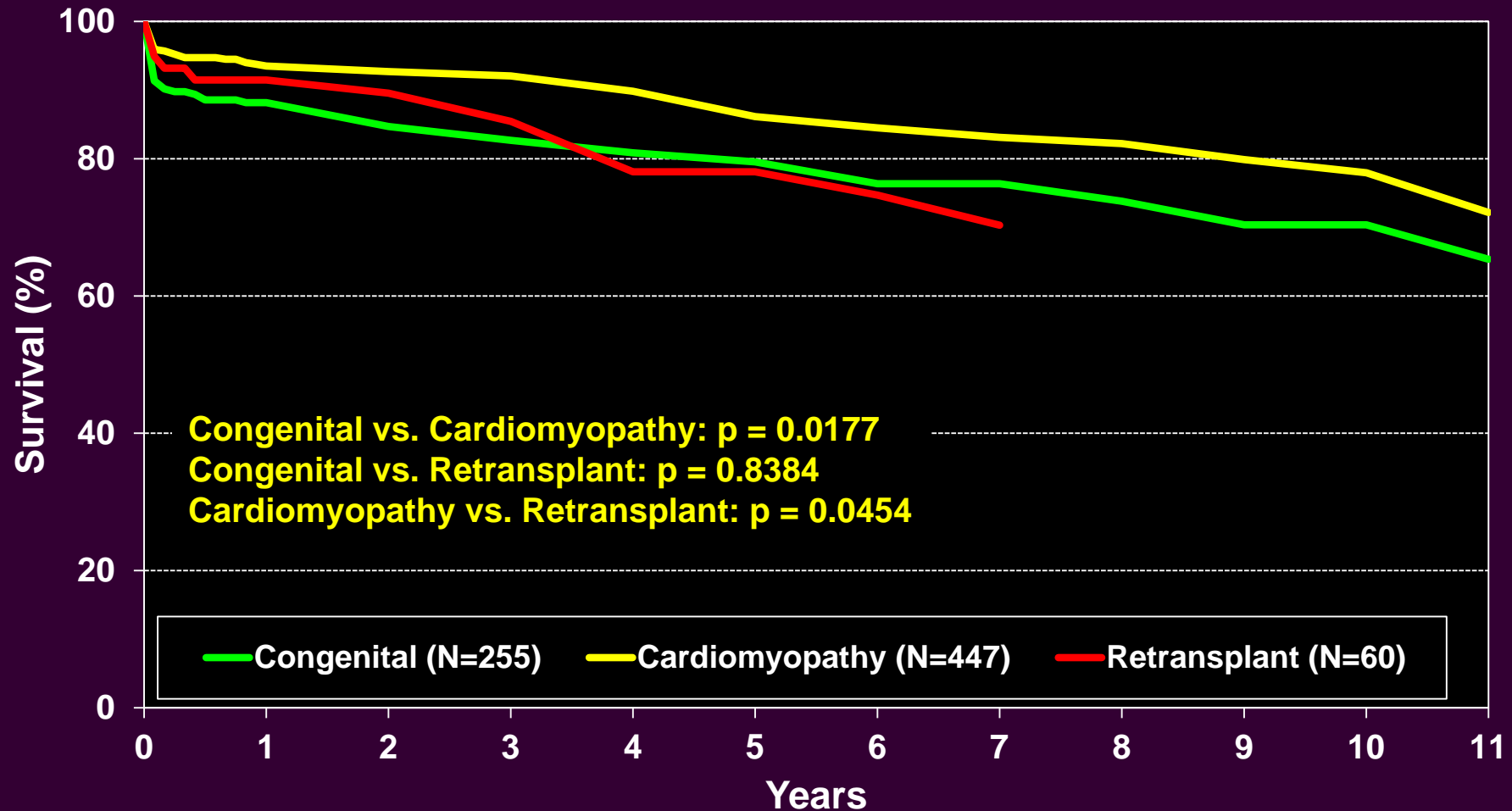




Pediatric Heart Transplants

Kaplan-Meier Survival by Diagnosis

Age: 6-10 Years (Transplants: January 2000 – June 2011)

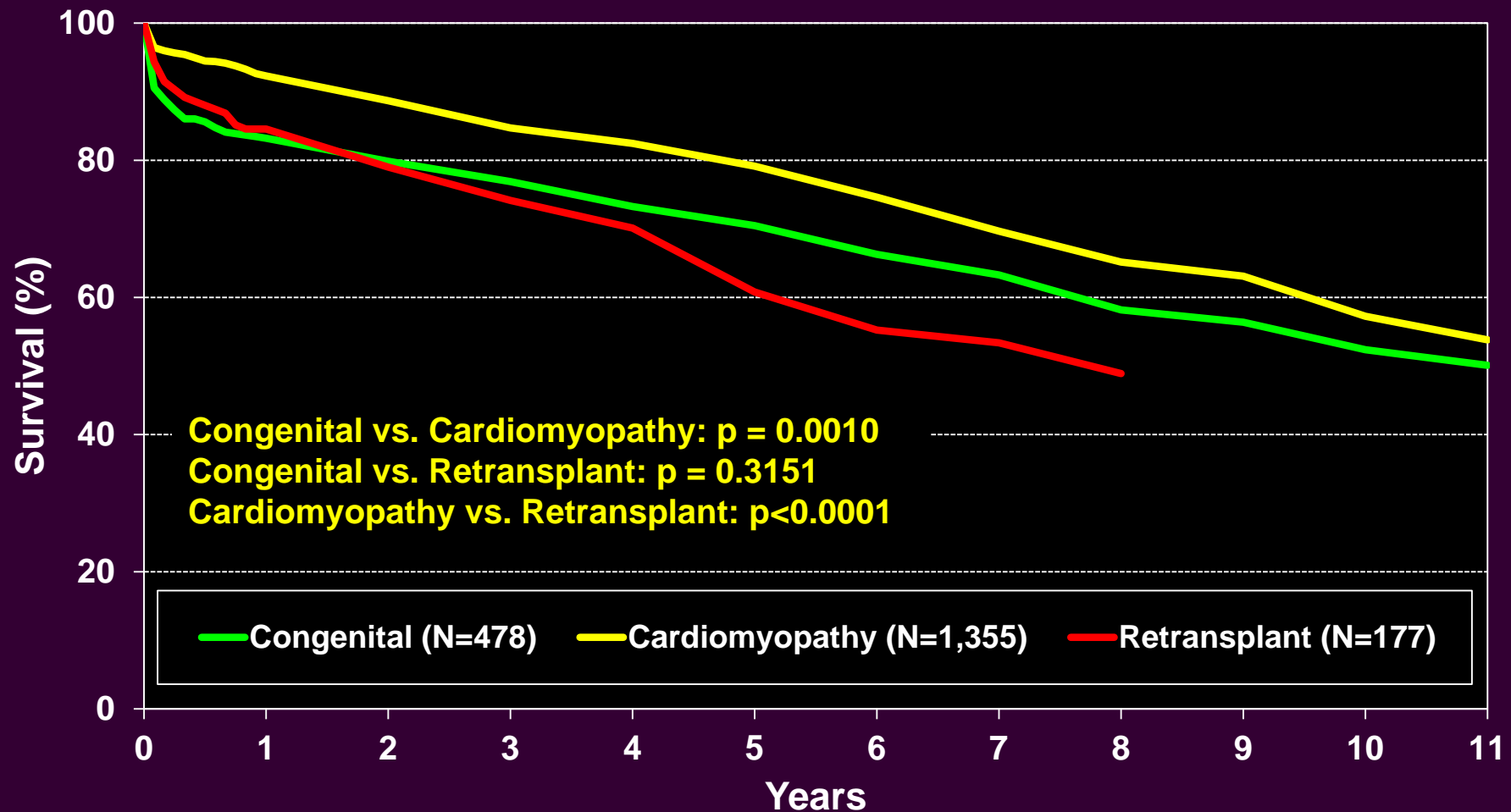




Pediatric Heart Transplants

Kaplan-Meier Survival by Diagnosis

Age: 11-17 Years (Transplants: January 2000 – June 2011)

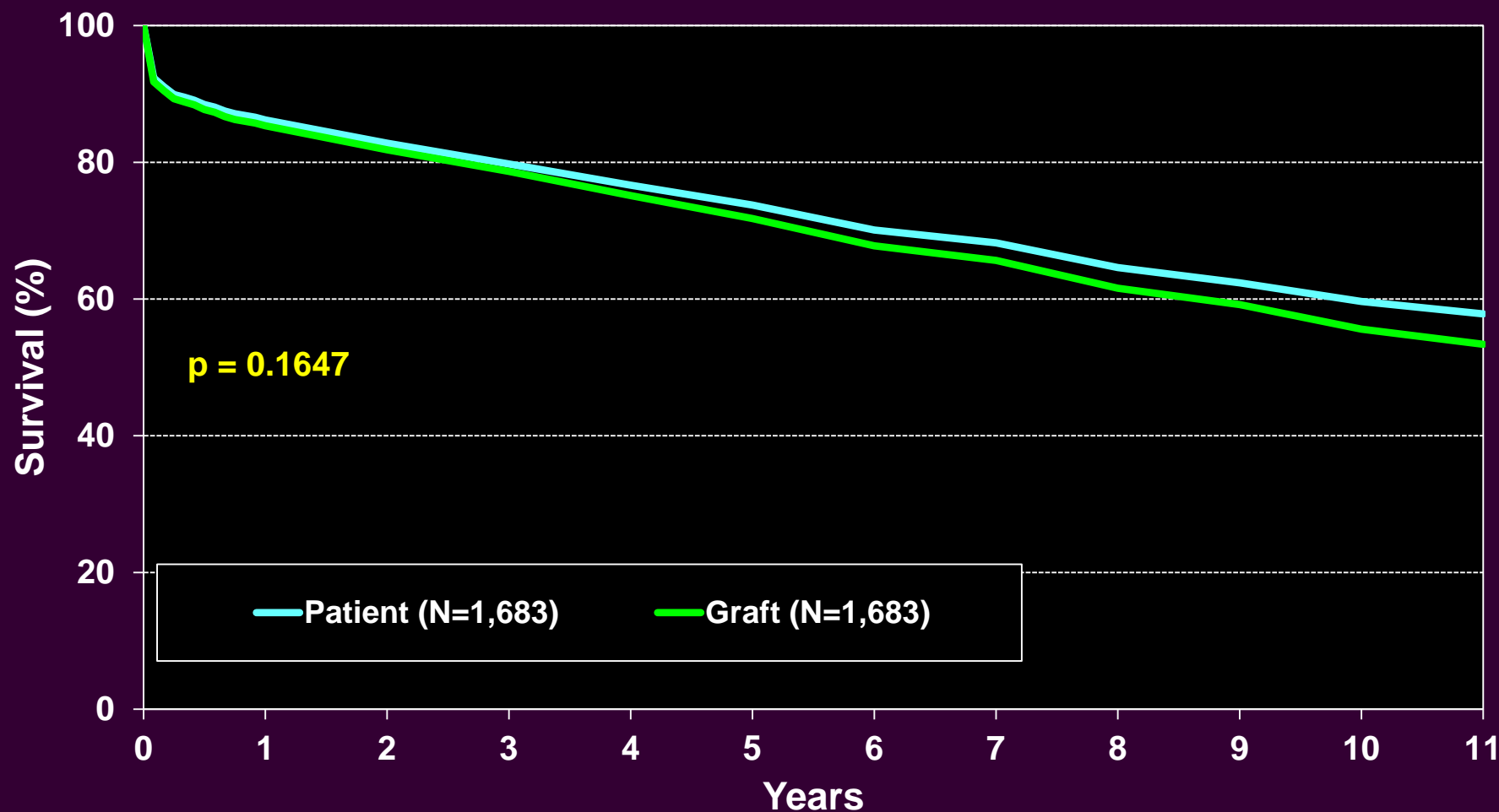




Pediatric Heart Transplants

Kaplan-Meier Patient vs. Graft Survival (Transplants: 1/2000-6/2011)

Average Center Volume: 1-4 Transplants per Year

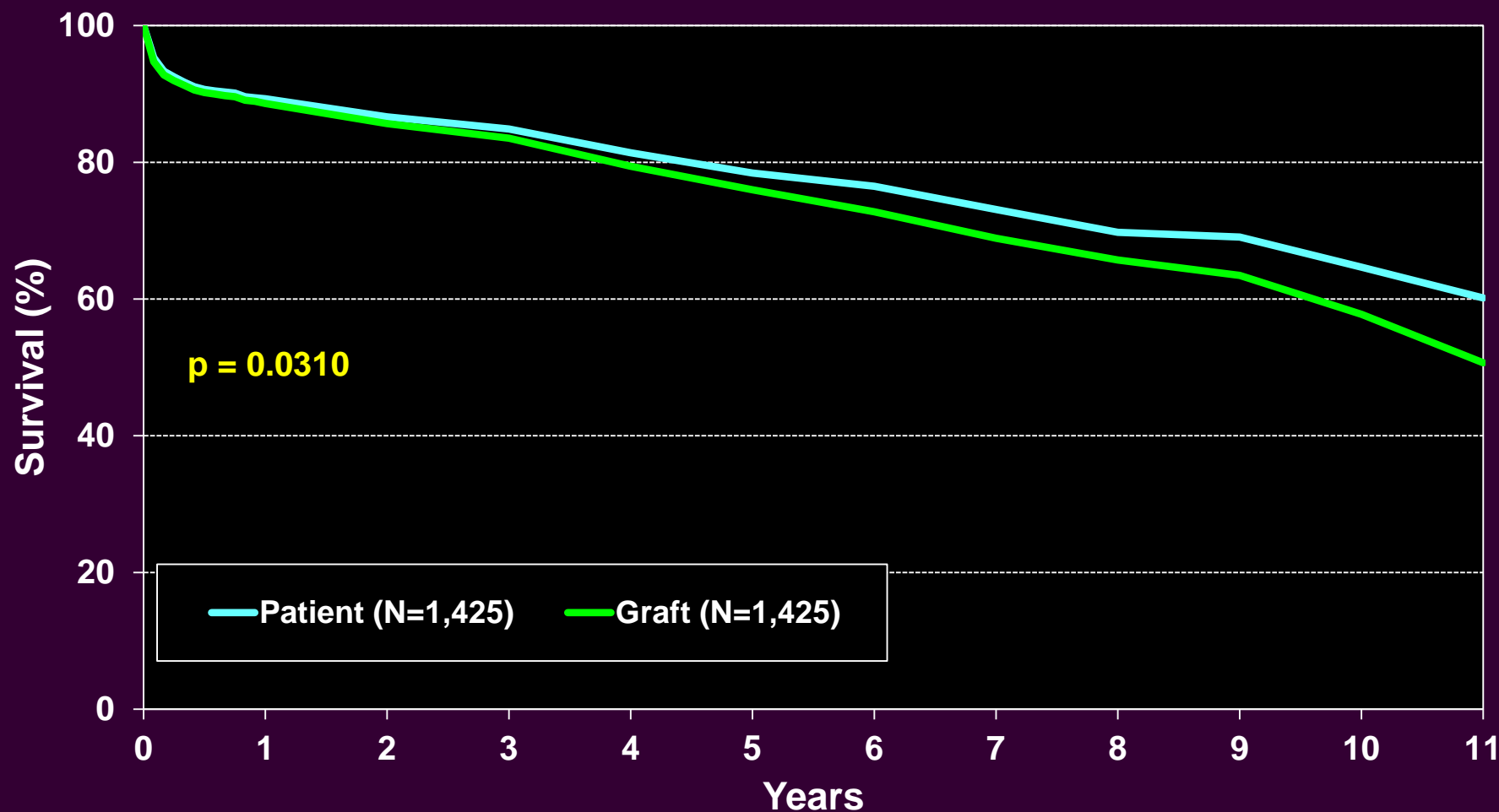




Pediatric Heart Transplants

Kaplan-Meier Patient vs. Graft Survival (Transplants: 1/2000-6/2011)

Average Center Volume: 5-9 Transplants per Year

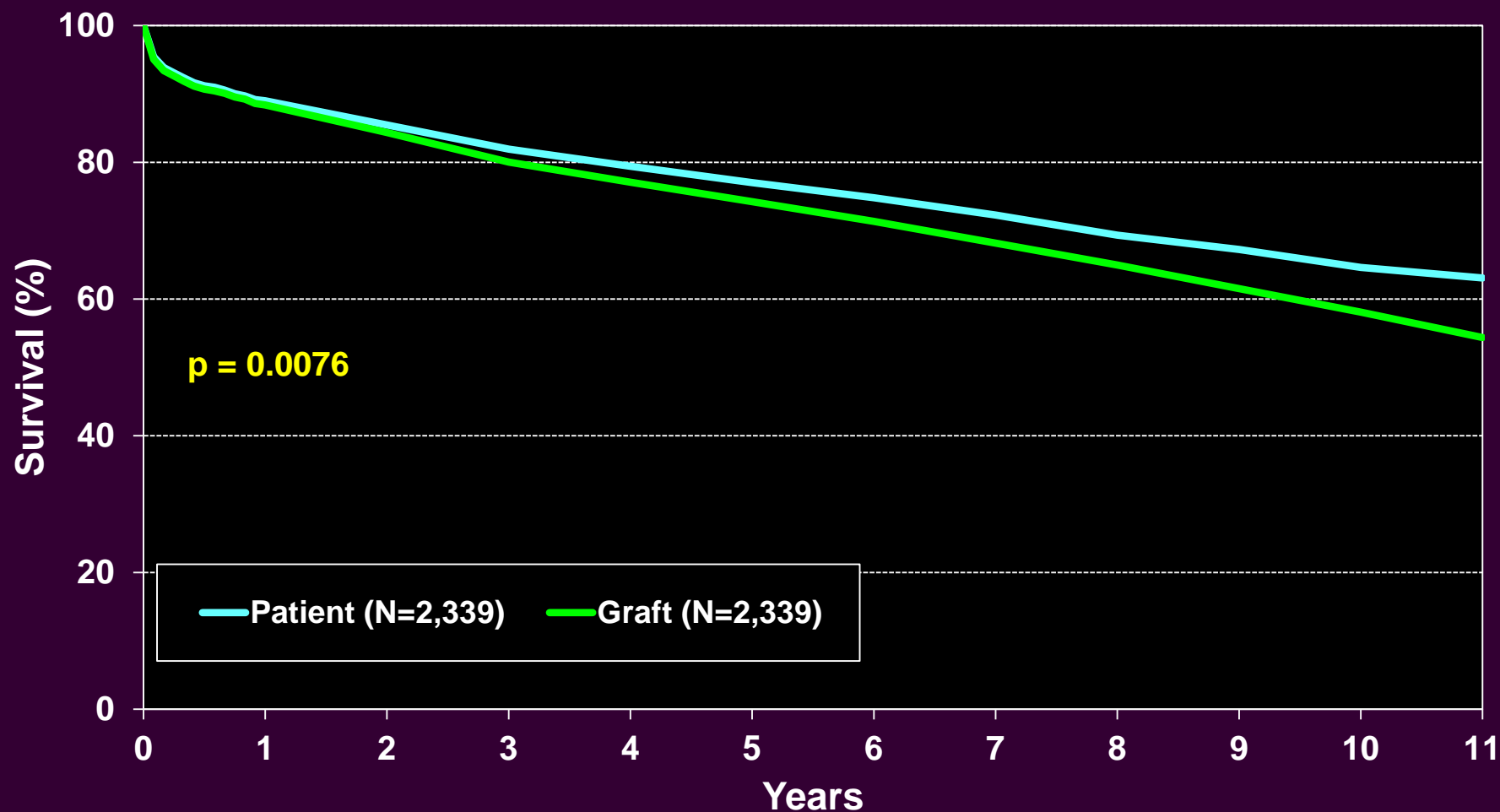




Pediatric Heart Transplants

Kaplan-Meier Patient vs. Graft Survival (Transplants: 1/2000-6/2011)

Average Center Volume: 10+ Transplants per Year

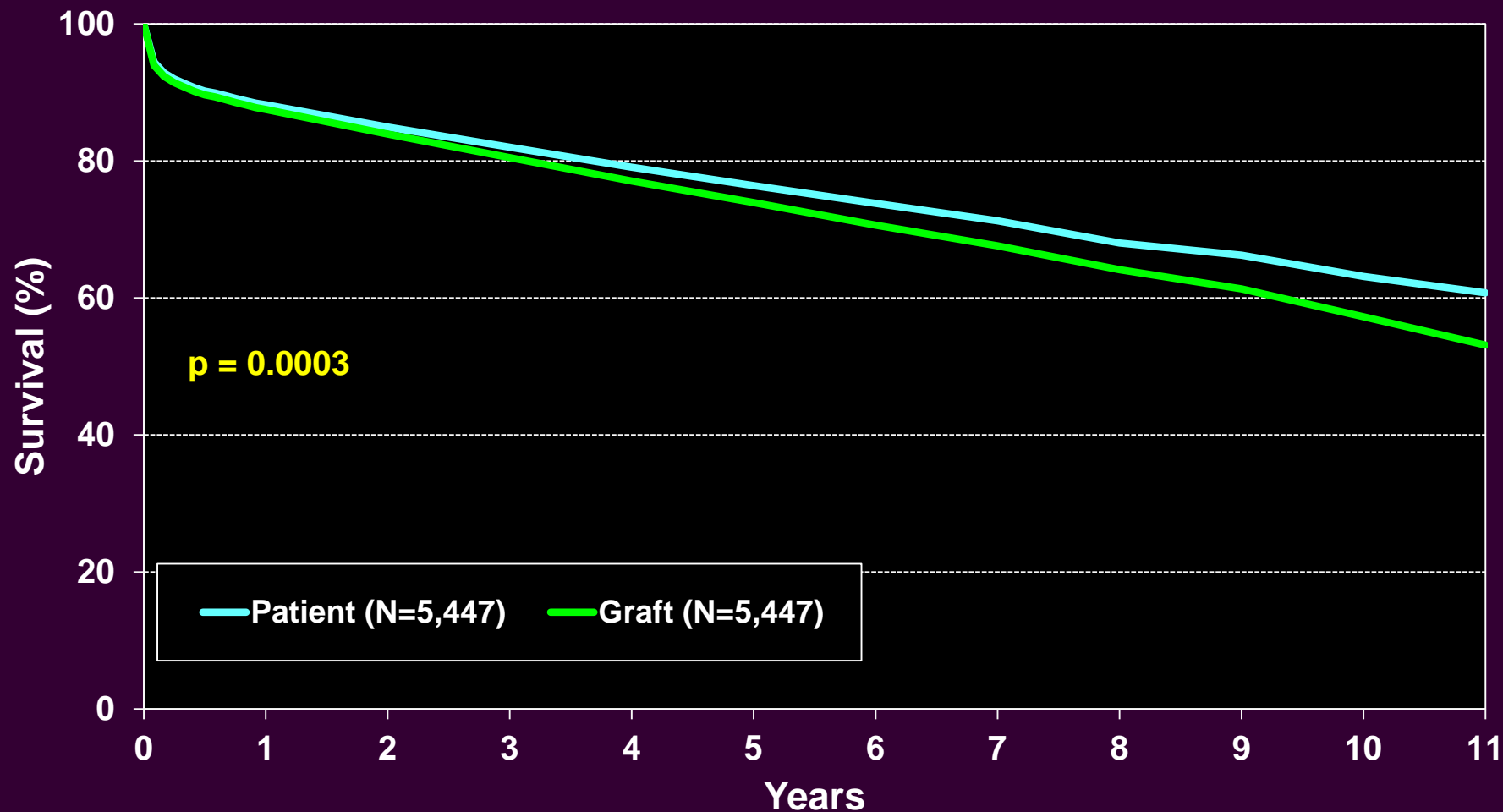




Pediatric Heart Transplants

Kaplan-Meier Patient vs. Graft Survival (Transplants: 1/2000-6/2011)

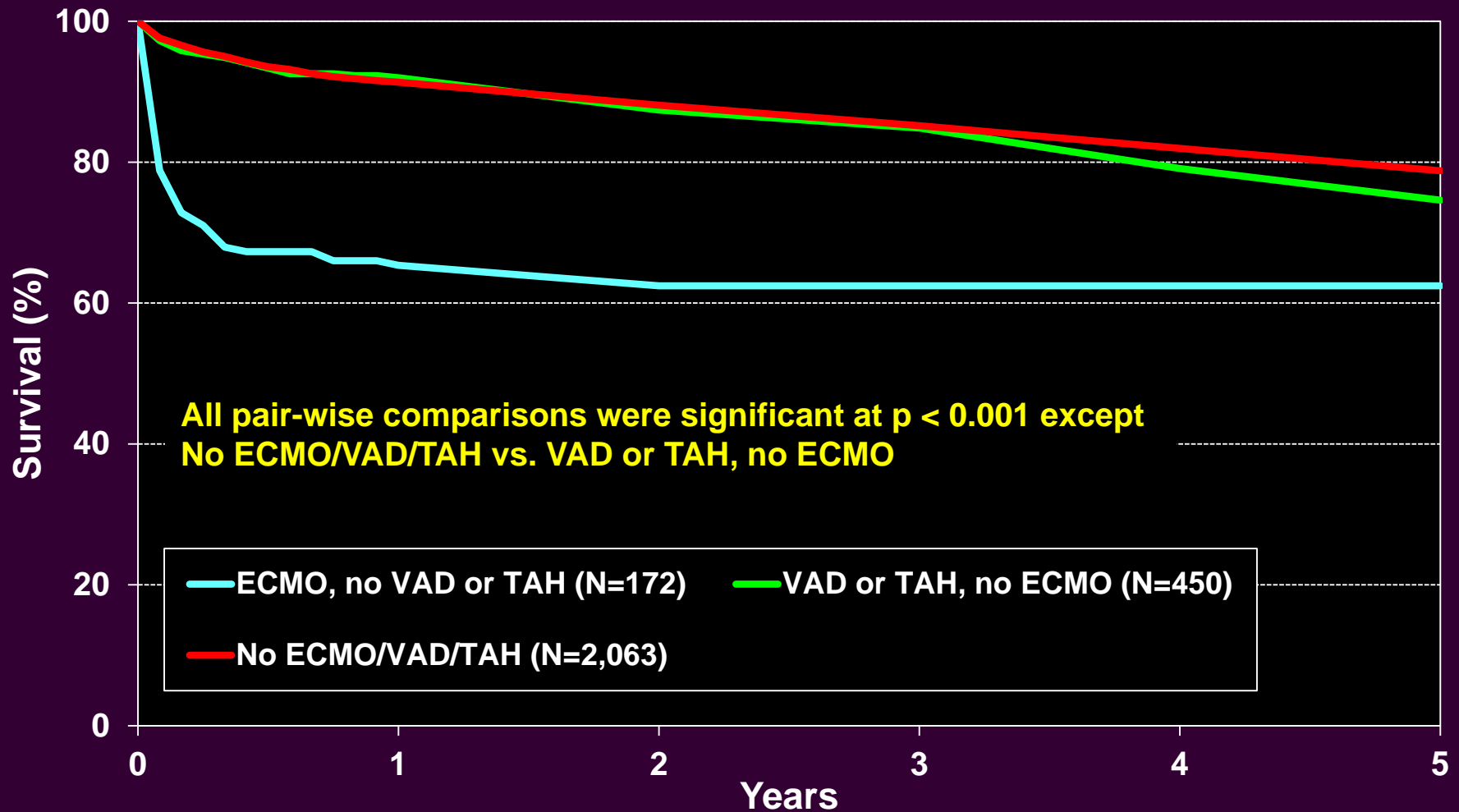
All Center Volumes





Pediatric Heart Transplants

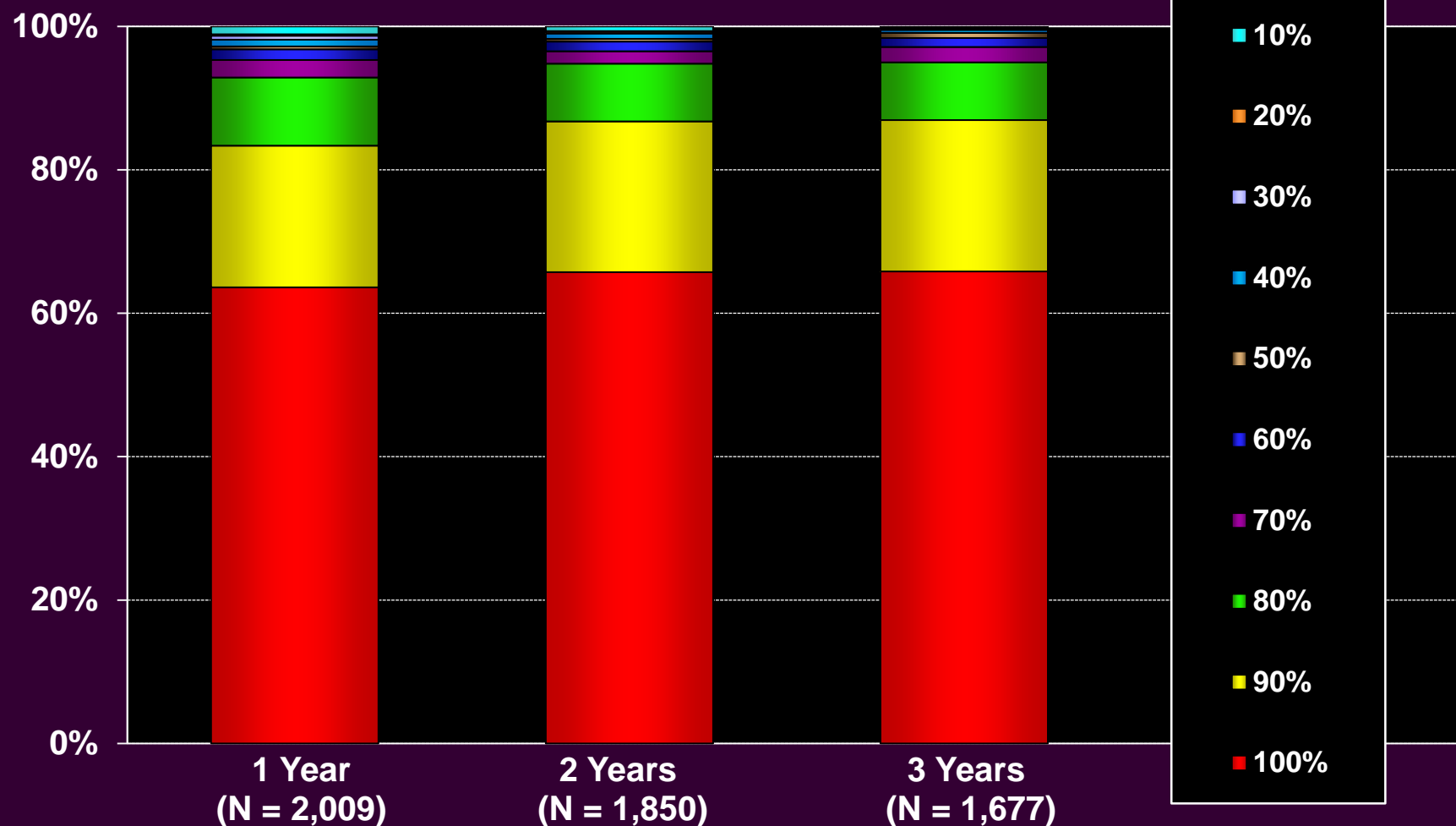
Kaplan-Meier Survival by Mechanical Circulatory Support Usage* (Transplants: January 2000 – June 2011)



Pediatric Heart Transplants

Functional Status of Surviving Recipients

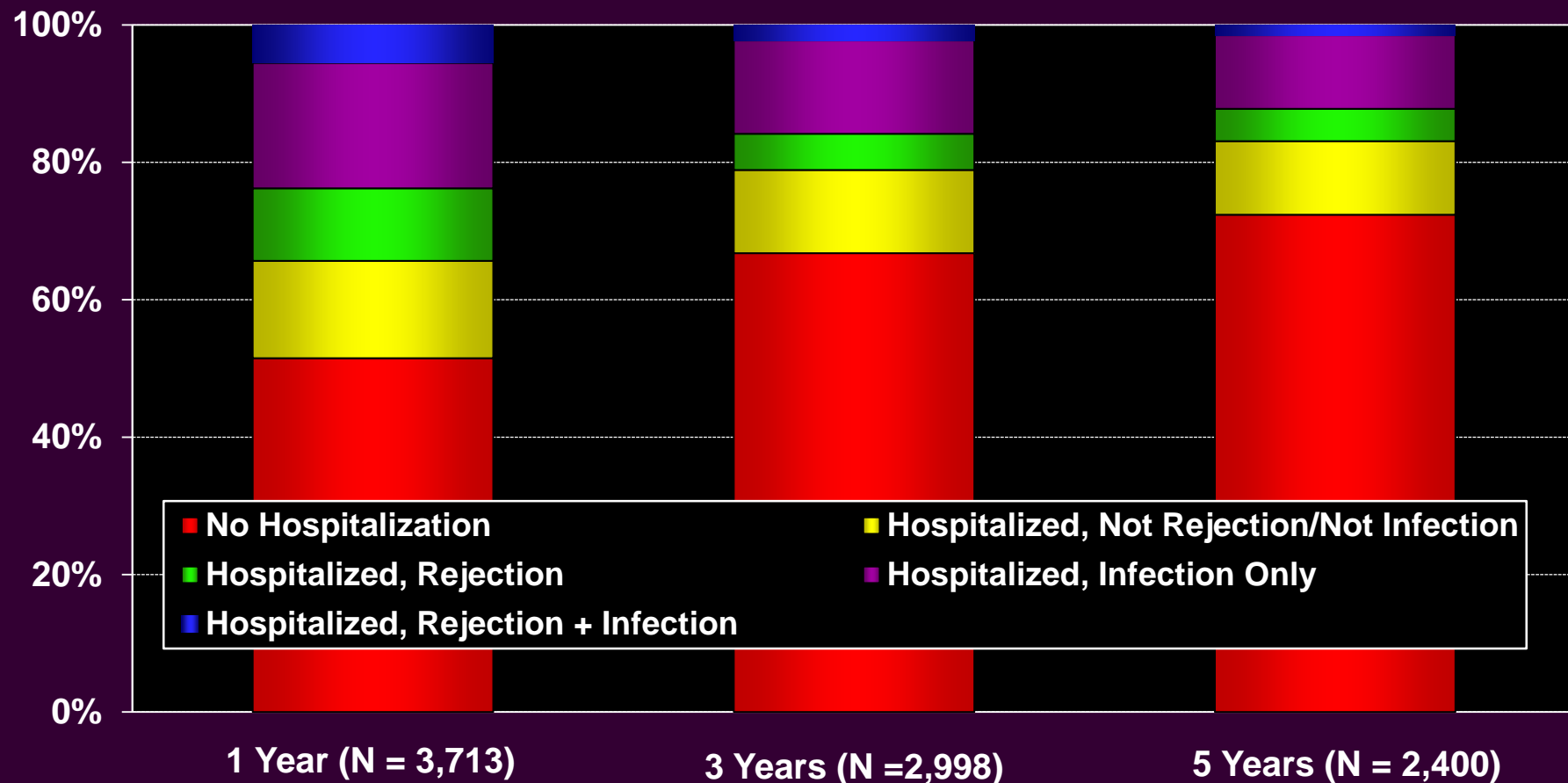
(Follow-ups: March 2005 – June 2012)





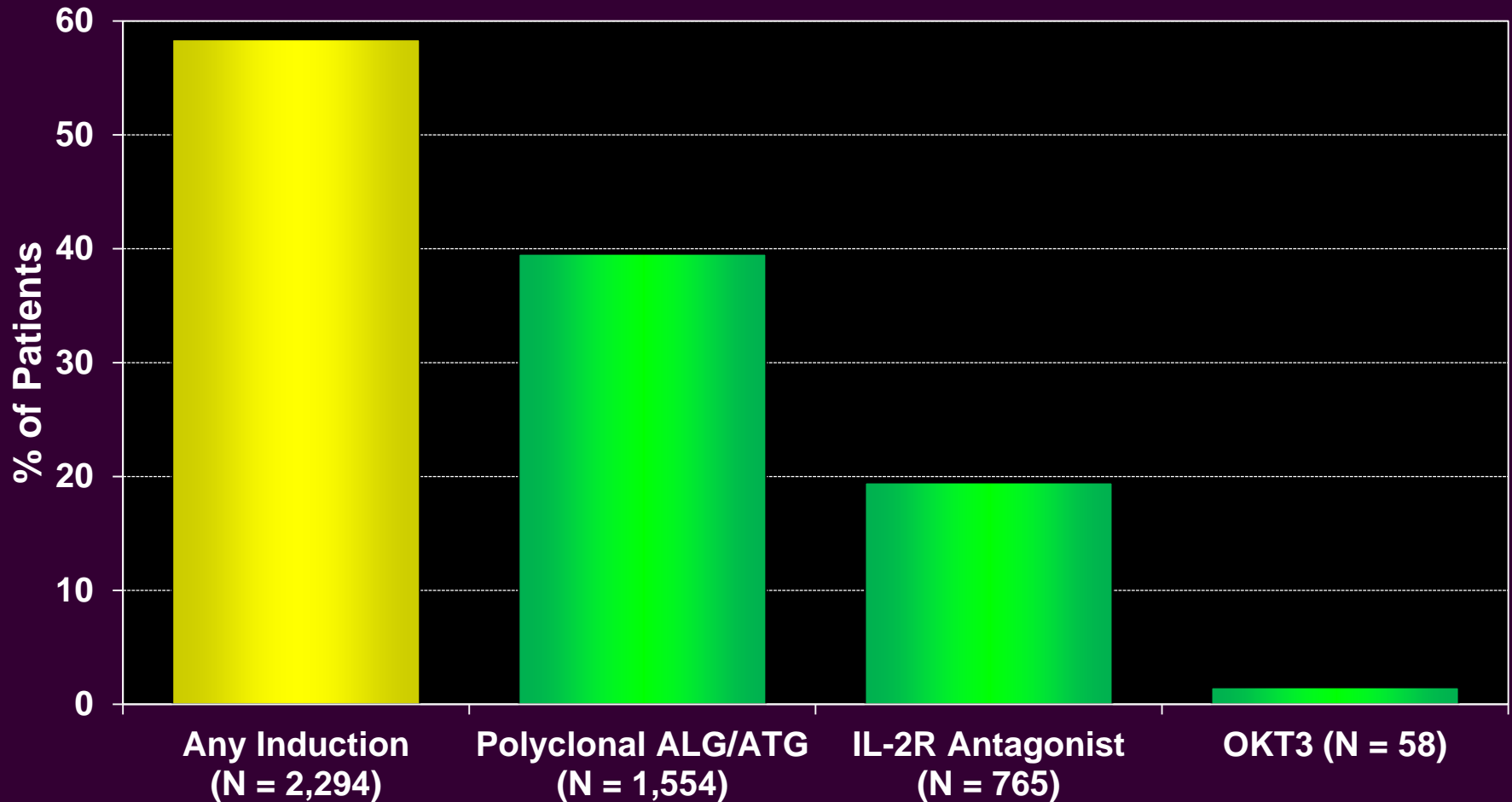
Pediatric Heart Transplants

Rehospitalization Post-transplant of Surviving Recipients (Follow-ups: January 2000 – June 2012)



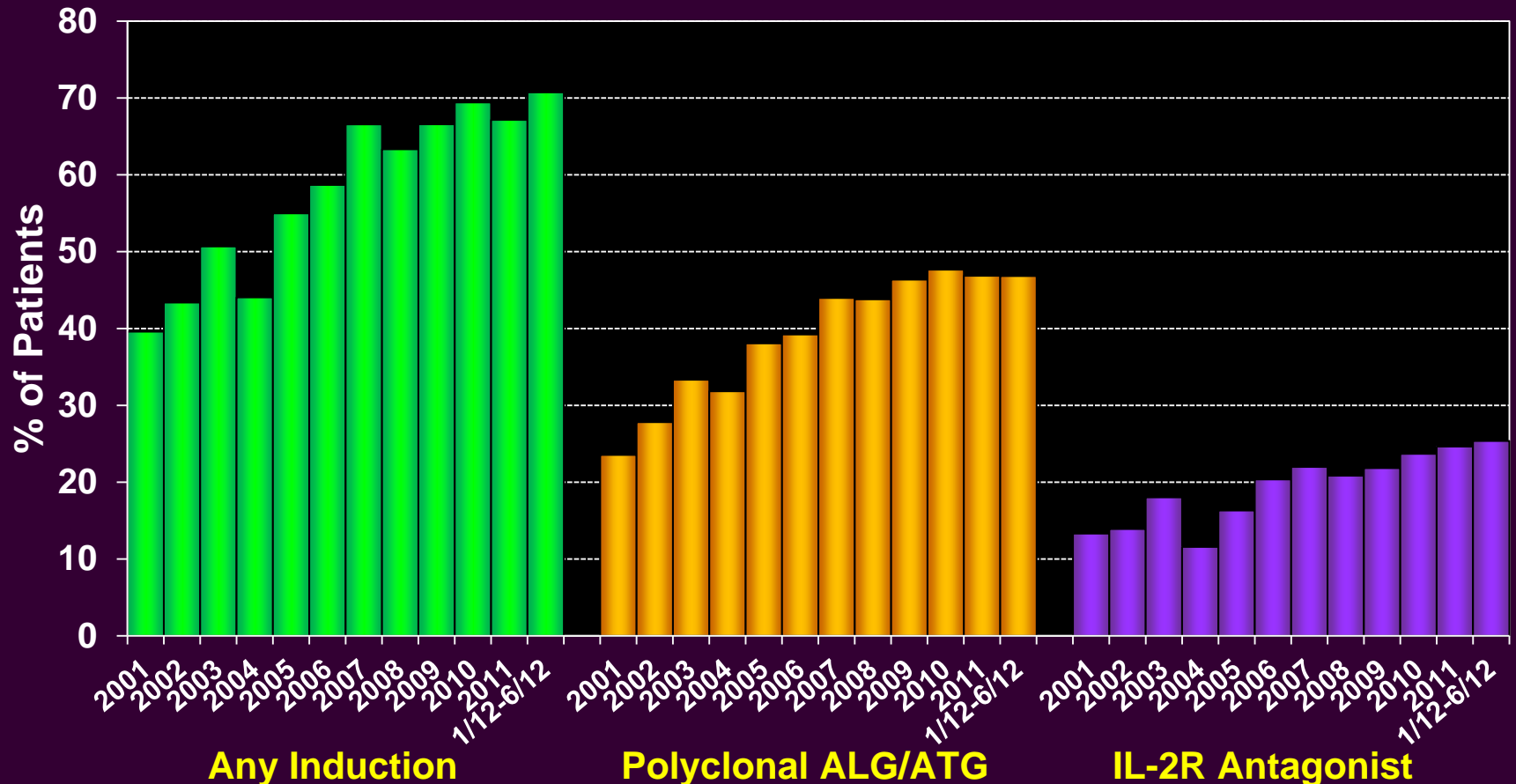
Induction and Maintenance Immunosuppression

Pediatric Heart Transplants Induction Immunosuppression (Transplants: January 2001 – June 2012)



Analysis is limited to patients who were
alive at the time of the discharge

Pediatric Heart Transplants Induction Immunosuppression (Transplants: January 2001 – June 2012)



IL-2R Antagonist

Test of increasing trend over time:

Any induction $p < 0.0001$

Polyclonal $p < 0.0001$

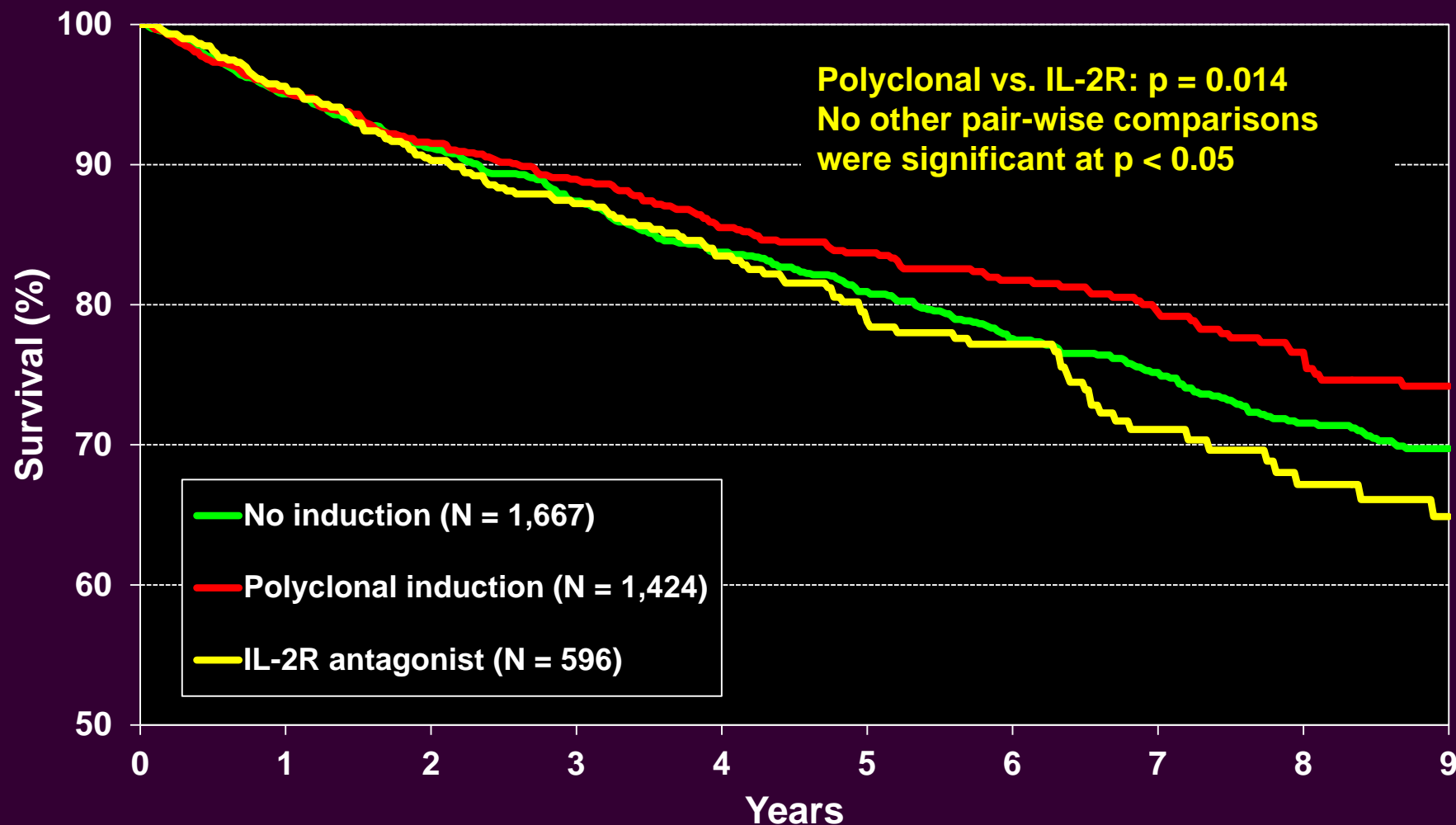
IL-2R $p < 0.0001$

**Analysis is limited to patients who were
alive at the time of the discharge**



Pediatric Heart Transplants

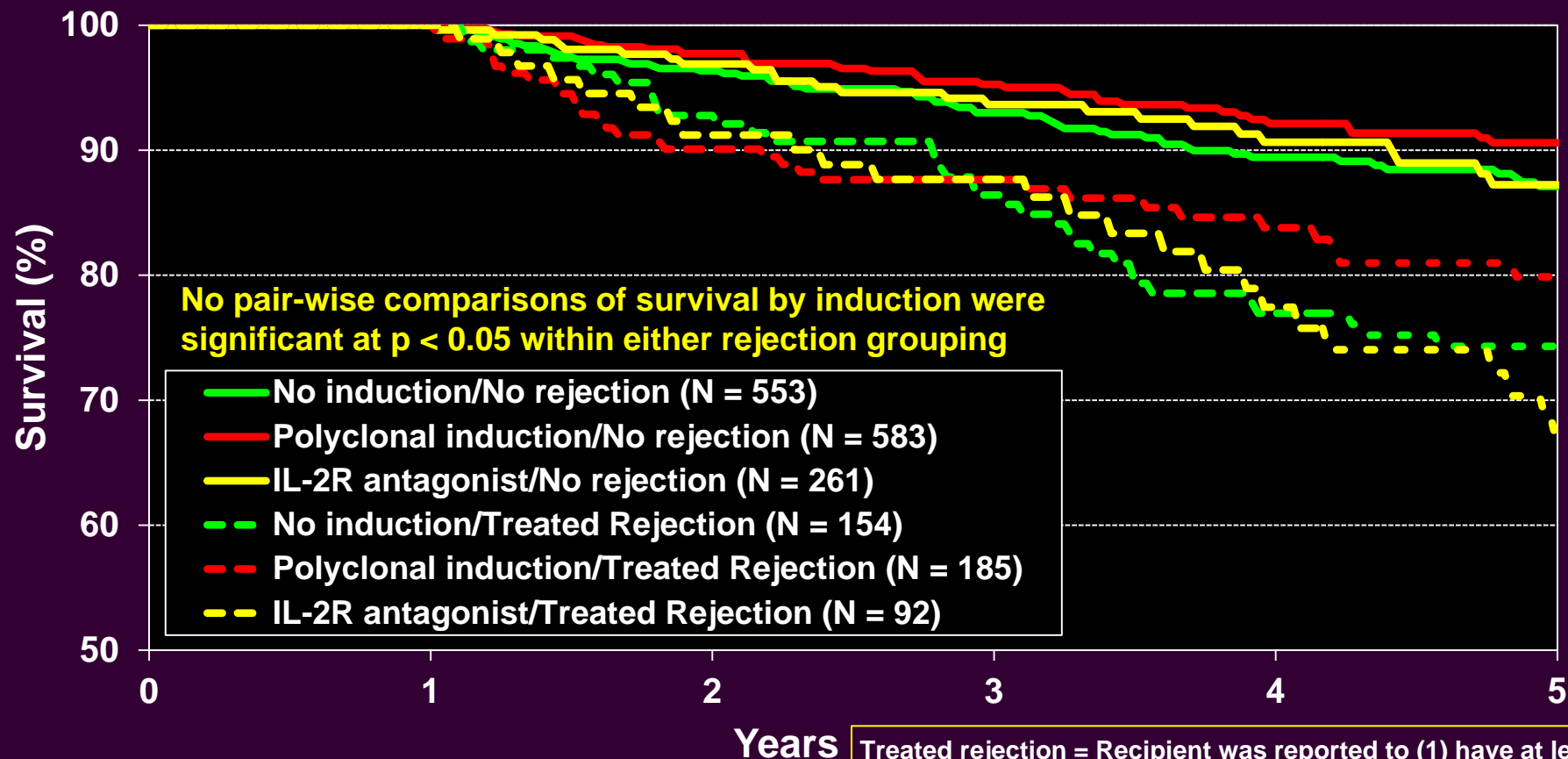
Kaplan-Meier Survival by Induction Group Conditional on Survival to 14 Days (Transplants: January 2000 – June 2011)



Pediatric Heart Transplants

Kaplan-Meier Survival by Induction and Treated Rejection Between Transplant Discharge and 1-Year Follow-up

Conditional on Survival to 1 Year (1-Year Follow-ups: July 2004 – June 2011)

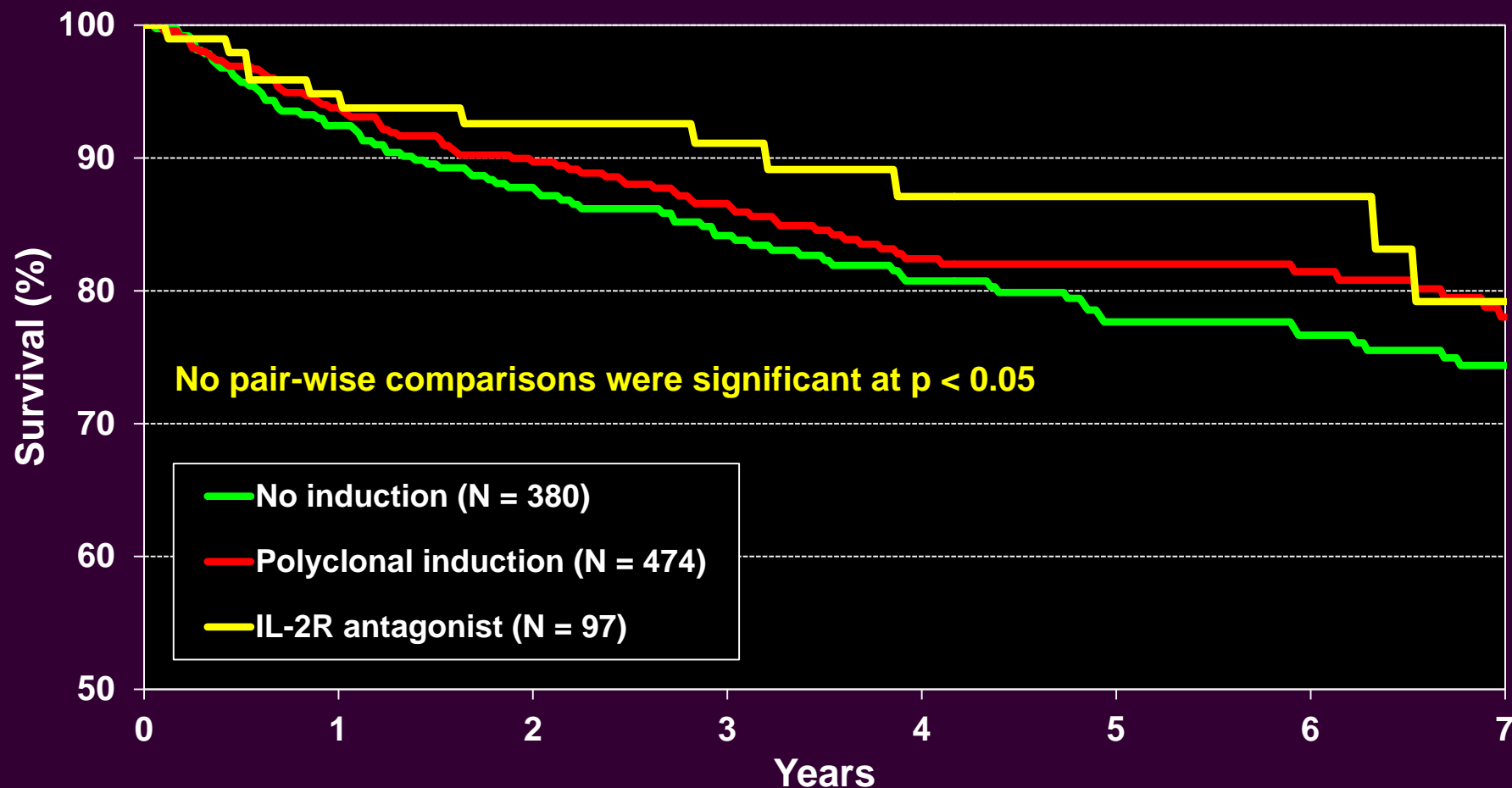




Pediatric Heart Transplants

Kaplan-Meier Survival by Induction Group

Age: <1 Year (Transplants: January 2000 – June 2011)
Conditional on Survival to 14 Days

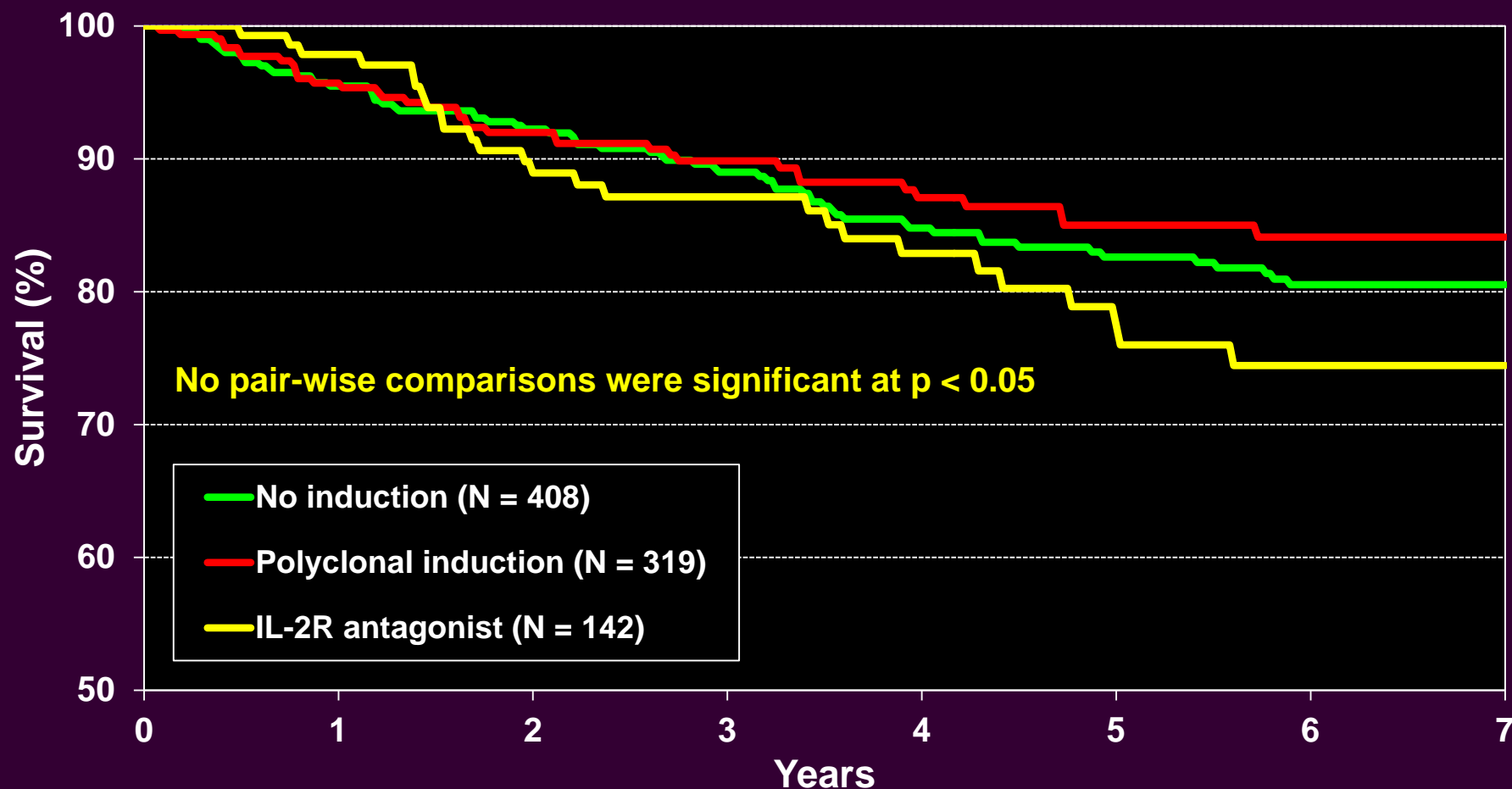




Pediatric Heart Transplants

Kaplan-Meier Survival by Induction Group

Age: 1-5 Years (Transplants: January 2000 – June 2011)
Conditional on Survival to 14 Days

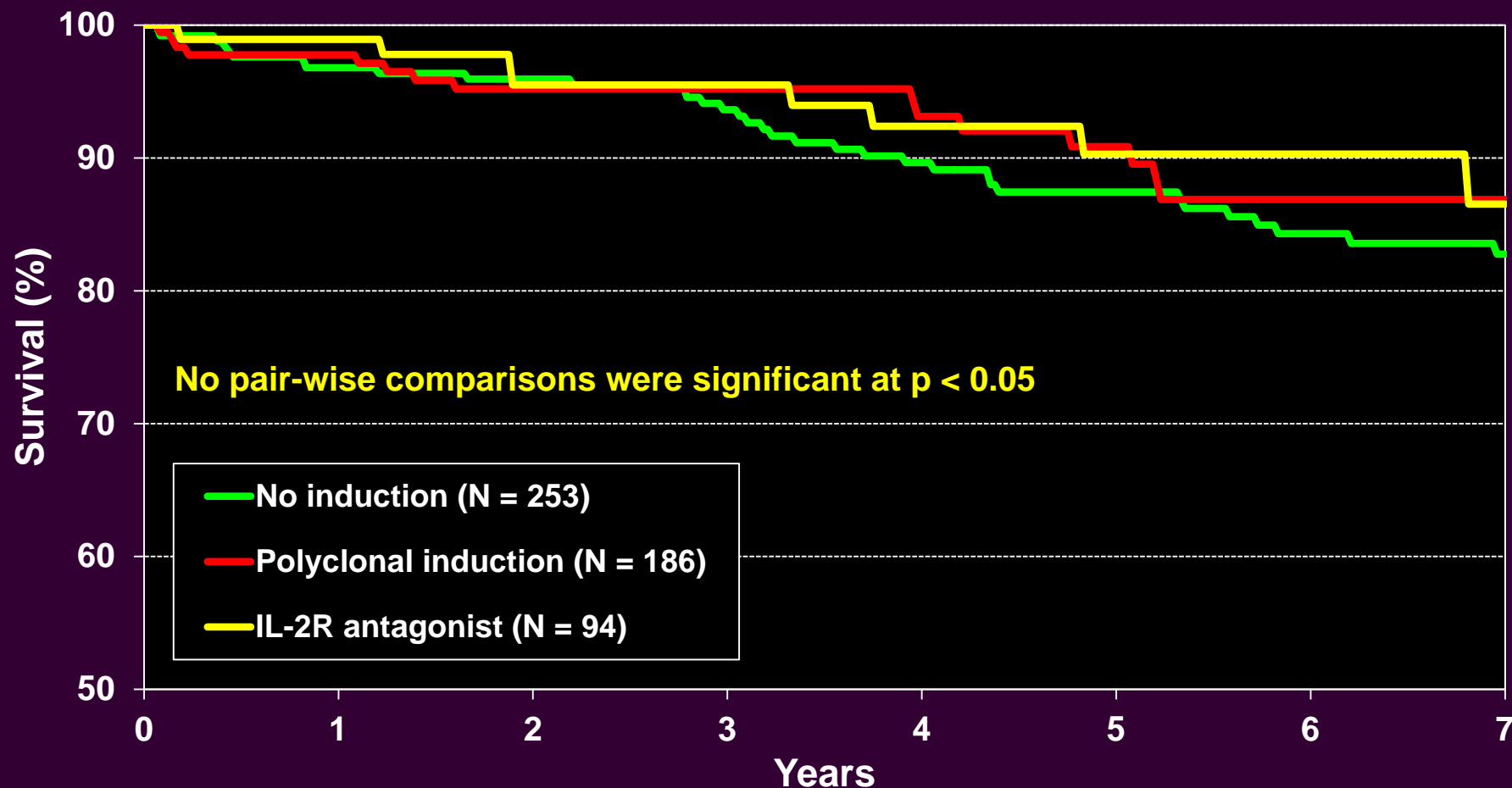




Pediatric Heart Transplants

Kaplan-Meier Survival by Induction Group

Age: 6-10 Years (Transplants: January 2000 – June 2011)
Conditional on Survival to 14 Days

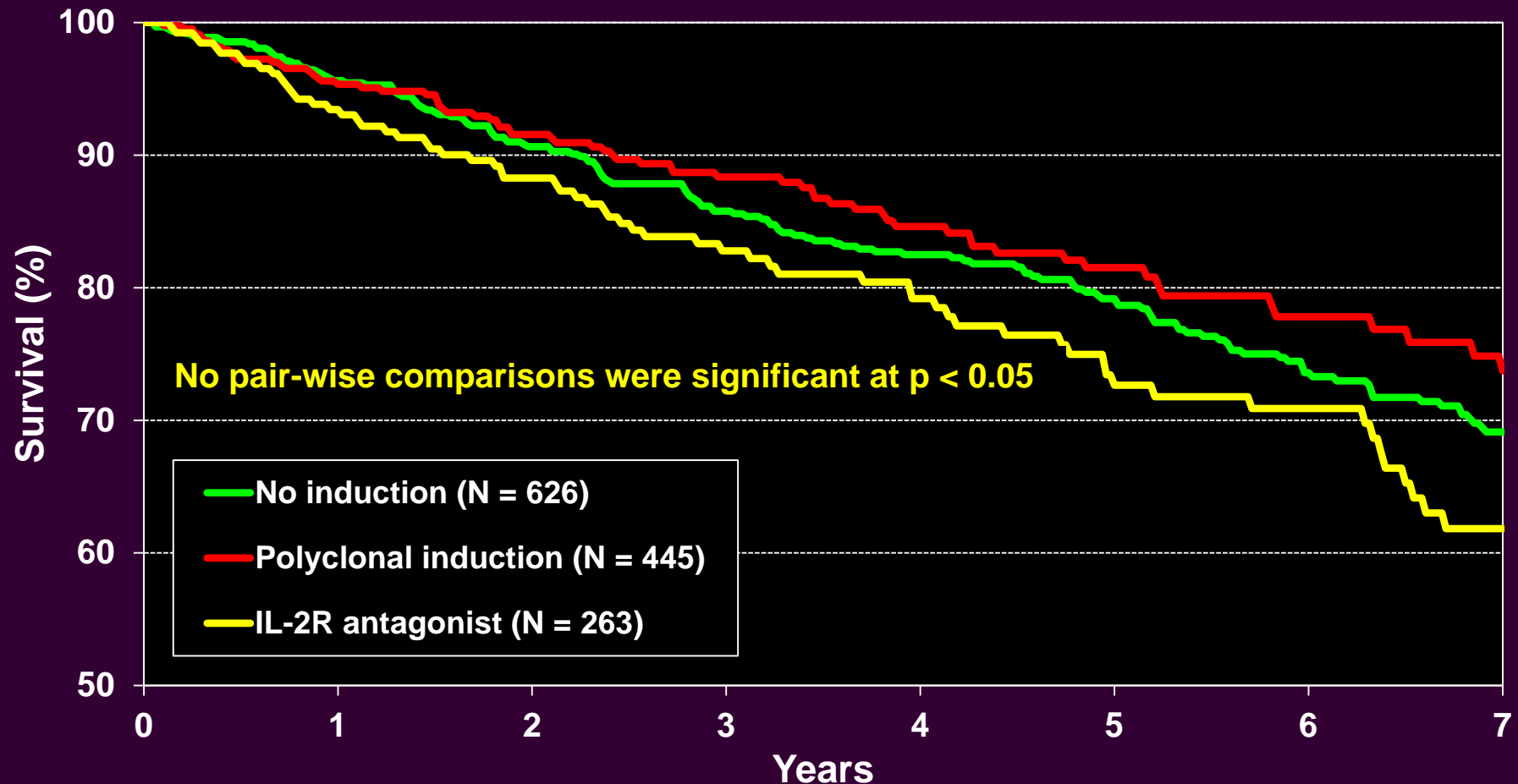




Pediatric Heart Transplants

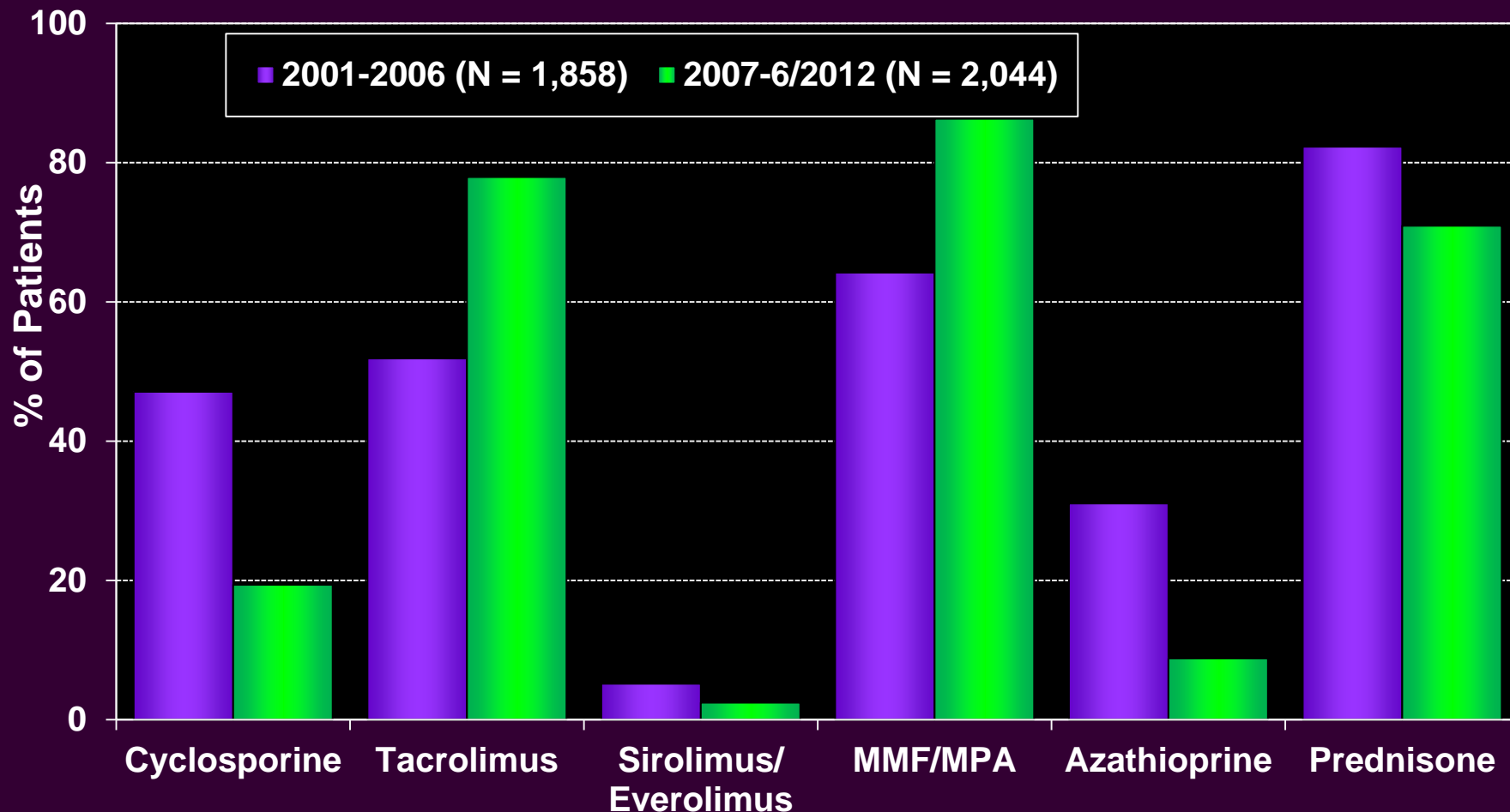
Kaplan-Meier Survival by Induction Group

Age: 11-17 Years (Transplants: January 2000 – June 2011)
Conditional on Survival to 14 Days



Pediatric Heart Transplants

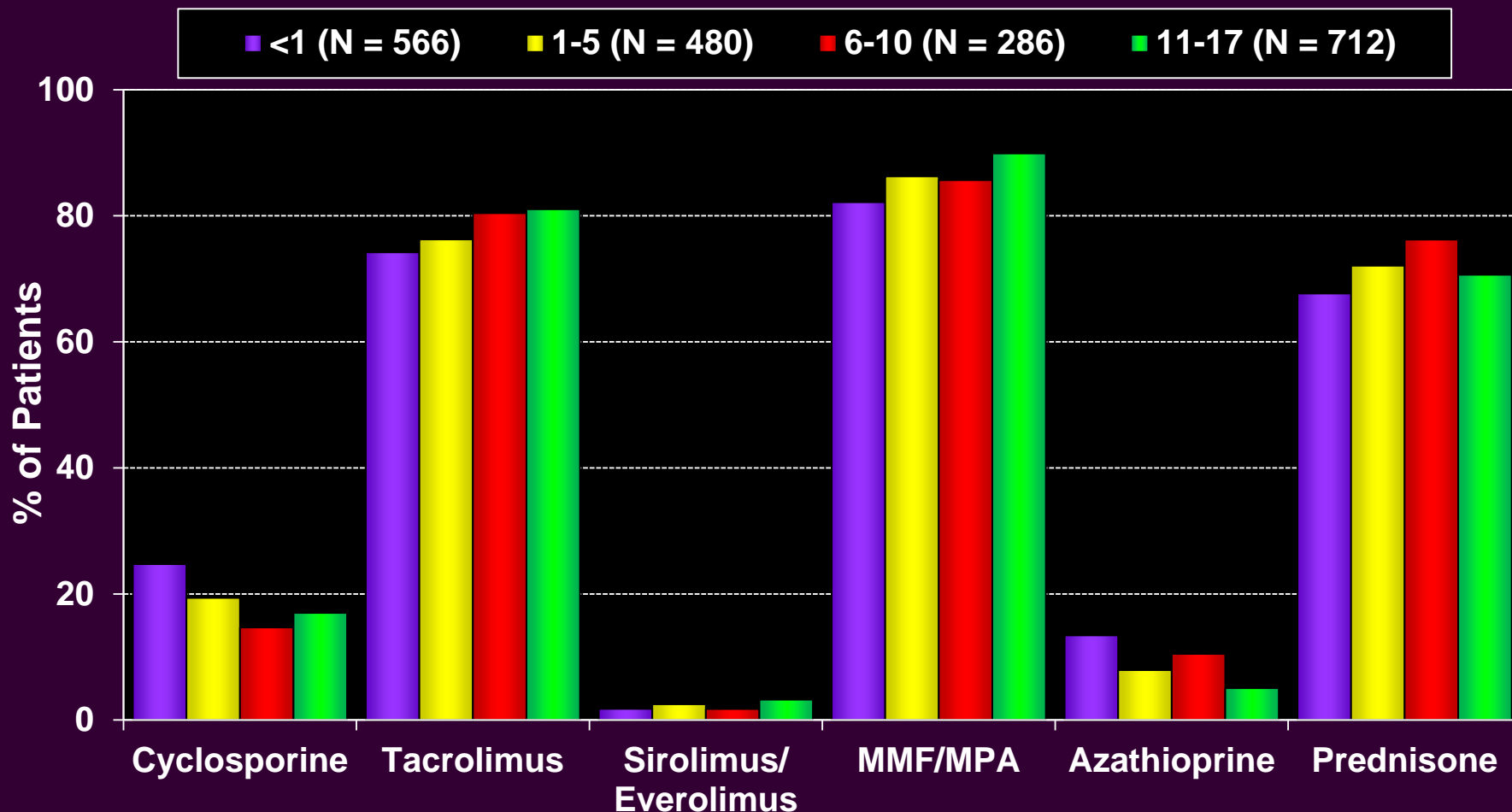
Maintenance Immunosuppression at Time of Transplant Discharge by Era (Transplants: January 2001 – June 2012)



Analysis is limited to patients who were alive at the time of the discharge

Pediatric Heart Transplants

Maintenance Immunosuppression at Time of Transplant Discharge by Age (Follow-ups: January 2007 – June 2012)



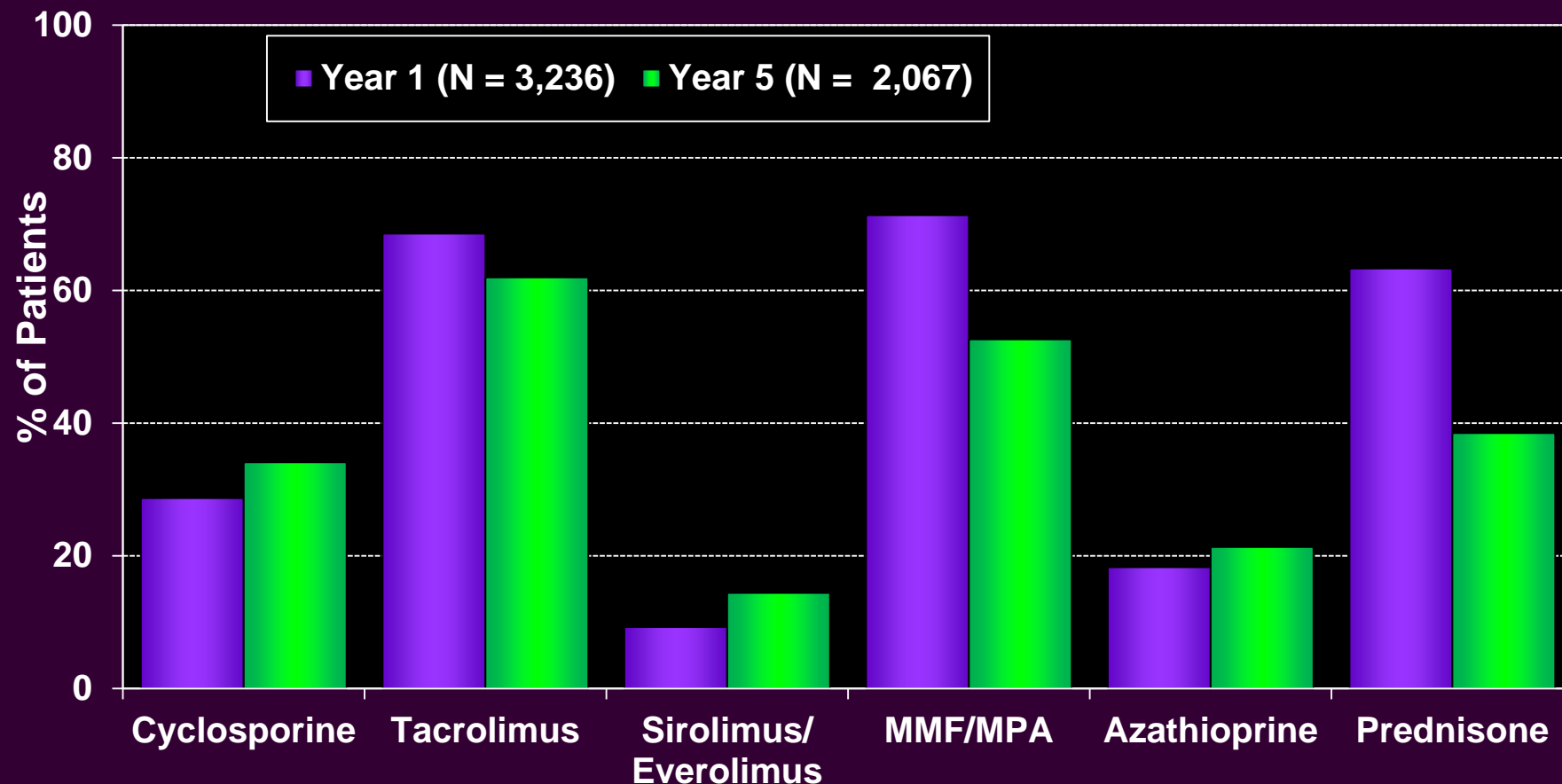
Analysis is limited to patients who were alive at the time of the discharge



Pediatric Heart Transplants

Maintenance Immunosuppression at Time of Follow-up

(Follow-ups: January 2001 – June 2012)

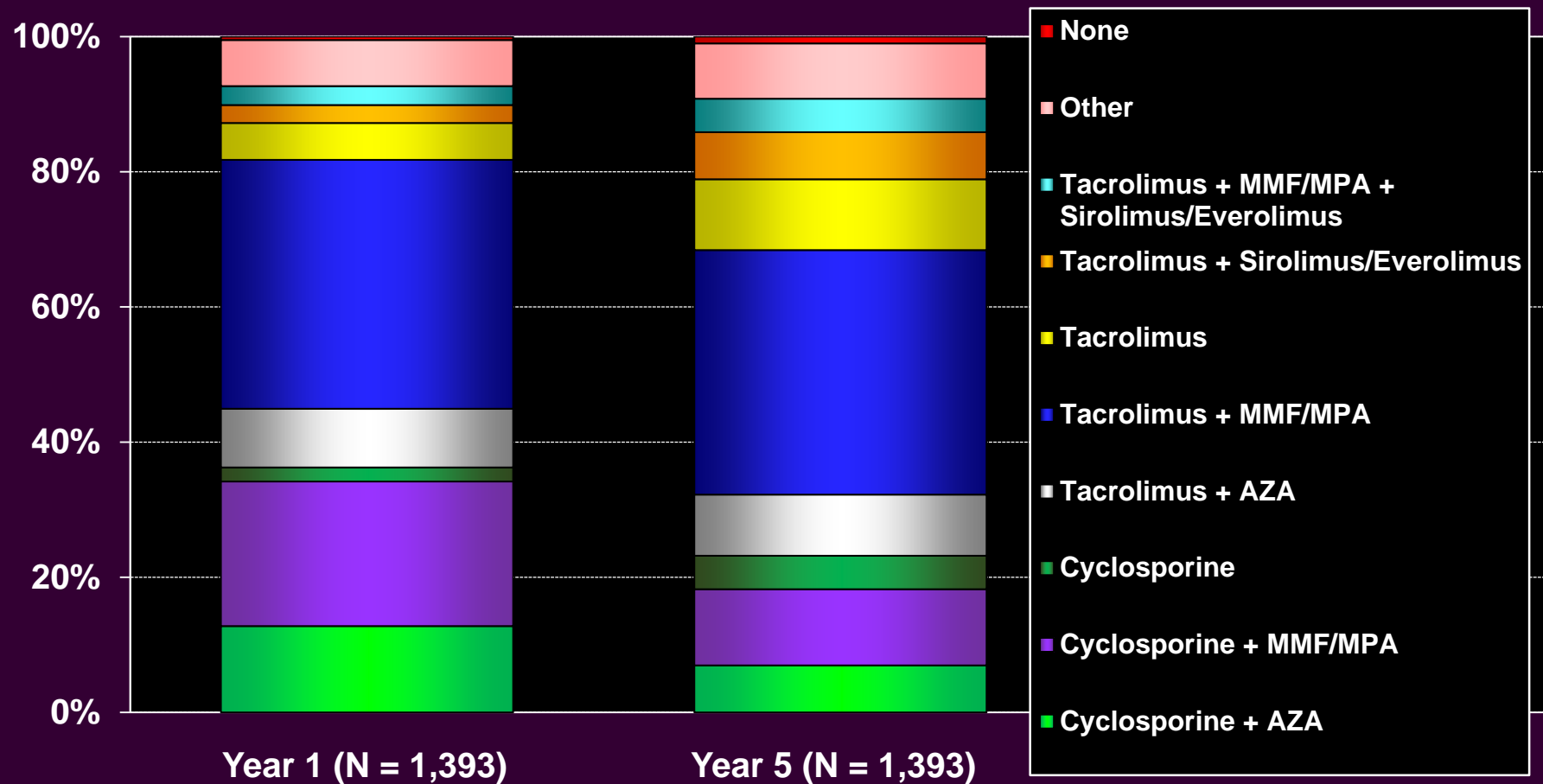


NOTE: Different patients are analyzed in Year 1 and Year 5



Pediatric Heart Transplants

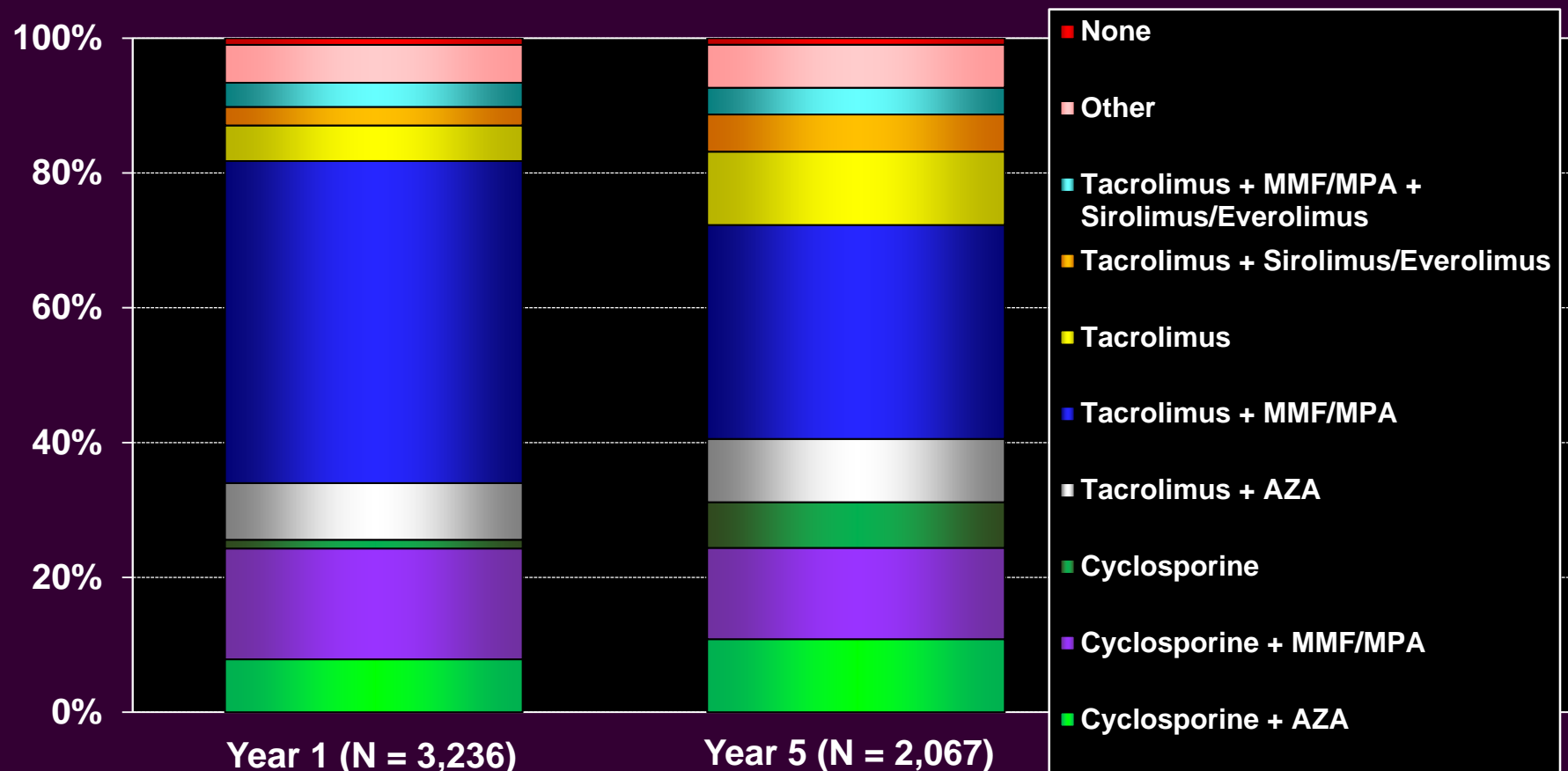
Maintenance Immunosuppression at Time of Follow-up for Same Patients at Each Time Point (Follow-ups: January 2001 – June 2012)





Pediatric Heart Transplants

Maintenance Immunosuppression Drug Combinations at Time of Follow-up (Follow-ups: January 2001 – June 2012)



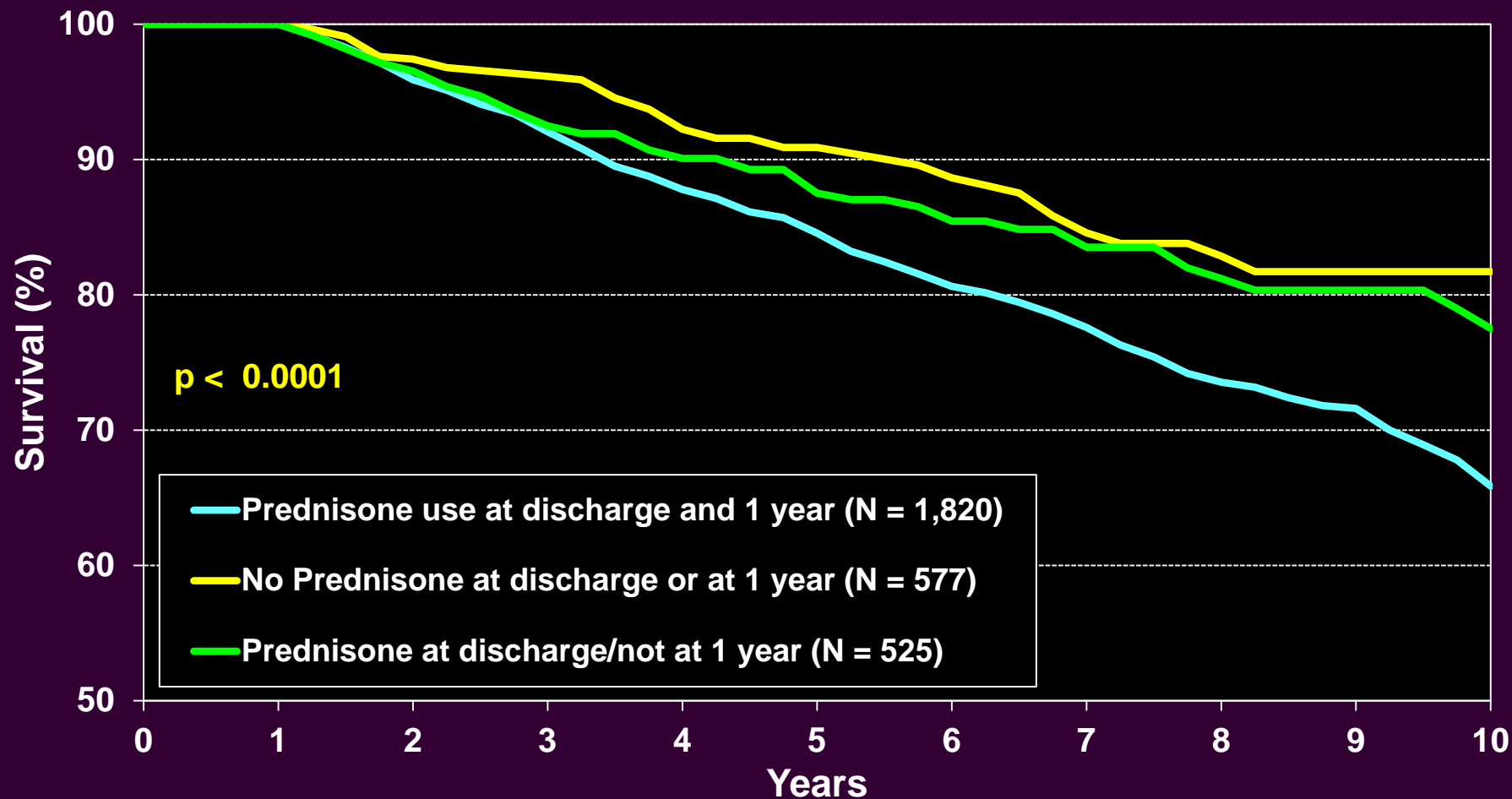
NOTE: Different patients are analyzed in Year 1 and Year 5



Pediatric Heart Transplants

Kaplan-Meier Survival Based on Prednisone Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)



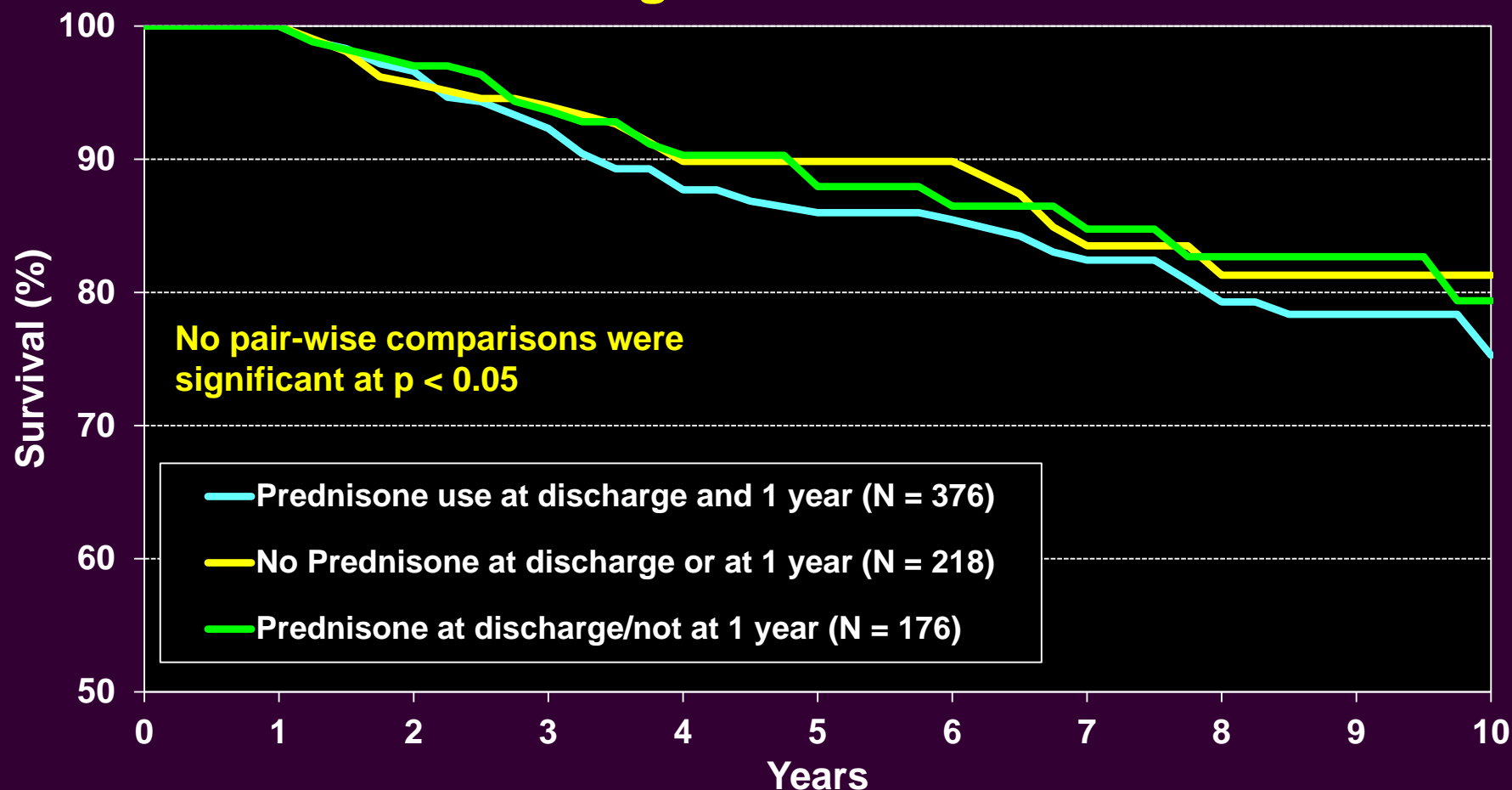


Pediatric Heart Transplants

Kaplan-Meier Survival Based on Prednisone Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)

Age: < 1 Year



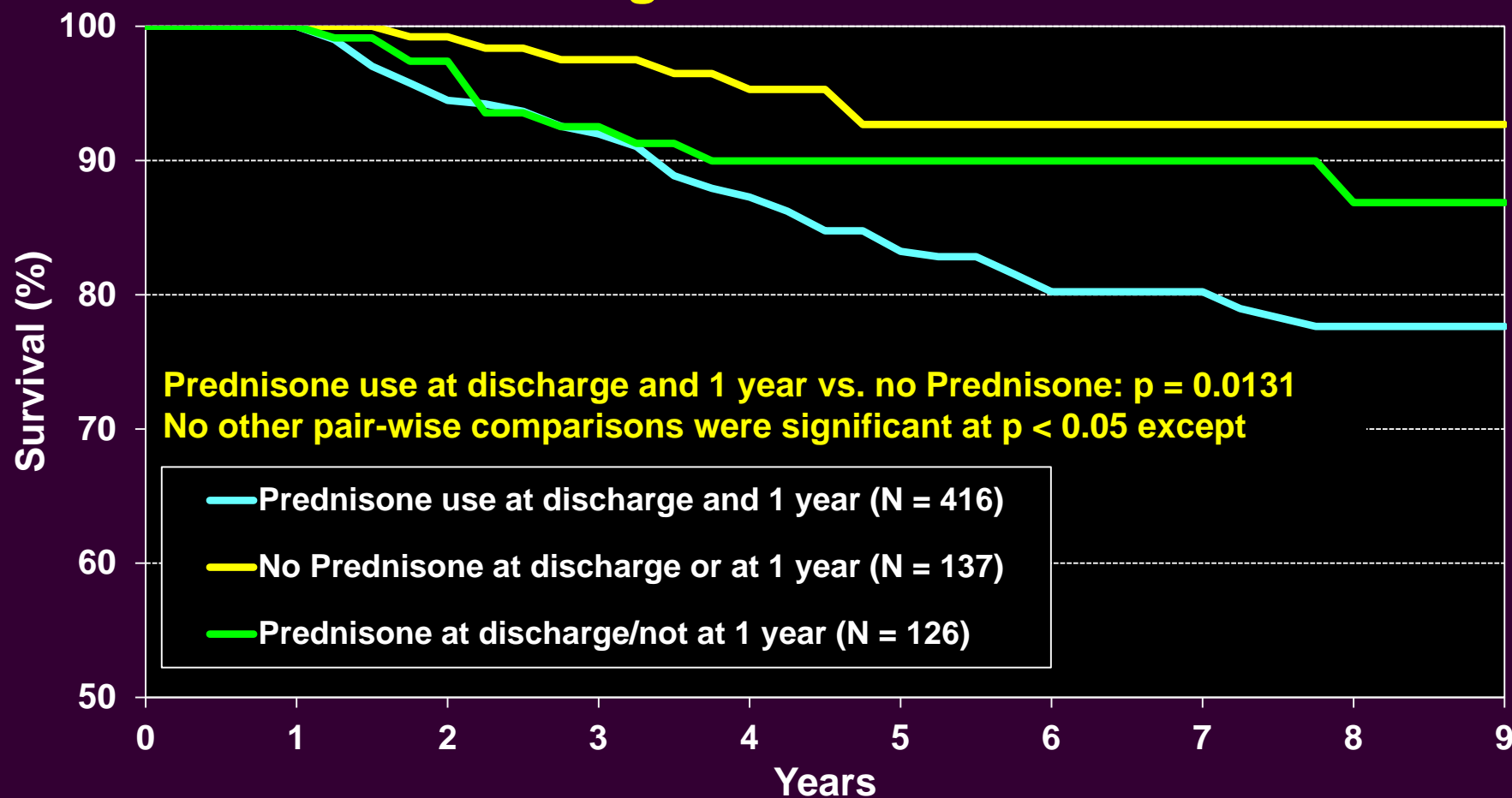


Pediatric Heart Transplants

Kaplan-Meier Survival Based on Prednisone Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)

Age: 1-5 Years



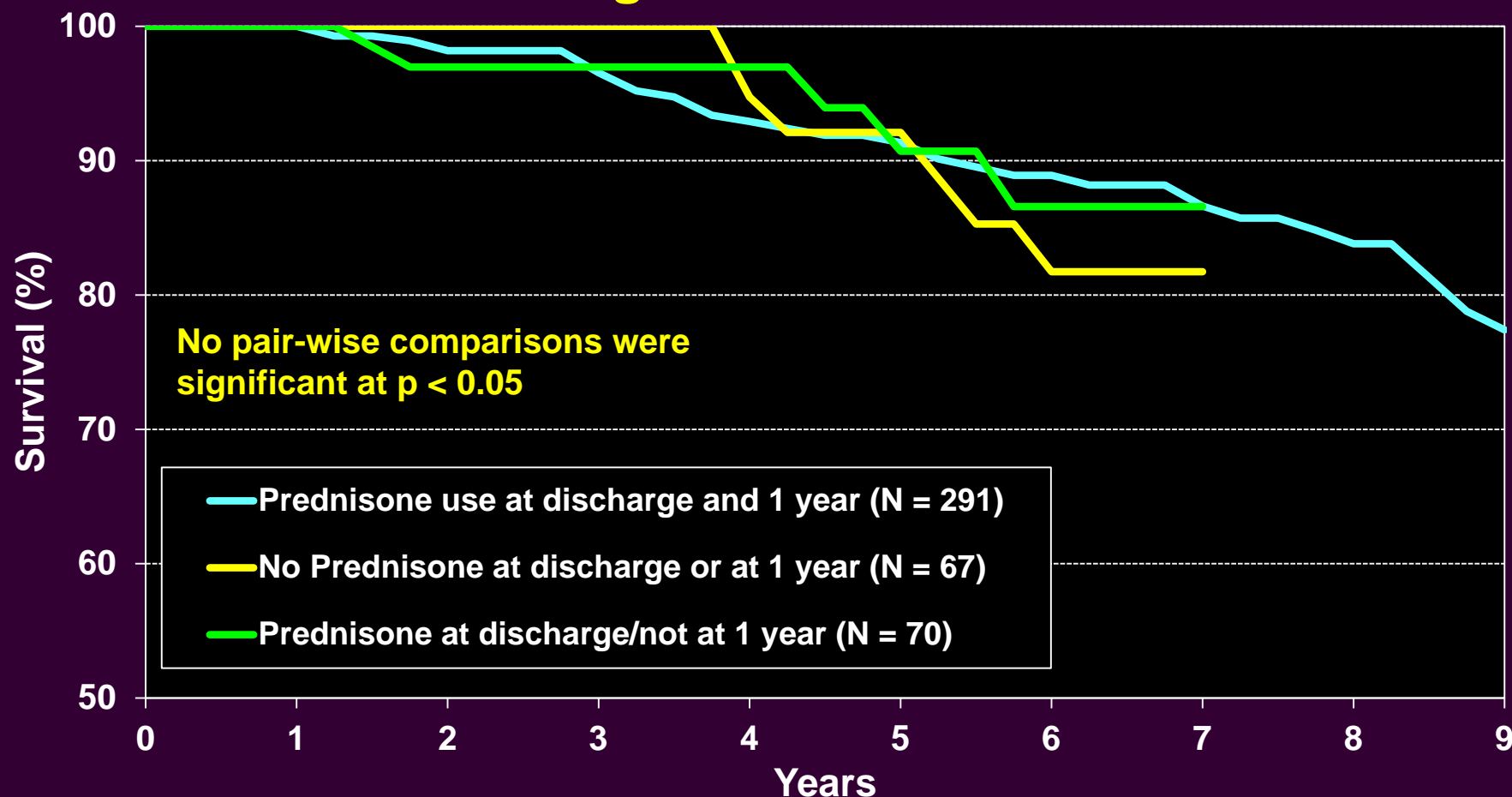


Pediatric Heart Transplants

Kaplan-Meier Survival Based on Prednisone Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)

Age: 6-10 Years



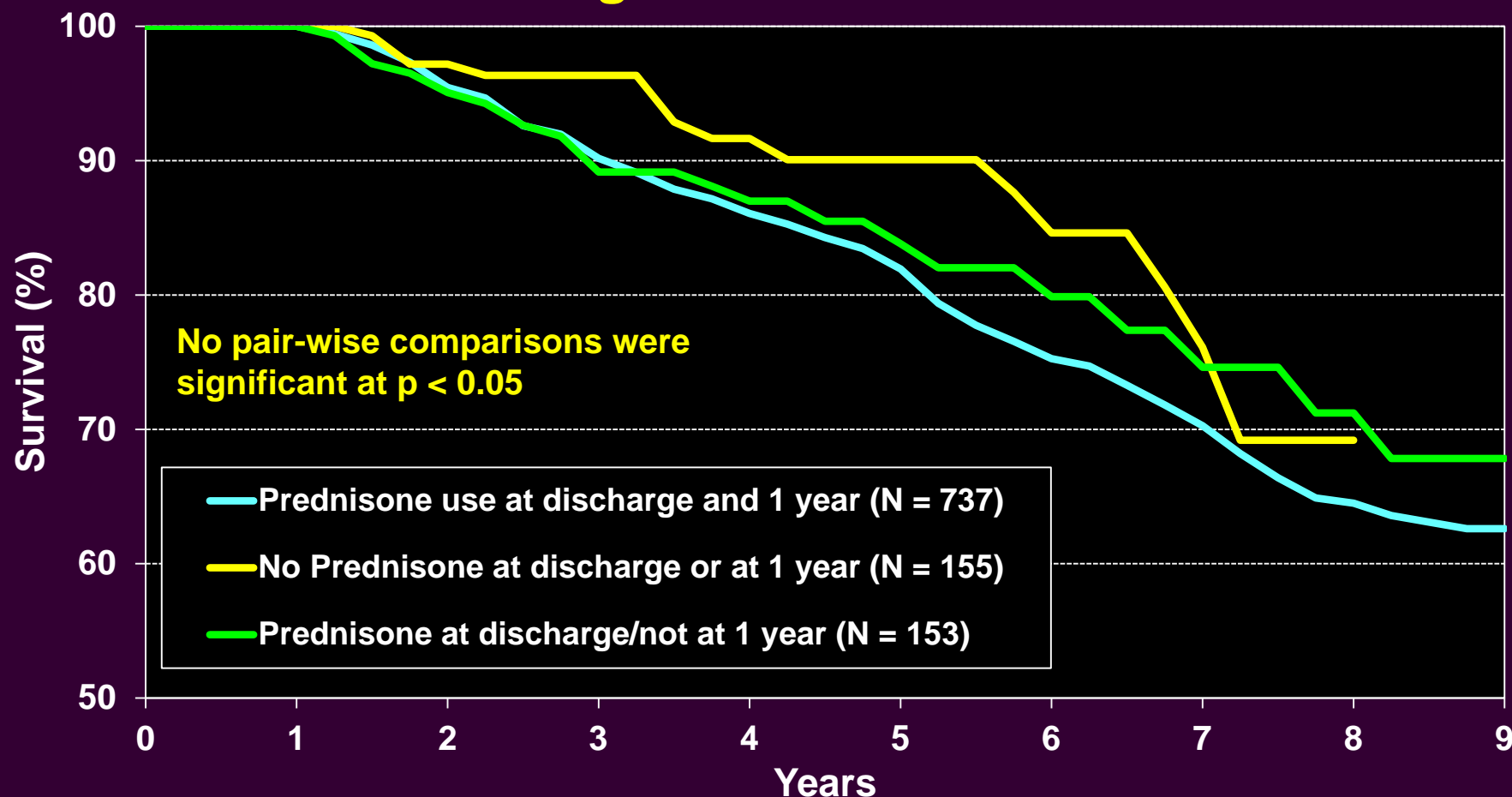


Pediatric Heart Transplants

Kaplan-Meier Survival Based on Prednisone Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)

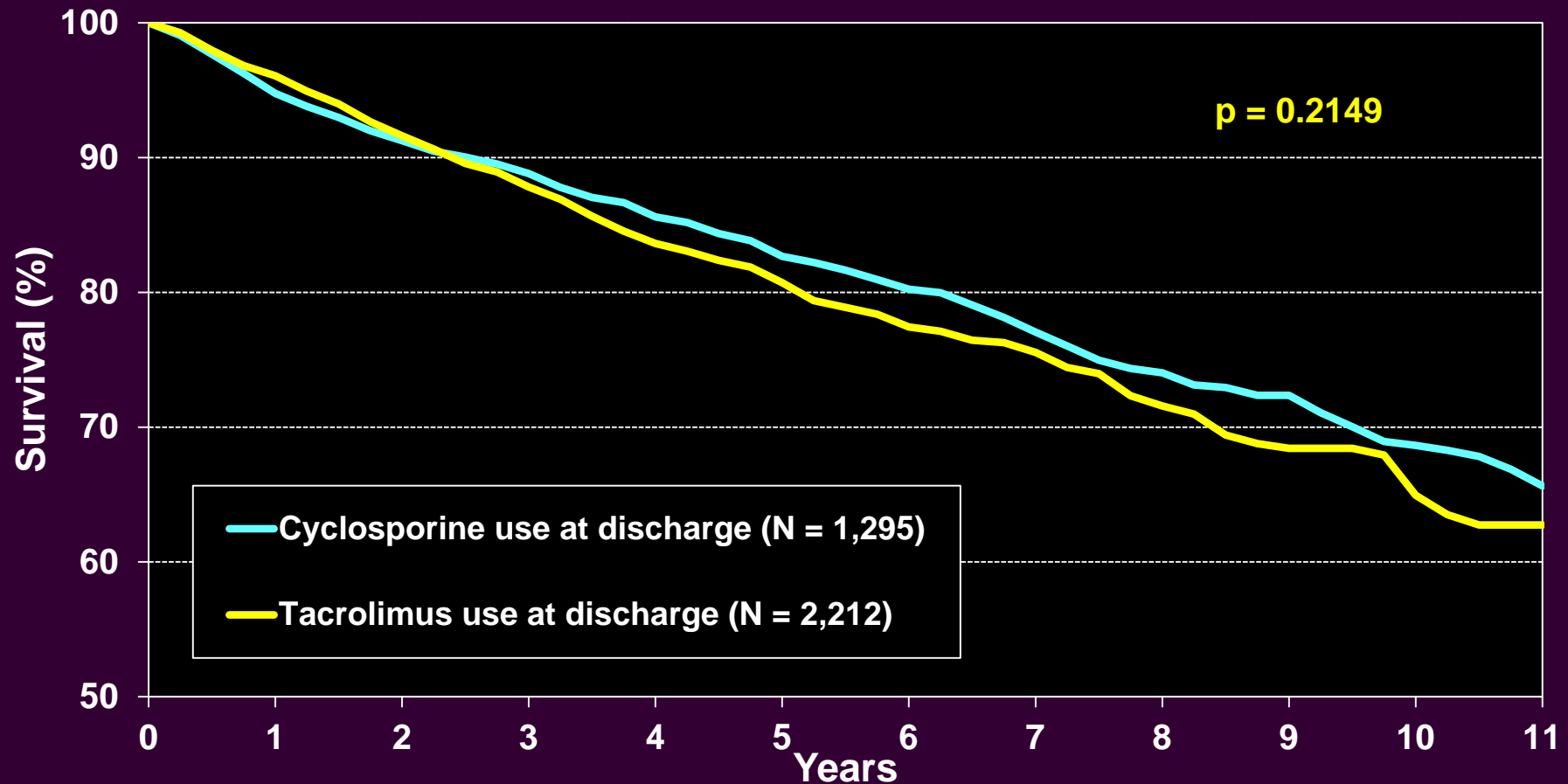
Age: 11-17 Years





Pediatric Heart Transplants

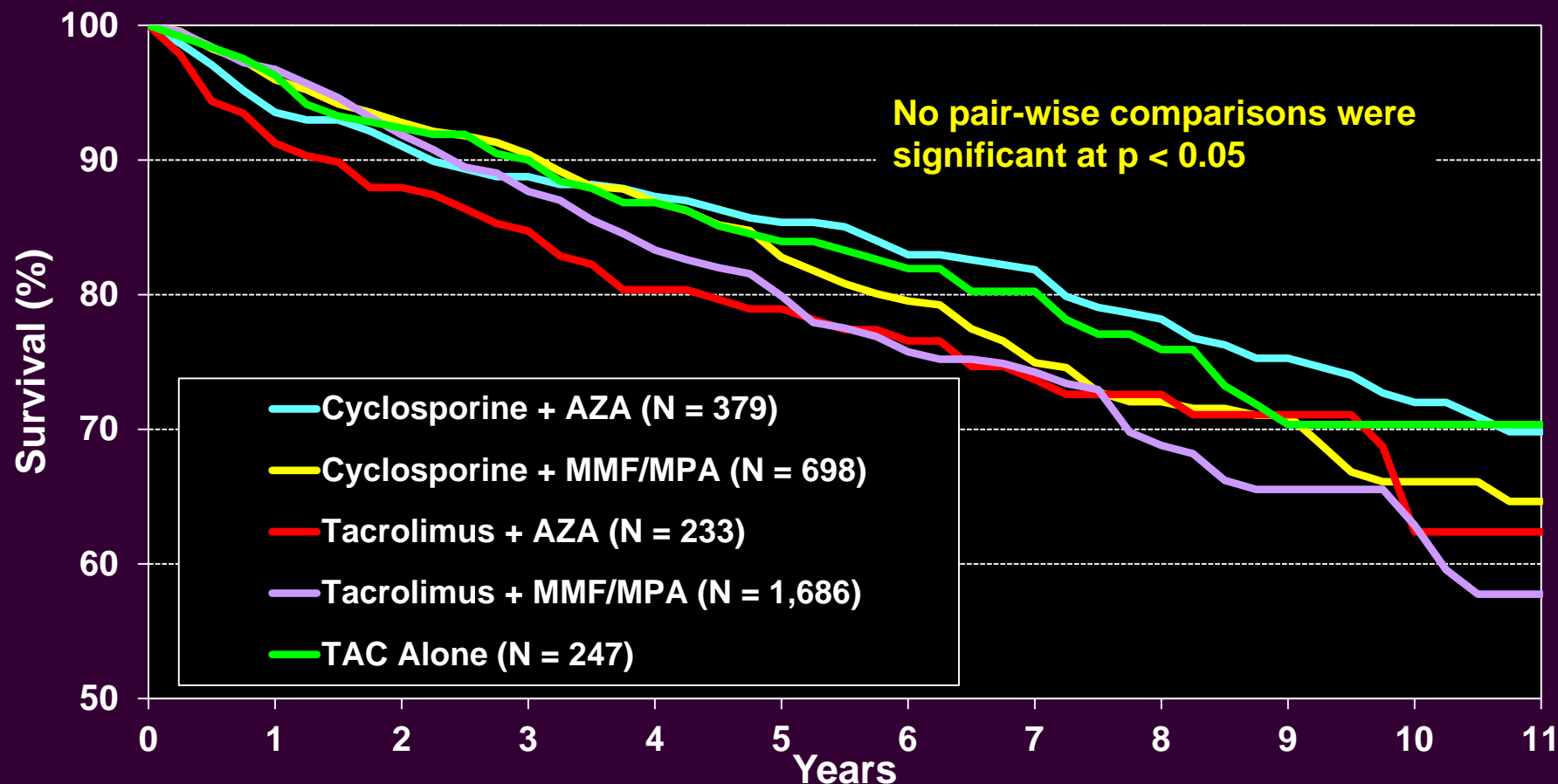
Kaplan-Meier Survival by Calcineurin Inhibitor Use at Discharge (Transplants: January 2000 – June 2011) Conditional on Survival to 14 Days





Pediatric Heart Transplants

Kaplan-Meier Survival by Maintenance Immunosuppression at Discharge (Transplants: January 2000 – June 2011) Conditional on Survival to 14 Days

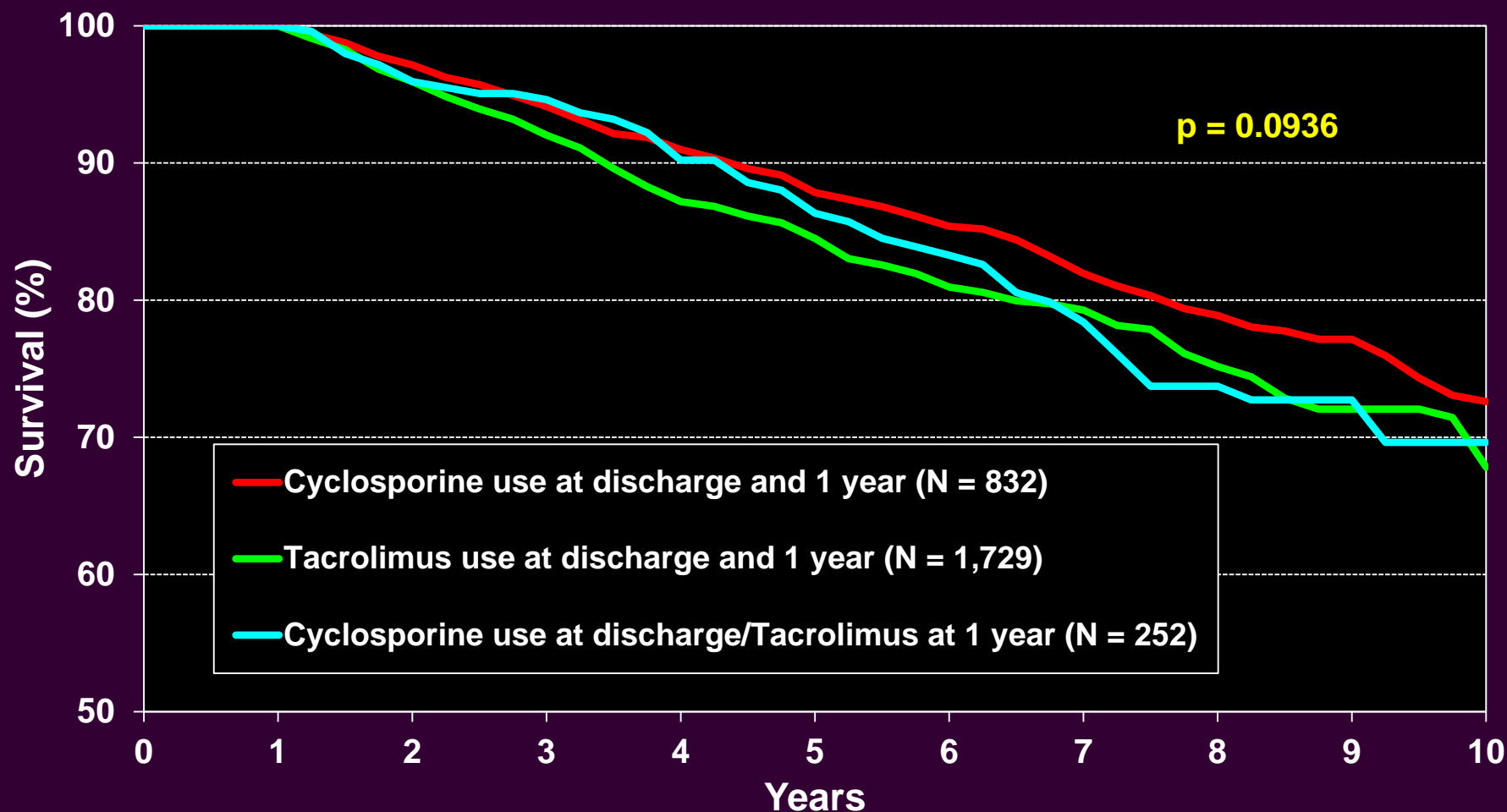




Pediatric Heart Transplants

Kaplan-Meier Survival by Calcineurin Inhibitor Use

Conditional on Survival to 1 Year (Transplants: January 2000 – June 2011)

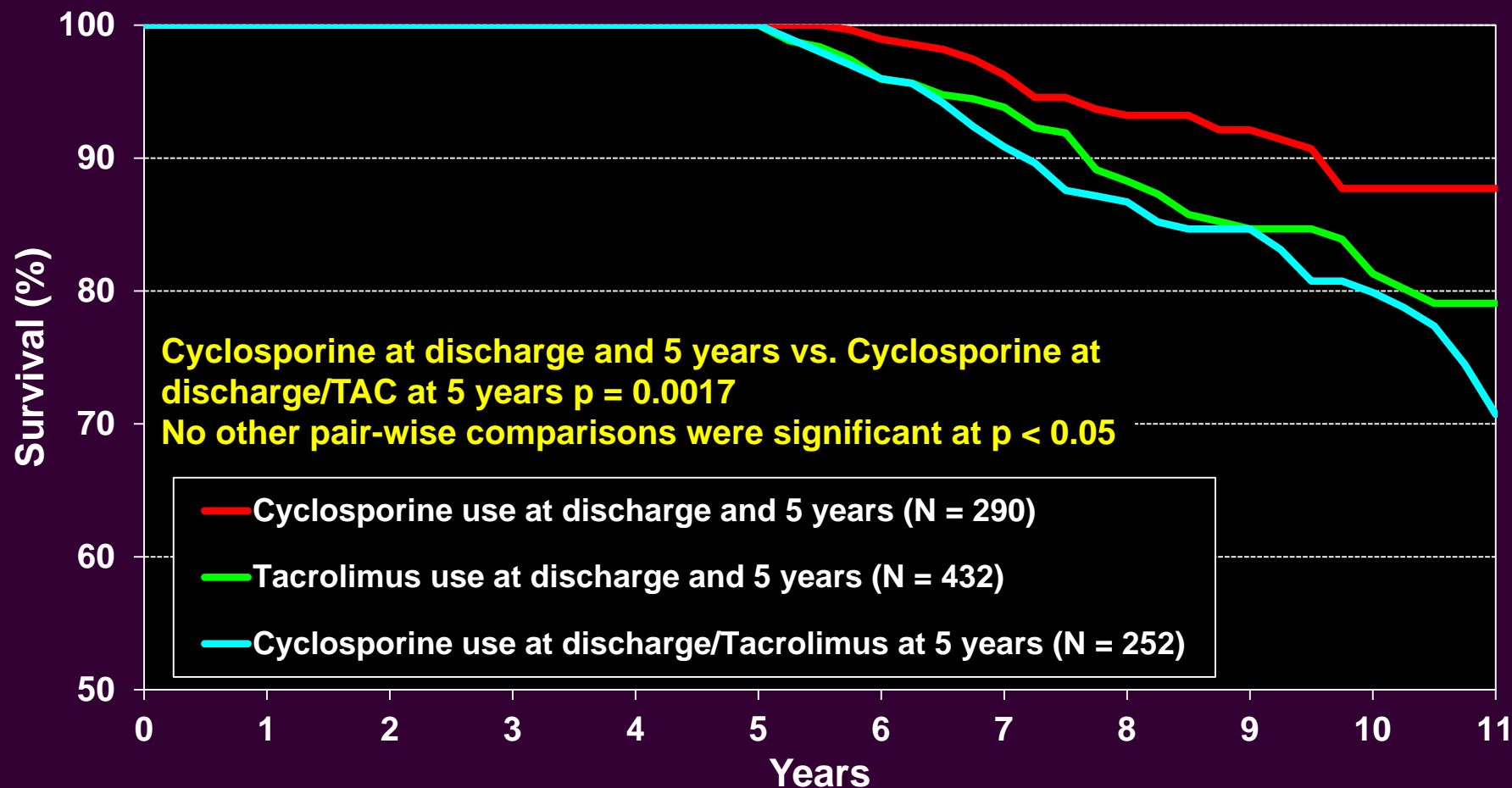




Pediatric Heart Transplants

Kaplan-Meier Survival by Calcineurin Inhibitor Use

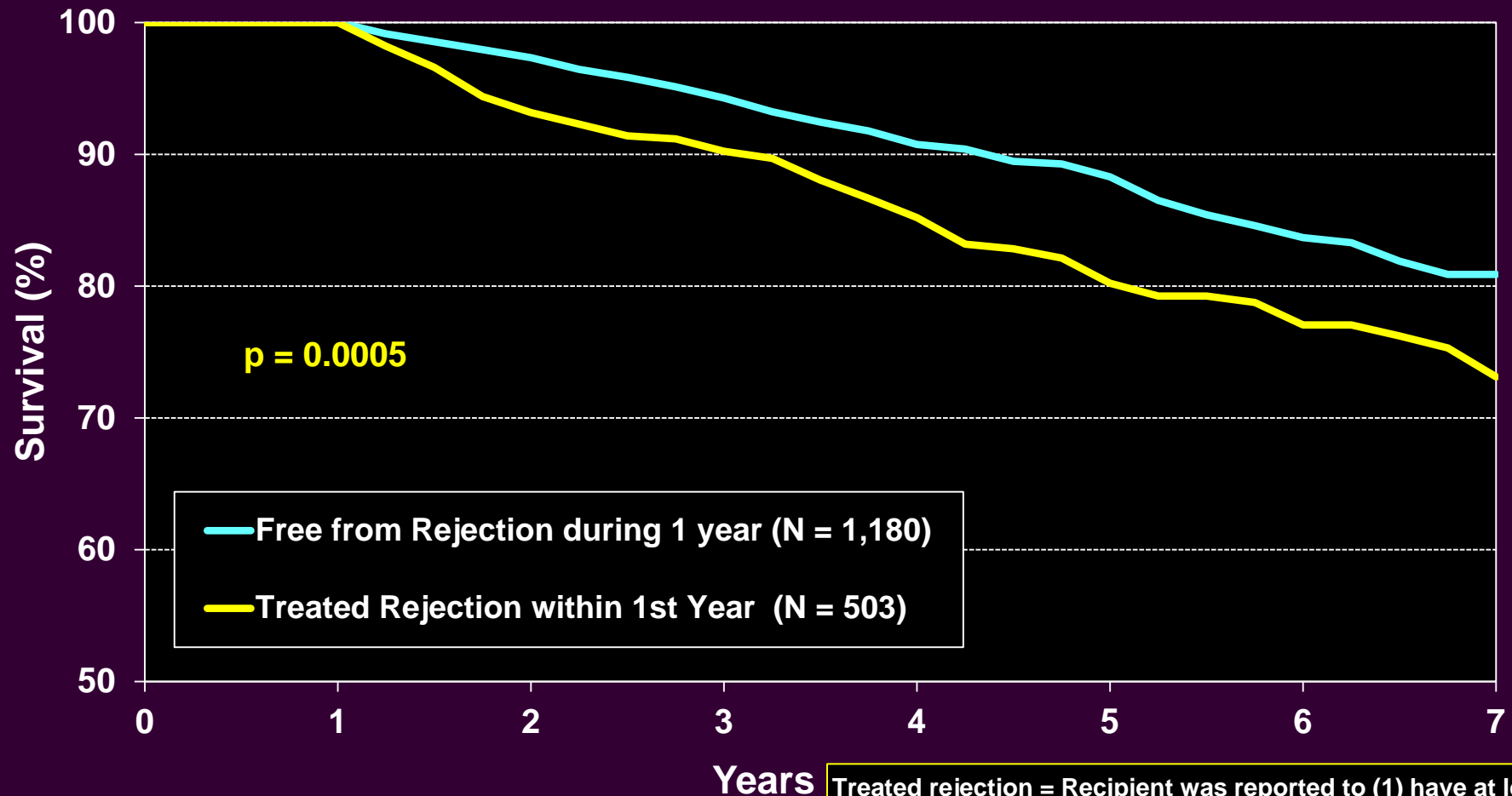
(Transplants: January 2000 – June 2006)
Conditional on Survival to 5 Years



Rejection and Post Transplant Morbidities

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year
Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

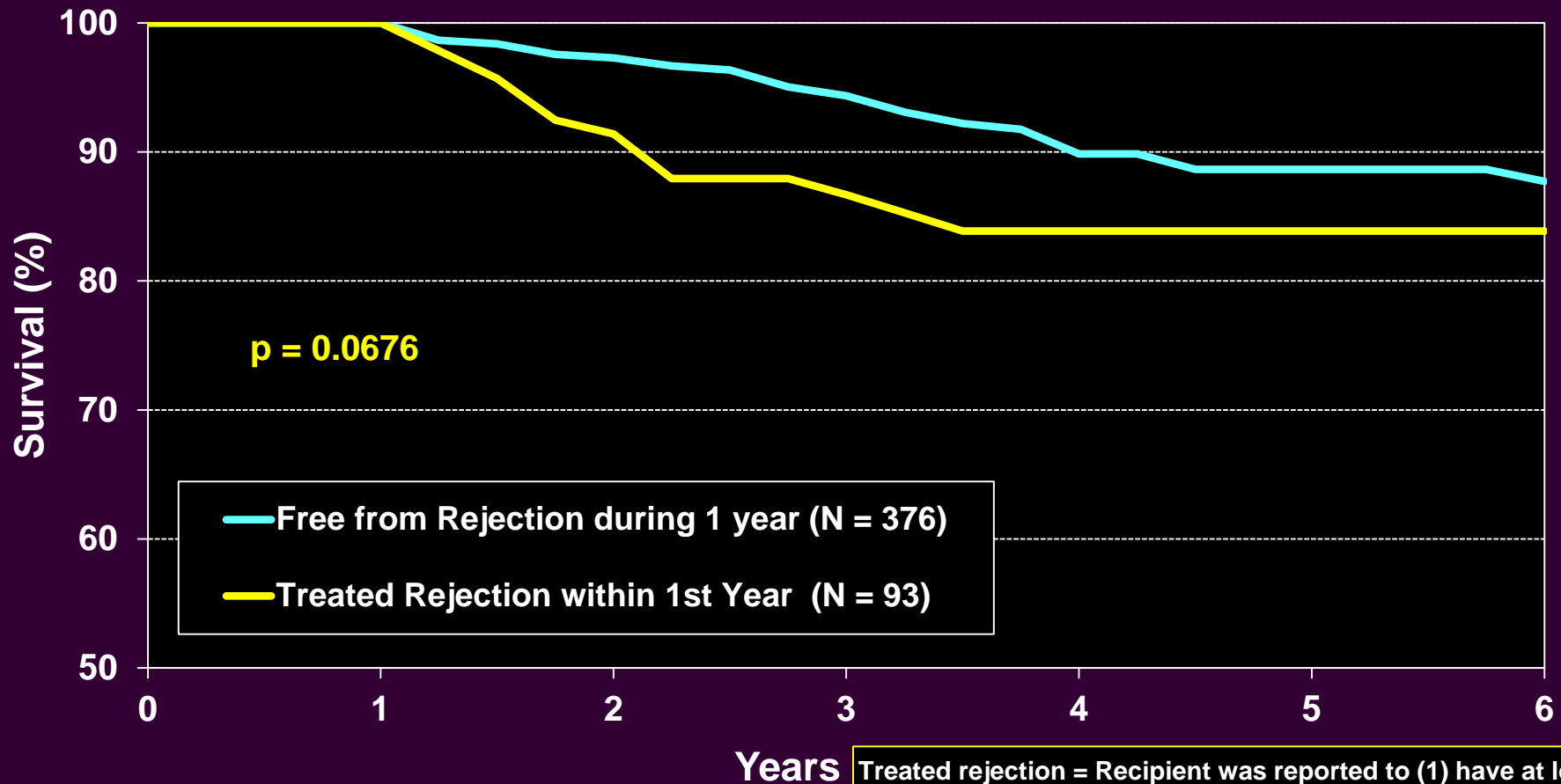


Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.
No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year
Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

Age = < 1 Year



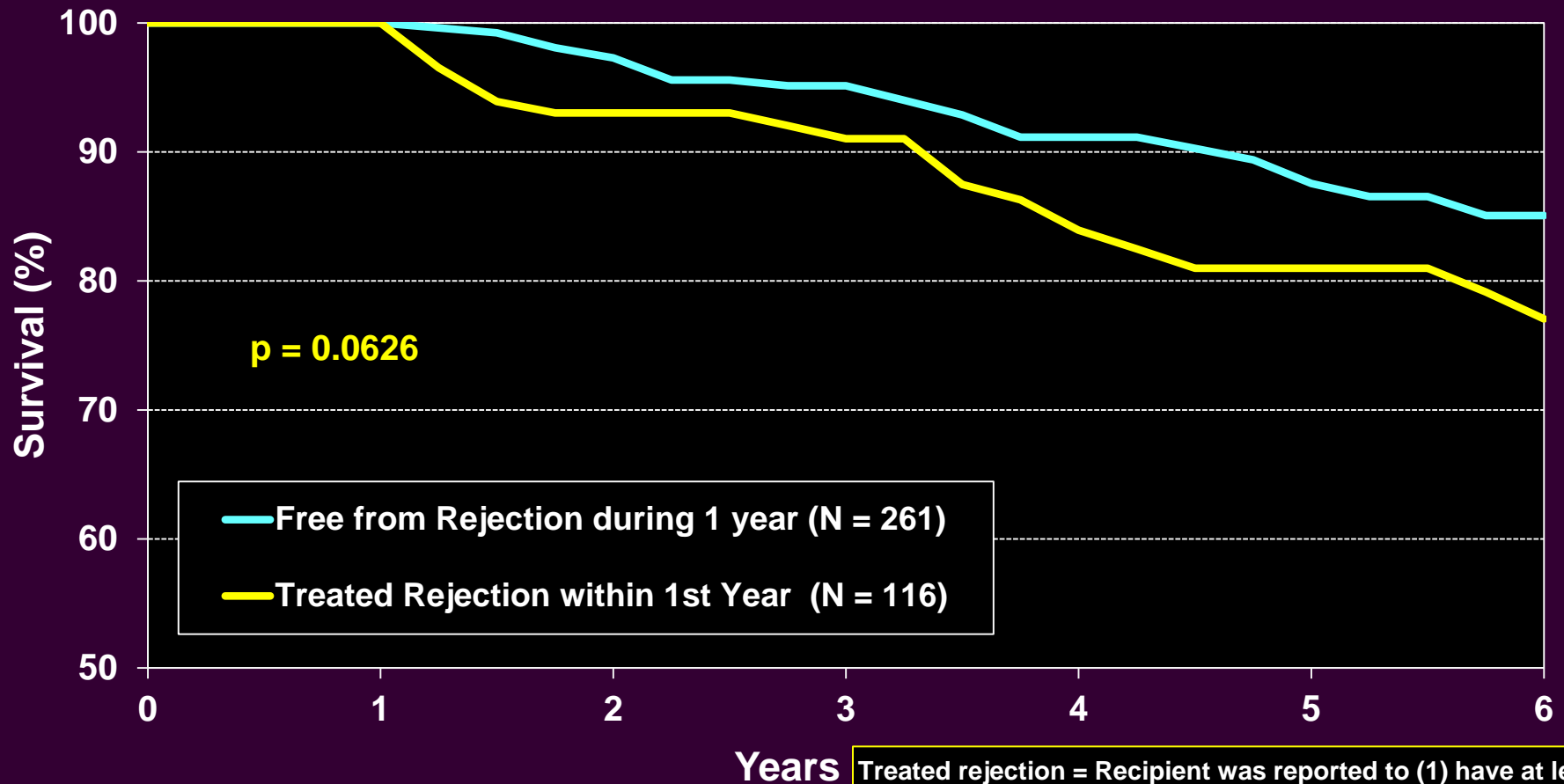
Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.
No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

Age = 1-5 Years



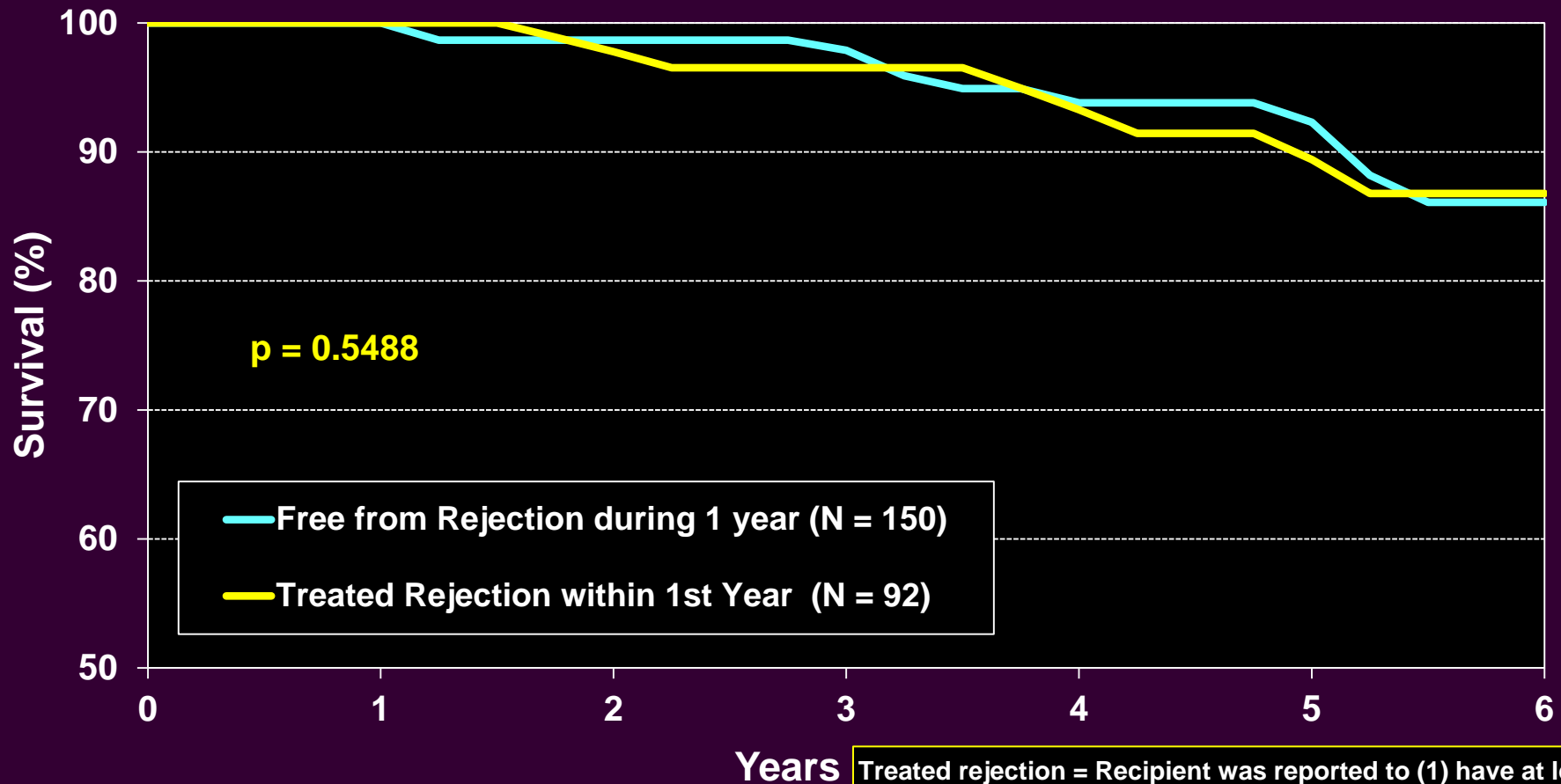
Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection. No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

Age = 6-10 Years



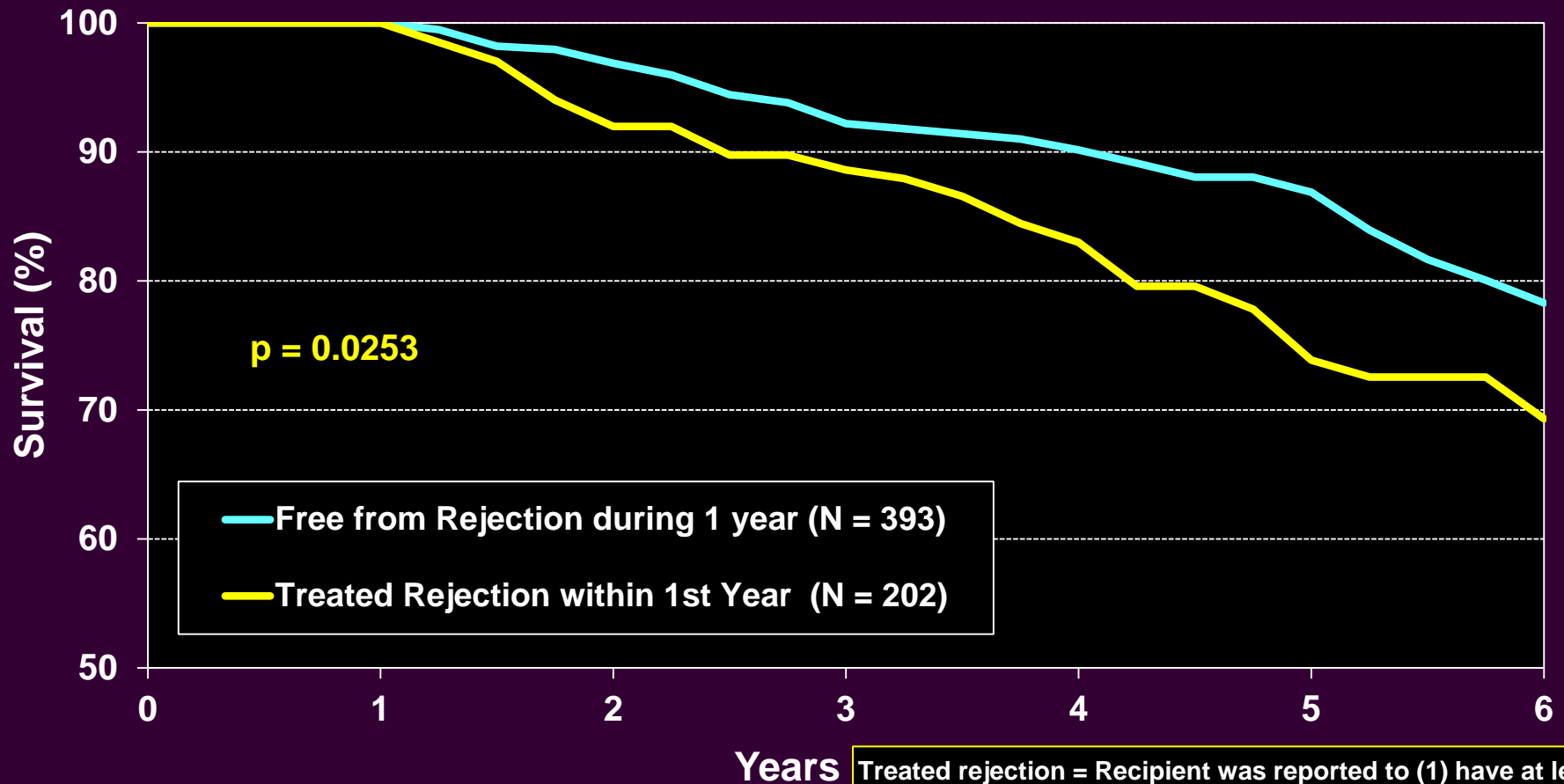
Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection. No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

Age = 11-17 Years

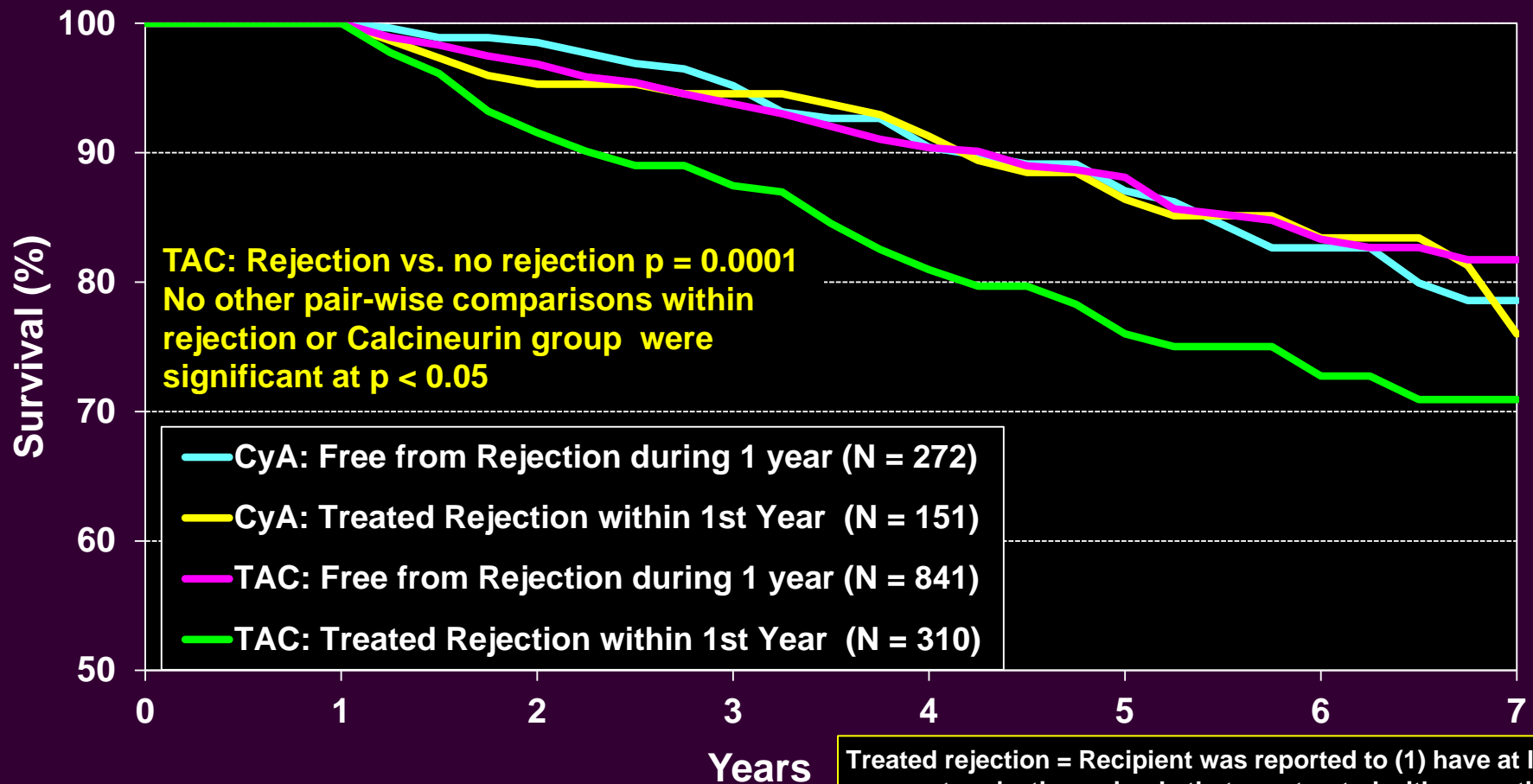


Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection. No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year Stratified by Calcineurin Use at Discharge

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)



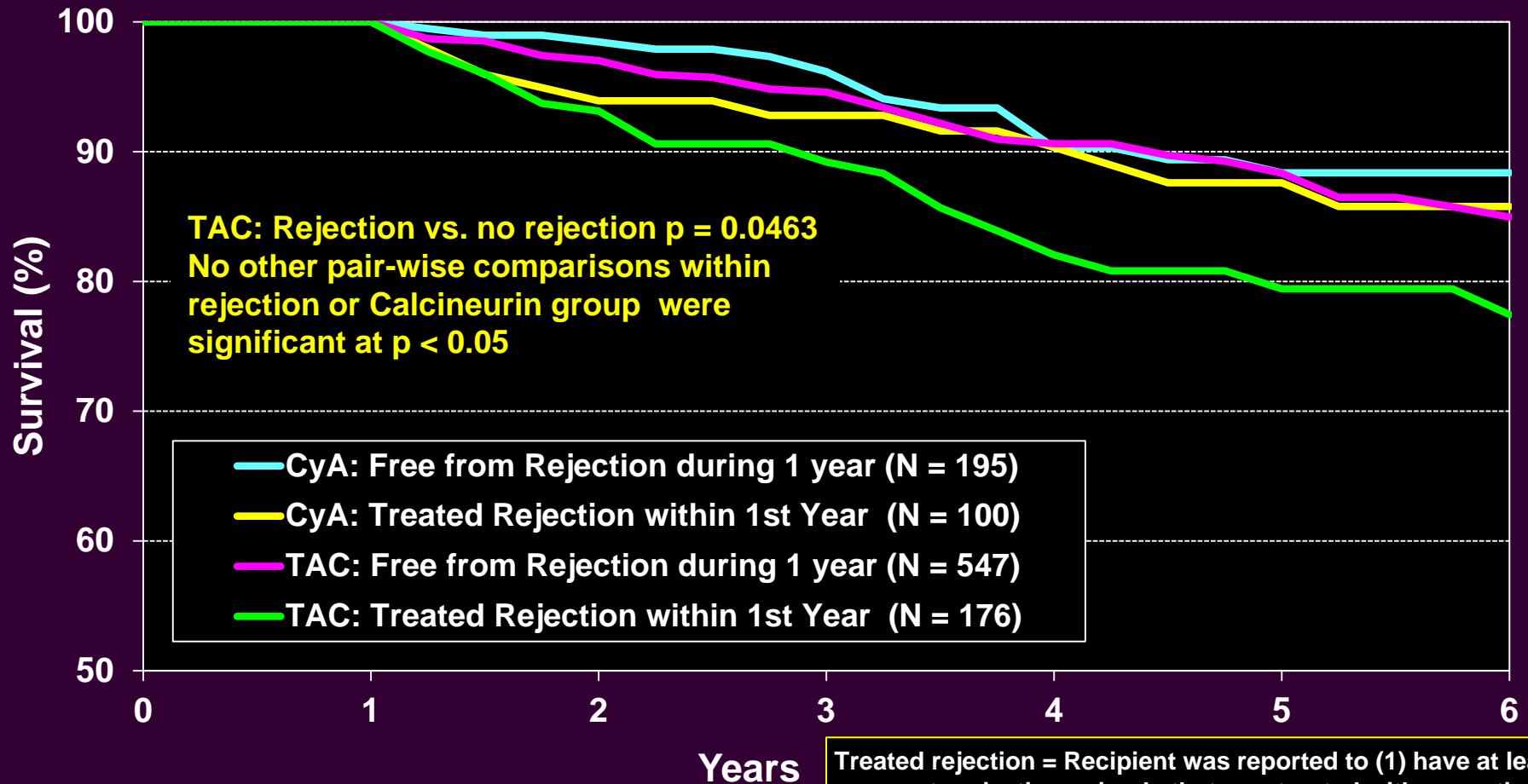
Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection. No rejection = Recipient had (i) no acute rejection episodes and (ii) was reported either as not hospitalized for rejection or did not receive anti-rejection agents.

Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year

Stratified by Calcineurin Use at Discharge: Age = 0-10 Years

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)

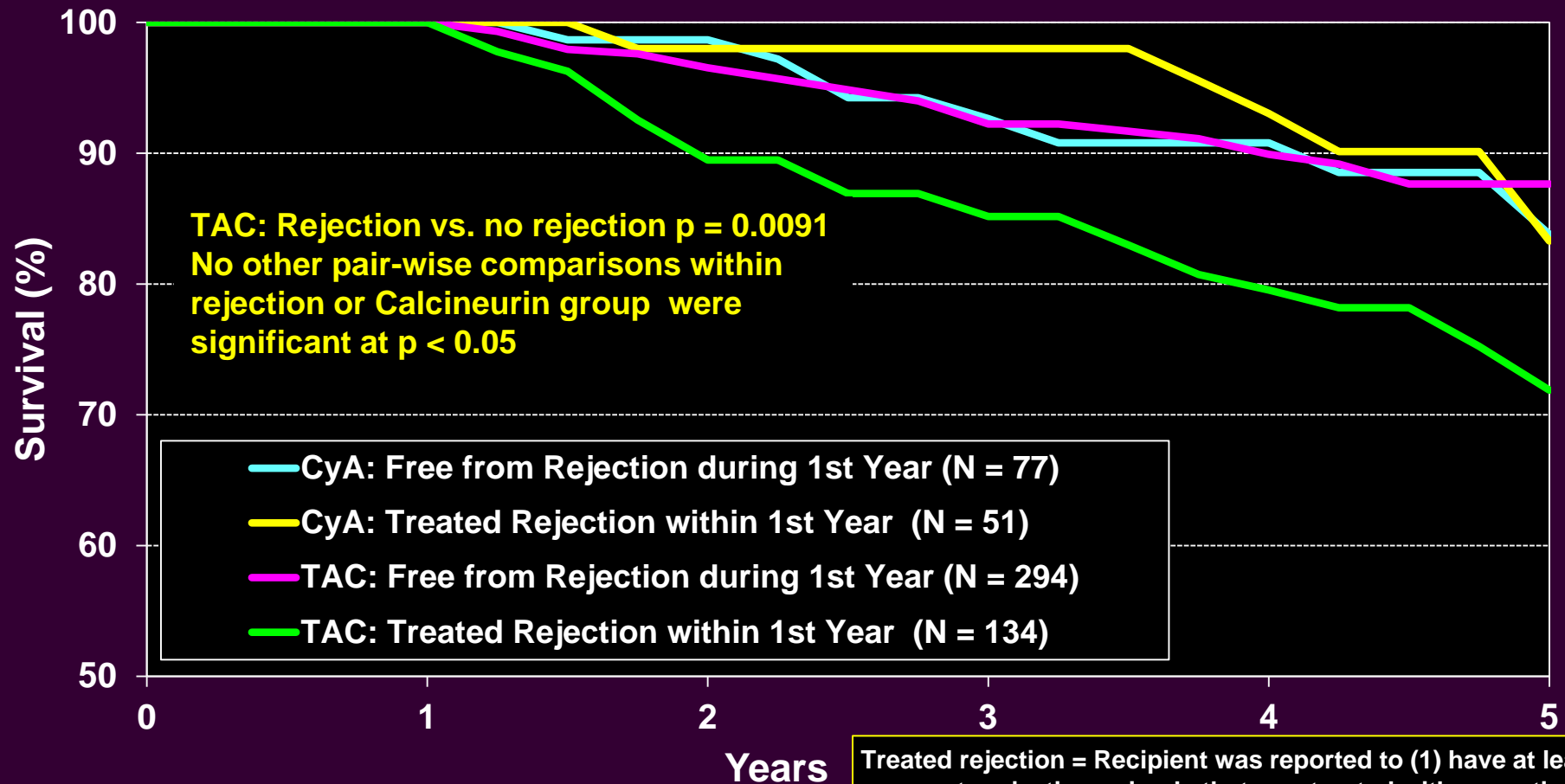


Pediatric Heart Transplants

Kaplan-Meier Survival Based on Treated Rejection within 1st Year

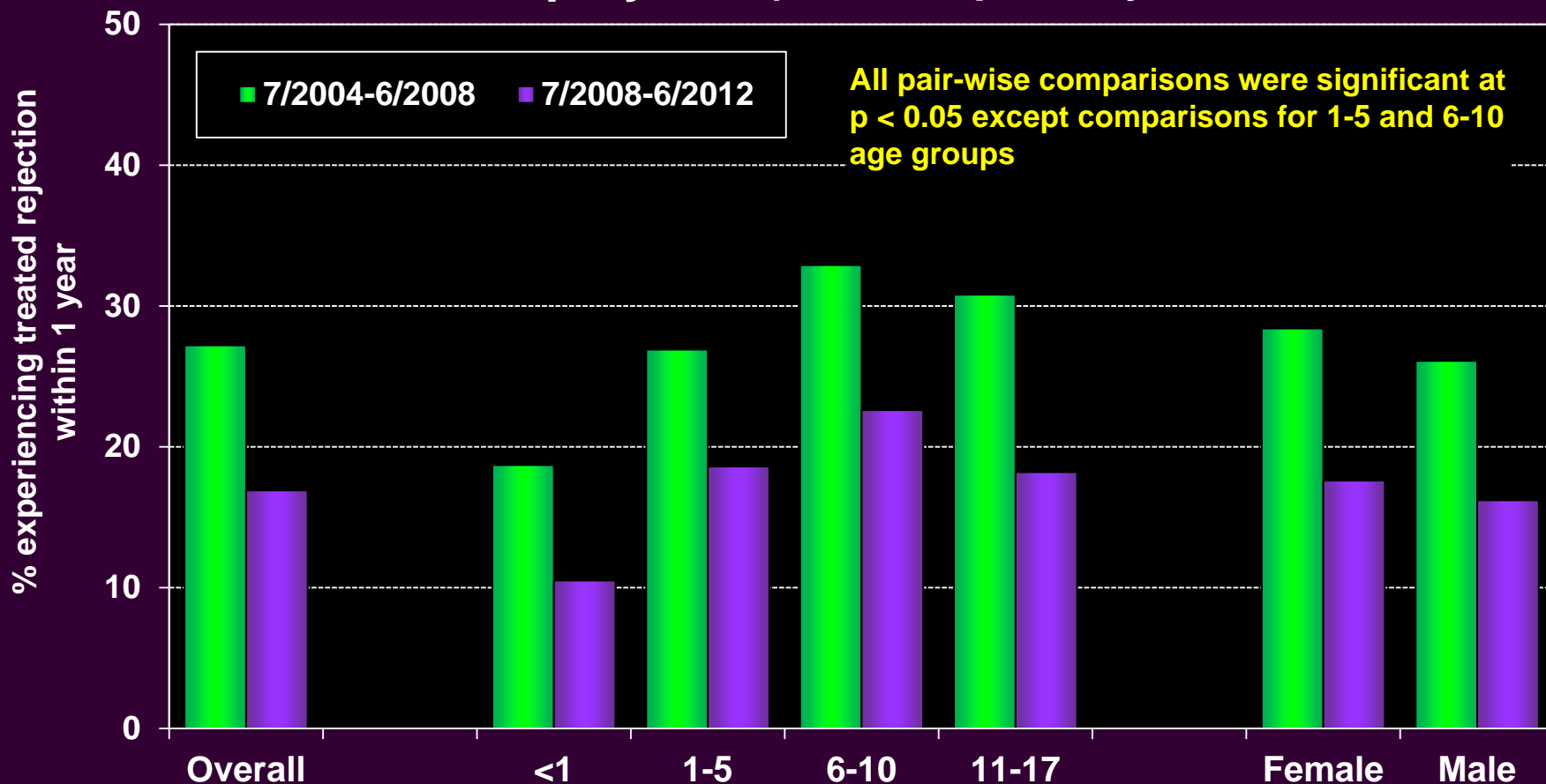
Stratified by Calcineurin Use at Discharge: Age = 11-17 Years

Conditional on survival to 1 year (1-Year Follow-ups: July 2004 – June 2011)



Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Era (Follow-ups: July 2004 – June 2012)

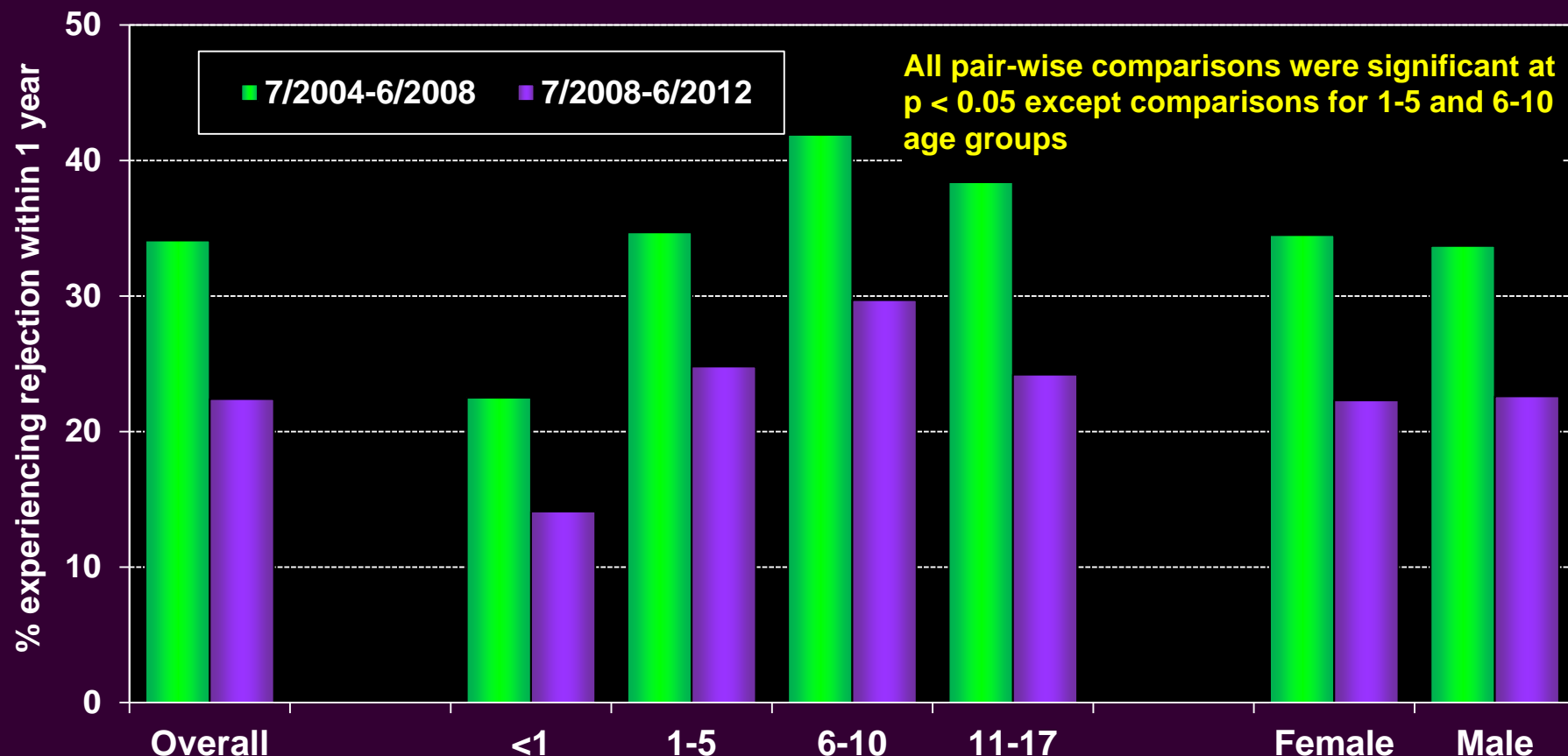


Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Era (Follow-ups: July 2004 – June 2012)

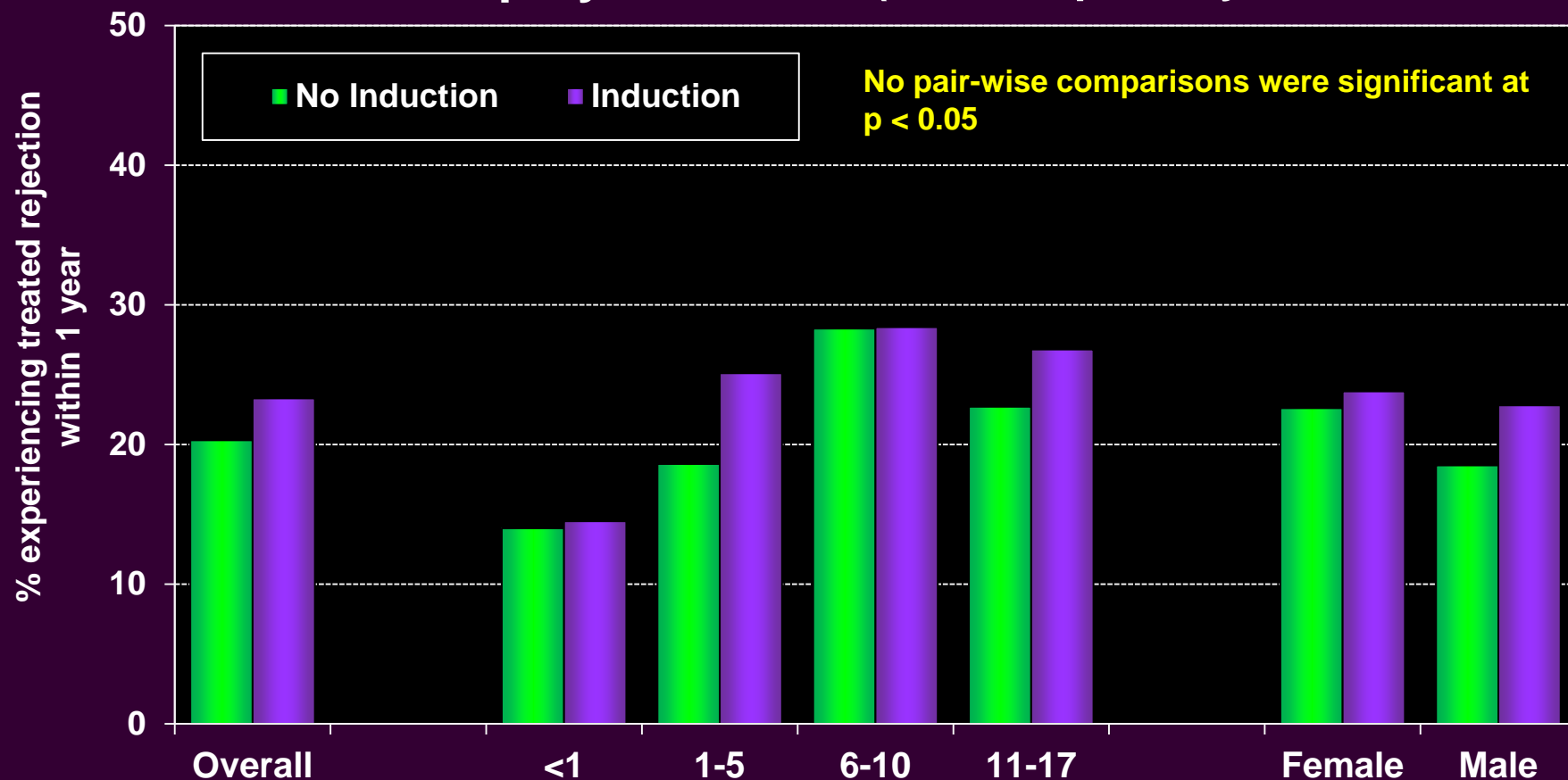


Analysis is limited to patients who were alive at the time of the follow-up

Any rejection = Recipient was reported to (1) have at least one acute rejection episode; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Induction (Follow-ups: July 2004 – June 2012)

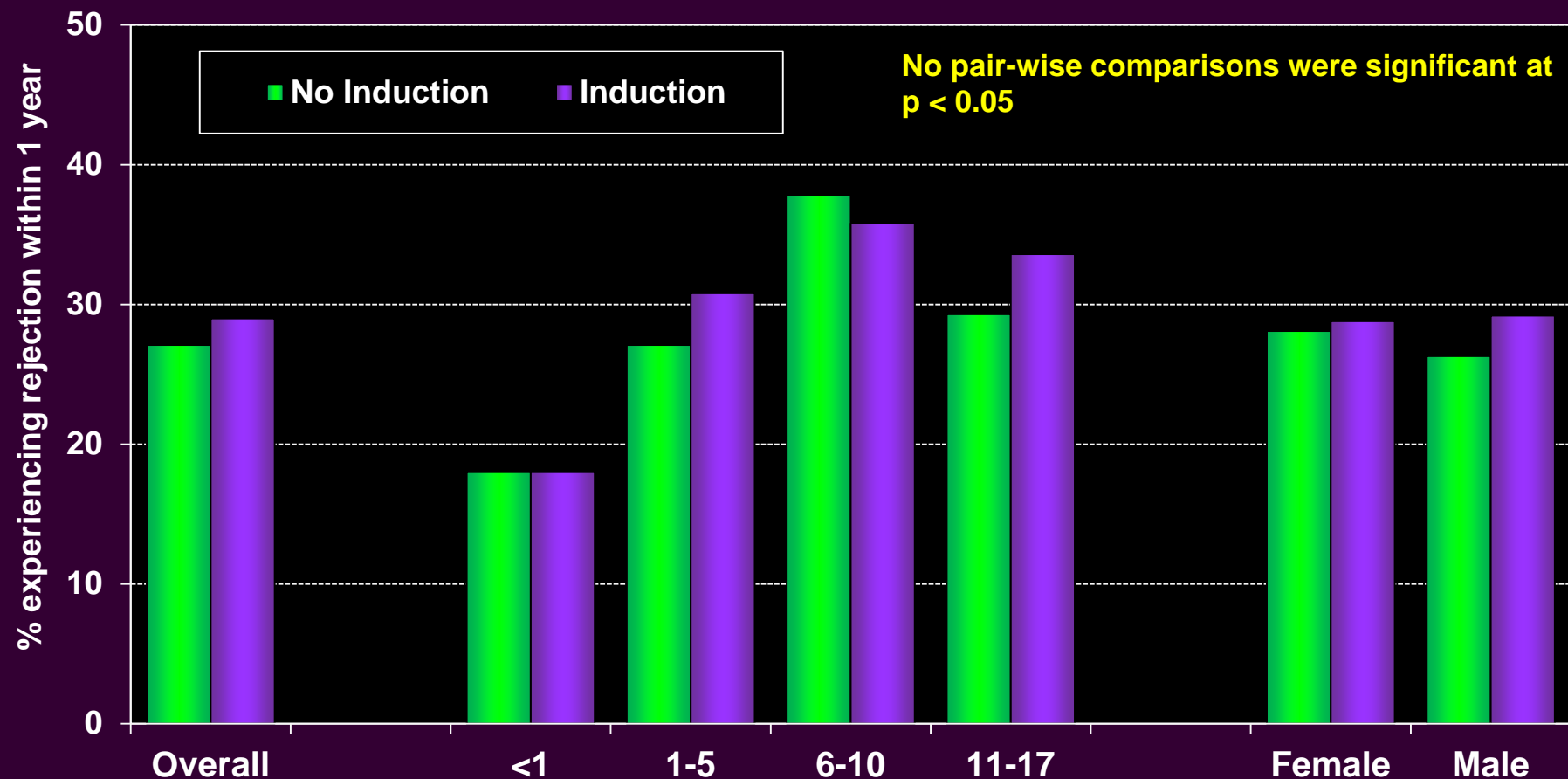


Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Induction (Follow-ups: July 2004 – June 2012)

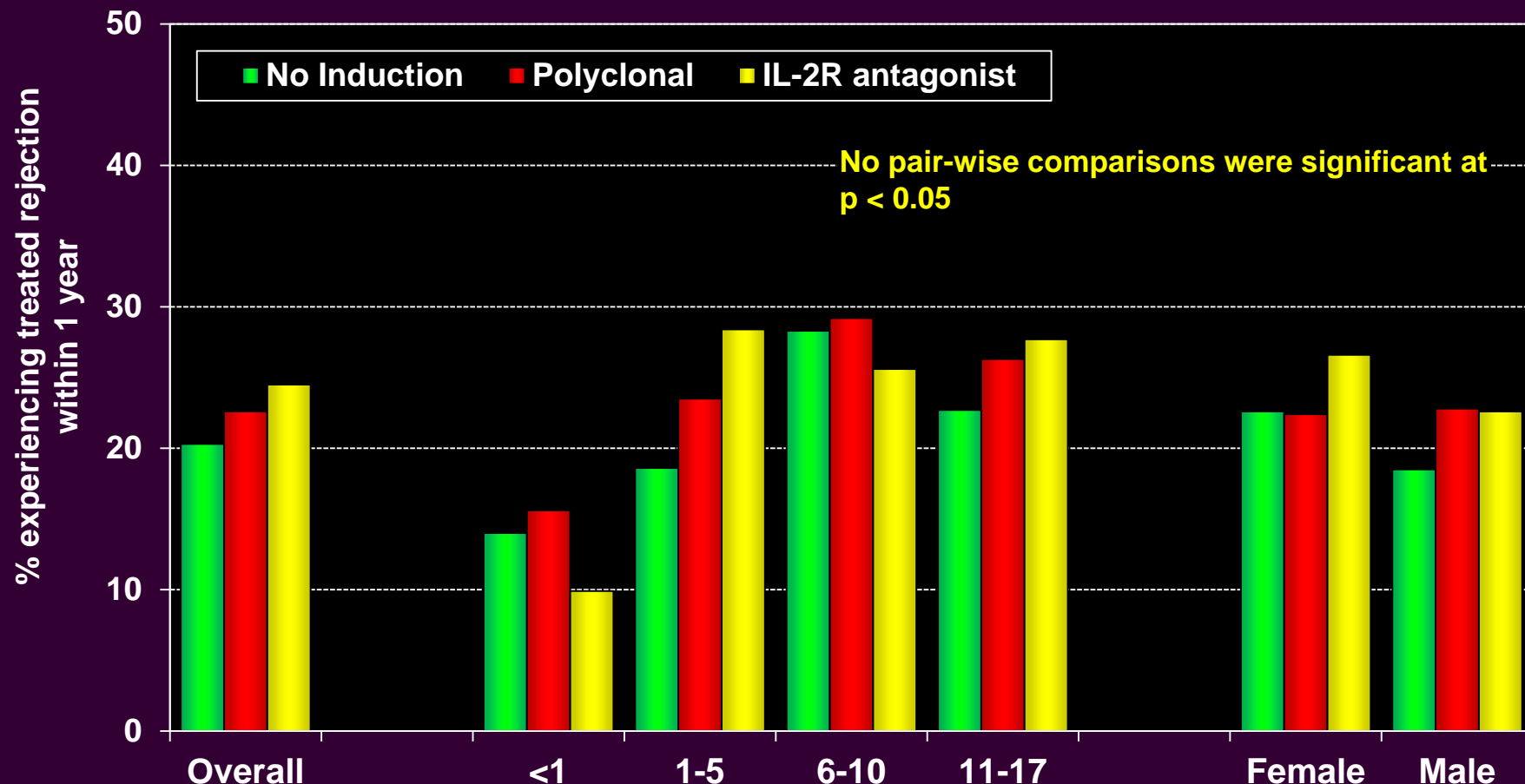


Analysis is limited to patients who were alive at the time of the follow-up

Any rejection = Recipient was reported to (1) have at least one acute rejection episode; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Induction Type (Follow-ups: July 2004 – June 2012)

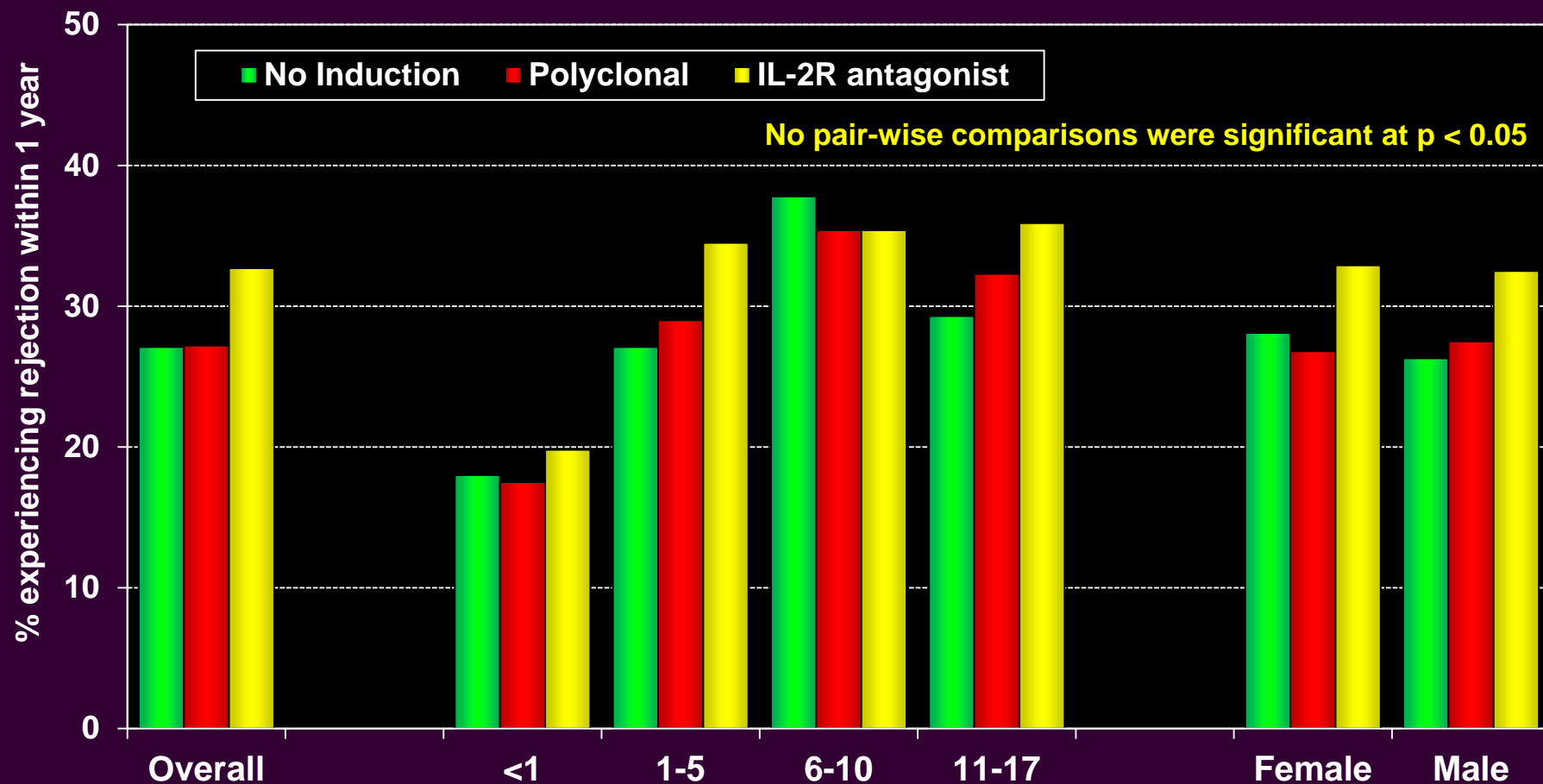


Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Induction Type (Follow-ups: July 2004 – June 2012)

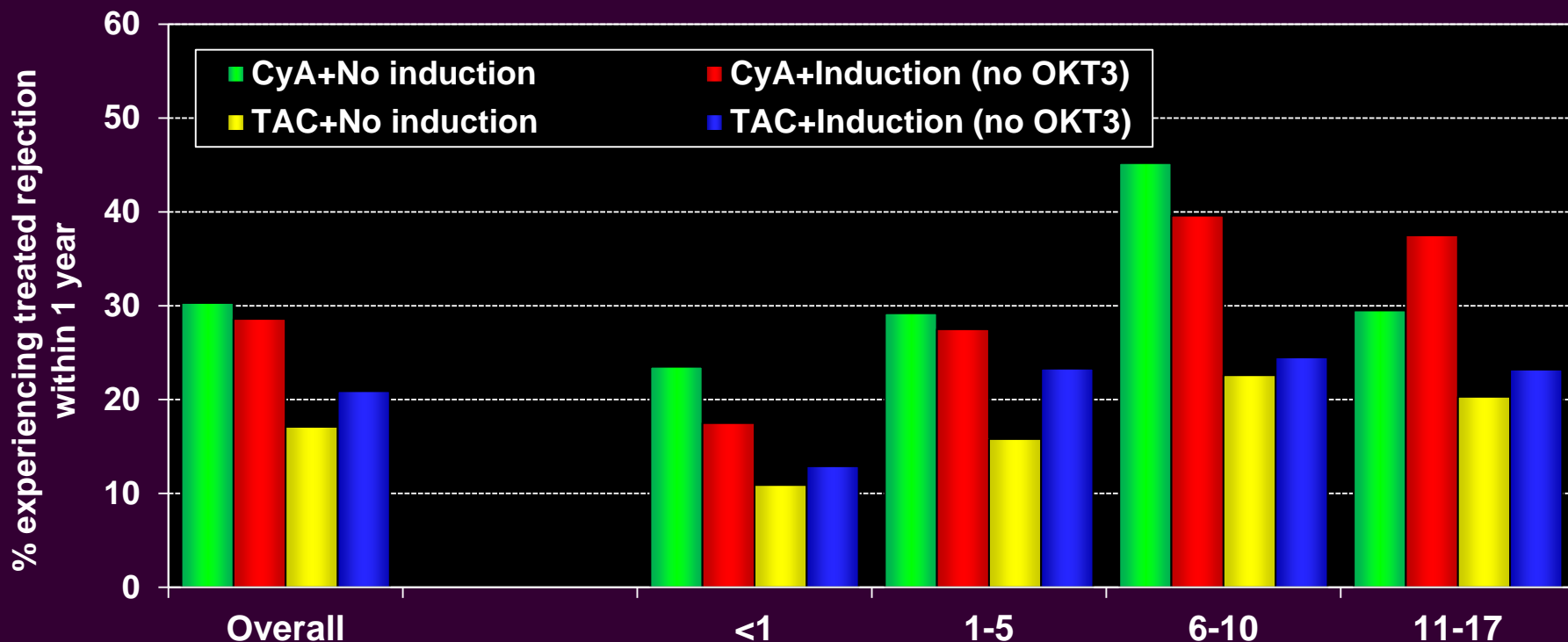


Analysis is limited to patients who were alive at the time of the follow-up

Any rejection = Recipient was reported to (1) have at least one acute rejection episode; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Maintenance Immunosuppression and Induction (Follow-ups: July 2004 – June 2012)



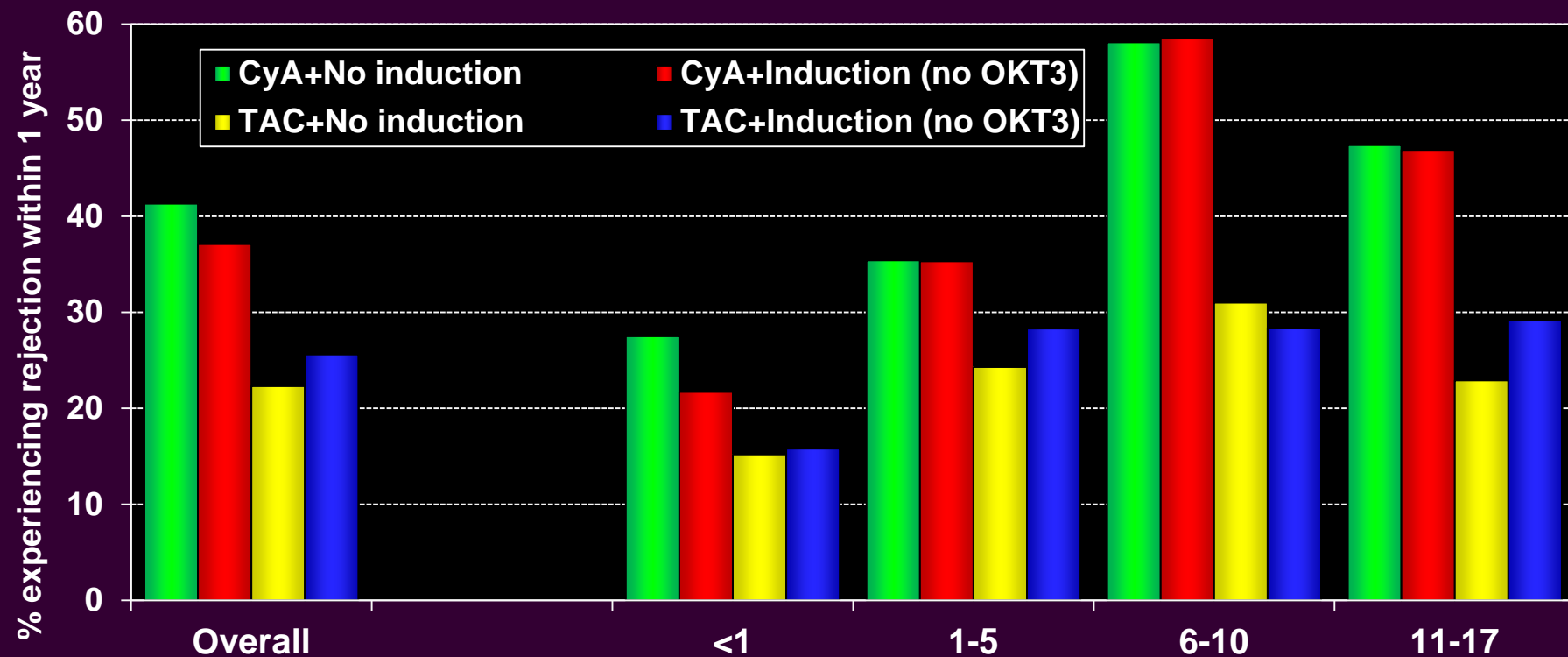
CyA + No Induction vs. TAC + No Induction (Overall), CyA + Induction vs. TAC + No Induction (Overall and 11-17 years) and CyA + Induction vs. TAC + Induction (Overall and 11-17 years) were significant at $p < 0.05$. No other pair-wise comparisons were significant at $p < 0.05$.

Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Maintenance Immunosuppression and Induction (Follow-ups: July 2004 – June 2012)



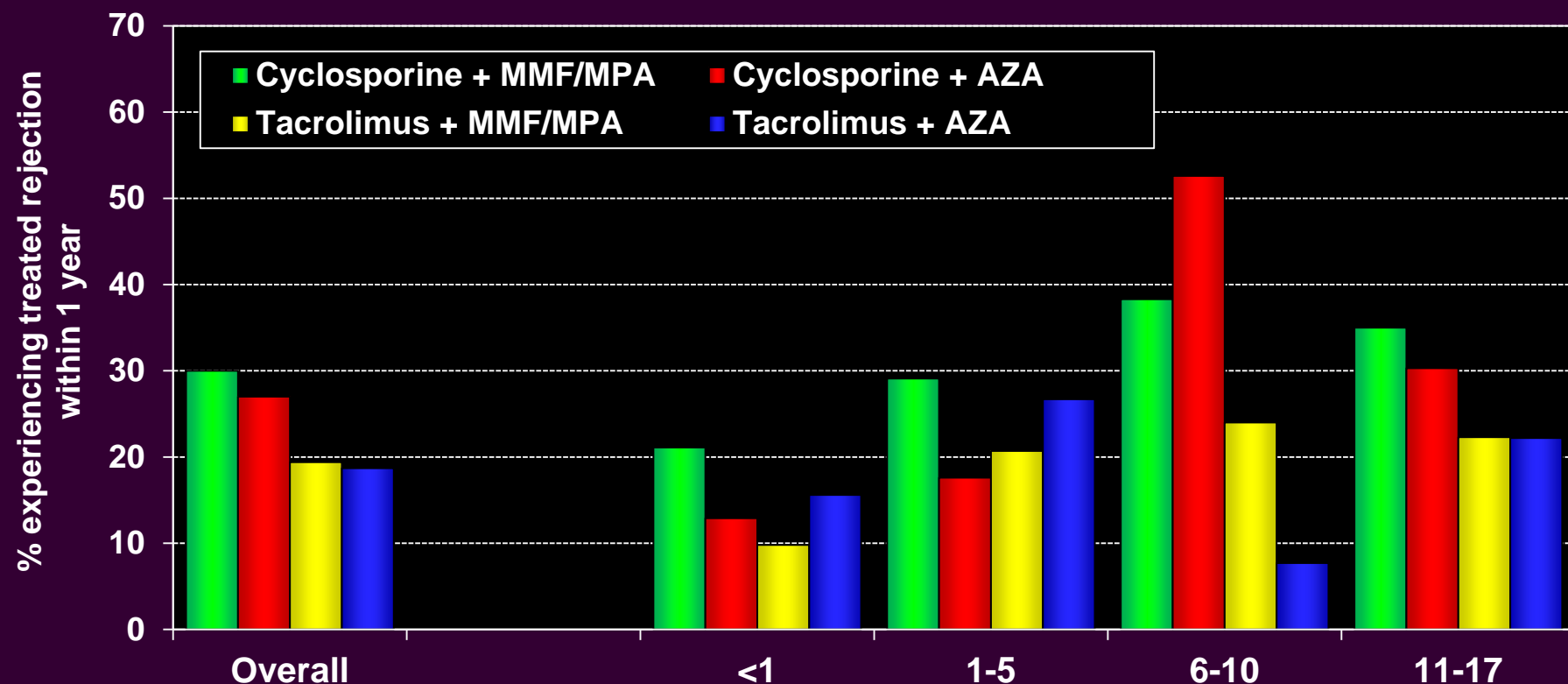
CyA + No Induction vs. TAC + No Induction (Overall and 11-17 years), CyA + No Induction vs. TAC + Induction (Overall and 6-10 years), CyA + Induction vs. TAC + No Induction (Overall, 6-10 and 11-17 years) and CyA + Induction vs. TAC + Induction (Overall, 1-10 and 11-17 years) were significant at $p < 0.05$. No other pair-wise comparisons were significant at $p < 0.05$. Analysis is limited to patients who were alive at the time of the follow-up

Any rejection = Recipient was reported to (1) have at least one acute rejection episode; or (2) have been hospitalized for rejection.



Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Maintenance Immunosuppression (Follow-ups: July 2004 – June 2012)



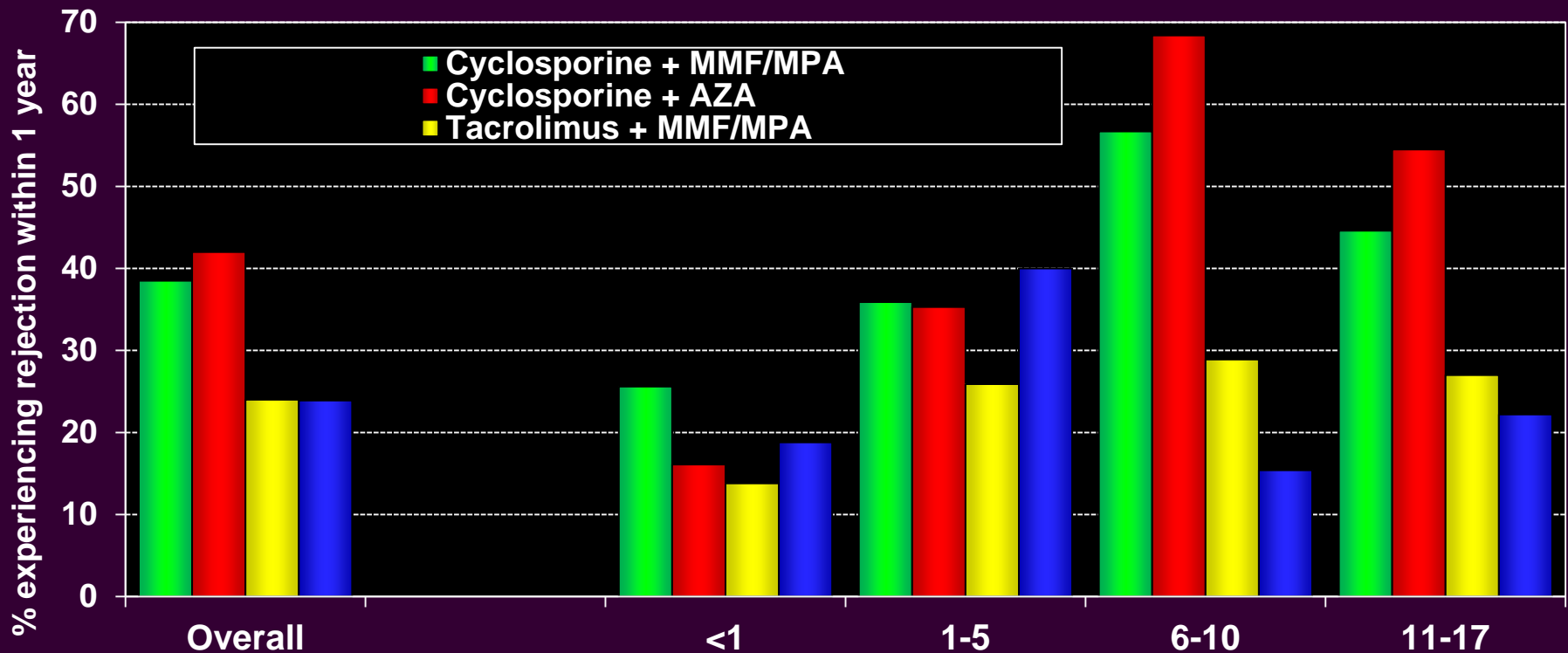
CyA + MMF/MPA vs. TAC + MMF/MPA for Overall, <1 and 11-17 years were significant at $p < 0.05$. No other pair-wise comparisons were significant at $p < 0.05$.

Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Maintenance Immunosuppression (Follow-ups: July 2004 – June 2012)

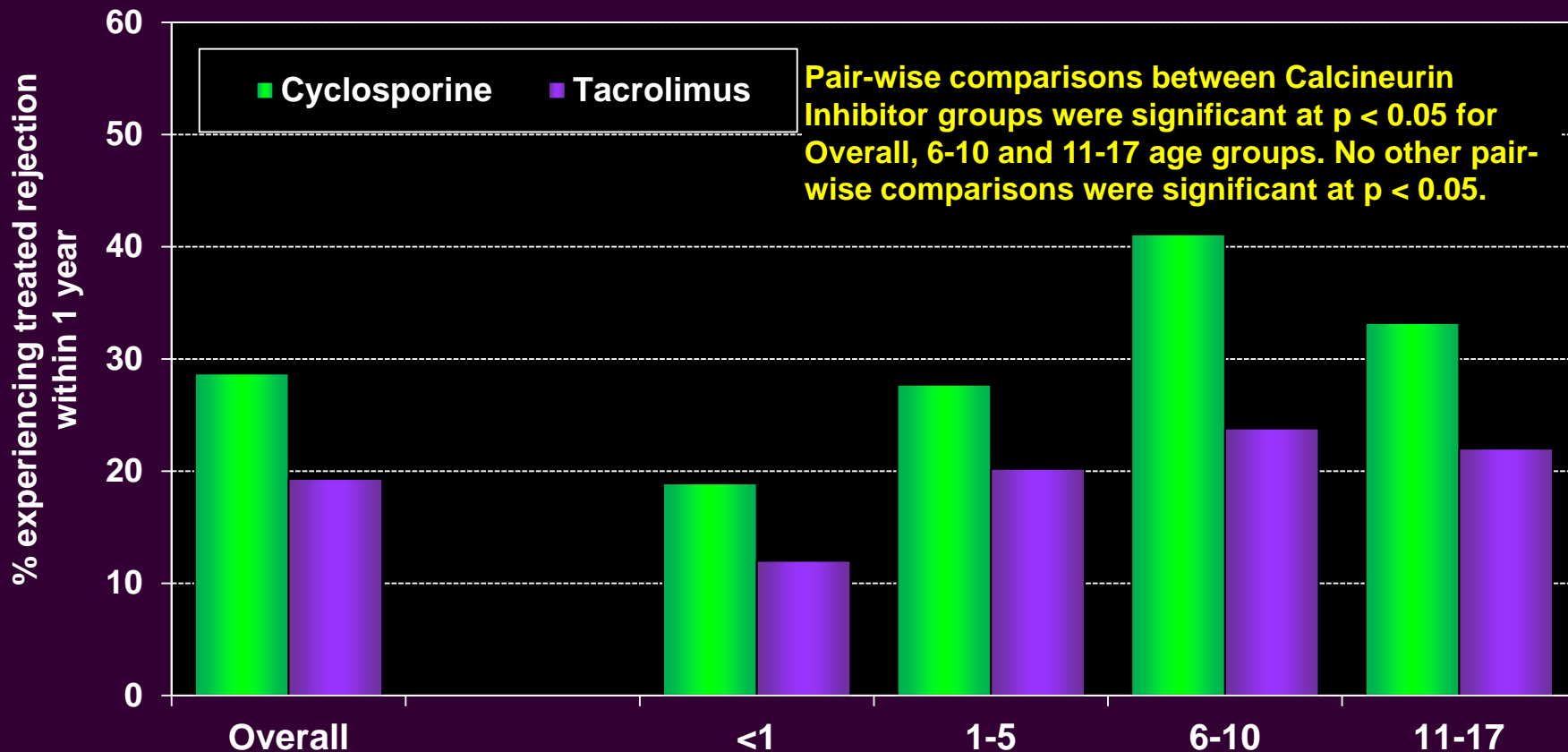


CyA + MMF/MPA vs. TAC + MMF/MPA and CyA + AZA vs. TAC + MMF/MPA for Overall, 6-10 and 11-17 years were significant at $p < 0.05$. No other pair-wise comparisons were significant at $p < 0.05$.

Analysis is limited to patients who were alive at the time of the follow-up

Pediatric Heart Transplants

Percentage Experiencing Treated Rejection between Discharge and 1-Year Follow-Up by Calcineurin Inhibitor Use at Discharge
(Follow-ups: July 2004 – June 2012)

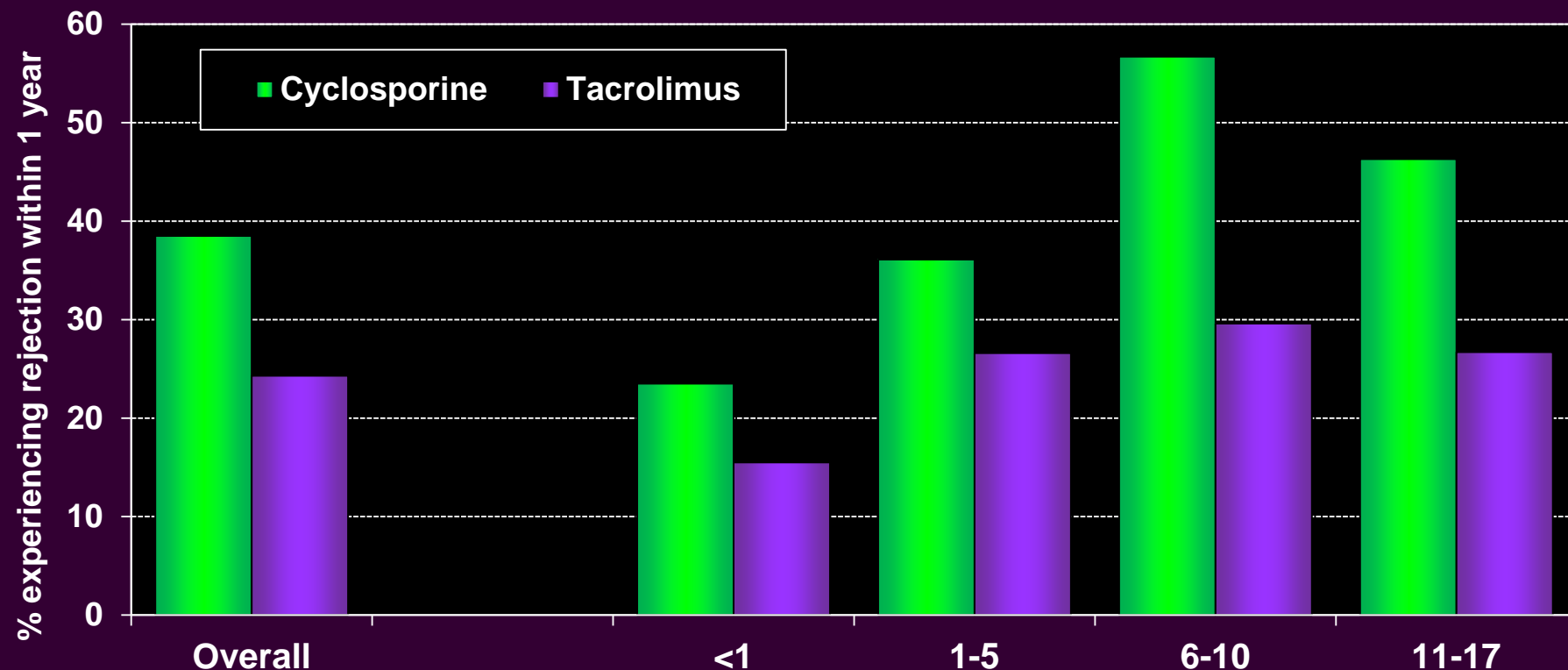


Analysis is limited to patients who were alive at the time of the follow-up

Treated rejection = Recipient was reported to (1) have at least one acute rejection episode that was treated with an anti-rejection agent; or (2) have been hospitalized for rejection.

Pediatric Heart Transplants

Percentage Experiencing Any Rejection between Discharge and 1-Year Follow-Up by Calcineurin Inhibitor Use at Discharge
(Follow-ups: July 2004 – June 2012)



Pair-wise comparisons between Calcineurin Inhibitor groups were significant at $p < 0.05$ for Overall, 6-10 and 11-17 age groups. No other pair-wise comparisons were significant at $p < 0.05$.

Analysis is limited to patients who were alive at the time of the follow-up

Any rejection = Recipient was reported to (1) have at least one acute rejection episode; or (2) have been hospitalized for rejection.



Pediatric Heart Transplants

Freedom from Coronary Artery Vasculopathy

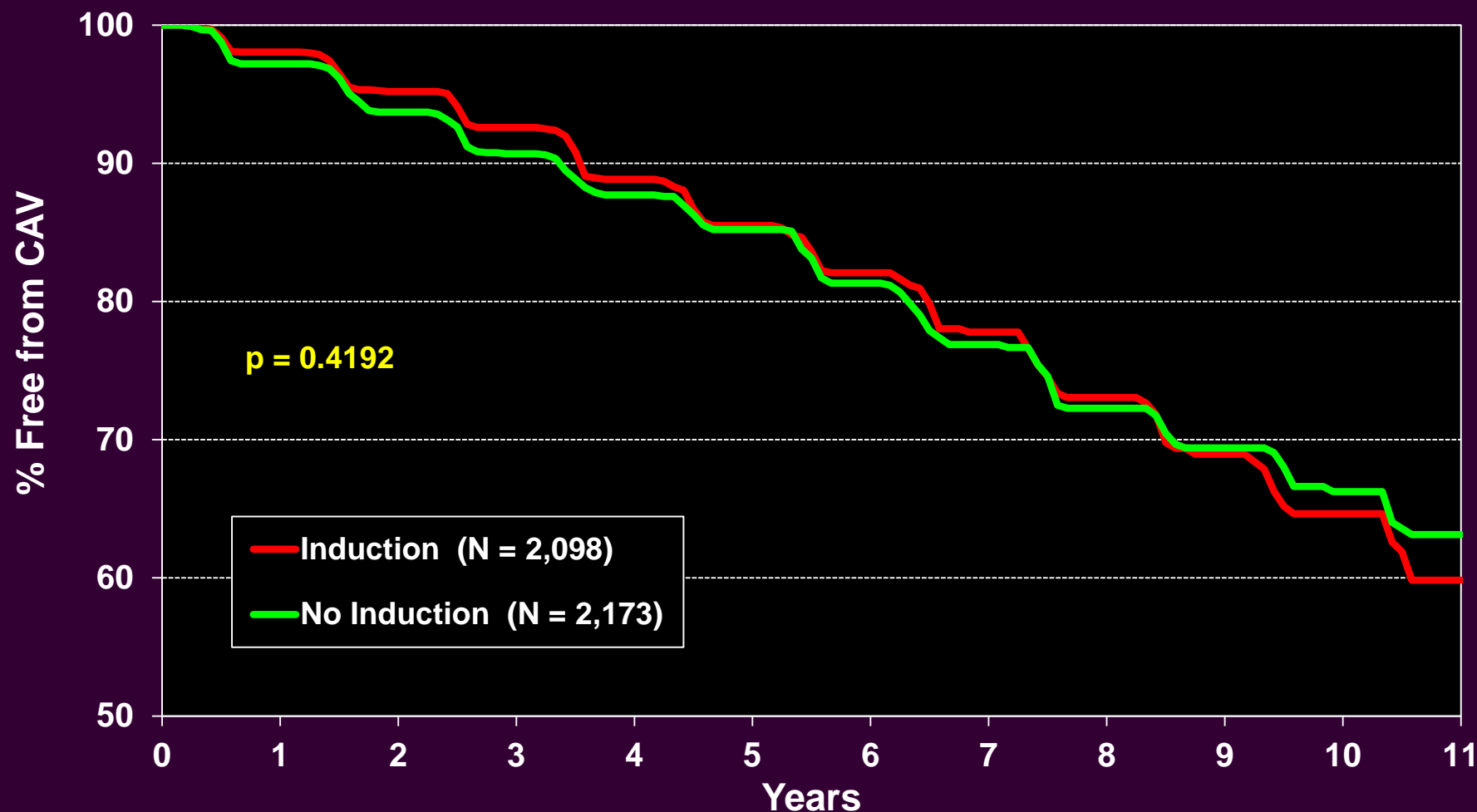
(Follow-ups: April 1994 – June 2012)





Pediatric Heart Transplants

Freedom from Coronary Artery Vasculopathy Stratified by Induction (Follow-ups: April 1994 – June 2012)

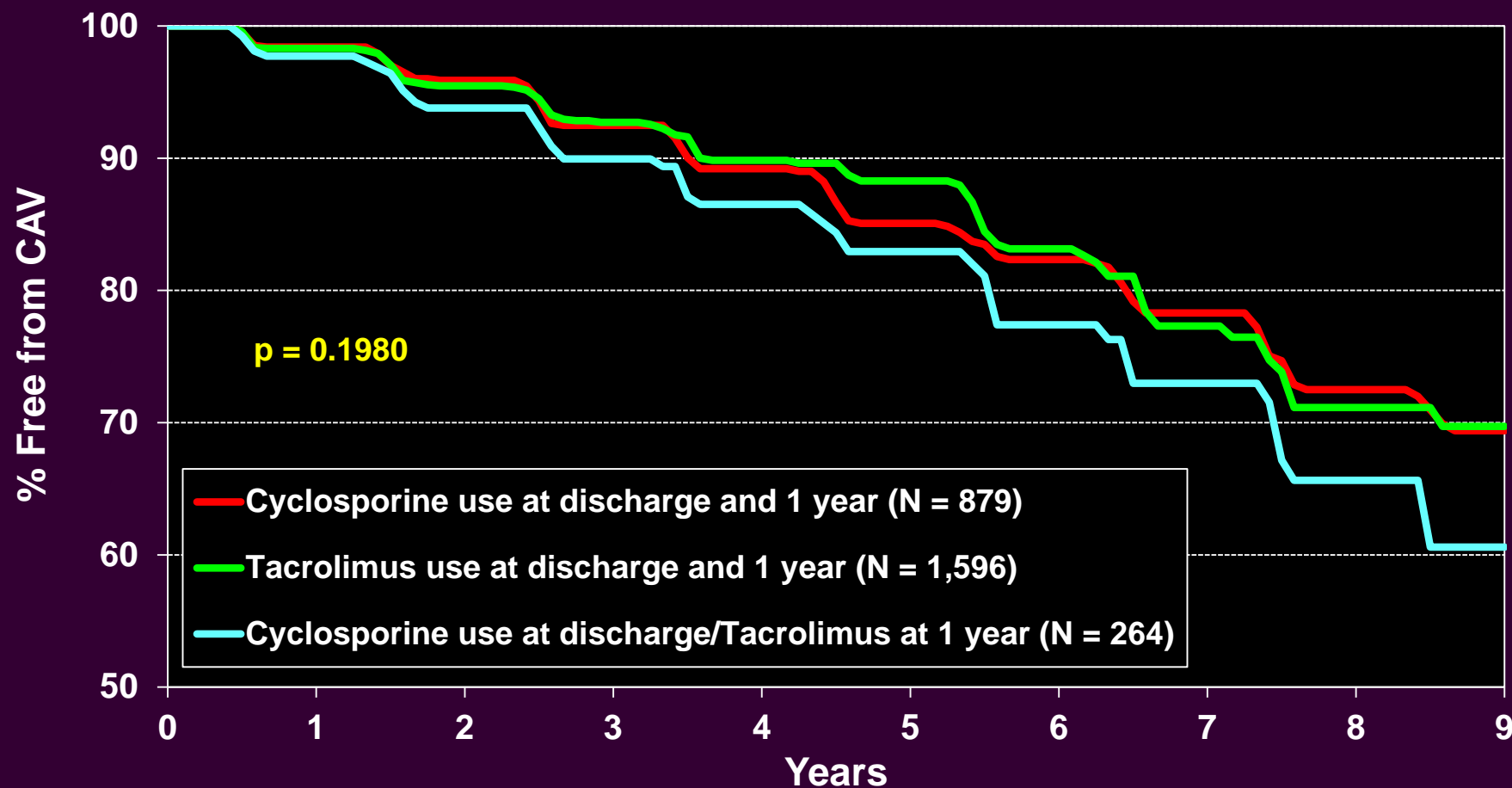




Pediatric Heart Transplants

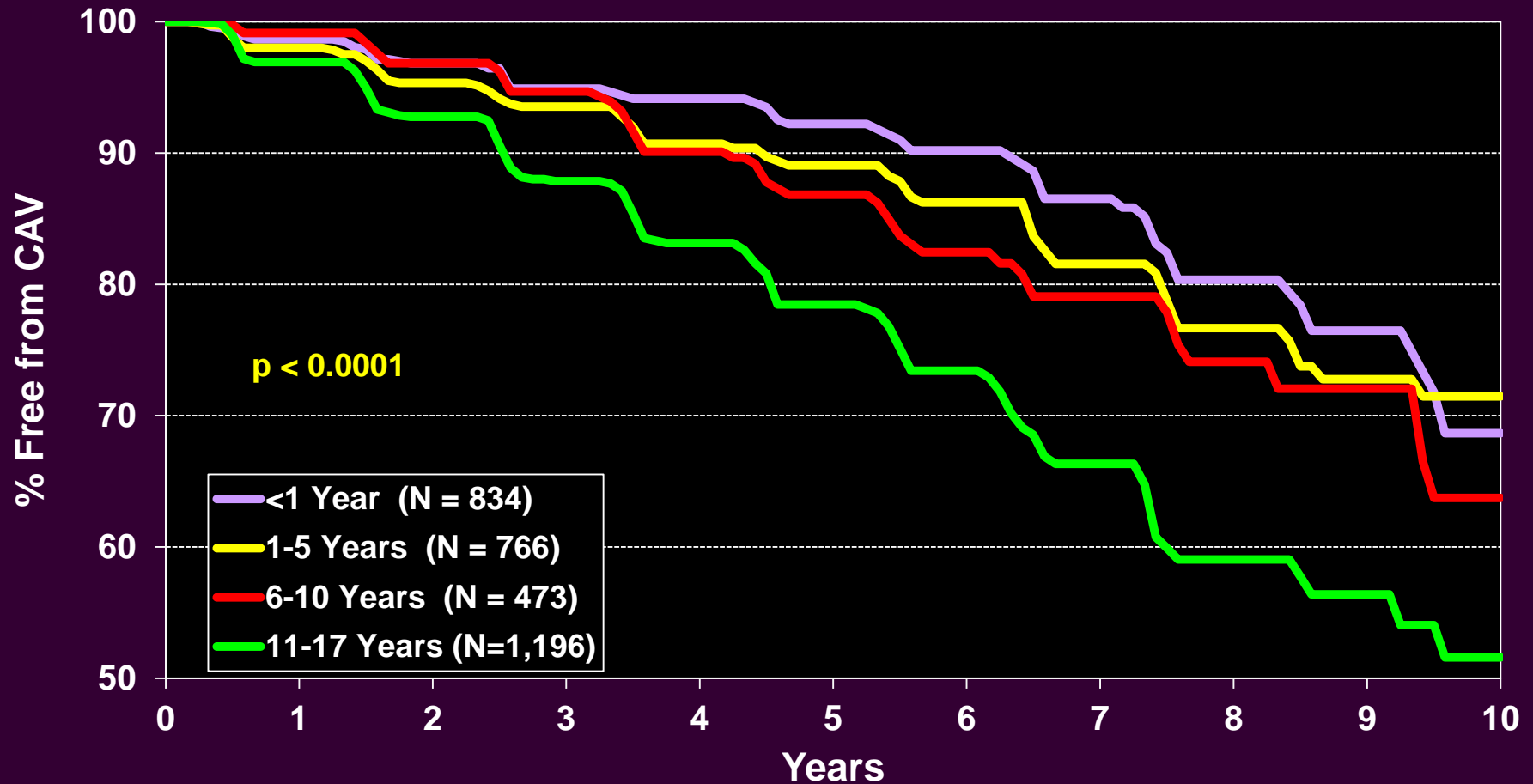
Freedom from Coronary Artery Vasculopathy Stratified by Calcineurin Inhibitor Use (Follow-ups: 2000 – June 2012)

Conditional on Survival to 1 Year



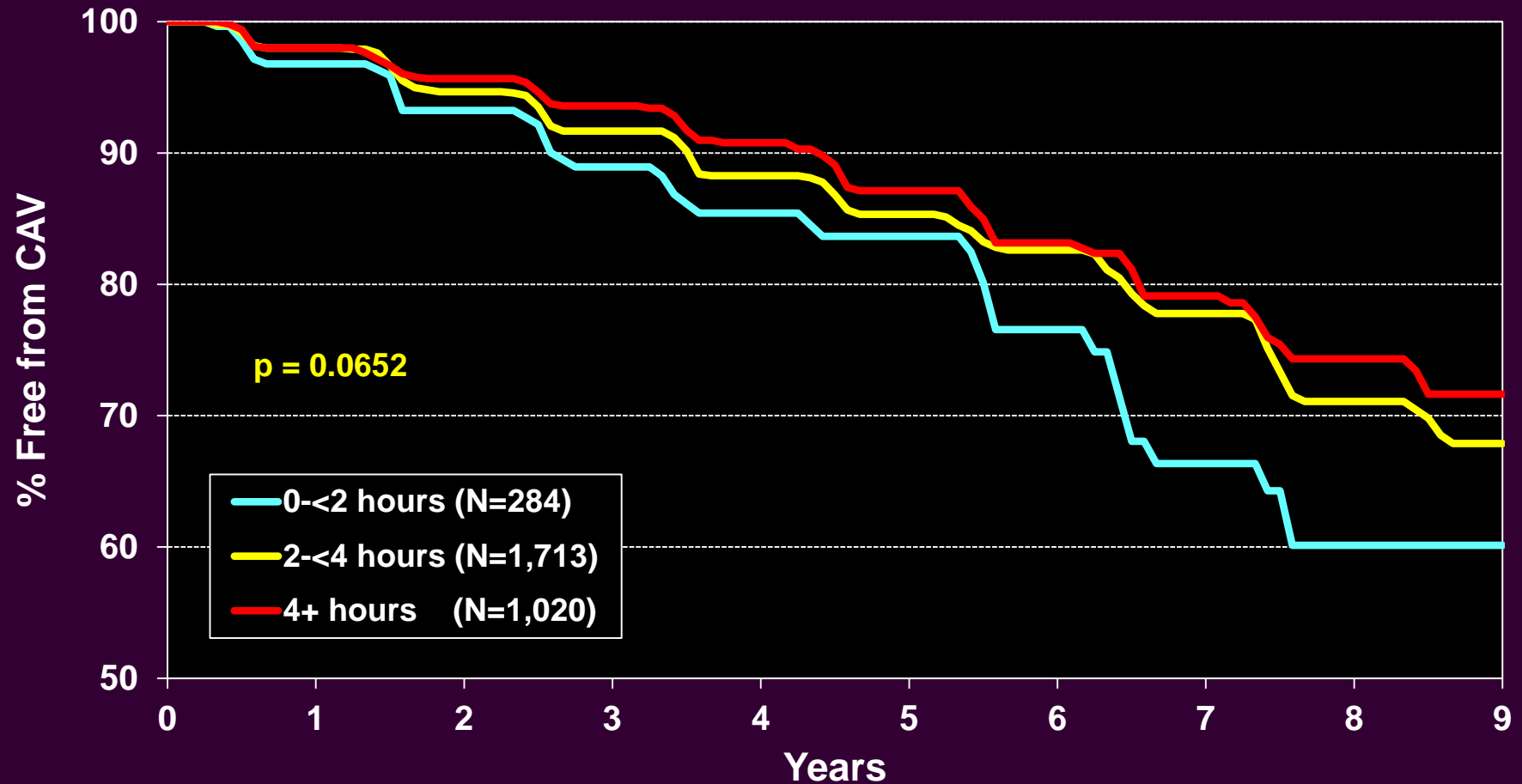
Pediatric Heart Transplants

Freedom from Coronary Artery Vasculopathy by Age Group (Follow-ups: 2000 – June 2012)



Pediatric Heart Transplants

Freedom from Coronary Artery Vasculopathy by Ischemia Time (Follow-ups: 2000 – June 2012)

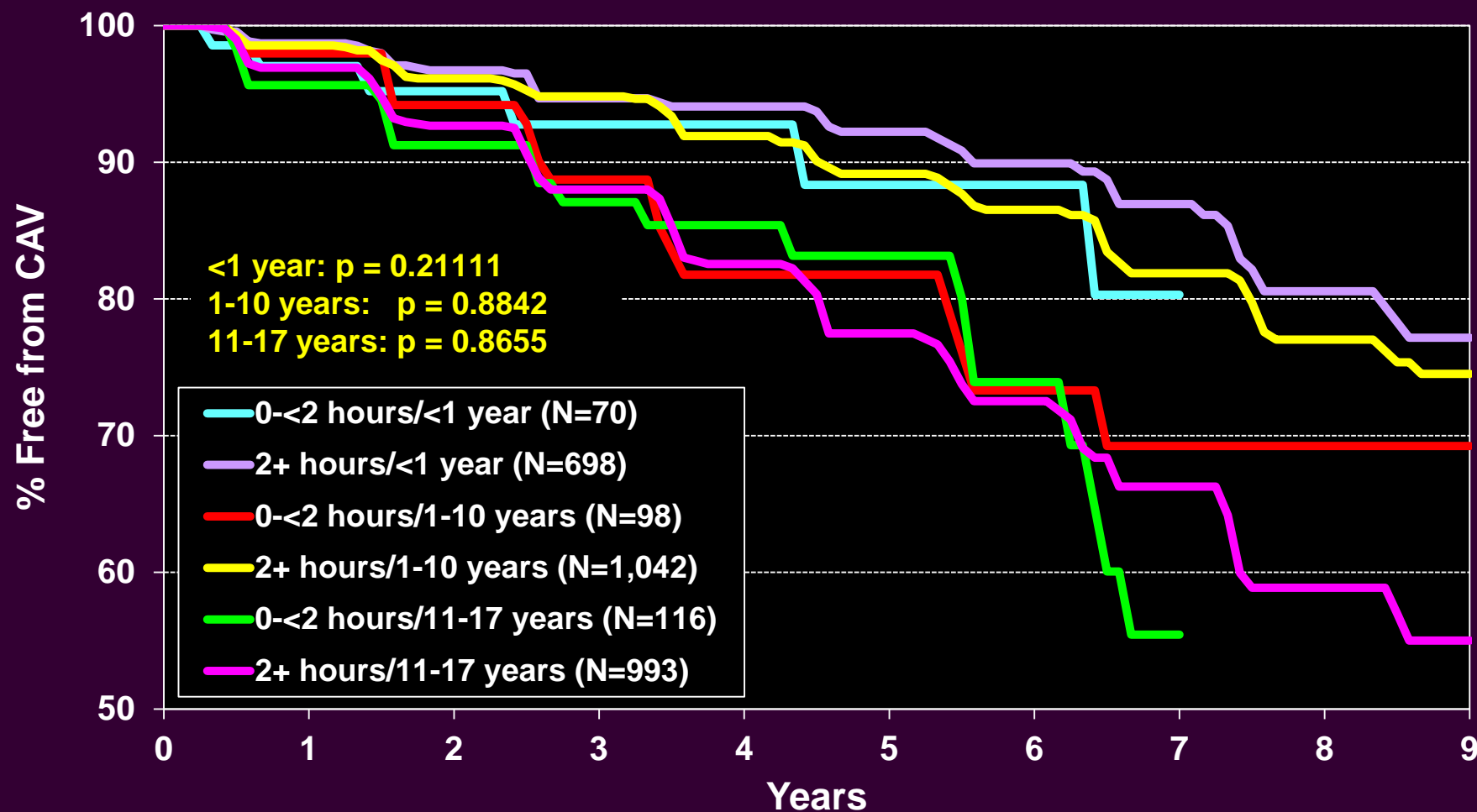




Pediatric Heart Transplants

Freedom from Coronary Artery Vasculopathy

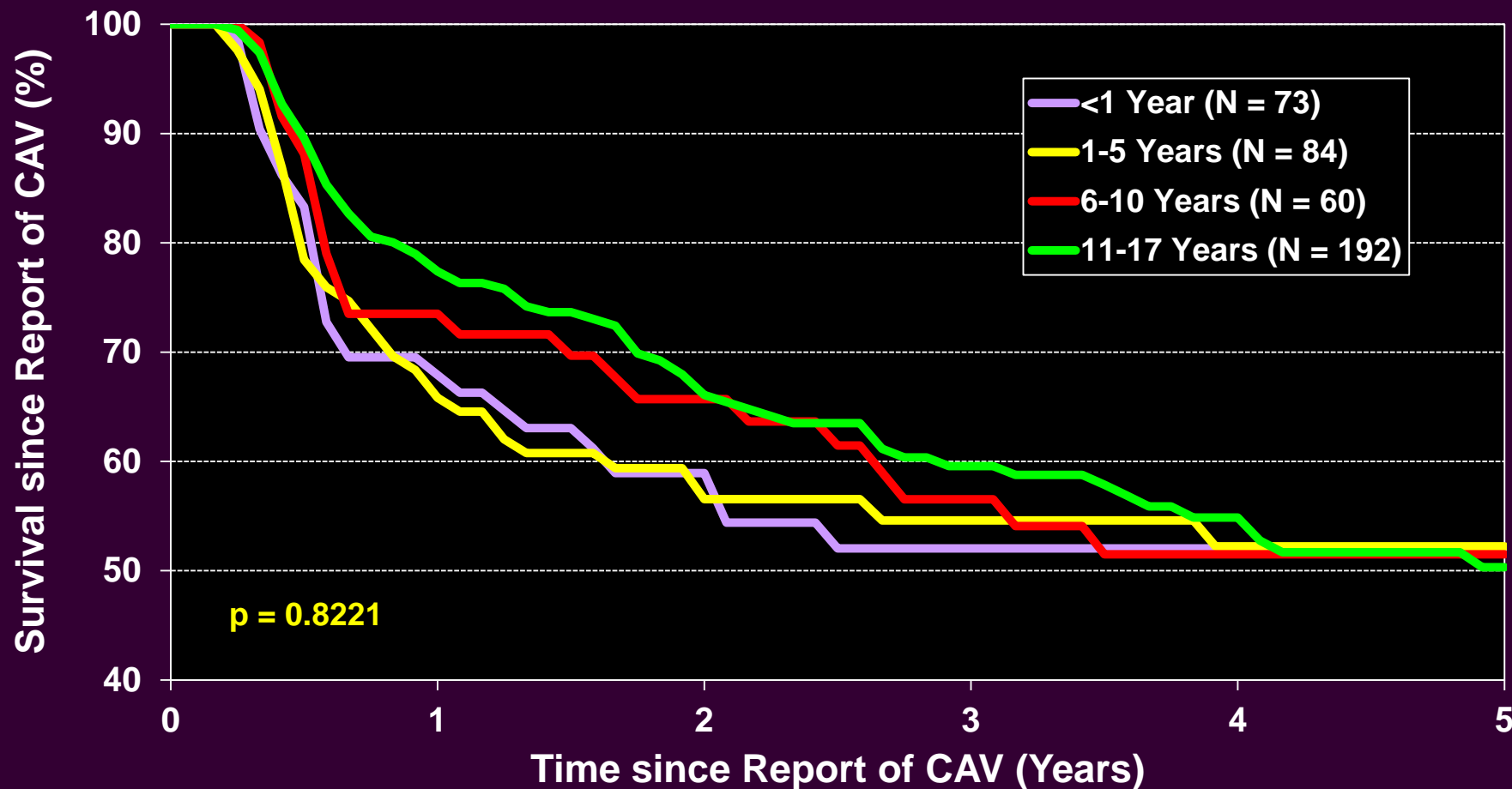
by Ischemia Time and Recipient Age (Follow-ups: 2000 – June 2012)





Pediatric Heart Transplants

Graft Survival Following Report of Coronary Artery Vasculopathy by Age Group (Follow-ups: 2000 – June 2012)

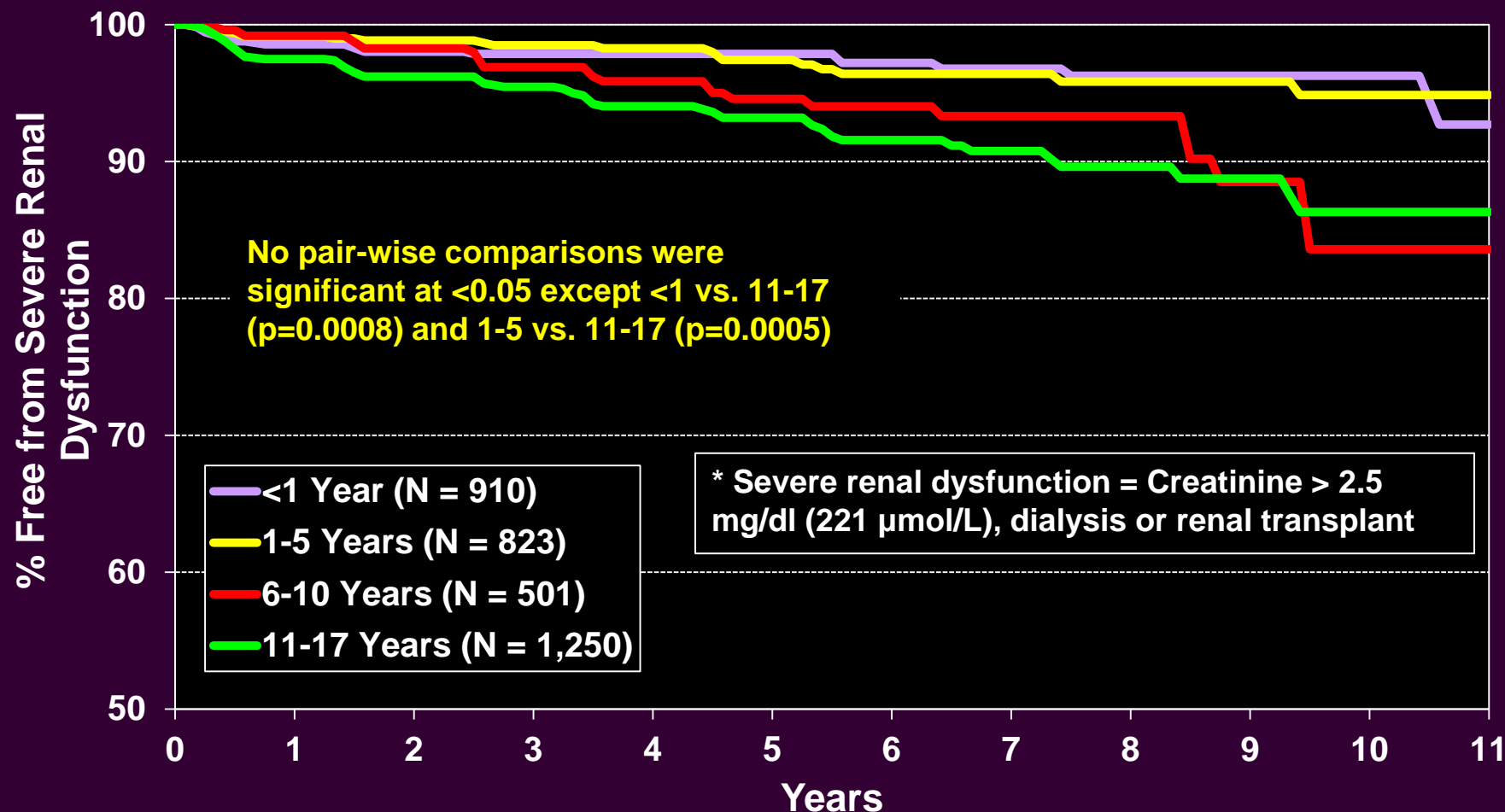




Pediatric Heart Transplants

Freedom from Severe Renal Dysfunction* by Age Group

(Follow-ups: 2000 – June 2012)

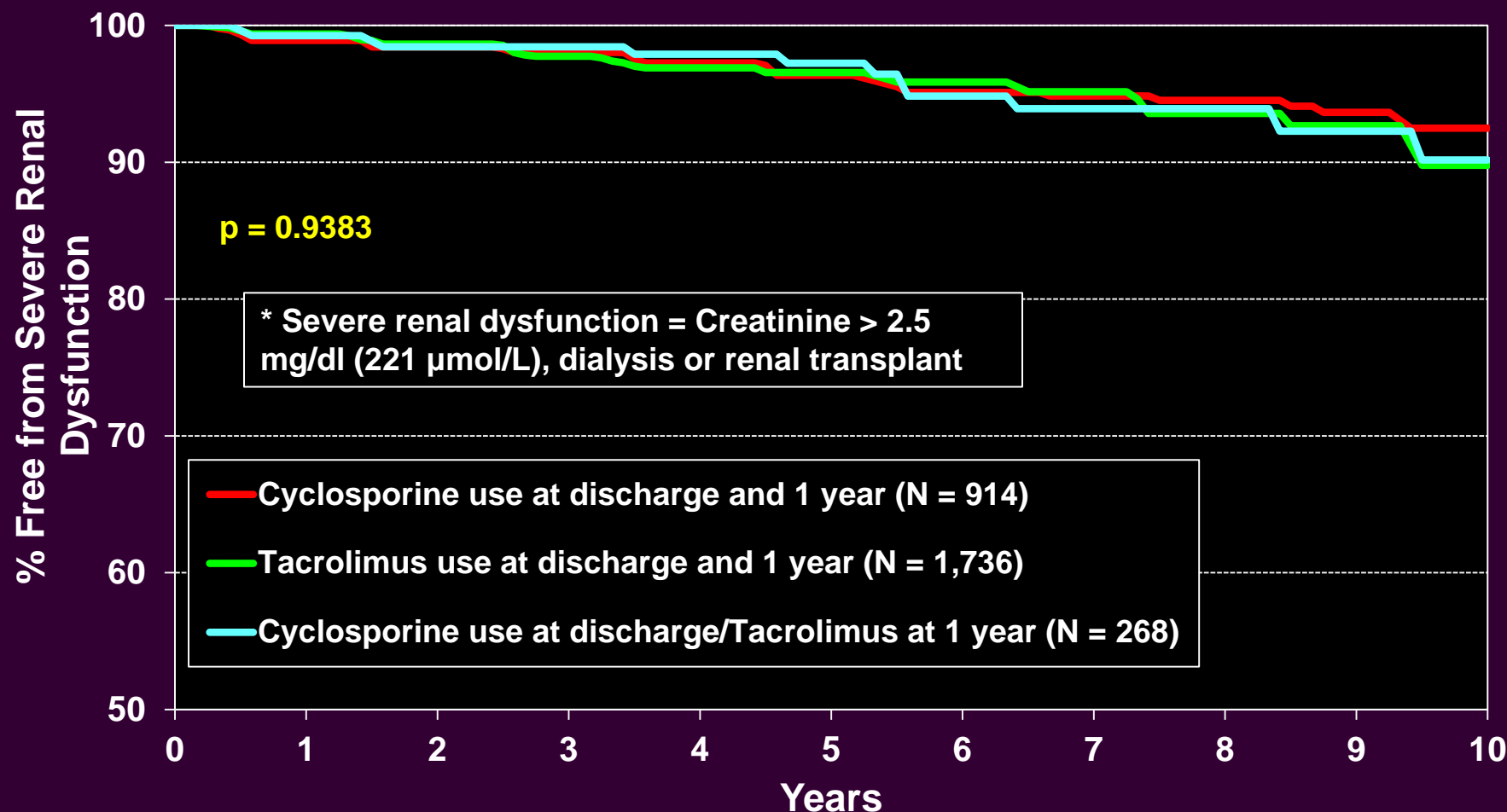




Pediatric Heart Transplants

Freedom from Severe Renal Dysfunction* by Calcineurin Inhibitor Use (Follow-ups: 2000 – June 2012)

Conditional on Survival to 1 Year

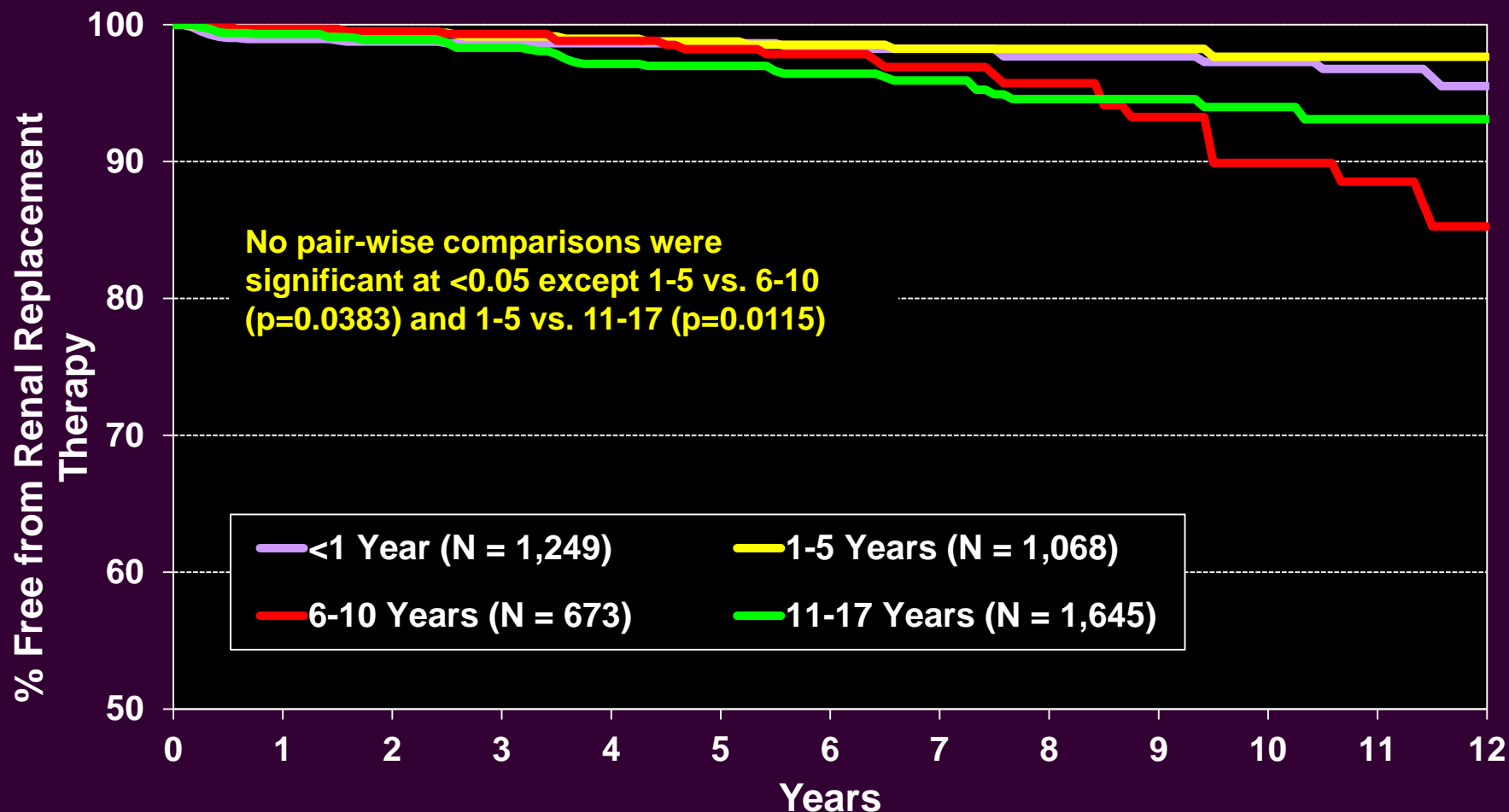




Pediatric Heart Transplants

Freedom from Renal Replacement Therapy by Age Group

(Follow-ups: April 1994 – June 2012)





Pediatric Heart Transplants

Post Transplant Malignancy (Follow-ups: April 1994 – June 2012) Cumulative Morbidity Rates in Survivors

Malignancy/Type		1-Year Survivors	5-Year Survivors	10-Year Survivors
No Malignancy		4,676 (98.4%)	2,091 (95%)	668 (90.5%)
Malignancy (all types combined)		78 (1.6%)	109 (5.0%)	70 (9.5%)
<i>Malignancy Type*</i>	<i>Lymphoma</i>	72	103	67
	<i>Other</i>	5	7	4
	<i>Skin</i>	0	1	1
	<i>Type Not Reported</i>	1	0	0

*Recipients may have experienced more than one type of malignancy so sum of individual malignancy types may be greater than total number with malignancy.



Pediatric Heart Transplants

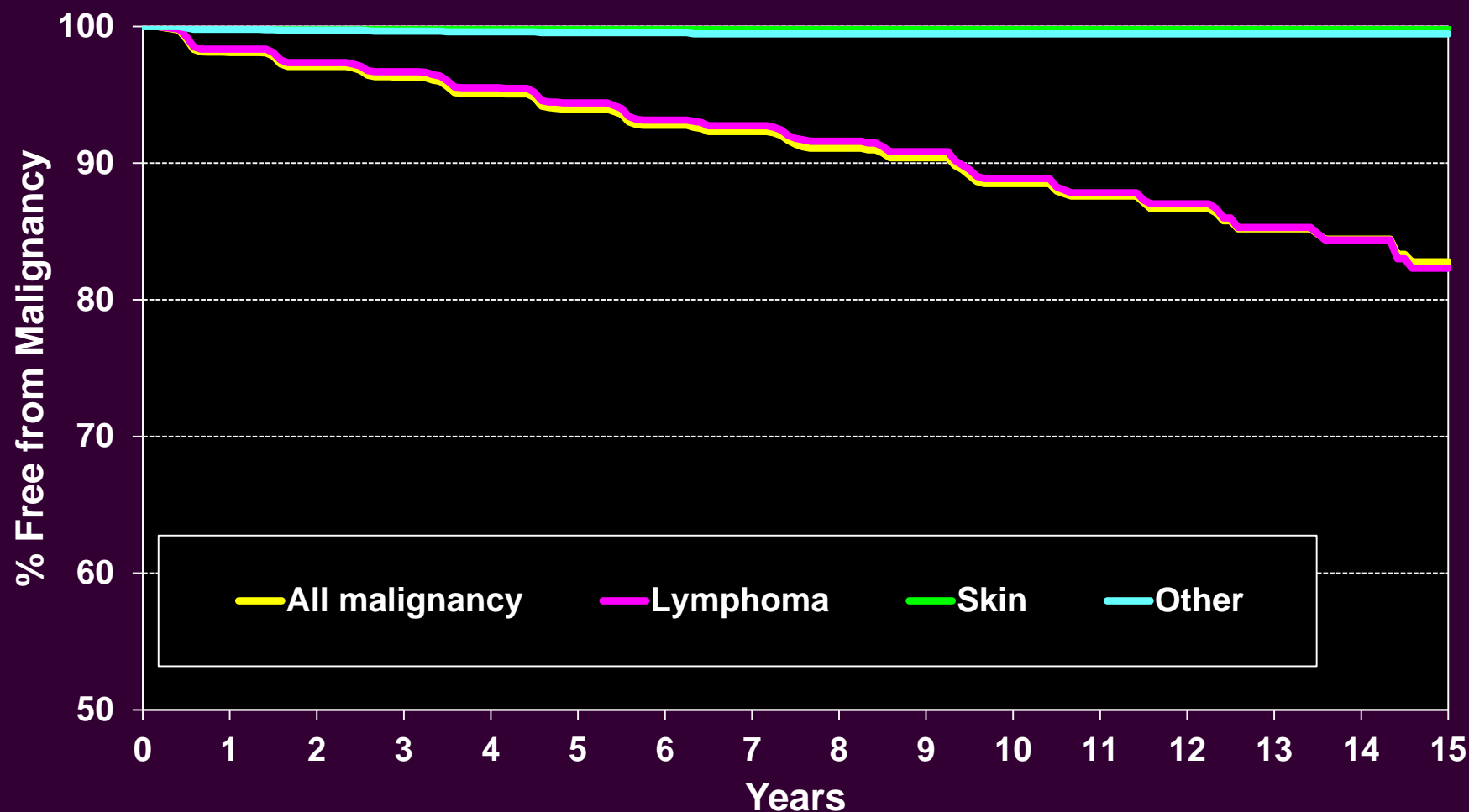
Post Transplant Malignancy (Follow-ups: April 1994 – June 2012) Cumulative Morbidity Rates in Survivors

	Malignancy/Type	Recipient Age			
		<1	1-5	6-10	11-17
1-Year Survivors	No Malignancy	1,260 (99.1%)	1,083 (98.6%)	673 (97.1%)	1,660 (98.2%)
	Malignancy*	12 (0.9%)	15 (1.4%)	20 (2.9%)	31 (1.8%)
5-Year Survivors	No Malignancy	577 (95.5%)	477 (92.4%)	346 (95.3%)	691 (96.4%)
	Malignancy*	27 (4.5%)	39 (7.6%)	17 (4.7%)	26 (3.6%)
10-Year Survivors	No Malignancy	231 (90.9%)	165 (87.3%)	91 (91.9%)	181 (92.3%)
	Malignancy*	23 (9.1%)	24 (12.7%)	8 (8.1%)	15 (7.7%)



Pediatric Heart Transplants

Freedom From Malignancy (Follow-ups: April 1994 – June 2012)

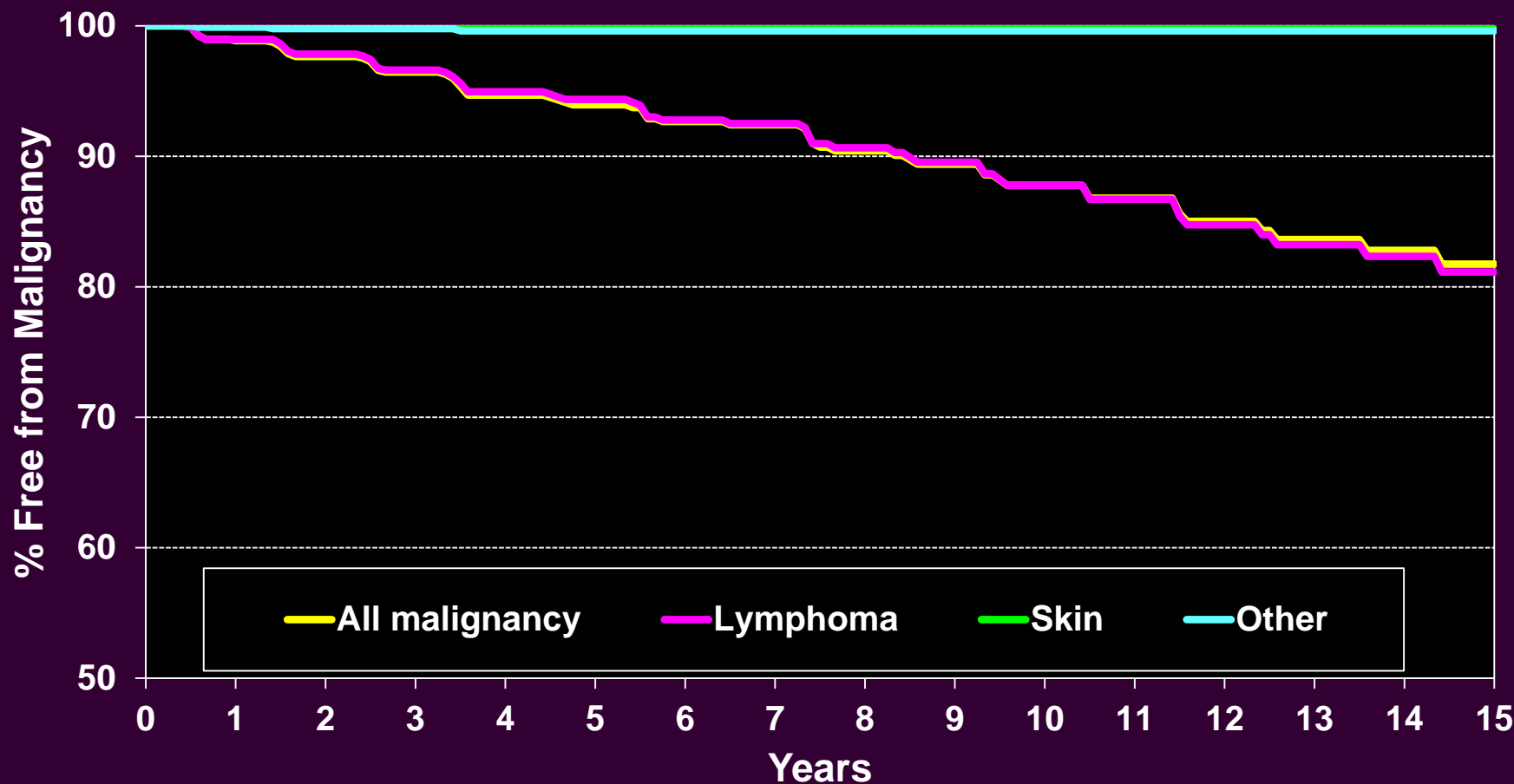




Pediatric Heart Transplants

Freedom From Malignancy (Follow-ups: April 1994 – June 2012)

Age: < 1 Year

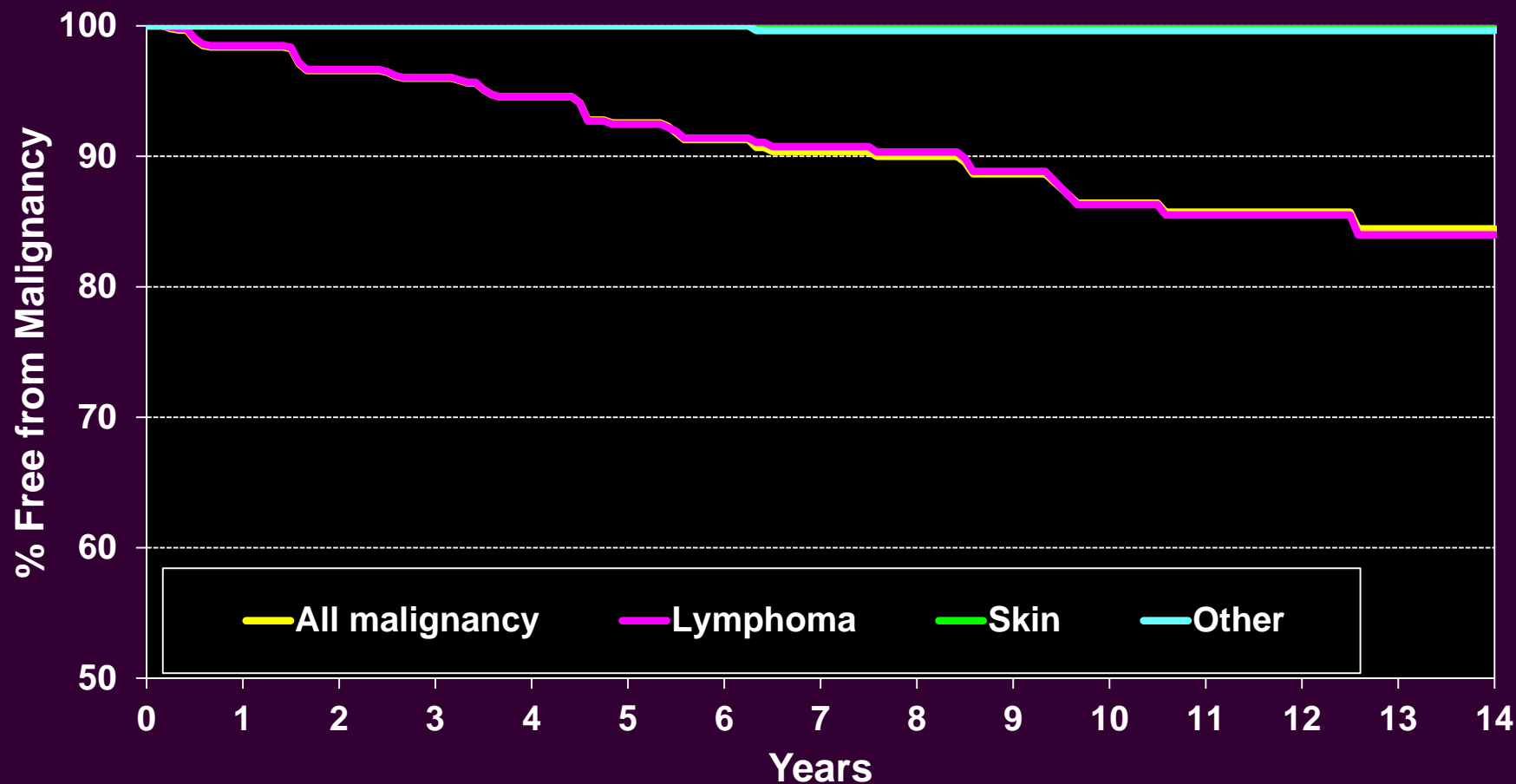




Pediatric Heart Transplants

Freedom From Malignancy (Follow-ups: April 1994 – June 2012)

Age: 1-5 Years

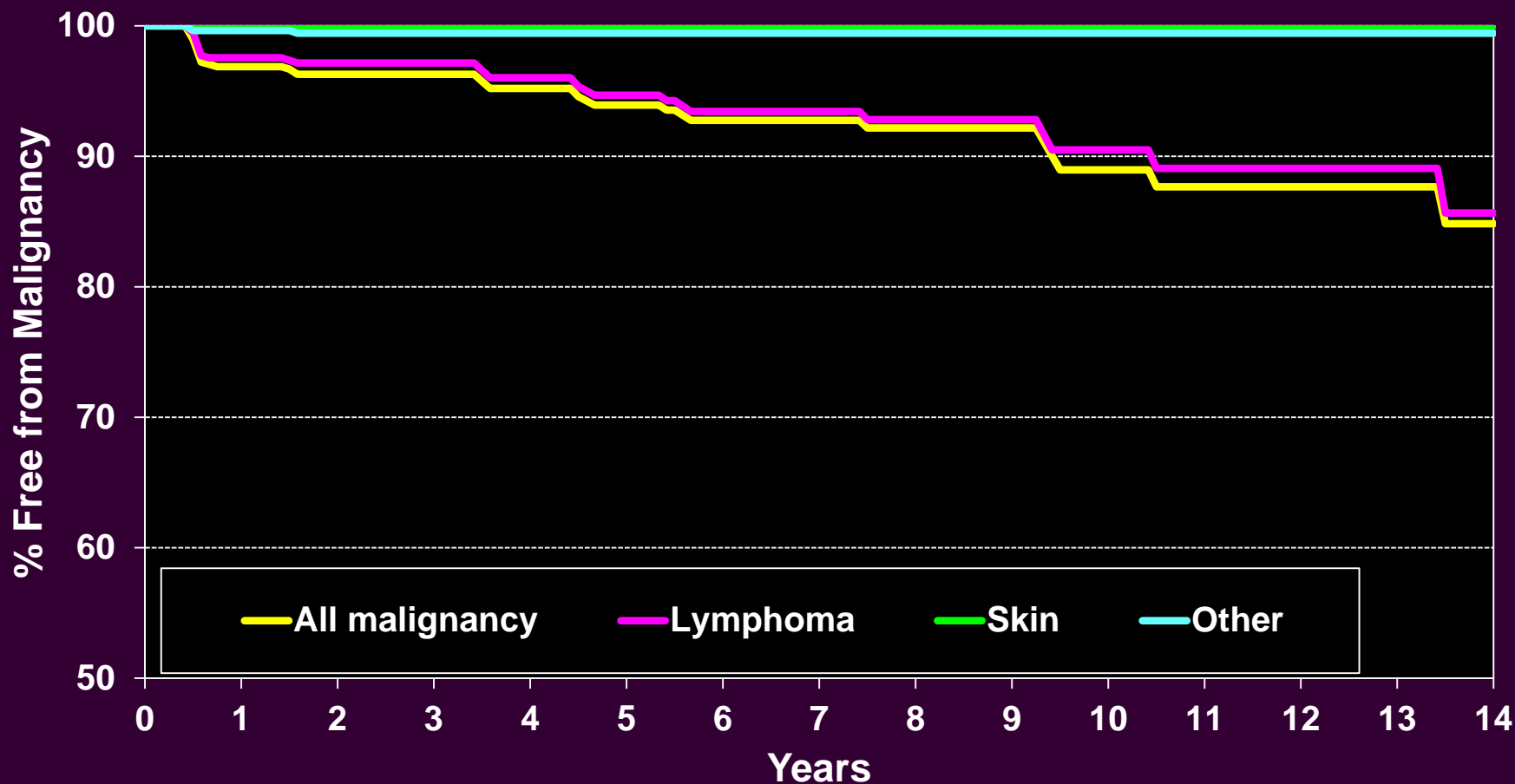




Pediatric Heart Transplants

Freedom From Malignancy (Follow-ups: April 1994 – June 2012)

Age: 6-10 Years

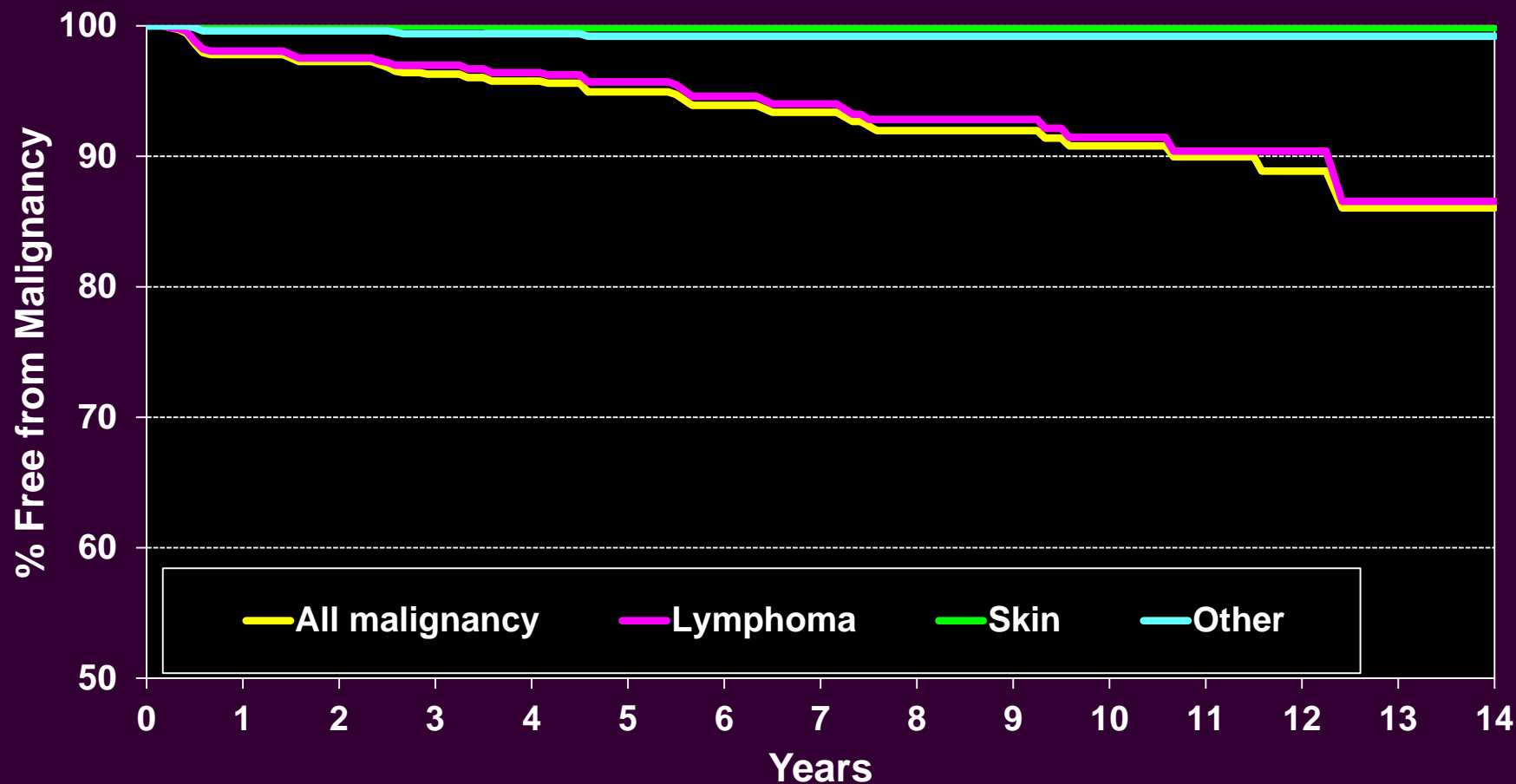




Pediatric Heart Transplants

Freedom From Malignancy (Follow-ups: April 1994 – June 2012)

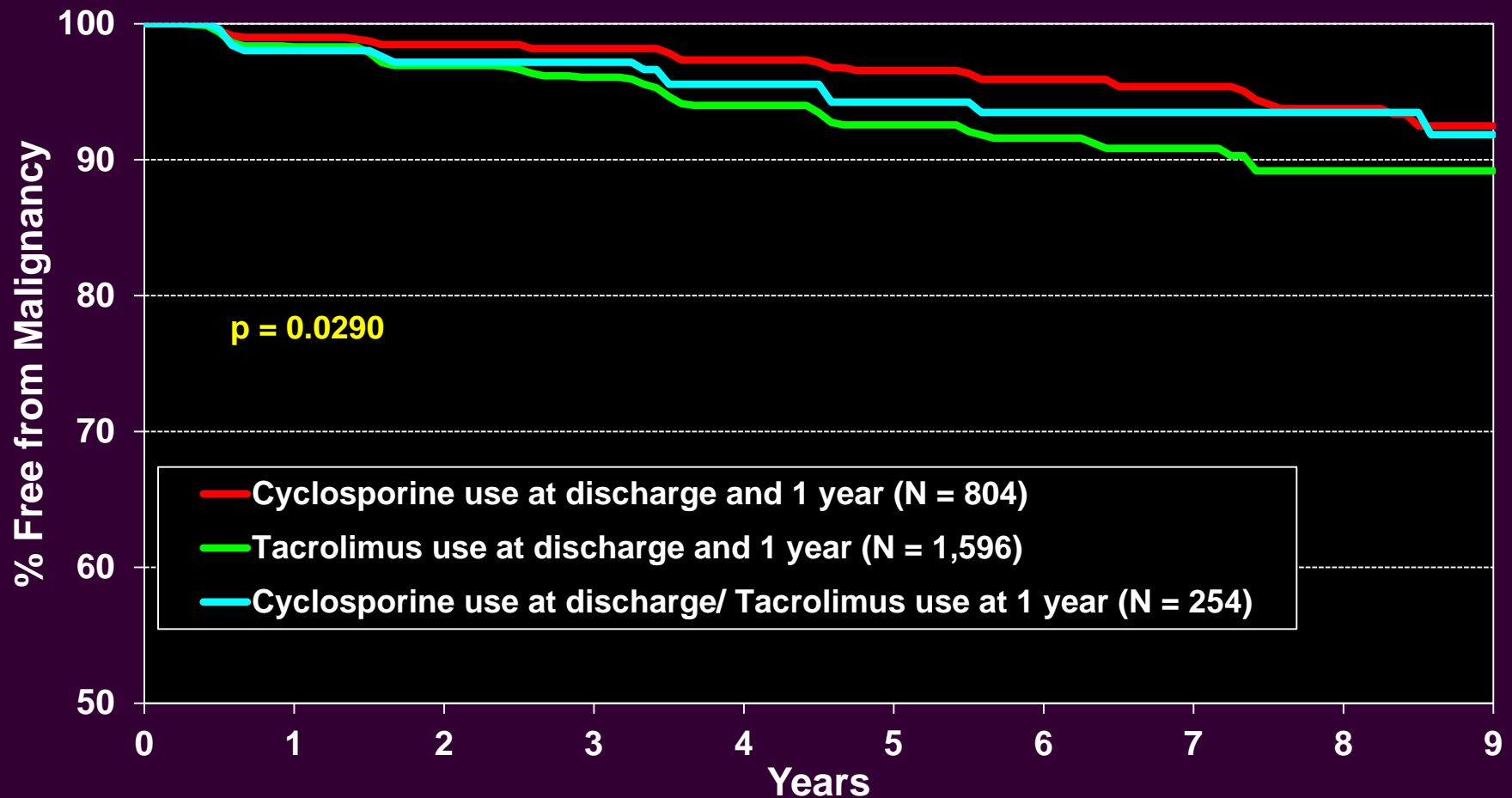
Age: 11-17 Years





Pediatric Heart Transplants

Freedom From Malignancy by Maintenance Immunosuppression
Combinations (Follow-ups: January 2000 – June 2012)
Conditional on Survival to 1 year



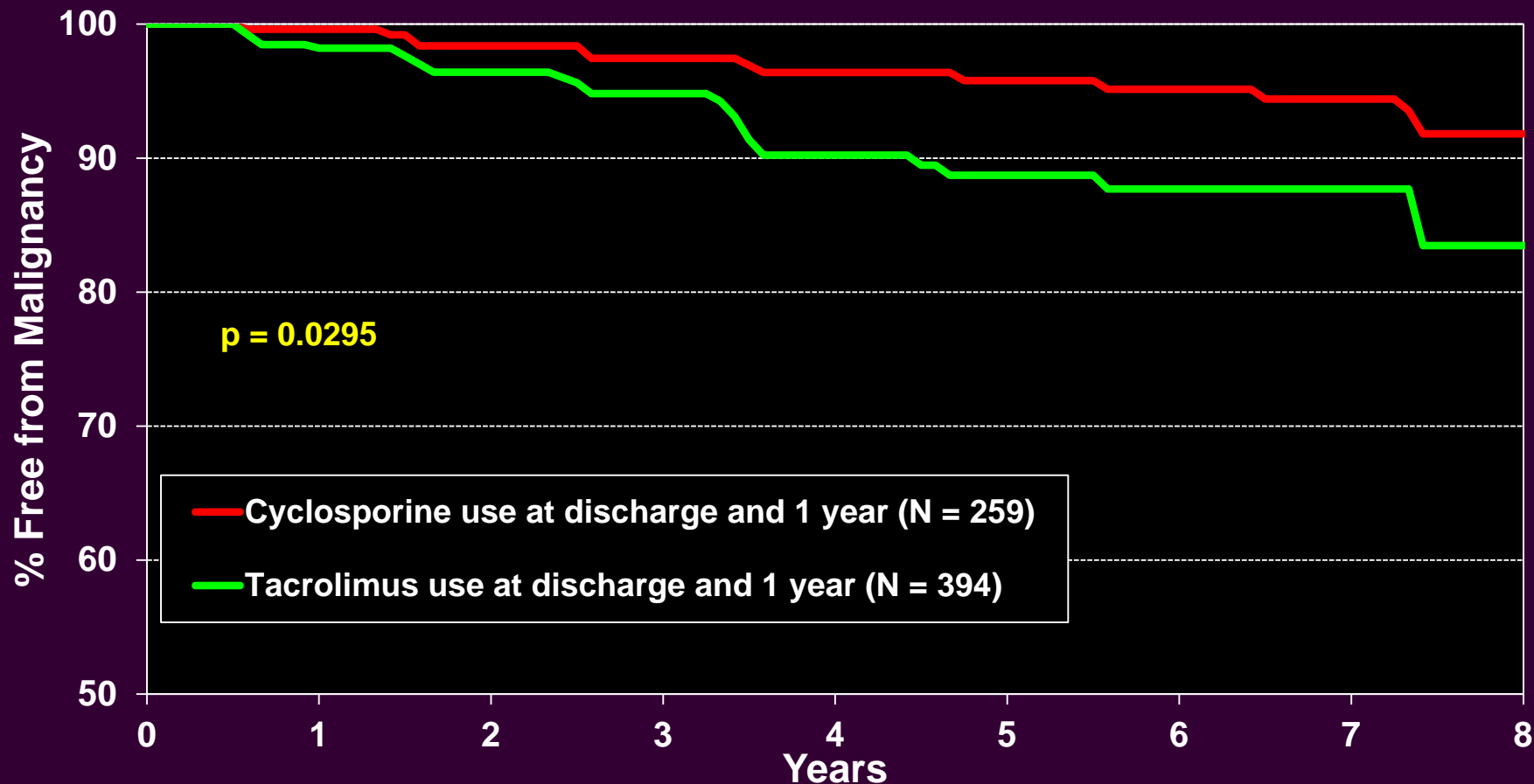


Pediatric Heart Transplants

Freedom From Malignancy by Maintenance Immunosuppression

Combinations Conditional on Survival to 1 year

Age: <1 Year (Follow-ups: January 2000 – June 2012)



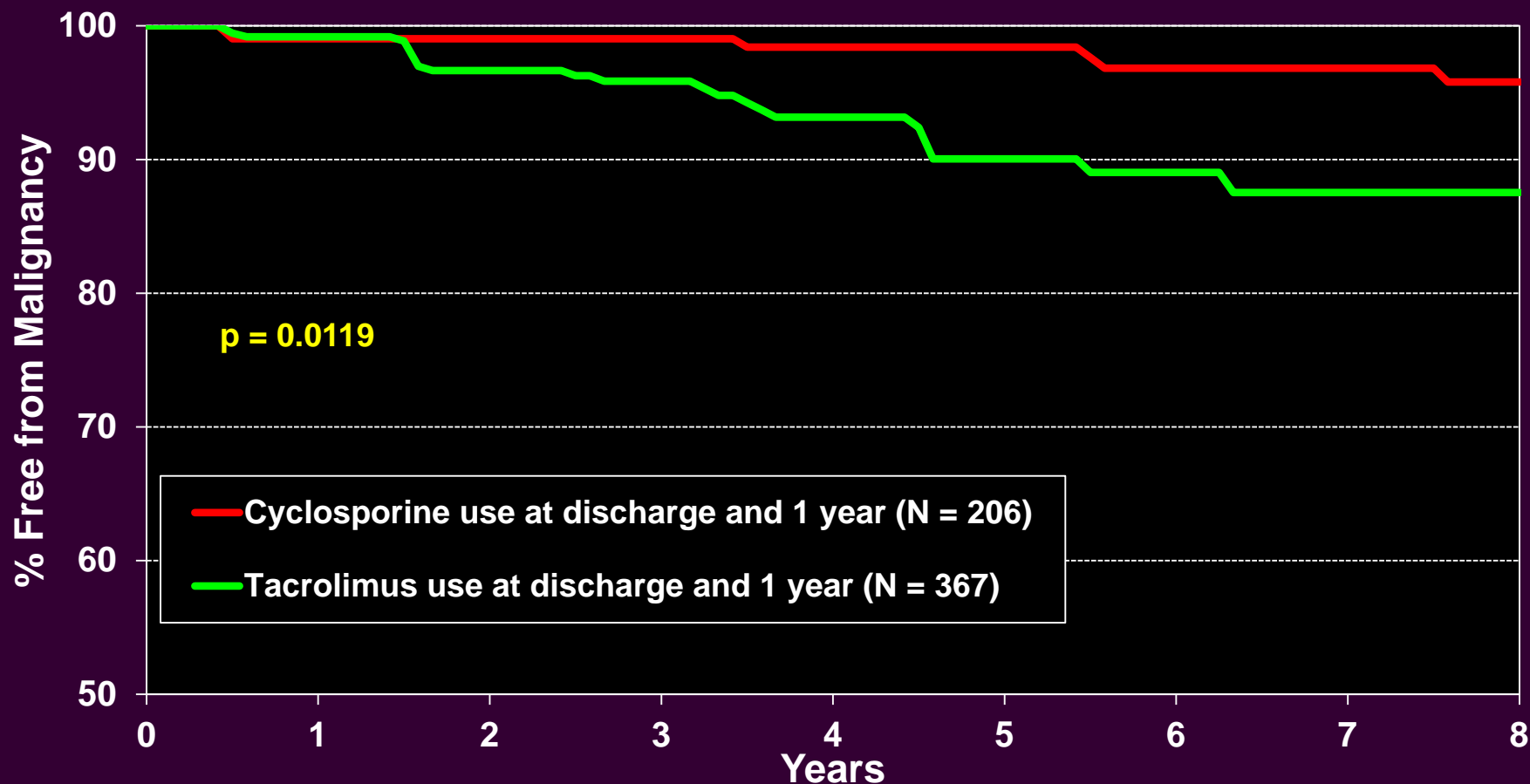


Pediatric Heart Transplants

Freedom From Malignancy by Maintenance Immunosuppression

Combinations Conditional on Survival to 1 year

Age: 1-5 Years (Follow-ups: January 2000 – June 2012)



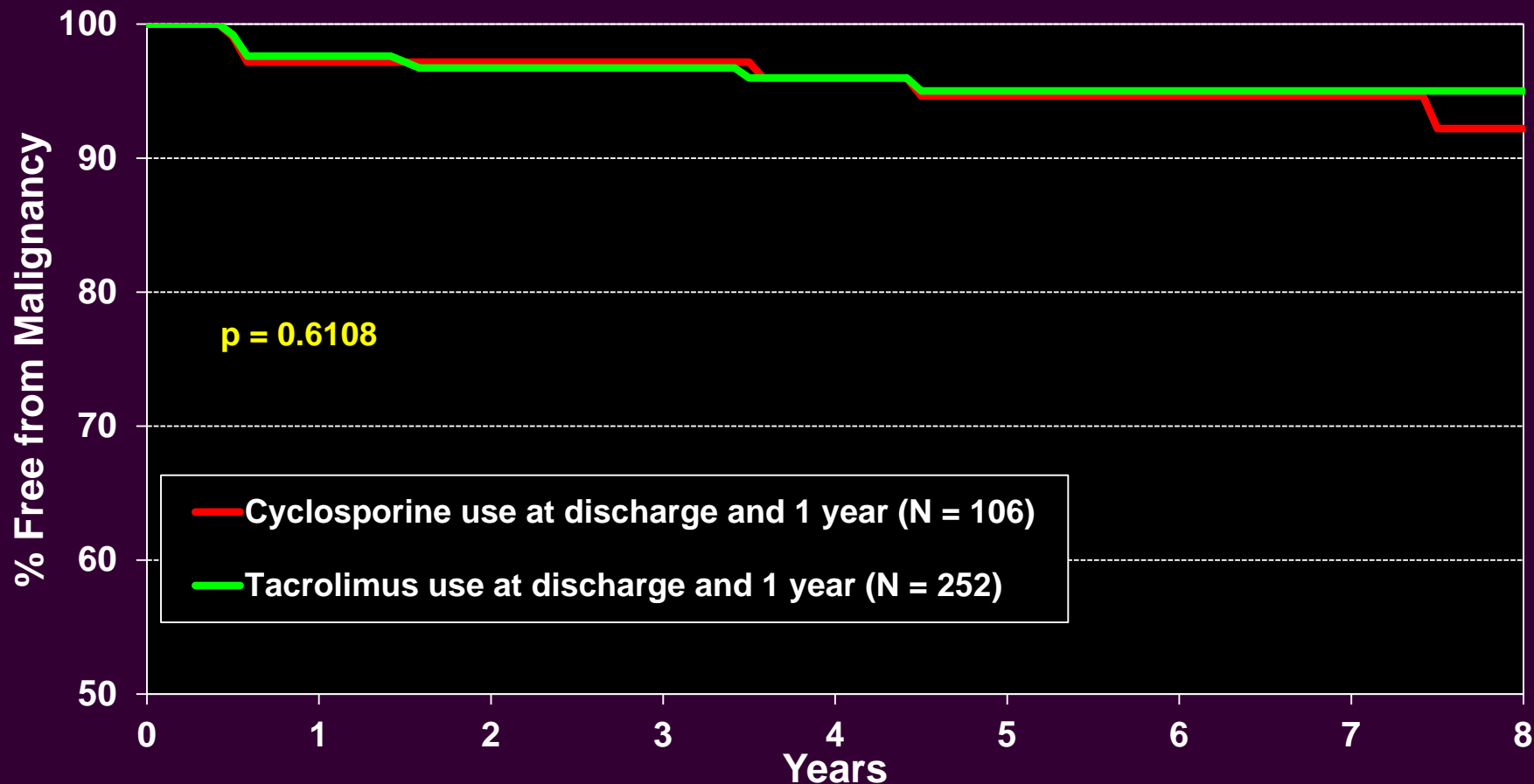


Pediatric Heart Transplants

Freedom From Malignancy by Maintenance Immunosuppression

Combinations Conditional on Survival to 1 year

Age: 6-10 Years (Follow-ups: January 2000 – June 2012)



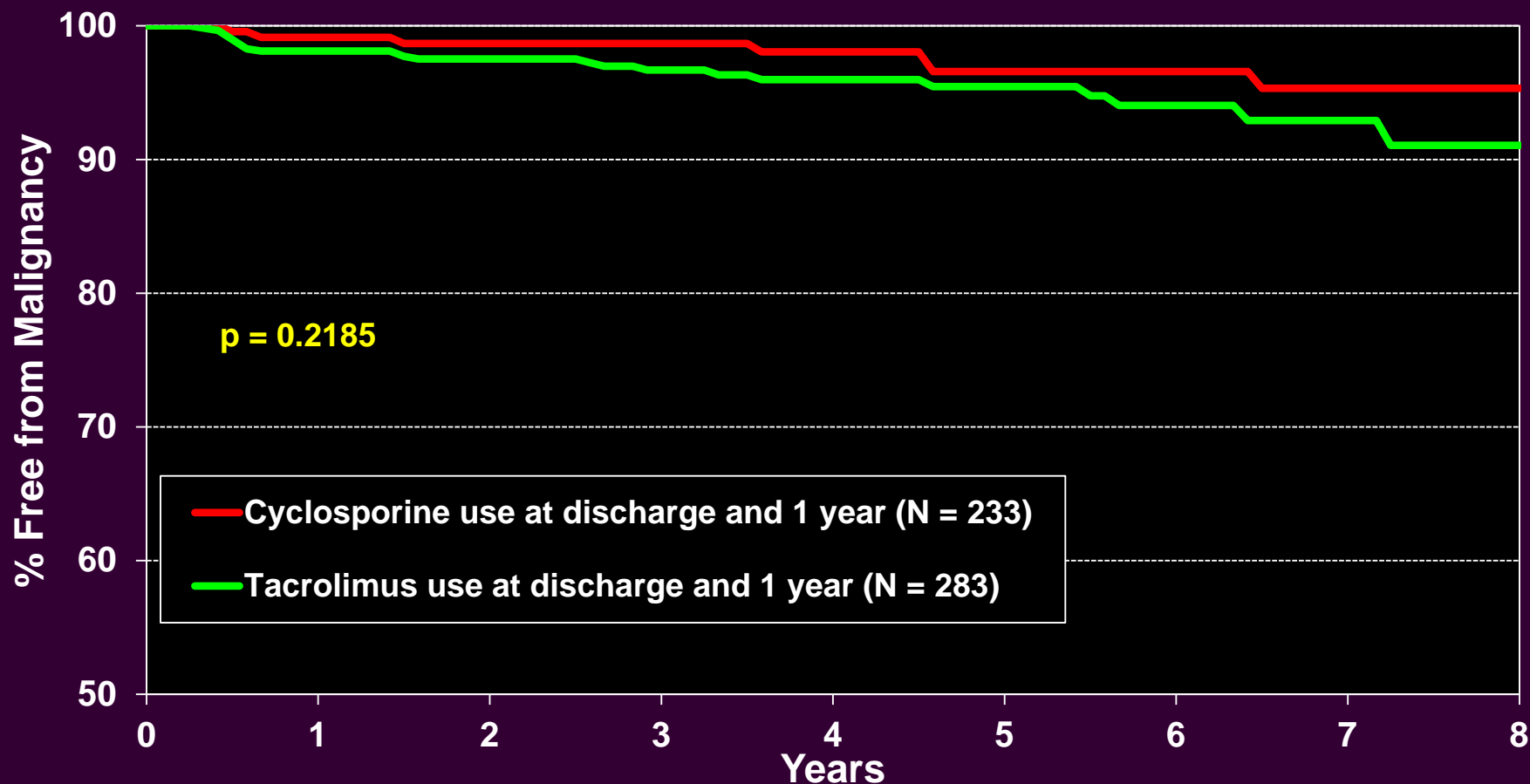


Pediatric Heart Transplants

Freedom From Malignancy by Maintenance Immunosuppression

Combinations Conditional on Survival to 1 year

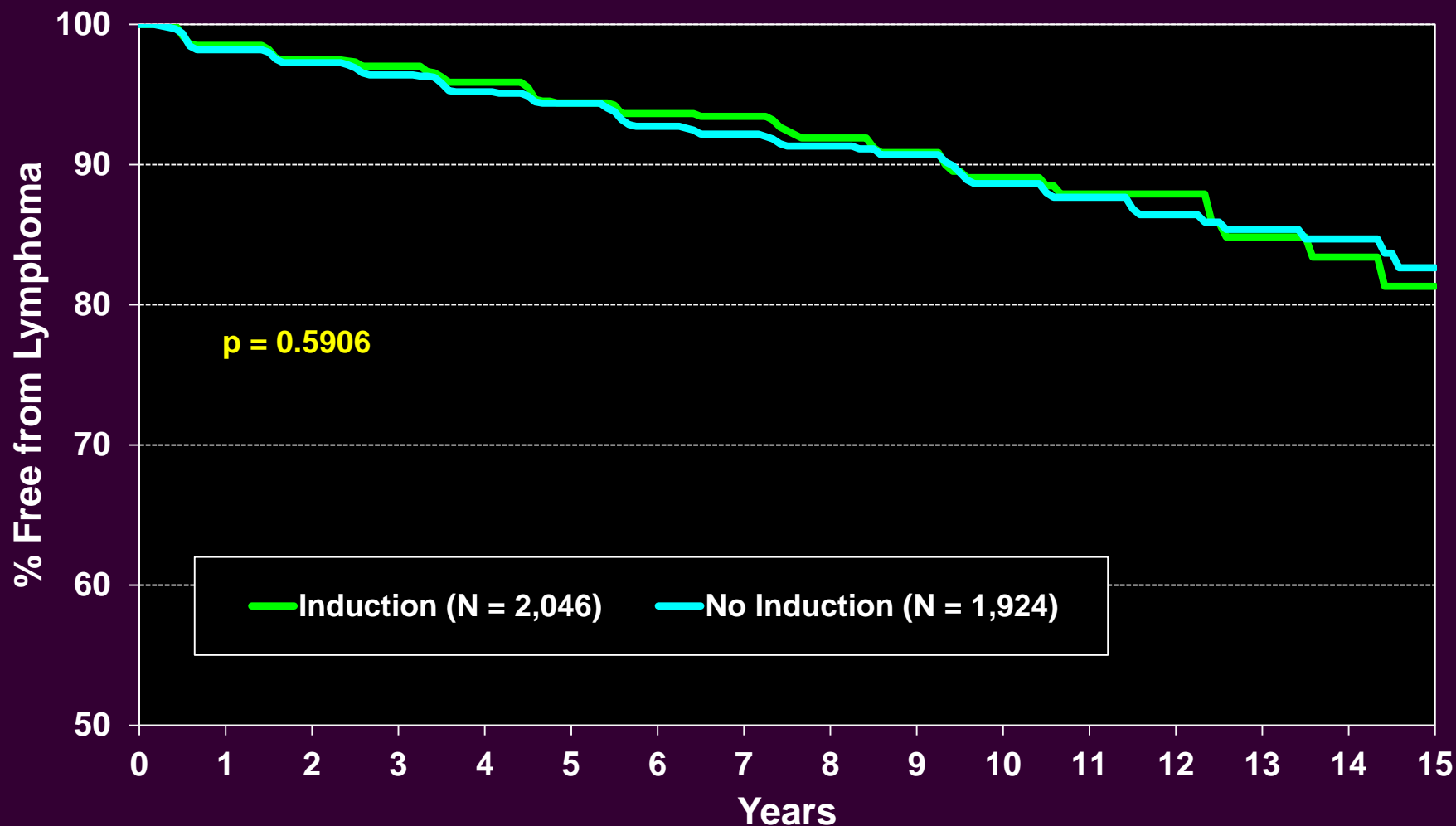
Age: 11-17 Years (Follow-ups: January 2000 – June 2012)



Pediatric Heart Transplants

Freedom From Lymphoma By Induction

(Follow-ups: April 1994 – June 2012)





Pediatric Heart Transplants

Incidence of Hypertension between 1 and 3 Years

(Transplants: January 2000 – June 2009)

Maintenance Immunosuppression at discharge and 1 year	% HTN reported between 1 and 3 years		P-value
	For Patients on drug	For Patients not on drug	
Azathioprine	19.5	24.6	0.1394
Cyclosporine	22.8	22.1	0.8243
MMF/MPA	23.5	23.0	0.8860
Prednisone	25.9	20.2	0.0862
Sirolimus/Everolimus	37.5	23.1	0.2280
Tacrolimus	23.5	22.6	0.7700



Pediatric Heart Transplants

Incidence of Hypertension between 3 and 5 Years

(Transplants: January 2000 – June 2007)

Maintenance Immunosuppression at discharge and 1 year	% HTN reported between 3 and 5 years		P-value
	For Patients on drug	For Patients not on drug	
Azathioprine	11.8	15.9	0.2884
Cyclosporine	12.3	15.0	0.4440
MMF/MPA	14.3	14.0	0.9338
Prednisone	17.0	9.0	0.0412
Sirolimus/Everolimus	14.3	13.8	0.9999
Tacrolimus	15.8	13.0	0.4213



Pediatric Heart Transplants

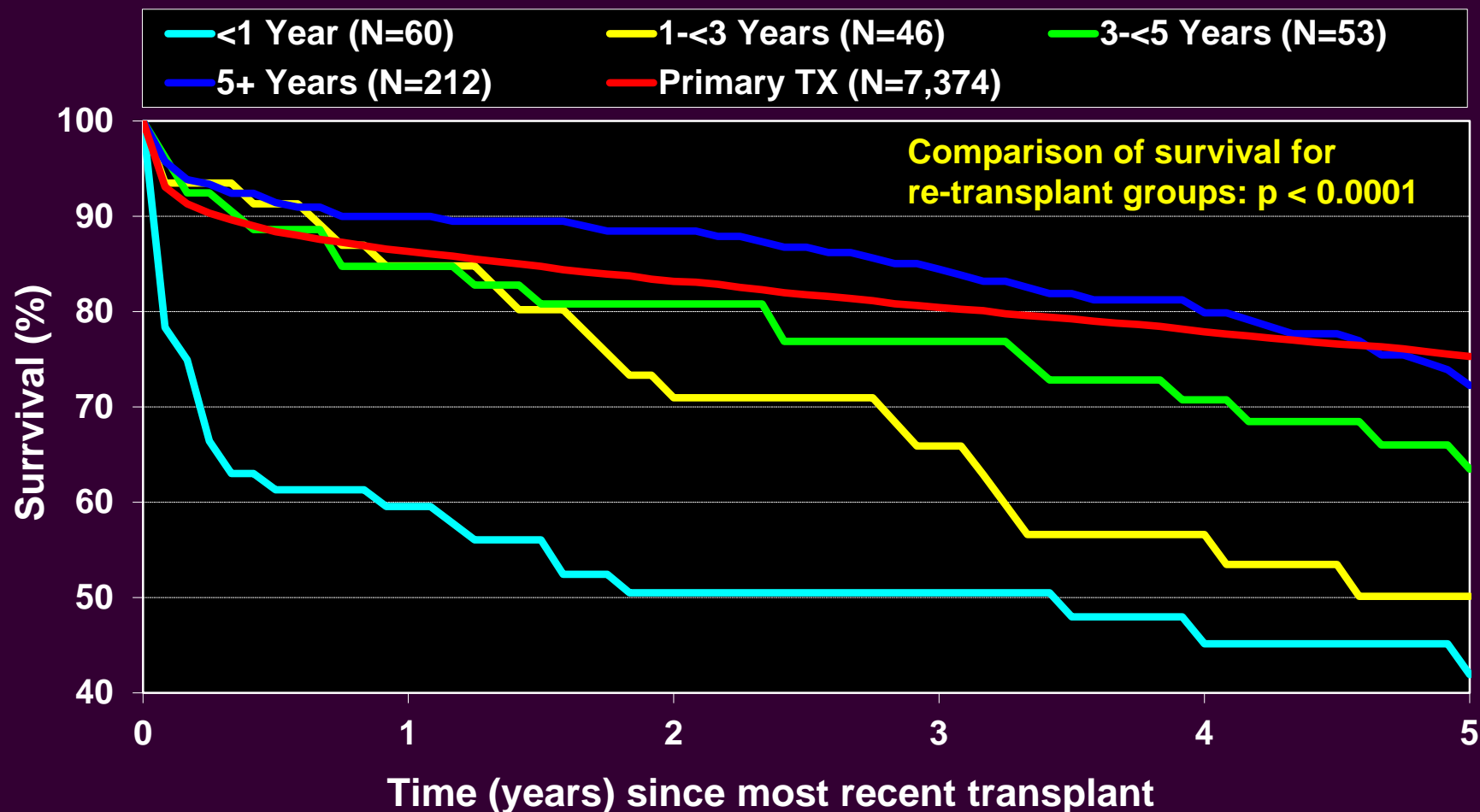
Relationship of Rejection and Coronary Artery Vasculopathy (Follow-ups: July 2004 – June 2012)

Rejection During 1 st Year	Reported CAV between 1 st and 3 rd years post-transplant		
	Yes	No	All
Yes	24 6.0%	379 94.0%	403 100%
No	32 4.5%	686 95.5%	718 100%

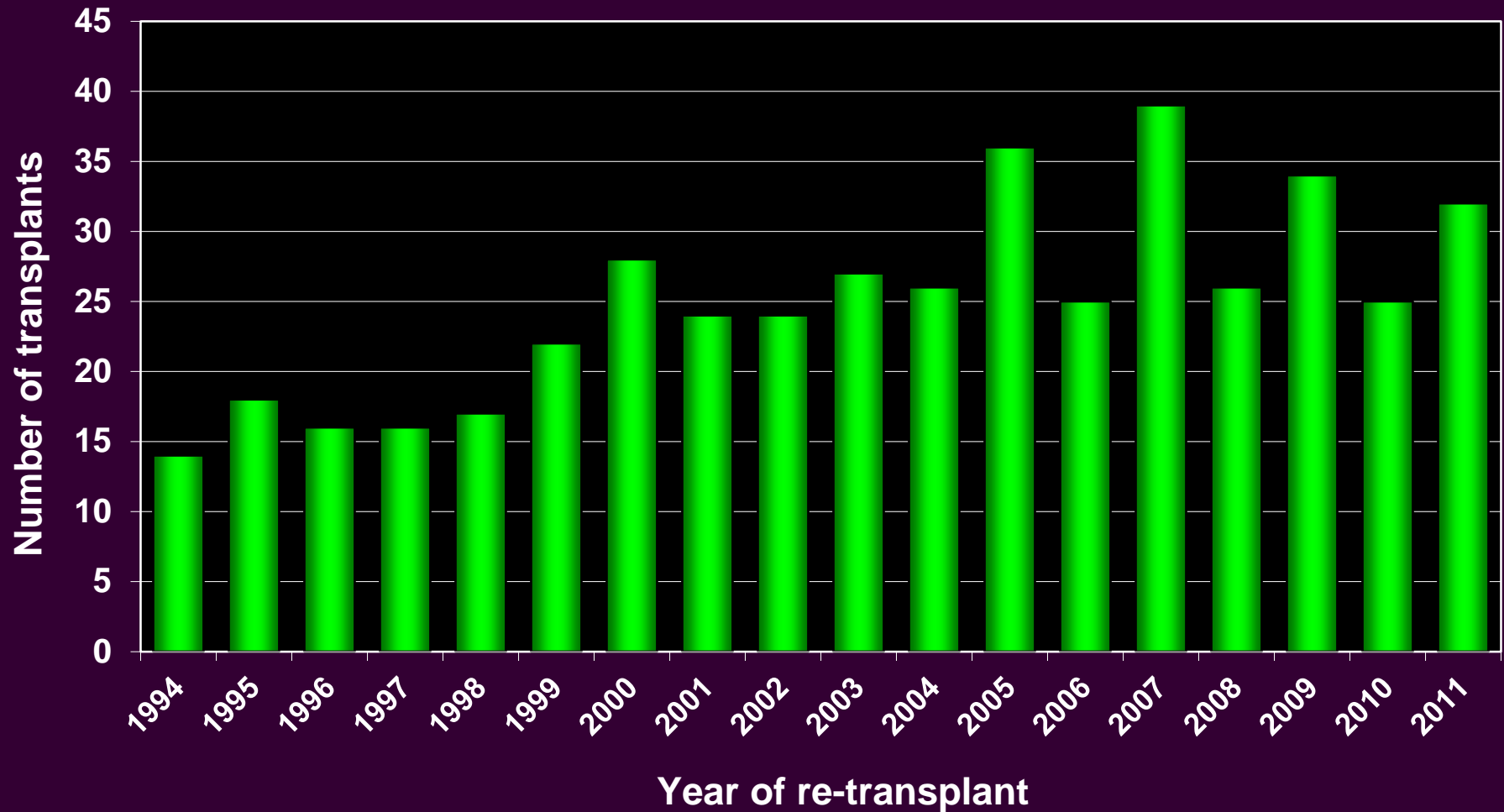
p = 0.2691

Pediatric Heart Re-transplants

Kaplan-Meier Survival Rates Stratified by Inter-transplant Interval (Transplants: January 1994 – June 2011)



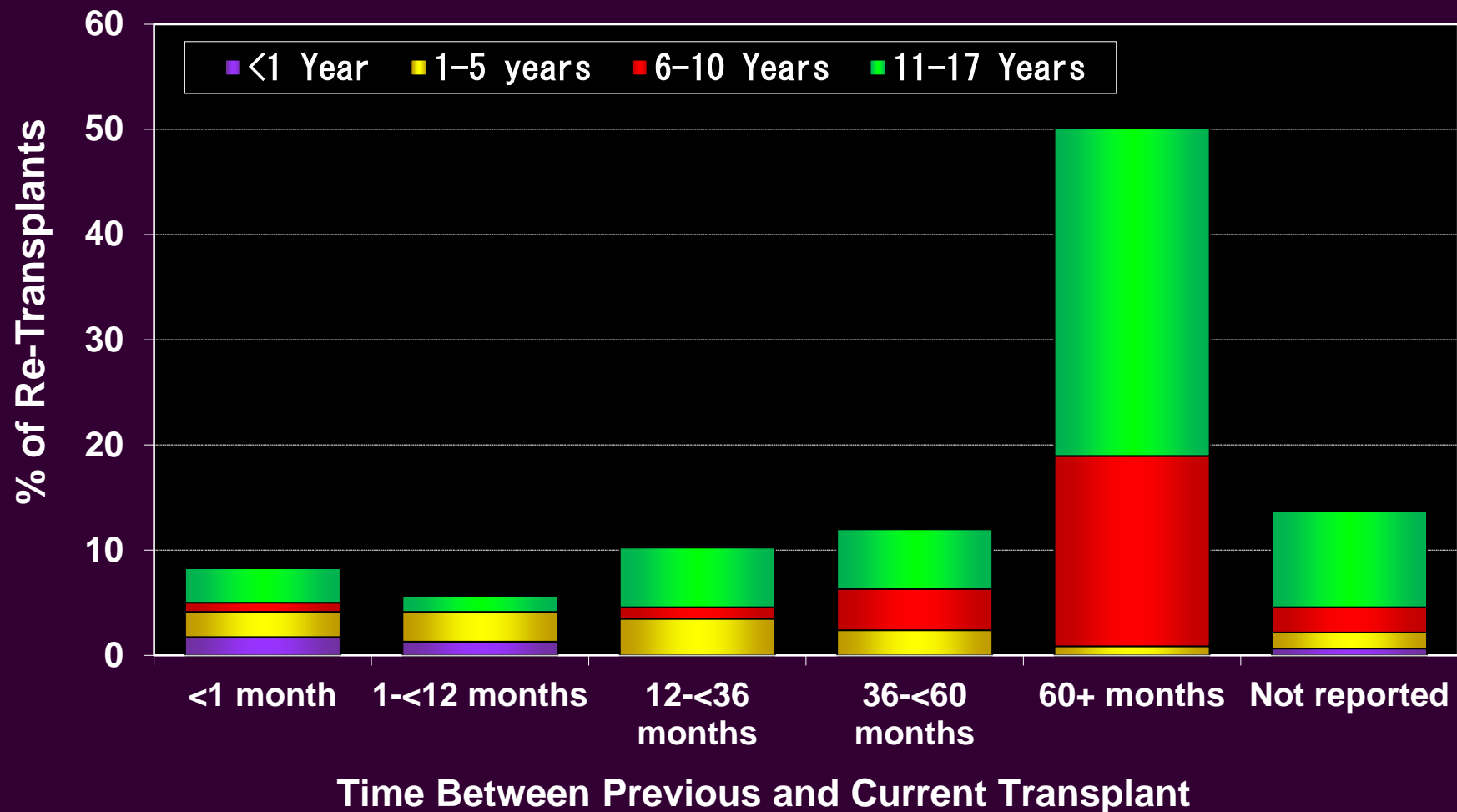
Pediatric Heart Re-transplants By Year of Re-transplant



Pediatric Heart Re-transplants

By Inter-transplant Interval and Recipient Age

(Re-transplants: January 1994 – June 2012)



Only patients who were less than 18 years old at the time of re-transplant are included. Analysis is based on the recipient age at the time of re-transplant

Pediatric Heart Transplants

Cause of Death (Deaths: January 2000 – June 2012)

CAUSE OF DEATH	0-30 Days (N = 290)	31 Days - 1 Year (N = 320)	>1 Year - 3 Years (N = 262)	>3 Years - 5 Years (N = 215)	>5 Years - 10 Years (N = 379)	>10 Years (N = 320)
CORONARY ARTERY VASCULOPATHY	3 (1.0%)	14 (4.4%)	42 (16.0%)	52 (24.2%)	90 (23.7%)	84 (26.3%)
ACUTE REJECTION	24 (8.3%)	50 (15.6%)	51 (19.5%)	28 (13.0%)	49 (12.9%)	16 (5.0%)
LYMPHOMA		5 (1.6%)	6 (2.3%)	7 (3.3%)	26 (6.9%)	20 (6.3%)
MALIGNANCY, OTHER		4 (1.3%)	4 (1.5%)	2 (0.9%)	8 (2.1%)	13 (4.1%)
CMV		7 (2.2%)	1 (0.4%)			
INFECTION, NON-CMV	35 (12.1%)	41 (12.8%)	16 (6.1%)	8 (3.7%)	16 (4.2%)	23 (7.2%)
GRAFT FAILURE	103 (35.5%)	59 (18.4%)	89 (34.0%)	76 (35.3%)	129 (34.0%)	98 (30.6%)
TECHNICAL	21 (7.2%)	3 (0.9%)	1 (0.4%)	1 (0.5%)	4 (1.1%)	6 (1.9%)
OTHER	22 (7.6%)	25 (7.8%)	23 (8.8%)	16 (7.4%)	26 (6.9%)	18 (5.6%)
MULTIPLE ORGAN FAILURE	38 (13.1%)	59 (18.4%)	12 (4.6%)	9 (4.2%)	10 (2.6%)	17 (5.3%)
RENAL FAILURE		7 (2.2%)	1 (0.4%)	1 (0.5%)	2 (0.5%)	9 (2.8%)
PULMONARY	14 (4.8%)	31 (9.7%)	10 (3.8%)	8 (3.7%)	11 (2.9%)	7 (2.2%)
CEREBROVASCULAR	30 (10.3%)	15 (4.7%)	6 (2.3%)	7 (3.3%)	8 (2.1%)	9 (2.8%)

Pediatric Heart Transplants

Cause of Death for Age = <1 Year (Deaths: January 2000 - June 2012)

CAUSE OF DEATH	0-30 Days (N = 90)	31 Days - 1 Year (N = 116)	>1 Year - 3 Years (N = 59)	>3 Years - 5 Years (N = 37)	>5 Years - 10 Years (N = 52)	>10 Years (N = 50)
CORONARY ARTERY VASCULOPATHY	2 (2.2%)	3 (2.6%)	8 (13.6%)	7 (18.9%)	13 (25.0%)	16 (32.0%)
ACUTE REJECTION	9 (10.0%)	10 (8.6%)	10 (16.9%)	2 (5.4%)	3 (5.8%)	3 (6.0%)
LYMPHOMA			3 (5.1%)	2 (5.4%)	8 (15.4%)	6 (12.0%)
MALIGNANCY, OTHER			1 (1.7%)	1 (2.7%)	1 (1.9%)	
CMV		3 (2.6%)				
INFECTION, NON-CMV	13 (14.4%)	10 (8.6%)	4 (6.8%)	2 (5.4%)	4 (7.7%)	5 (10.0%)
GRAFT FAILURE	35 (38.9%)	25 (21.6%)	14 (23.7%)	10 (27.0%)	16 (30.8%)	11 (22.0%)
TECHNICAL	5 (5.6%)		1 (1.7%)		1 (1.9%)	1 (2.0%)
OTHER	5 (5.6%)	13 (11.2%)	9 (15.3%)	4 (10.8%)		1 (2.0%)
MULTIPLE ORGAN FAILURE	10 (11.1%)	24 (20.7%)	4 (6.8%)	4 (10.8%)	2 (3.8%)	5 (10.0%)
RENAL FAILURE		5 (4.3%)			1 (1.9%)	1 (2.0%)
PULMONARY	5 (5.6%)	19 (16.4%)	5 (8.5%)	2 (5.4%)	3 (5.8%)	
CEREBROVASCULAR	6 (6.7%)	4 (3.4%)		3 (8.1%)		1 (2.0%)



Pediatric Heart Transplants

Cause of Death for Age = 1-5 Years (Deaths: January 2000 - June 2012)

CAUSE OF DEATH	0-30 Days (N = 55)	31 Days - 1 Year (N = 77)	>1 Year - 3 Years (N = 60)	>3 Years - 5 Years (N = 43)	>5 Years - 10 Years (N = 58)	>10 Years (N = 78)
CORONARY ARTERY VASCULOPATHY		4 (5.2%)	14 (23.3%)	9 (20.9%)	14 (24.1%)	15 (19.2%)
ACUTE REJECTION	9 (16.4%)	22 (28.6%)	12 (20.0%)	8 (18.6%)	7 (12.1%)	6 (7.7%)
LYMPHOMA			1 (1.7%)	3 (7.0%)	5 (8.6%)	6 (7.7%)
MALIGNANCY, OTHER		1 (1.3%)	1 (1.7%)		1 (1.7%)	2 (2.6%)
CMV		1 (1.3%)				
INFECTION, NON-CMV	5 (9.1%)	11 (14.3%)	6 (10.0%)		3 (5.2%)	3 (3.8%)
GRAFT FAILURE	23 (41.8%)	14 (18.2%)	19 (31.7%)	13 (30.2%)	20 (34.5%)	24 (30.8%)
TECHNICAL	4 (7.3%)					1 (1.3%)
OTHER	1 (1.8%)	2 (2.6%)	2 (3.3%)	5 (11.6%)	2 (3.4%)	7 (9.0%)
MULTIPLE ORGAN FAILURE	5 (9.1%)	14 (18.2%)	1 (1.7%)	1 (2.3%)	2 (3.4%)	7 (9.0%)
RENAL FAILURE		1 (1.3%)				1 (1.3%)
PULMONARY	3 (5.5%)	3 (3.9%)		4 (9.3%)	1 (1.7%)	1 (1.3%)
CEREBROVASCULAR	5 (9.1%)	4 (5.2%)	4 (6.7%)		3 (5.2%)	5 (6.4%)

Pediatric Heart Transplants

Cause of Death for Age = 6-10 Years (Deaths: January 2000 - June 2012)

CAUSE OF DEATH	0-30 Days (N = 44)	31 Days - 1 Year (N = 20)	>1 Year - 3 Years (N = 20)	>3 Years - 5 Years (N = 38)	>5 Years - 10 Years (N = 61)	>10 Years (N = 64)
CORONARY ARTERY VASCULOPATHY	1 (2.3%)		5 (25.0%)	9 (23.7%)	15 (24.6%)	14 (21.9%)
ACUTE REJECTION	1 (2.3%)	2 (10.0%)	3 (15.0%)	10 (26.3%)	8 (13.1%)	2 (3.1%)
LYMPHOMA			1 (5.0%)	1 (2.6%)	7 (11.5%)	4 (6.3%)
MALIGNANCY, OTHER			1 (5.0%)		3 (4.9%)	2 (3.1%)
CMV		2 (10.0%)				
INFECTION, NON-CMV	4 (9.1%)	5 (25.0%)	2 (10.0%)	2 (5.3%)	3 (4.9%)	4 (6.3%)
GRAFT FAILURE	12 (27.3%)	1 (5.0%)	6 (30.0%)	12 (31.6%)	17 (27.9%)	23 (35.9%)
TECHNICAL	2 (4.5%)			1 (2.6%)	1 (1.6%)	
OTHER	7 (15.9%)	1 (5.0%)	1 (5.0%)		2 (3.3%)	2 (3.1%)
MULTIPLE ORGAN FAILURE	9 (20.5%)	5 (25.0%)			2 (3.3%)	2 (3.1%)
RENAL FAILURE			1 (5.0%)			5 (7.8%)
PULMONARY		1 (5.0%)		2 (5.3%)	1 (1.6%)	4 (6.3%)
CEREBROVASCULAR	8 (18.2%)	3 (15.0%)		1 (2.6%)	2 (3.3%)	2 (3.1%)



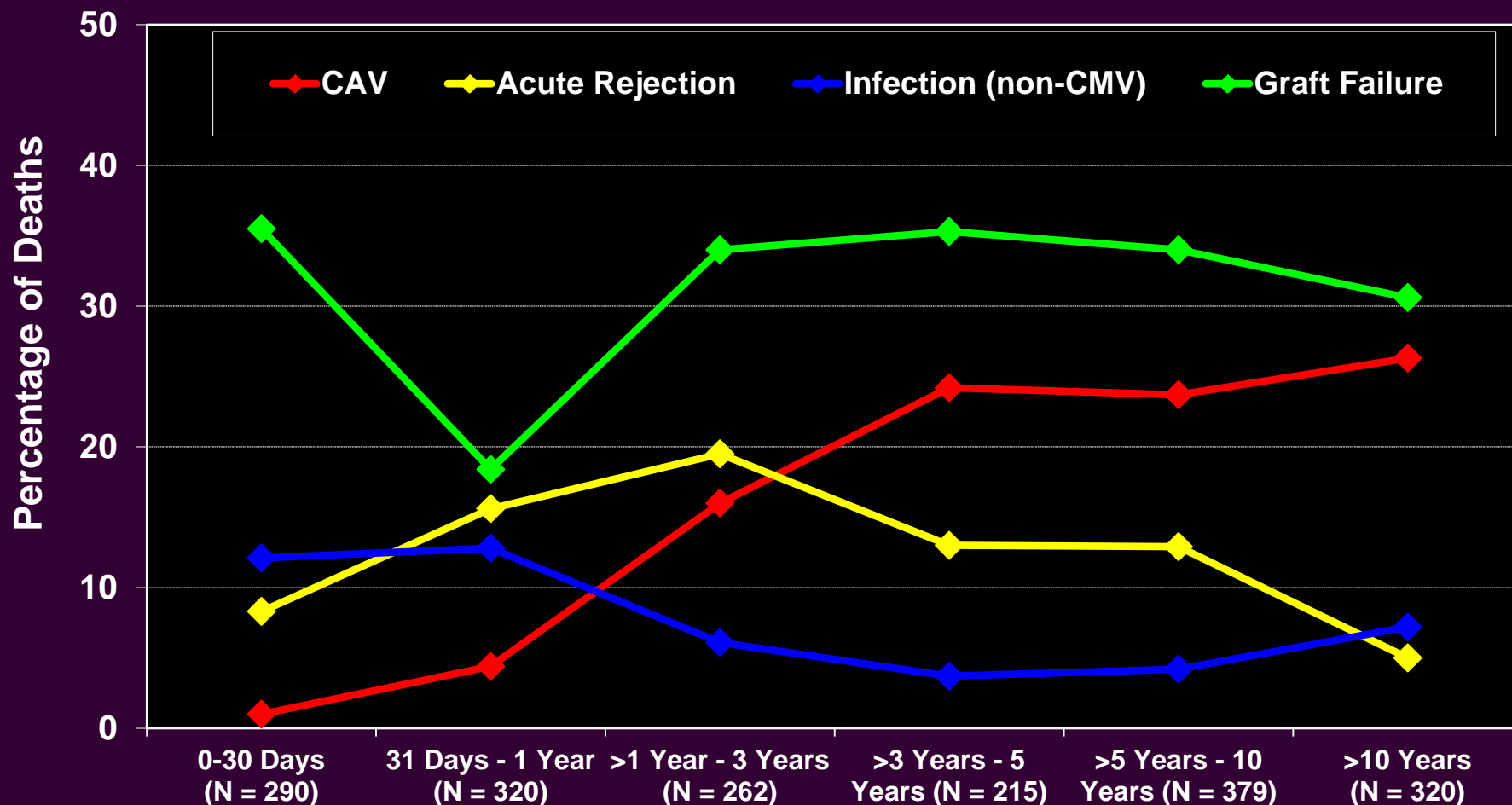
Pediatric Heart Transplants

Cause of Death for Age = 11-17 Years (Deaths: January 2000 - June 2012)

CAUSE OF DEATH	0-30 Days (N = 101)	31 Days - 1 Year (N = 107)	>1 Year - 3 Years (N = 123)	>3 Years - 5 Years (N = 97)	>5 Years - 10 Years (N = 208)	>10 Years (N = 128)
CORONARY ARTERY VASCULOPATHY		7 (6.5%)	15 (12.2%)	27 (27.8%)	48 (23.1%)	39 (30.5%)
ACUTE REJECTION	5 (5.0%)	16 (15.0%)	26 (21.1%)	8 (8.2%)	31 (14.9%)	5 (3.9%)
LYMPHOMA		5 (4.7%)	1 (0.8%)	1 (1.0%)	6 (2.9%)	4 (3.1%)
MALIGNANCY, OTHER		3 (2.8%)	1 (0.8%)	1 (1.0%)	3 (1.4%)	9 (7.0%)
CMV		1 (0.9%)	1 (0.8%)			
INFECTION, NON-CMV	13 (12.9%)	15 (14.0%)	4 (3.3%)	4 (4.1%)	6 (2.9%)	11 (8.6%)
GRAFT FAILURE	33 (32.7%)	19 (17.8%)	50 (40.7%)	41 (42.3%)	76 (36.5%)	40 (31.3%)
TECHNICAL	10 (9.9%)	3 (2.8%)			2 (1.0%)	4 (3.1%)
OTHER	9 (8.9%)	9 (8.4%)	11 (8.9%)	7 (7.2%)	22 (10.6%)	8 (6.3%)
MULTIPLE ORGAN FAILURE	14 (13.9%)	16 (15.0%)	7 (5.7%)	4 (4.1%)	4 (1.9%)	3 (2.3%)
RENAL FAILURE		1 (0.9%)		1 (1.0%)	1 (0.5%)	2 (1.6%)
PULMONARY	6 (5.9%)	8 (7.5%)	5 (4.1%)		6 (2.9%)	2 (1.6%)
CEREBROVASCULAR	11 (10.9%)	4 (3.7%)	2 (1.6%)	3 (3.1%)	3 (1.4%)	1 (0.8%)

Pediatric Heart Transplants

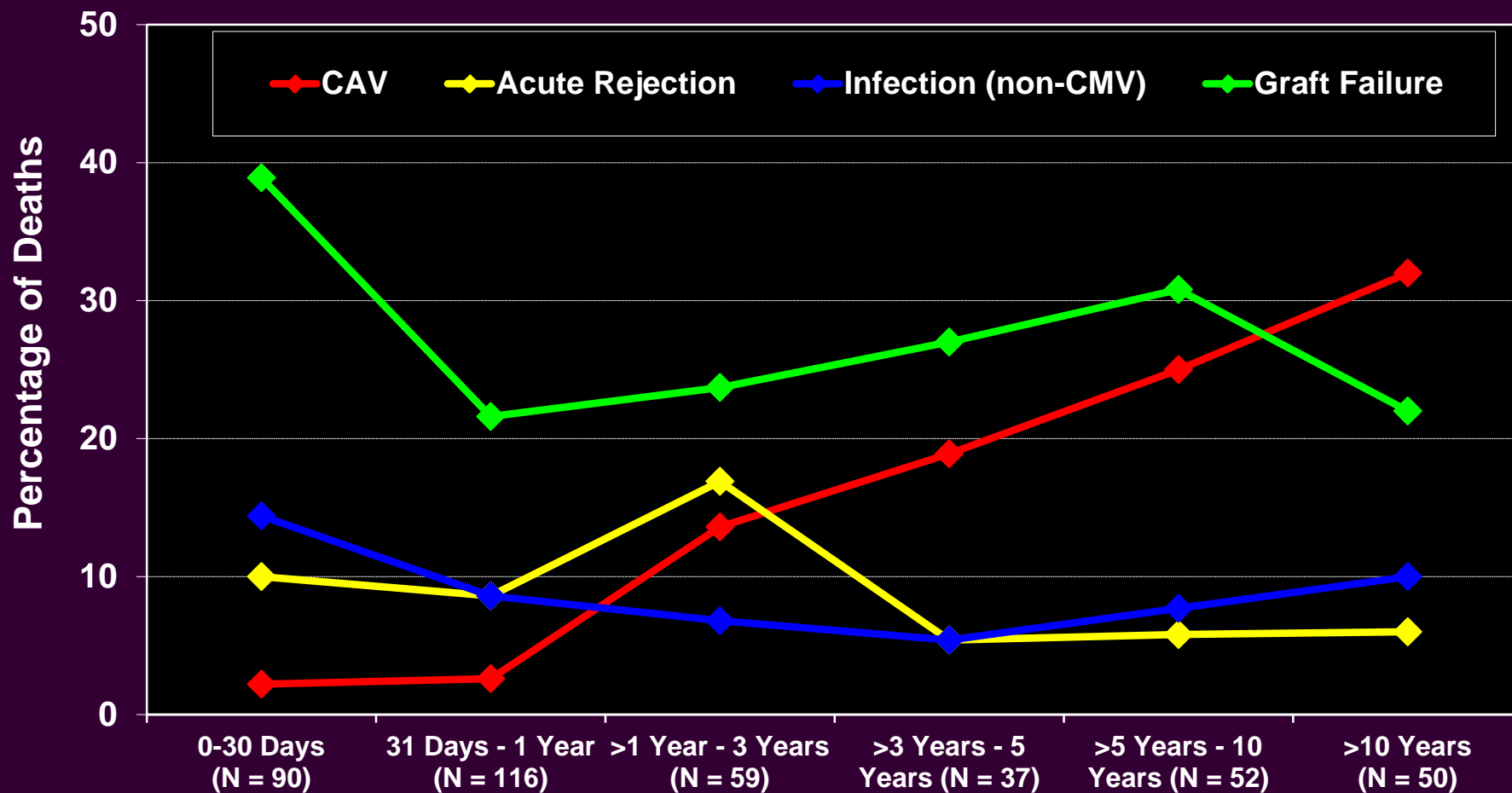
Relative Incidence of Leading Causes of Death (Deaths: January 2000 – June 2012)



Pediatric Heart Transplants

Relative Incidence of Leading Causes of Death

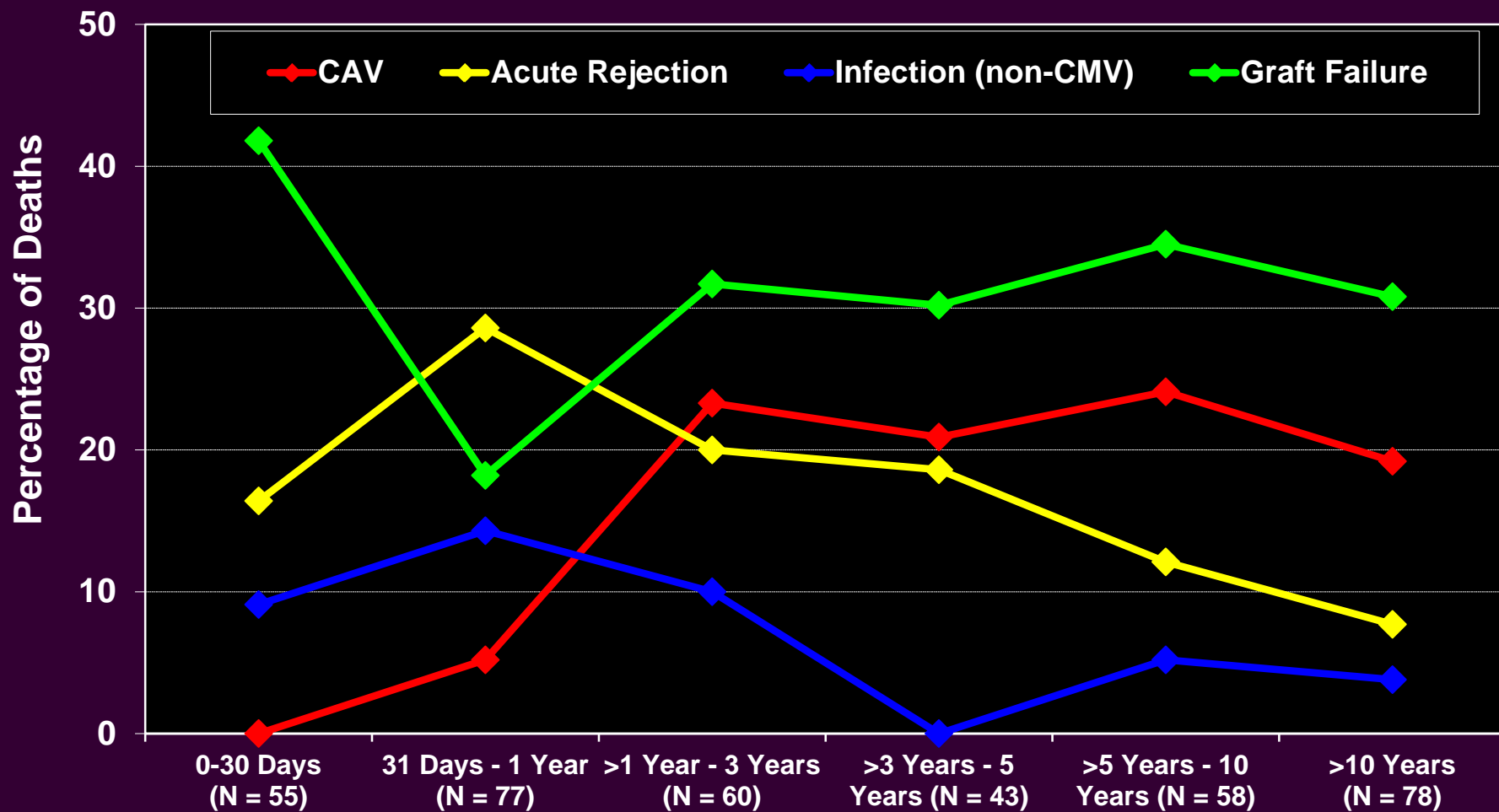
Age: <1 Year (Deaths: January 2000 – June 2012)



Pediatric Heart Transplants

Relative Incidence of Leading Causes of Death

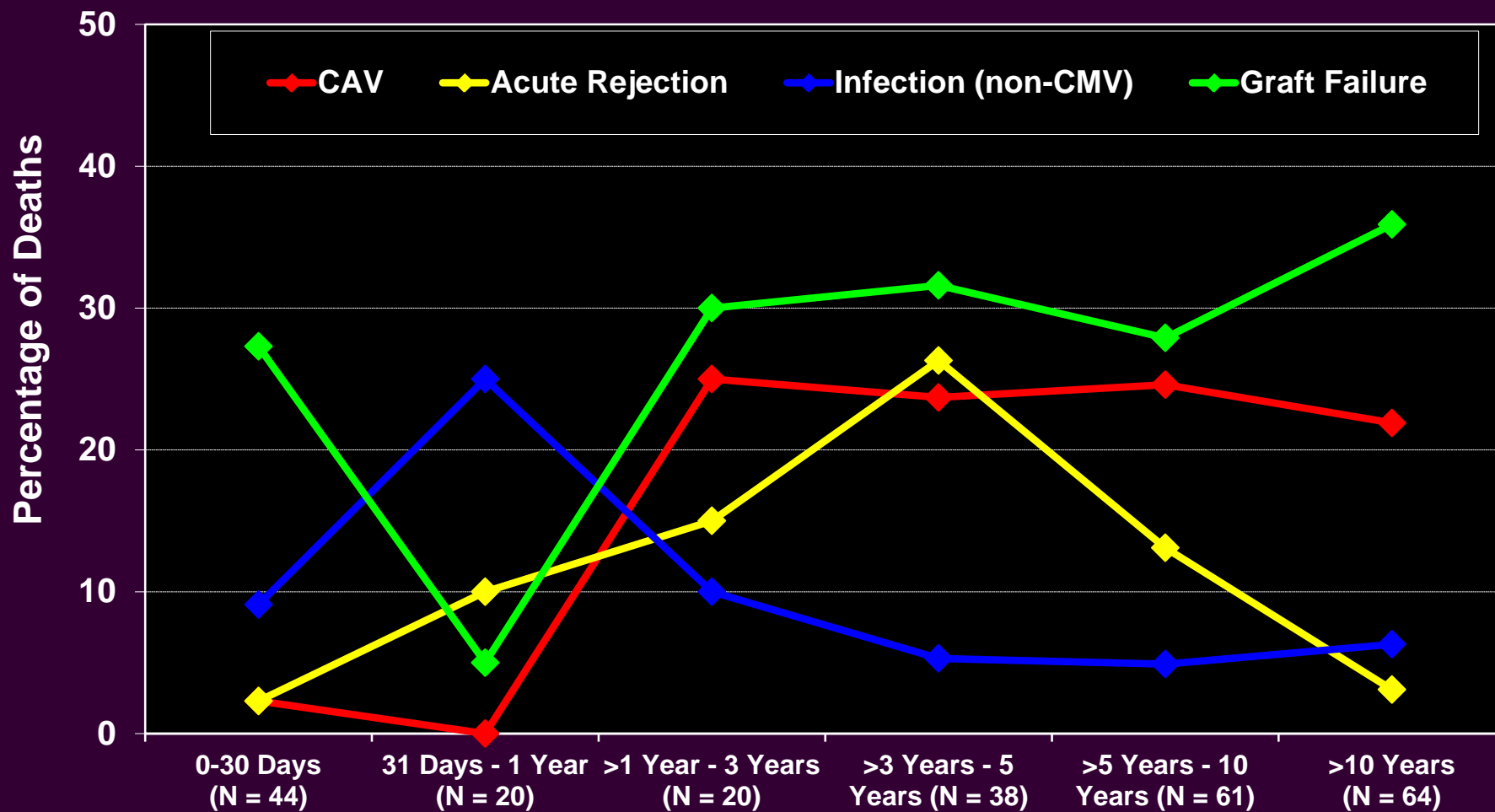
Age: 1-5 Years (Deaths: January 2000 – June 2012)



Pediatric Heart Transplants

Relative Incidence of Leading Causes of Death

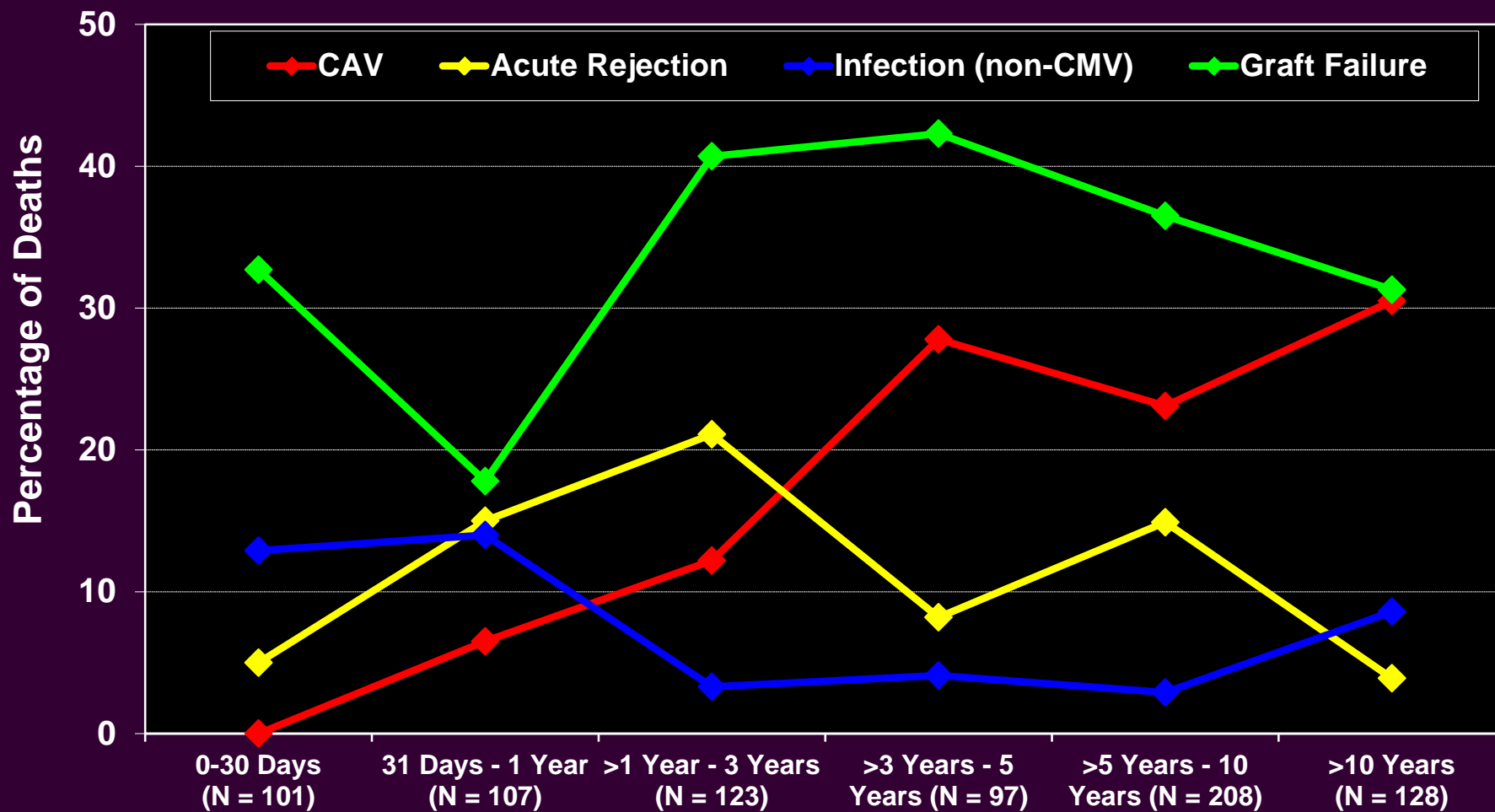
Age: 6-10 Years (Deaths: January 2000 – June 2012)



Pediatric Heart Transplants

Relative Incidence of Leading Causes of Death

Age: 11-17 Years (Deaths: January 2000 – June 2012)



Multivariable Analyses

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
ECMO	280	2.65	<.0001	2.00-3.50
Retransplant	206	2.16	0.0003	1.42-3.27
Congenital diagnosis	1426	2.04	<.0001	1.58-2.64
On dialysis	123	2.03	<.0001	1.42-2.90
Donor cause of death = cerebrovascular/stroke vs. head trauma	327	1.53	0.009	1.11-2.11
Donor cause of death other than (head trauma, cerebrovascular/stroke, anoxia and CNS tumor) vs. head trauma	289	1.49	0.027	1.05-2.12
Male donor/female recip vs. male donor/male recip	913	1.44	0.006	1.11-1.88
Prior sternotomy	830	1.42	0.007	1.10-1.83
On ventilator	700	1.35	0.017	1.06-1.73
PRA > 10%	311	1.35	0.05	1.00-1.81
Infection requiring IV drug therapy (within 2wk/TX)	610	1.32	0.027	1.03-1.69
Donor cause of death = anoxia vs. head trauma	902	0.75	0.026	0.58-0.97

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Borderline Significant Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Previous transfusions	1265	1.25	0.0669	0.98-1.58
Transplant year: 2009-2010 vs. 2001-2002	779	0.75	0.0826	0.54-1.04
Cerebrovascular event prior to transplant	198	0.65	0.0688	0.41-1.03

N = 3,516



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality

Continuous Factors (see figures)

Donor height

Ischemia time

Recipient BMI

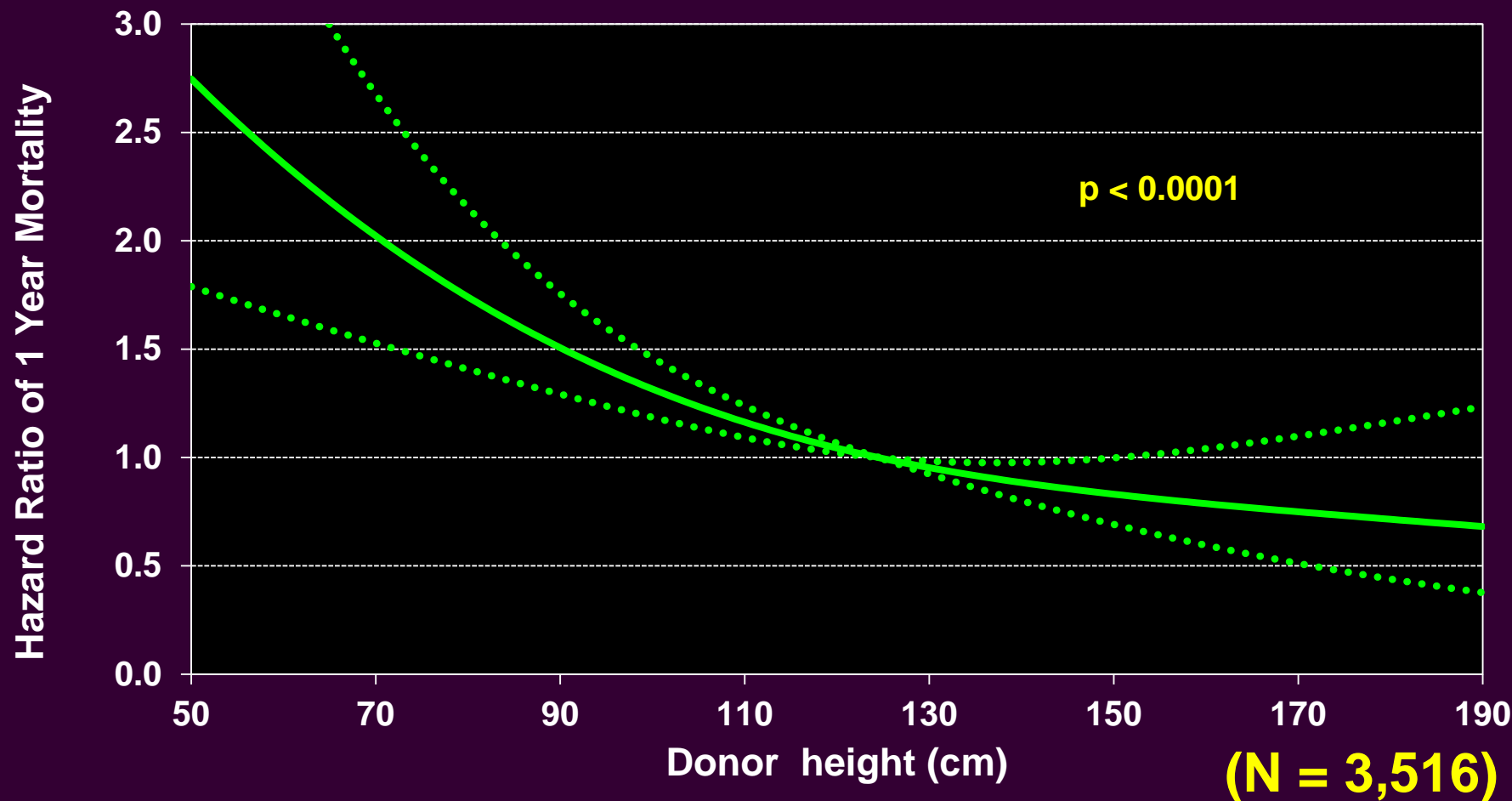
Recipient pre-transplant creatinine



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality with 95% Confidence Limits

Donor Height

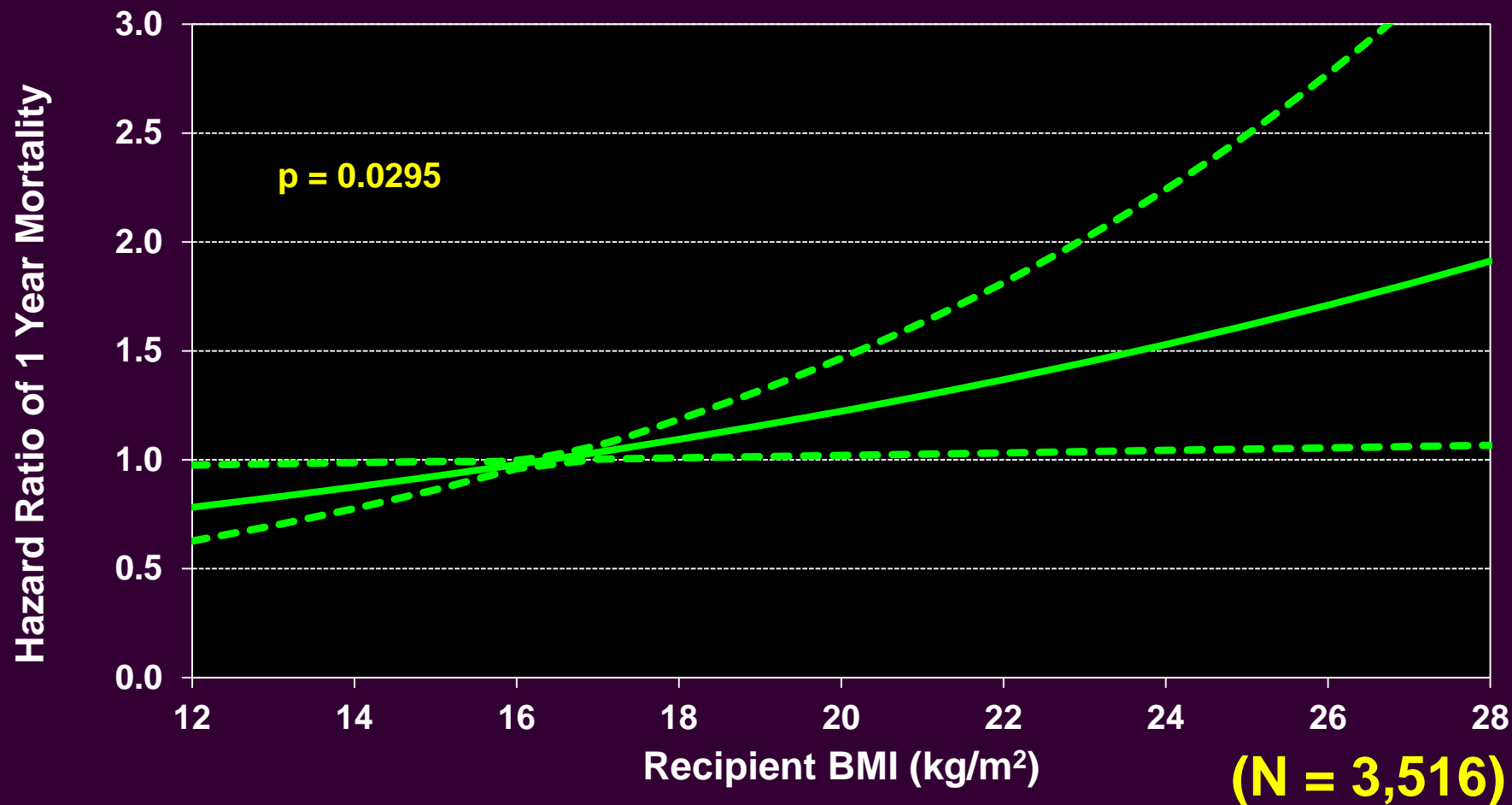




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality with 95% Confidence Limits

Recipient BMI

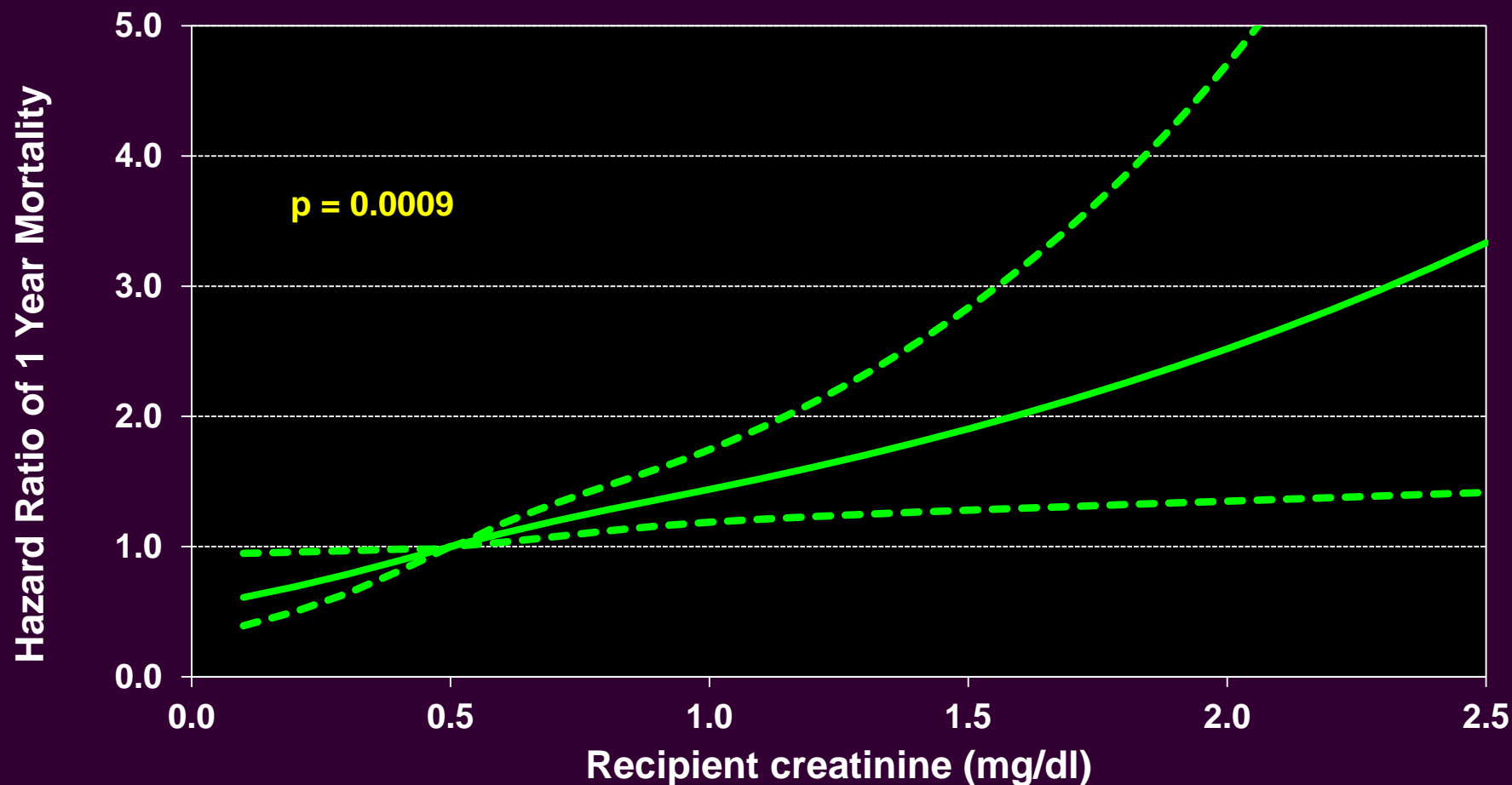




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality with 95% Confidence Limits

Recipient Pre-Transplant Creatinine

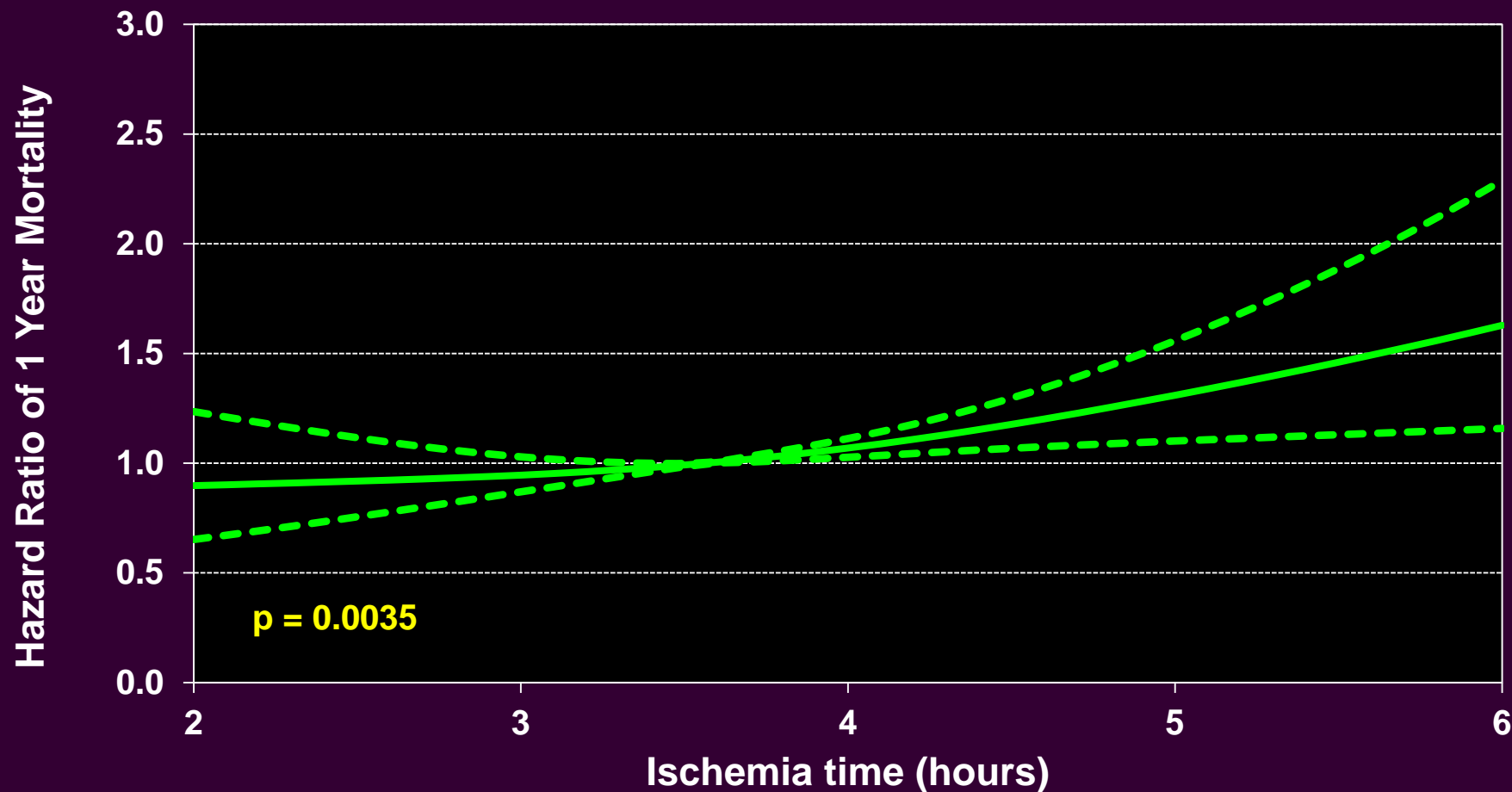




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality with 95% Confidence Limits

Ischemia time



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = <1 Year

Risk Factors For 1 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
ECMO, diagnosis = congenital	77	3.91	<.0001	2.53-6.05
ECMO, diagnosis = not congenital	50	2.37	0.0202	1.14-4.93
Donor cause of death = cerebrovascular/stroke vs. head trauma	31	2.25	0.0173	1.15-4.40
On dialysis	34	2.12	0.0053	1.25-3.61
Transplant year: 2007-2008 vs. 2001-2002	193	1.83	0.04	1.03-3.25
On ventilator	366	1.78	0.0021	1.23-2.57
PRA > 10%	63	1.77	0.0409	1.02-3.07
Prior sternotomy	205	1.67	0.0168	1.10-2.53
Infection requiring IV drug therapy (within 2wk/TX)	282	1.64	0.0053	1.16-2.31

Reference group = Congenital, no devices

N = 939

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = <1 Year

Borderline Significant Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Transplant year: 2005-2006 vs. 2001-2002	197	1.73	0.0782	0.94-3.18
Diagnosis = cardiomyopathy	323	0.59	0.0593	0.34-1.02

N = 939



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = <1 Year

Risk Factors For 1 Year Mortality

Continuous Factors (see figures)

Donor age

Ischemia time

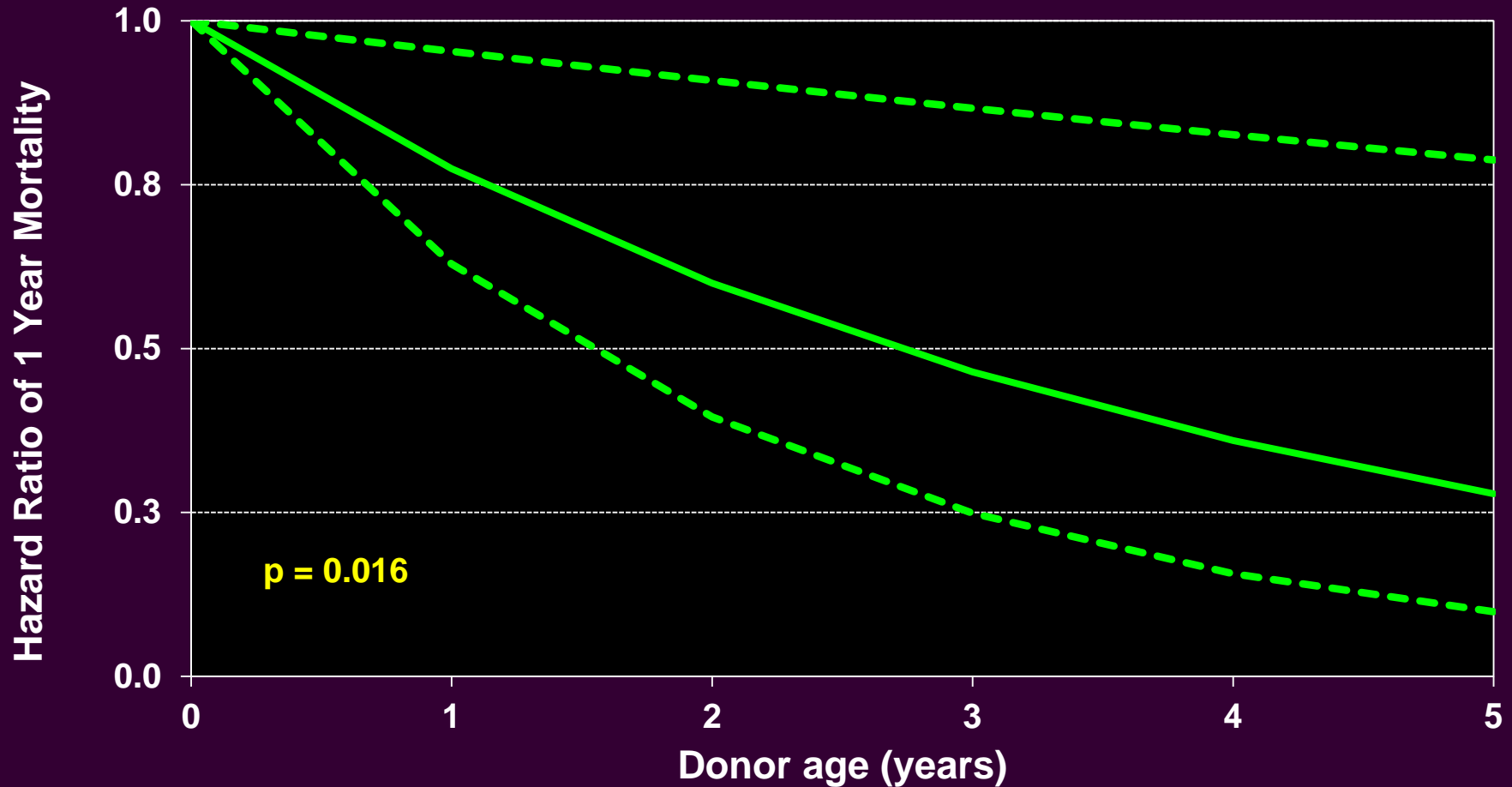
Recipient pre-transplant creatinine

Volume of pediatric transplants

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = <1 Year

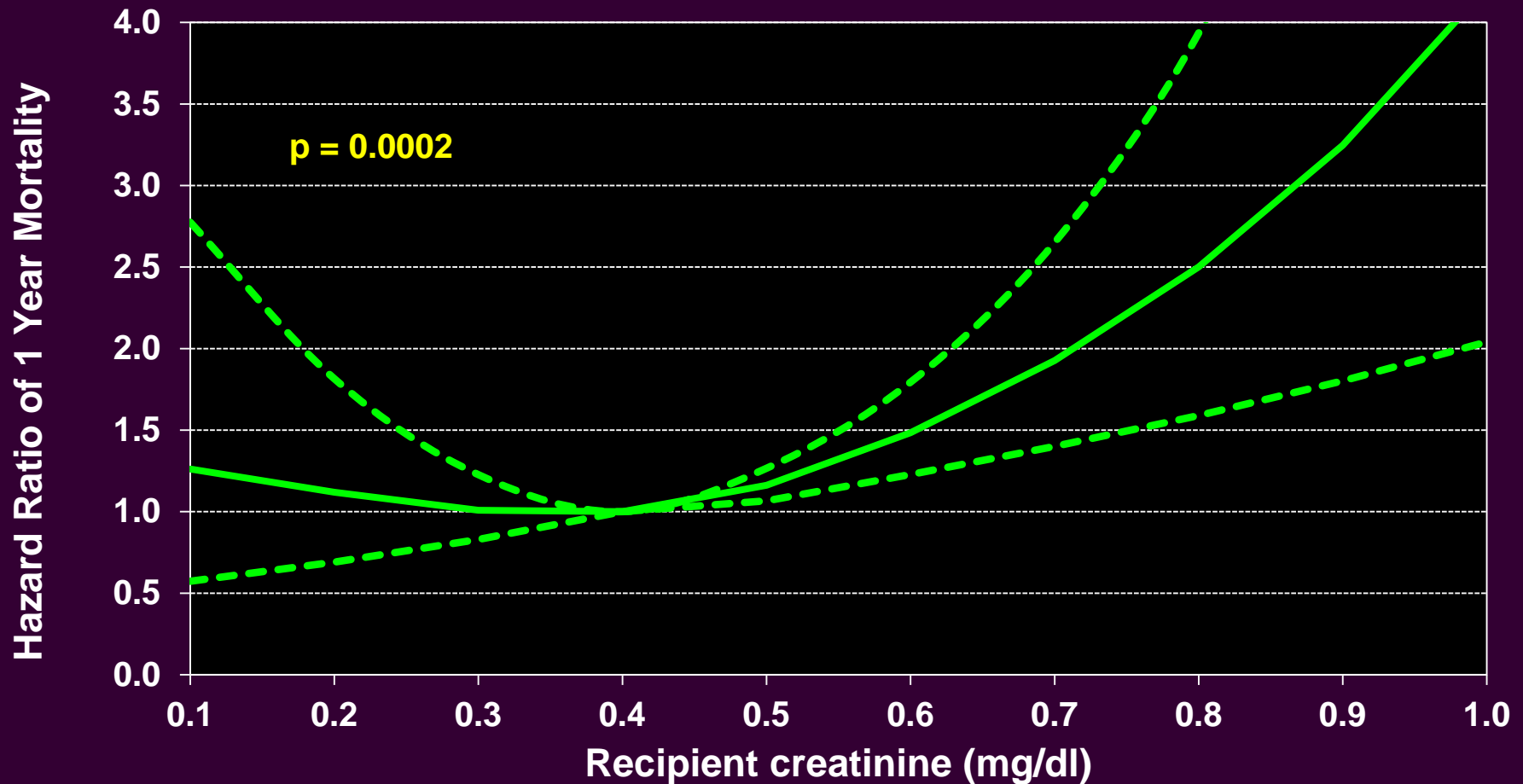
Donor Age



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = <1 Year

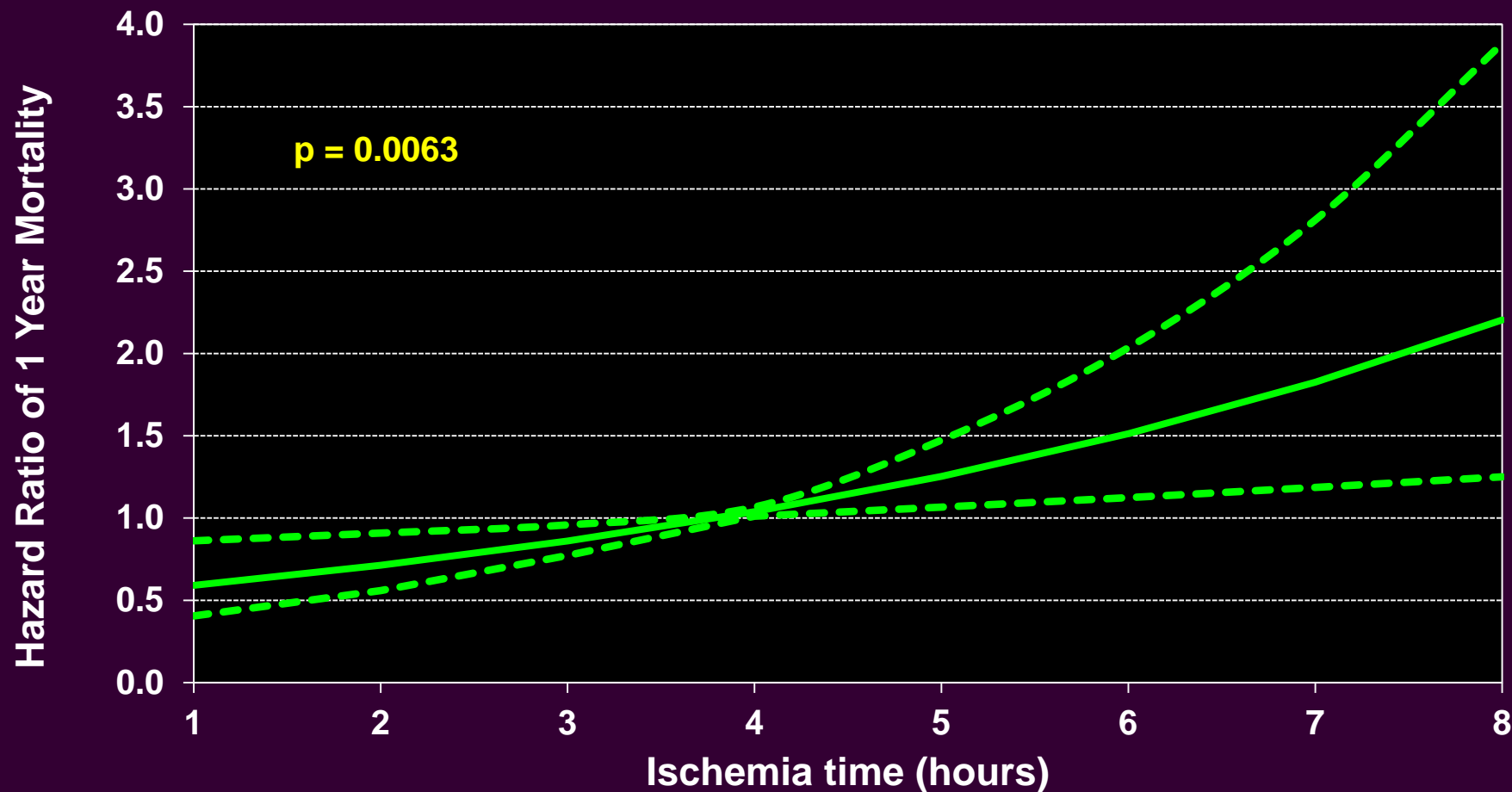
Recipient Pre-Transplant Creatinine



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = <1 Year

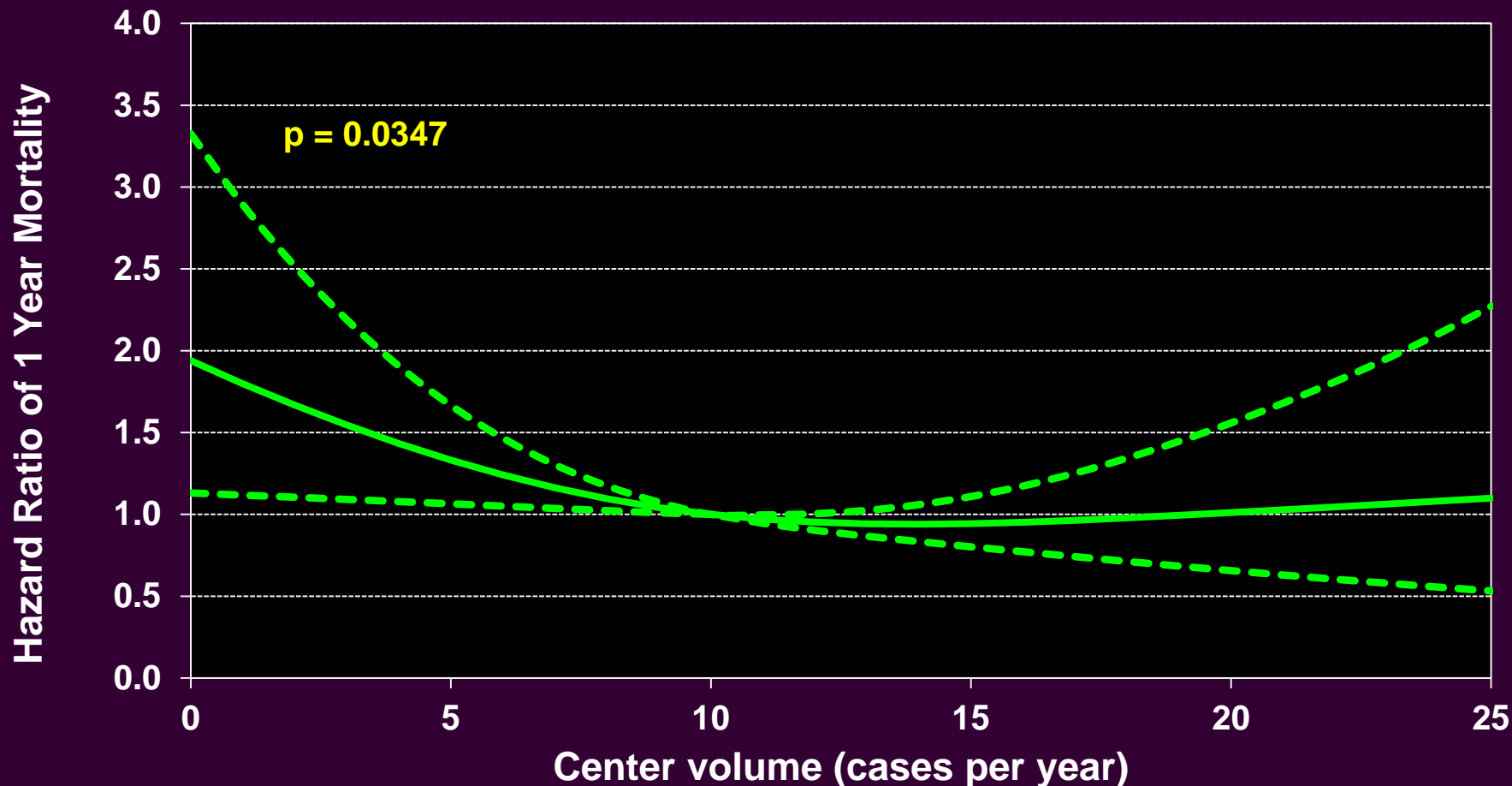
Ischemia time



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = <1 Year

Center Volume for Pediatric Transplants



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 1-5 Years

Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
ECMO or VAD, diagnosis = congenital	43	3.79	0.0005	1.78-8.07
Previous transfusion	289	2.01	0.003	1.27-3.19
No ECMO or VAD, diagnosis = congenital	324	1.89	0.0204	1.10-3.25
Transplant year: 2007-2008 vs. 2001-2002	192	0.50	0.0456	0.25-0.99
Transplant year: 2009-2010 vs. 2001-2002	176	0.49	0.0352	0.25-0.95
Cerebrovascular event prior to transplant	65	0.30	0.0455	0.09-0.98

N = 840

Reference group = Cardiomyopathy, no devices

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 1-5 Years

Borderline Significant Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
On dialysis	19	2.28	0.0858	0.89-5.84
PRA > 10%	92	1.72	0.0531	0.99-2.97
Female recipient	423	1.43	0.0992	0.93-2.20

N = 840



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 1-5 Years

Risk Factors For 1 Year Mortality

Continuous Factors (see figures)

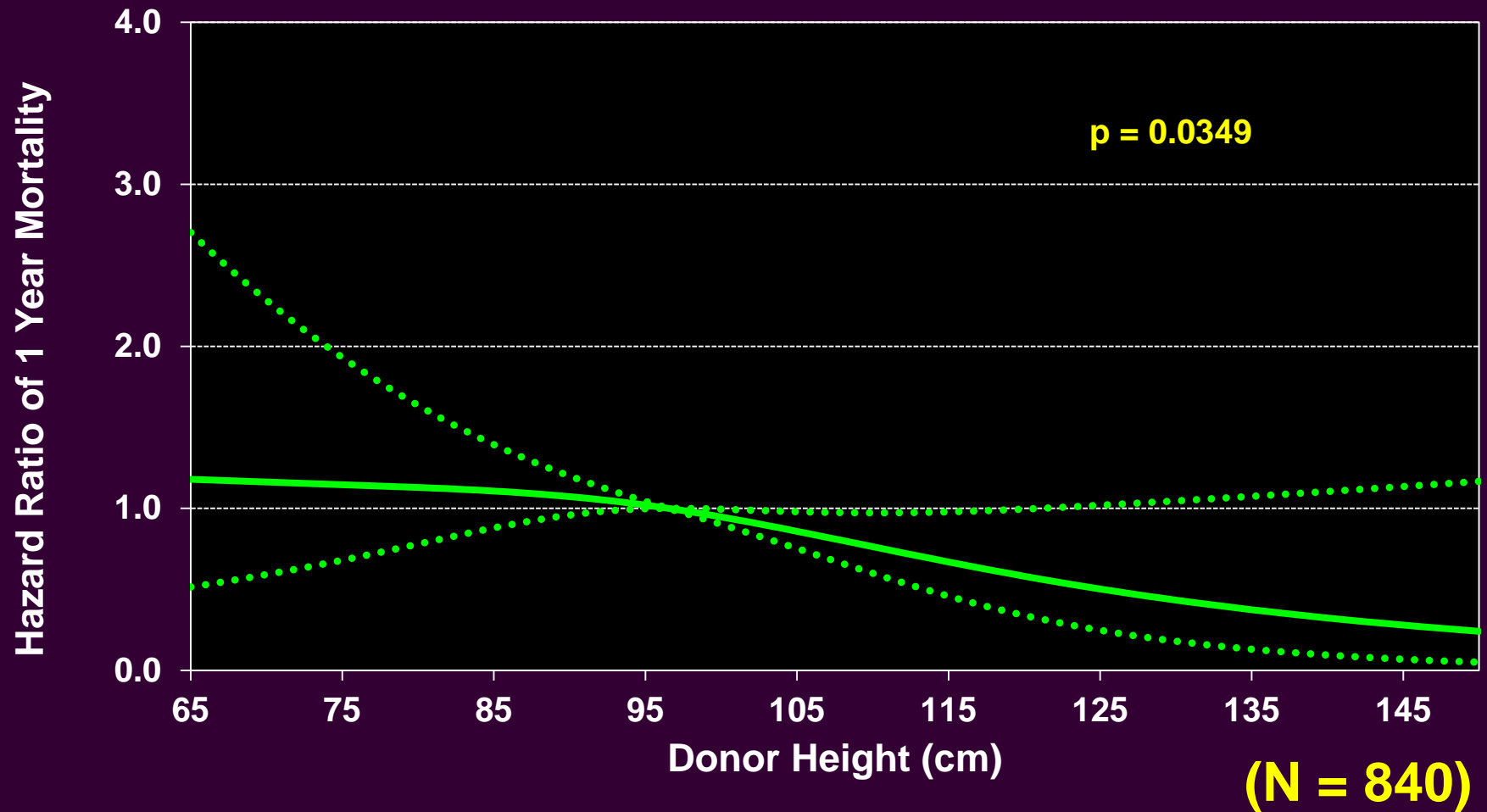
Donor height

Volume of pediatric transplants

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 1-5 Years

Donor Height

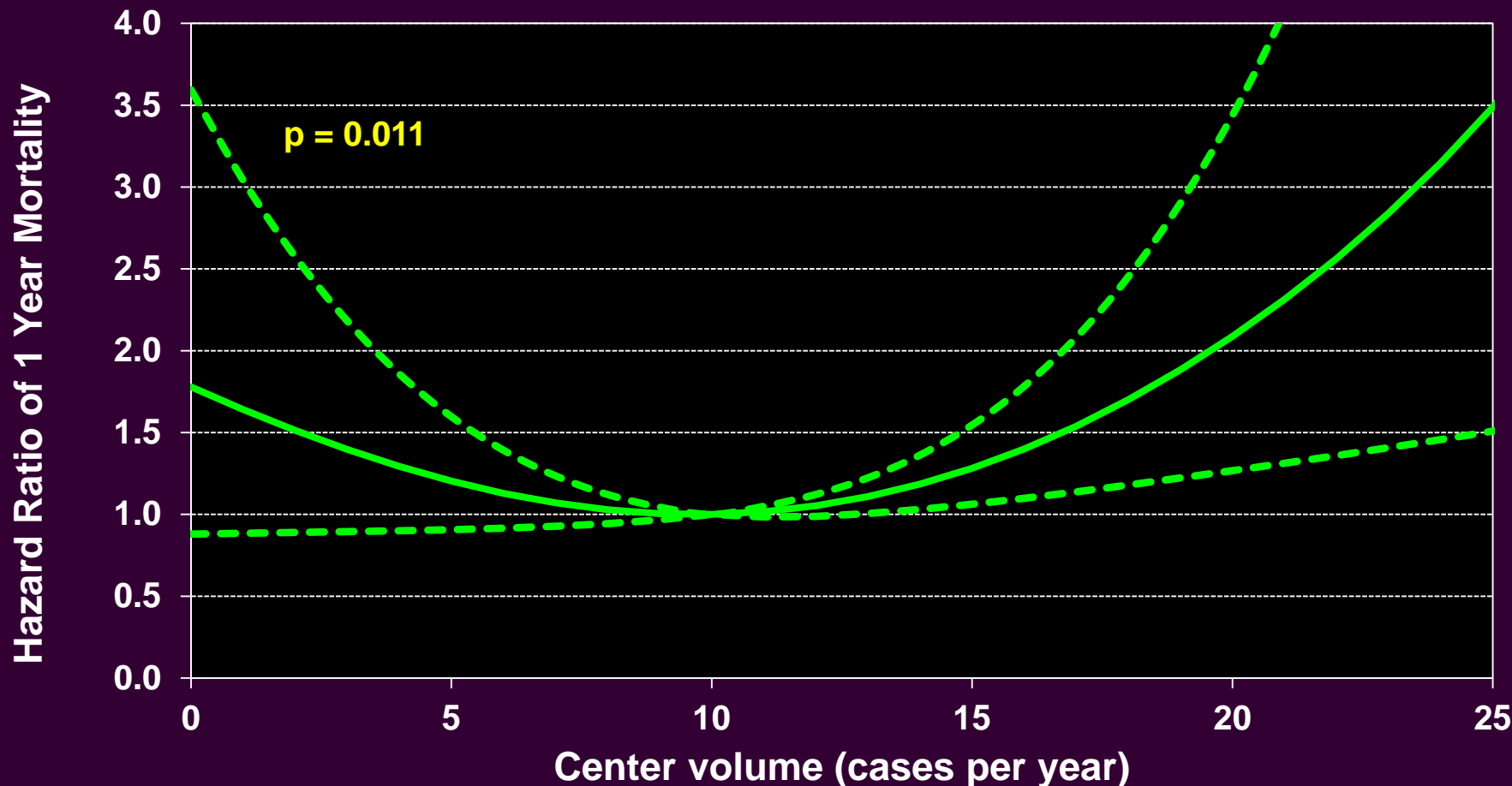




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 1-5 Years

Center Volume for Pediatric Transplants



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 6-10 Years

Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
ECMO	33	2.56	0.0431	1.03-6.37
Transplant year: 2005-2006 vs. 2001-2002	92	0.27	0.0476	0.07-0.99

N = 499

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 6-10 Years

Borderline Significant Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Diagnosis = congenital	172	2.30	0.051	1.00-5.30

N = 499



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 6-10 Years

Risk Factors For 1 Year Mortality

Continuous Factors (see figures)

Recipient pre-transplant creatinine

Recipient pre-transplant bilirubin
(borderline)

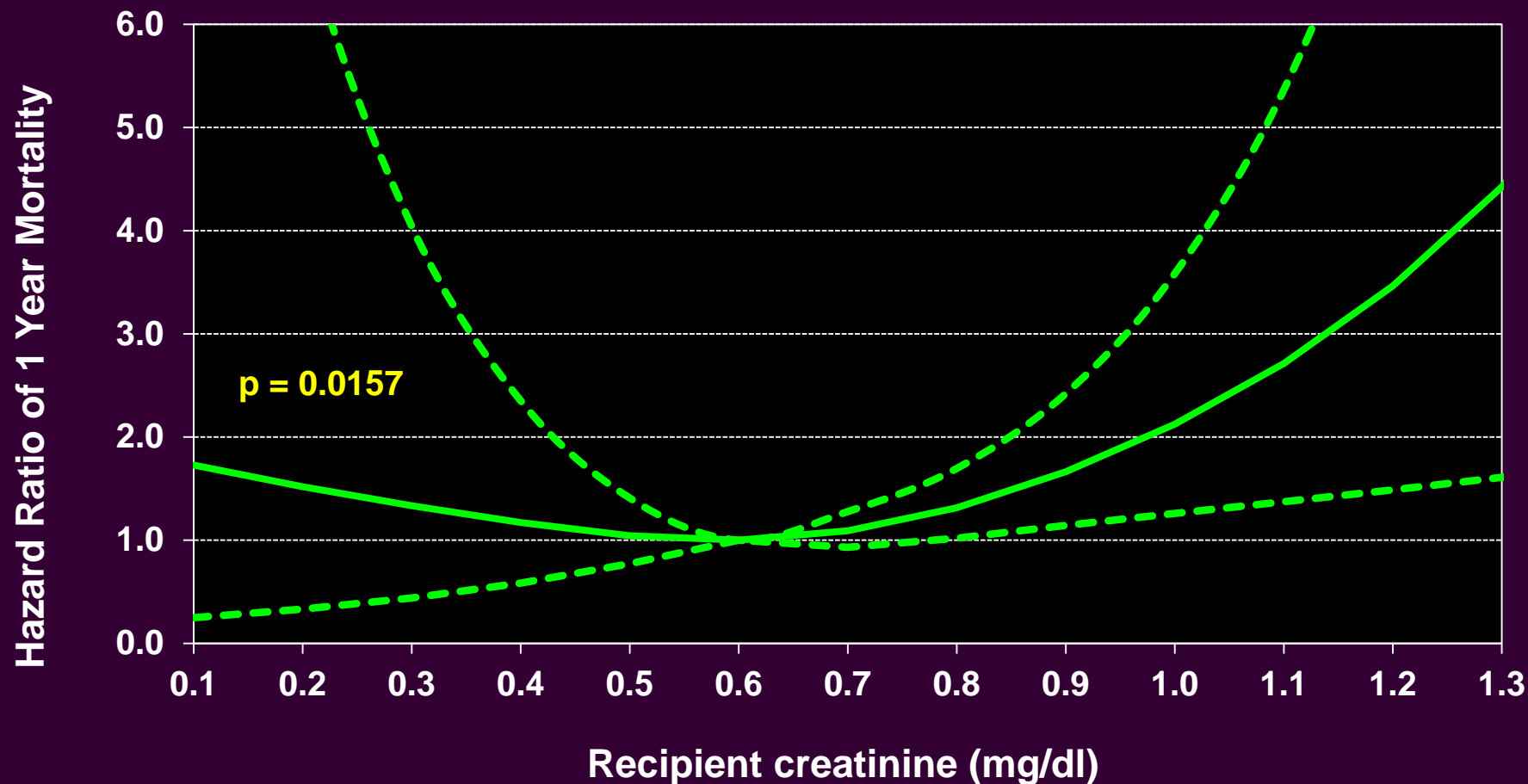
Recipient height (borderline)



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 6-10 Years

Recipient Pre-Transplant Creatinine

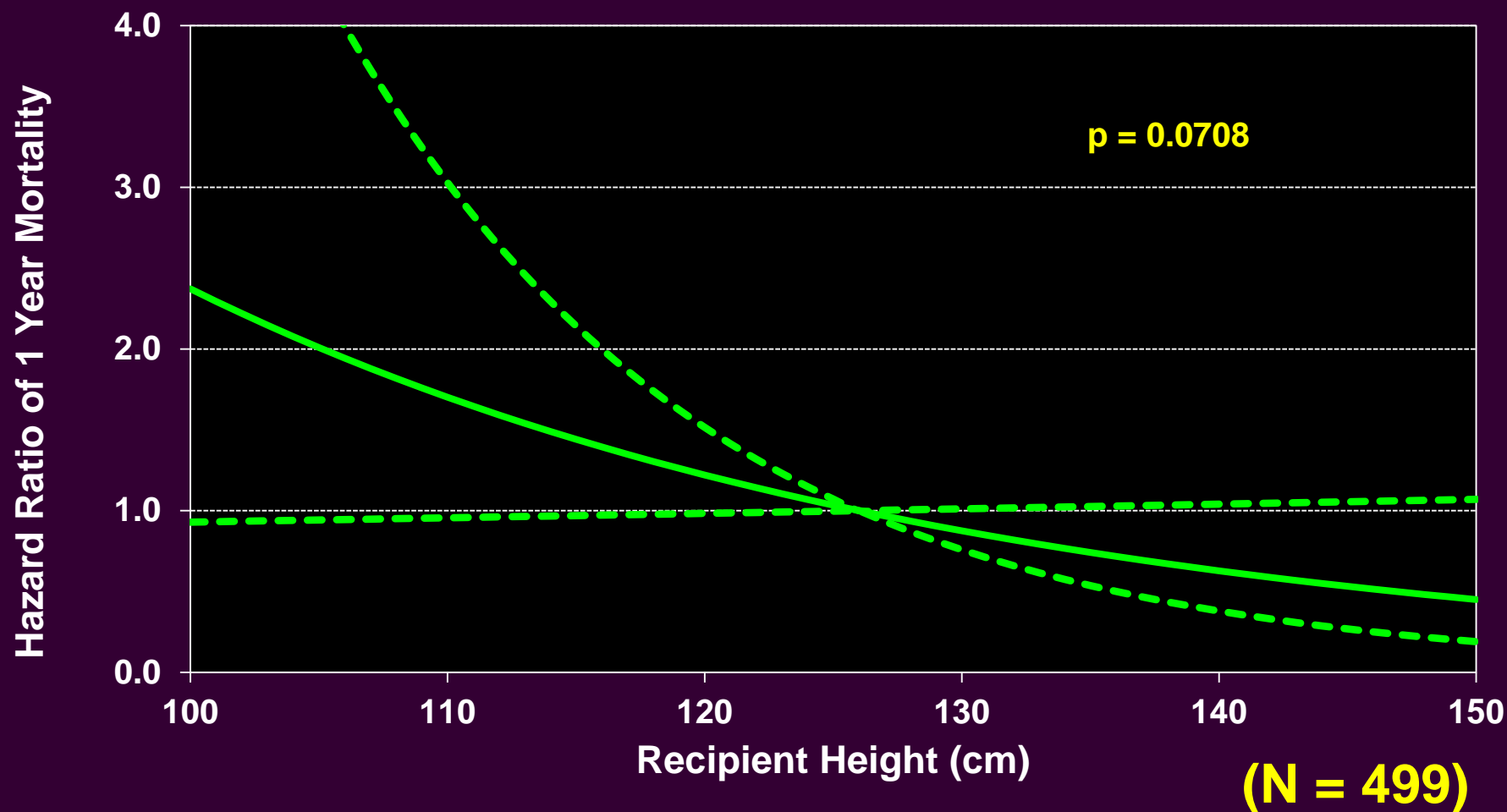




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 6-10 Years

Recipient Height

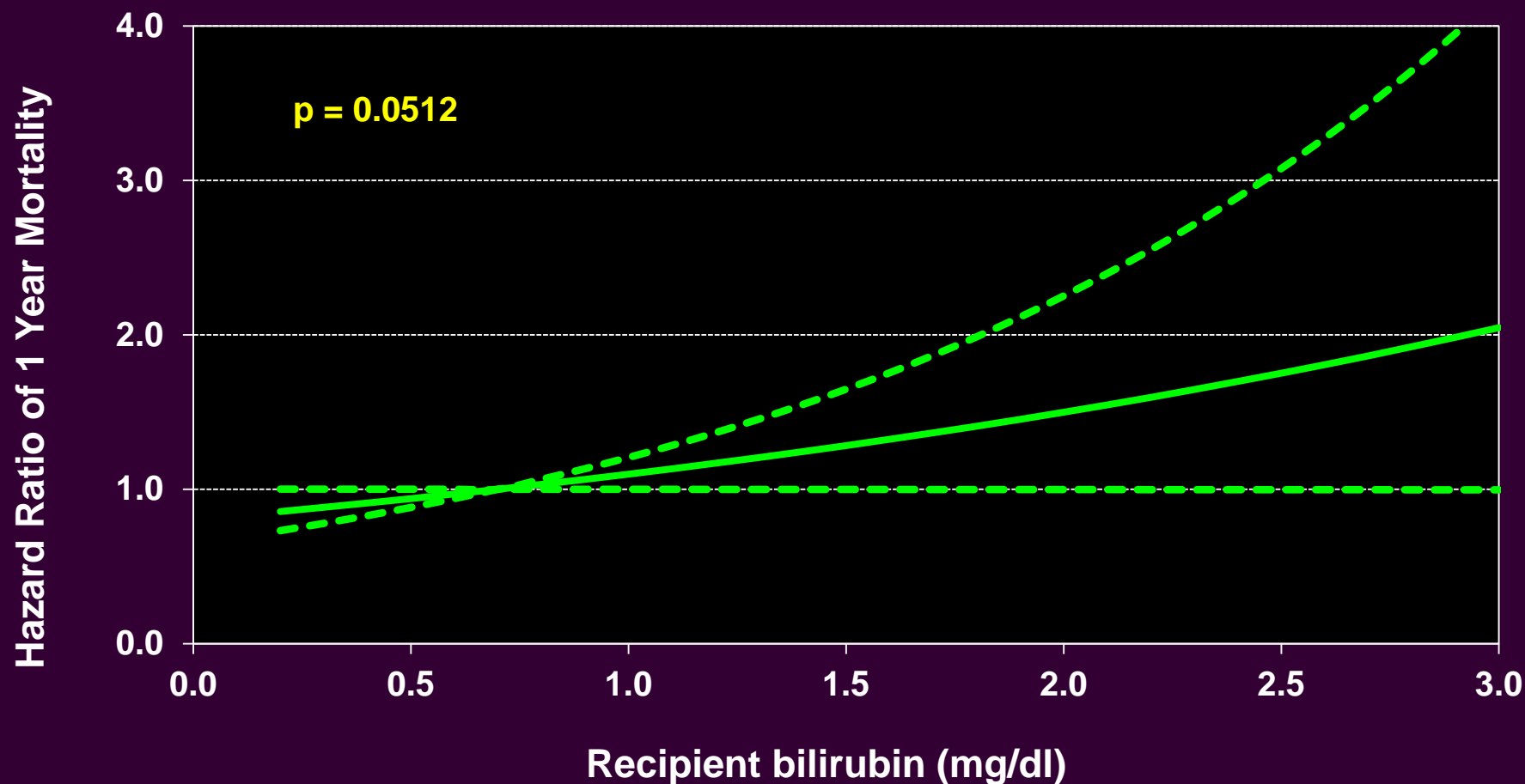




PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 6-10 Years

Recipient Pre-Transplant Bilirubin



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 11-17 Years

Risk Factors For 1 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
Retransplant	132	2.75	0.0003	1.59-4.77
On dialysis	53	2.47	0.0039	1.34-4.57
ECMO	47	2.17	0.0225	1.12-4.23
Diagnosis = congenital	305	2.17	0.0007	1.39-3.40
Donor cause of death other than (head trauma, cerebrovascular/stroke, anoxia and CNS tumor) vs. head trauma	100	1.88	0.0386	1.03-3.43
Previous transfusion	305	1.53	0.0449	1.01-2.33
Donor cause of death = anoxia vs. head trauma	171	0.41	0.038	0.18-0.95

Reference group = Cardiomyopathy, no devices

PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 11-17 Years

Borderline Significant Risk Factors For 1 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Donor clinical infection	404	0.68	0.0931	0.43-1.07
Transplant year: 2003-2004 vs. 2001-2002	241	0.59	0.0815	0.33-1.07
Transplant year: 2007-2008 vs. 2001-2002	251	0.58	0.0784	0.32-1.06

Reference group = Cardiomyopathy, no devices

N = 1,231



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Age = 11-17 Years

Risk Factors For 1 Year Mortality

Continuous Factors (see figures)

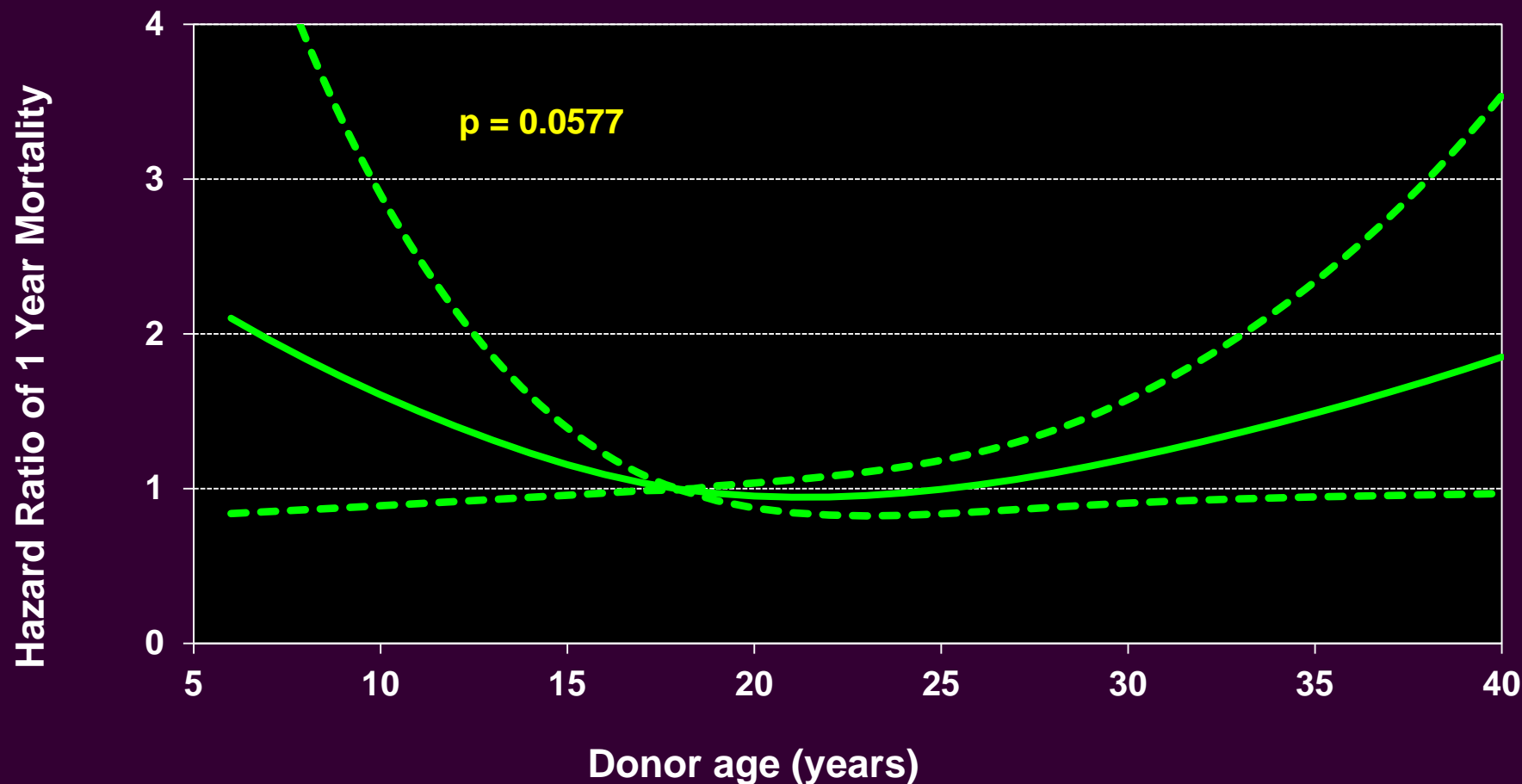
Donor age (borderline)



PEDIATRIC HEART TRANSPLANTS (2001-2010)

Risk Factors For 1 Year Mortality in Age = 11-17 Years

Donor Age



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors For 5 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
ECMO, age = 0 years	94	2.68	<.0001	1.94-3.70
Retransplant	188	1.75	0.0001	1.32-2.33
On dialysis	81	1.67	0.0037	1.18-2.37
Diagnosis = congenital	1283	1.62	<.0001	1.38-1.91
PRA > 10%	306	1.48	0.0003	1.20-1.82
Male donor/female recip vs. male donor/male recip	772	1.38	0.0009	1.14-1.67
Donor cause of death = cerebrovascular/stroke vs. head trauma	306	1.28	0.0418	1.01-1.62
On ventilator	597	1.26	0.0182	1.04-1.53
Infection requiring IV drug therapy (within 2wk/TX	475	1.24	0.0289	1.02-1.50
Not ABO identical	692	0.77	0.0057	0.64-0.93

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors For 5 Year Mortality

Continuous Factors (see figures)

Recipient age

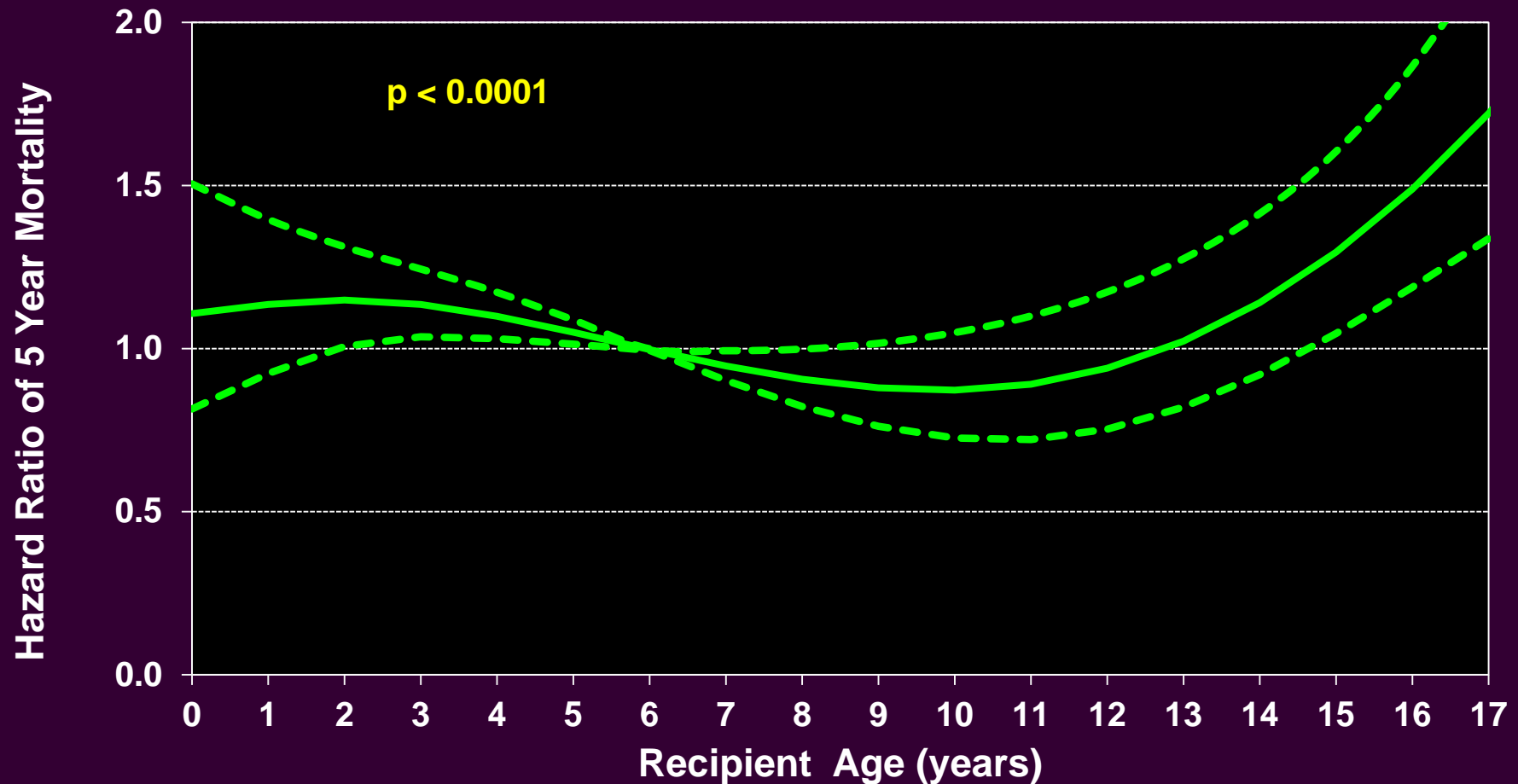
Estimated GFR



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors For 5 Year Mortality with 95% Confidence Limits

Recipient Age

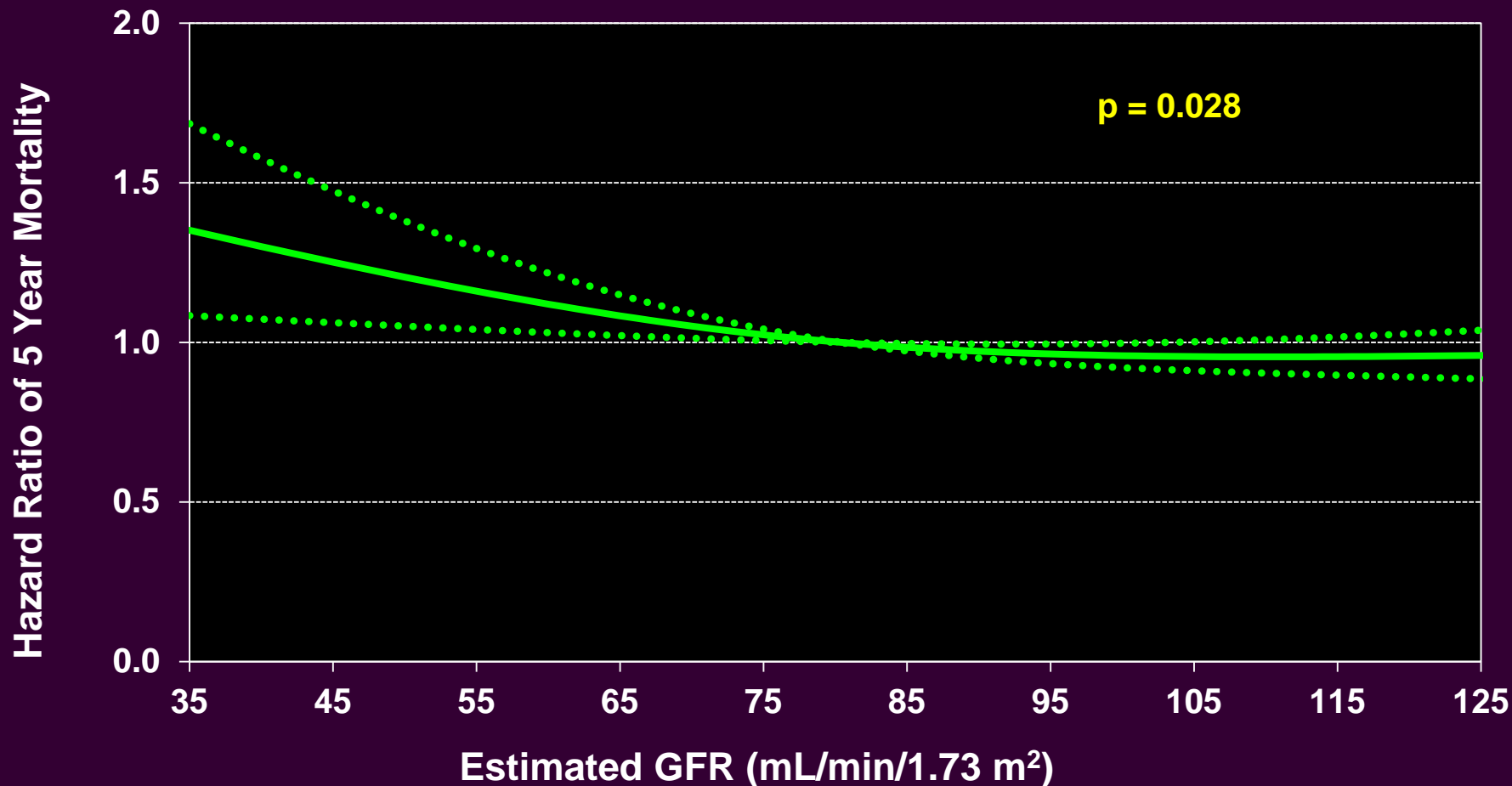




PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors For 5 Year Mortality with 95% Confidence Limits

Recipient Pre-Transplant Estimated GFR



PEDIATRIC HEART TRANSPLANTS (1992-2001)

Risk Factors For 10 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
Diagnosis = congenital, age = 0 years, ECMO	31	3.91	<.0001	2.46-6.22
Retransplant	145	2.05	<.0001	1.60-2.63
Diagnosis = congenital, age = 1 year	106	1.95	<.0001	1.45-2.63
Balloon pump	28	1.78	0.0248	1.08-2.94
Diagnosis = congenital, age = 0 years, no PGE or ECMO	390	1.60	<.0001	1.27-2.02
Diagnosis = congenital, age = 2-17 years	645	1.27	0.0036	1.08-1.49
On ventilator	490	1.19	0.0418	1.01-1.42
Hospitalized at time of transplant	2298	1.19	0.0122	1.04-1.36
Female recipient	1409	1.17	0.0077	1.04-1.31
Donor CMV +/-Recipient CMV -	723	1.14	0.046	1.00-1.31
0-3 vs. 4-6 total HLA mismatches	295	0.80	0.0409	0.65-0.99
Transplant year: 1998/1999 vs. 1992/1993	691	0.72	0.0003	0.6-0.86
Transplant year: 1996/1997 vs. 1992/1993	650	0.72	0.0003	0.6-0.86
Transplant year: 2000/2001 vs. 1992/1993	726	0.65	<.0001	0.55-0.78

Reference group = Cardiomyopathy, no devices

N = 3,301



PEDIATRIC HEART TRANSPLANTS (1992-2001)

Borderline Significant Risk Factors For 10 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
PRA > 10%	256	1.22	0.0523	1.00-1.49

N = 3,301

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (1992-2001)

Risk Factors For 10 Year Mortality

Continuous Factors (see figures)

Difference in age

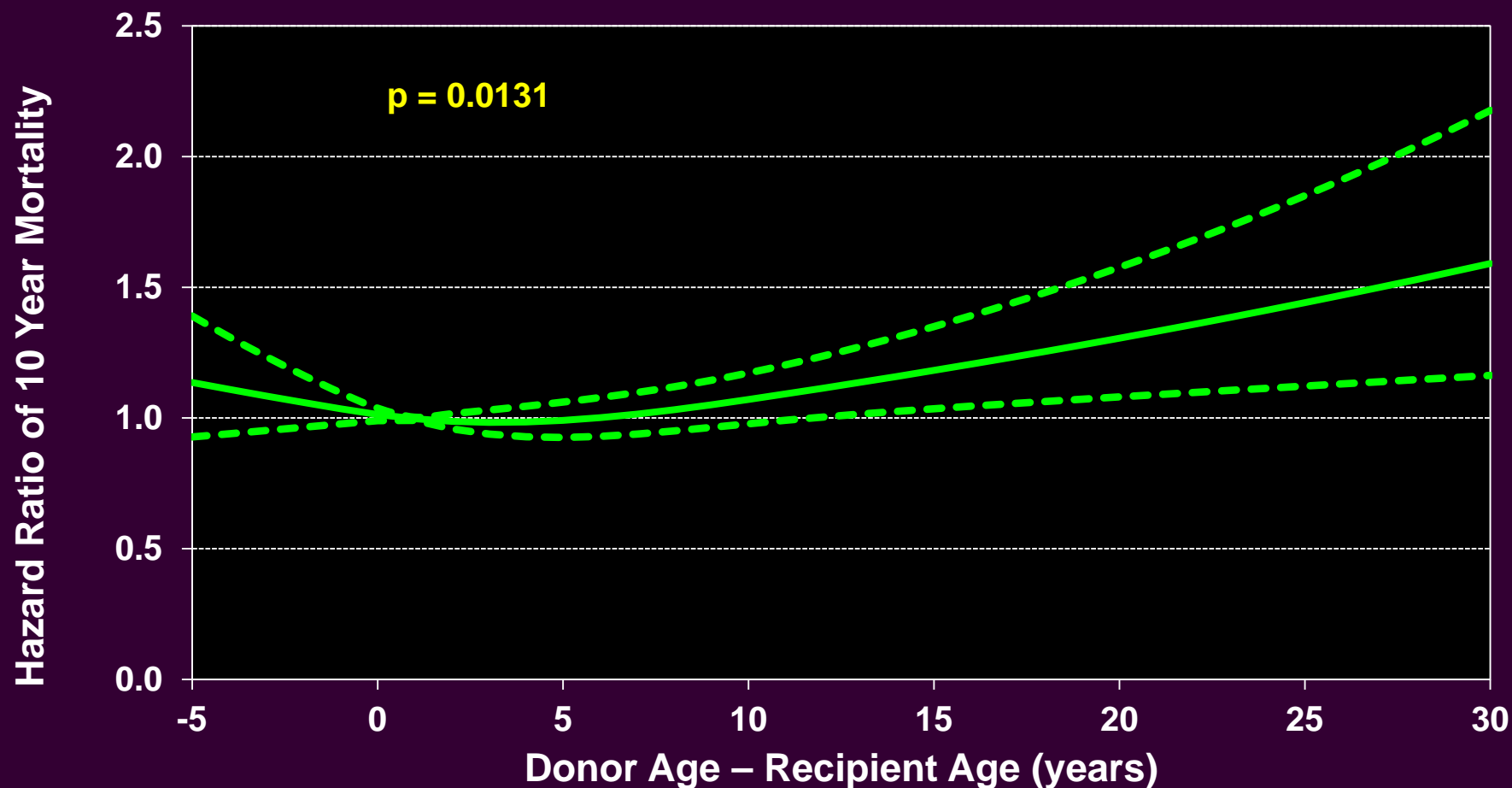
Volume of pediatric transplants



PEDIATRIC HEART TRANSPLANTS (1992-2001)

Risk Factors For 10 Year Mortality with 95% Confidence Limits

Difference in Age

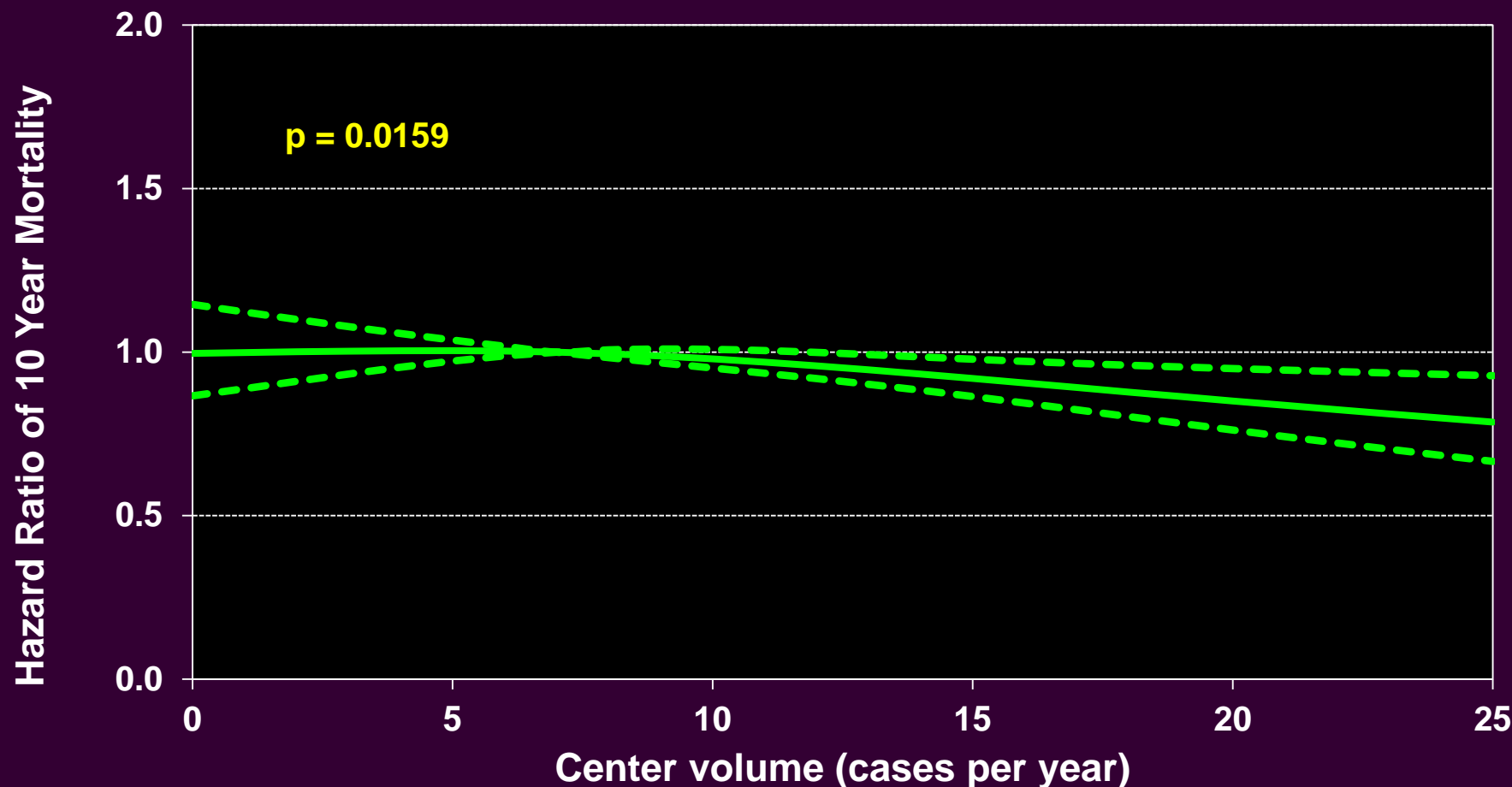




PEDIATRIC HEART TRANSPLANTS (1992-2001)

Risk Factors For 10 Year Mortality with 95% Confidence Limits

Center Volume for Pediatric Transplants



PEDIATRIC HEART TRANSPLANTS (1988-1996)

Risk Factors For 15 Year Mortality

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
Retransplant	79	1.84	<.0001	1.36-2.48
Balloon pump	32	1.59	0.0432	1.01-2.50
On ventilator	426	1.28	0.0025	1.09-1.49
Diagnosis = congenital	1214	1.18	0.0182	1.03-1.36
Transplant year: 1995-1996 vs. 1988-1989	603	0.82	0.0217	0.69-0.97
2 mismatches at DR locus	67	0.78	0.0396	0.62-0.99

N = 2,393

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (1988-1996)

Borderline Significant Risk Factors For 15 Year Mortality

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Recipient history of malignancy	49	1.41	0.0644	0.98-2.03
Female recipient	1003	1.10	0.986	0.98-1.24

N = 2,393

Reference group = Cardiomyopathy, no devices



PEDIATRIC HEART TRANSPLANTS (1988-1996)

Risk Factors For 15 Year Mortality

Continuous Factors (see figures)

Donor age

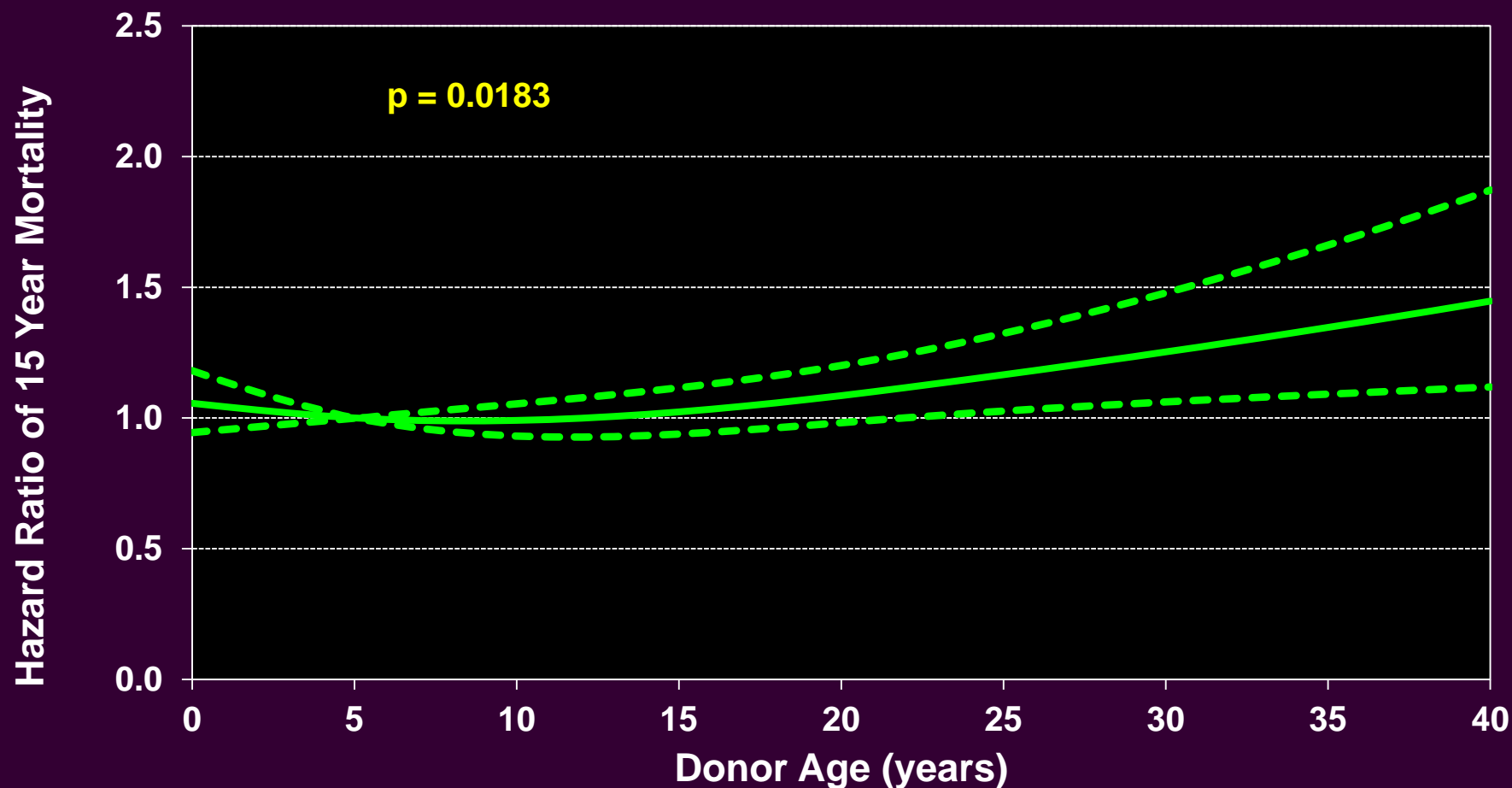
Volume of pediatric transplants



PEDIATRIC HEART TRANSPLANTS (1988-1996)

Risk Factors For 15 Year Mortality with 95% Confidence Limits

Donor Age

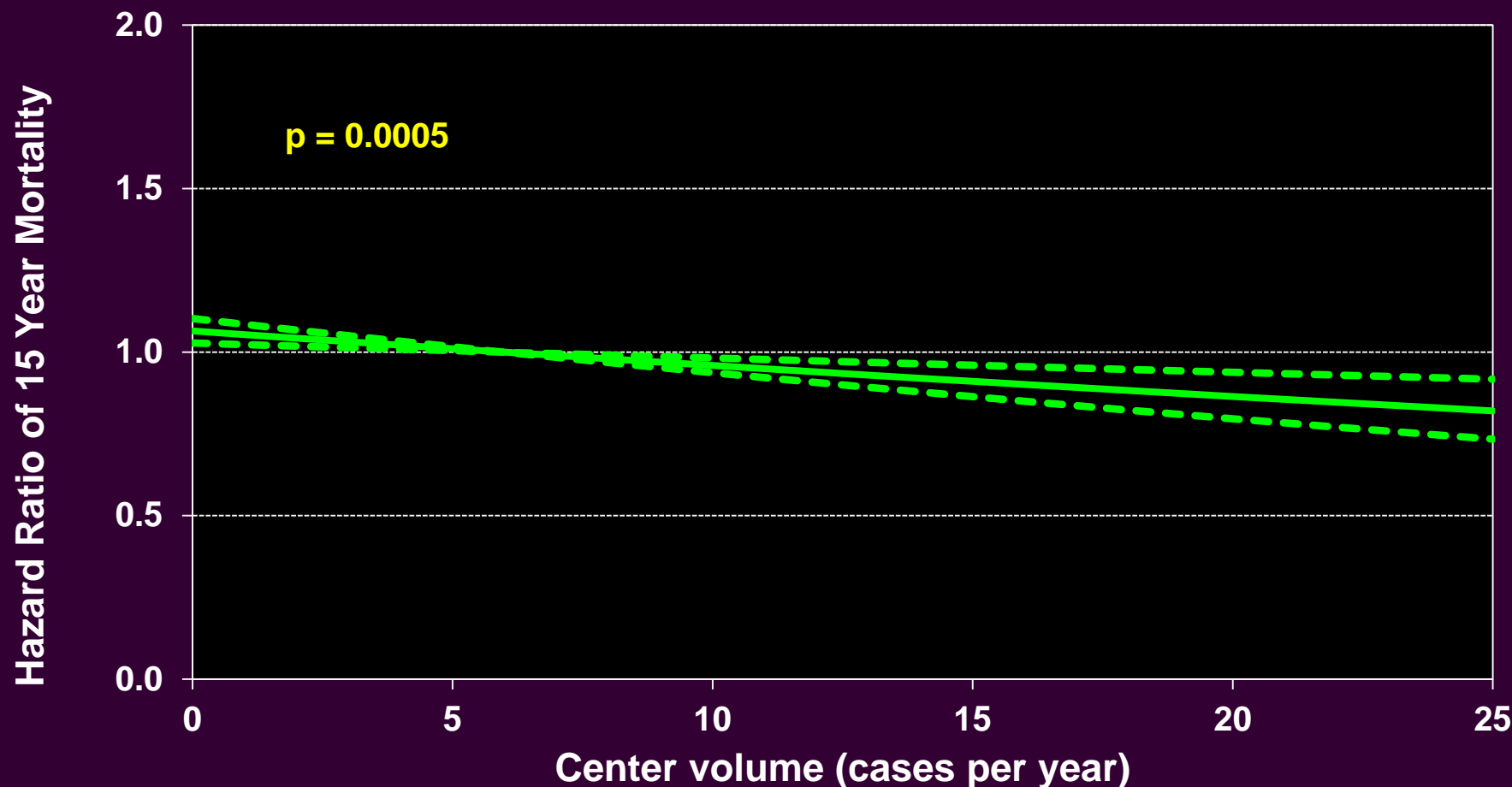




PEDIATRIC HEART TRANSPLANTS (1988-1996)

Risk Factors For 15 Year Mortality with 95% Confidence Limits

Center Volume for Pediatric Transplants



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing Severe Renal Dysfunction within 5 Years
Limited to Recipients without Severe Renal Dysfunction* Pre-Transplant
Conditional on Survival to Transplant Discharge

VARIABLE	N	Hazard Ratio	P-value	95% Confidence Interval
Dialysis prior to discharge	64	7.79	<.0001	4.32-14.05
Sirolimus used for maintenance	42	3.00	0.0345	1.08-8.31
Repeat transplant	140	2.85	0.0017	1.48-5.47
Cardiac re-operation prior to discharge	127	2.71	0.001	1.49-4.90
Diagnosis = congenital vs. non-congenital	896	2.09	0.0039	1.27-3.45
Female donor	934	0.57	0.0201	0.36-0.92

N = 2,199

*Severe renal dysfunction =
creatinine > 2.5 mg/dl or dialysis



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing Severe Renal Dysfunction within 5 Years
Limited to Recipients without Severe Renal Dysfunction* Pre-Transplant
Conditional on Survival to Transplant Discharge

Continuous Factors (see figures)

Recipient BSA

Donor/recipient weight ratio

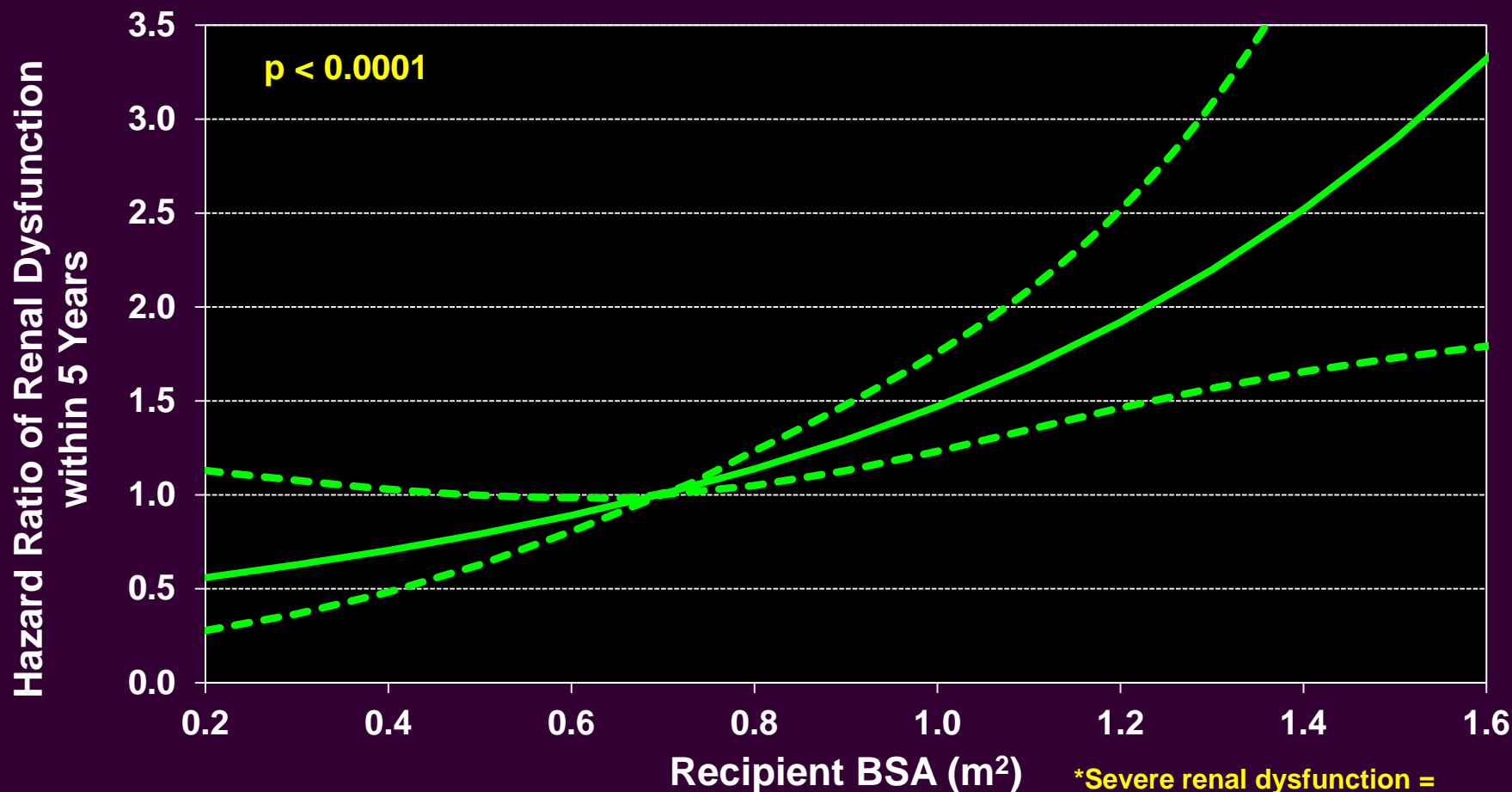
*Severe renal dysfunction =
creatinine > 2.5 mg/dl or dialysis



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing Severe Renal Dysfunction within 5 Years
Limited to Recipients without Severe Renal Dysfunction* Pre-Transplant
Conditional on Survival to Transplant Discharge

Recipient BSA

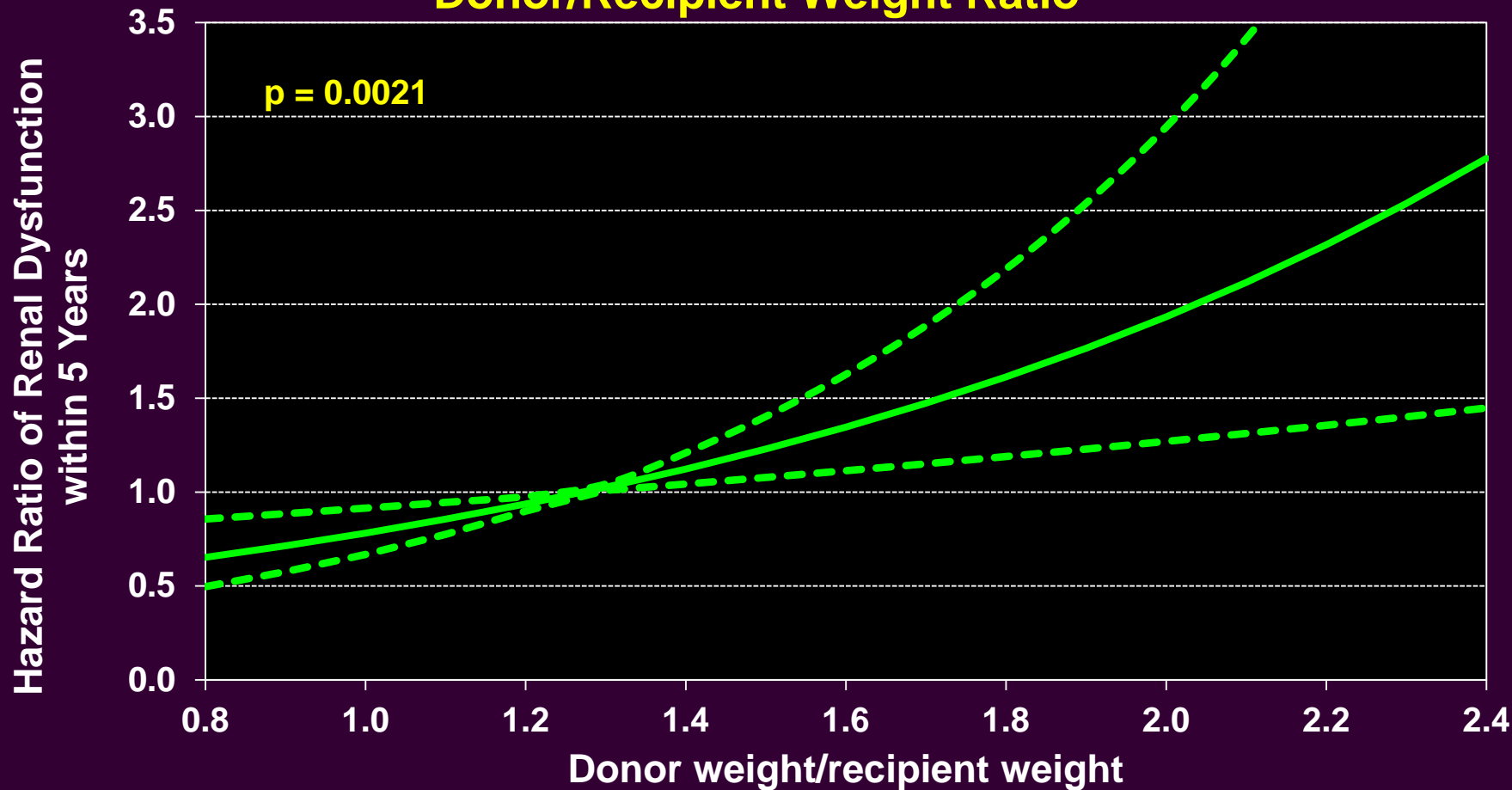


*Severe renal dysfunction =
creatinine > 2.5 mg/dl or dialysis

PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing Severe Renal Dysfunction within 5 Years
Limited to Recipients without Severe Renal Dysfunction* Pre-Transplant
Conditional on Survival to Transplant Discharge

Donor/Recipient Weight Ratio



*Severe renal dysfunction =
creatinine > 2.5 mg/dl or dialysis

PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Cyclosporine and Tacrolimus reported prior to discharge	91	2.41	0.0009	1.43-4.06
Repeat transplant	153	2.02	0.0012	1.32-3.10
PRA > 10%	228	1.56	0.0157	1.09-2.23
Ventilator at transplant	372	0.63	0.0304	0.42-0.96
Transplant year: 2005/2006 vs. 1999/2000	503	0.60	0.0301	0.37-0.95

N = 2,167



PEDIATRIC HEART TRANSPLANTS (1997-2006)

***Borderline Significant Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge***

<i>VARIABLE</i>	<i>N</i>	<i>Hazard Ratio</i>	<i>P-value</i>	<i>95% Confidence Interval</i>
Donor cause of death: cerebrovascular/stroke vs. head trauma	212	1.41	0.0893	0.95-2.11
IL2-R antagonist used for induction vs. no induction	227	1.41	0.0979	0.94-2.13
Male donor/female recipient vs. male donor/male recipient	552	1.32	0.0925	0.96-1.83

N = 2,167



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge

Continuous Factors (see figures)

Recipient weight

Transplant center volume

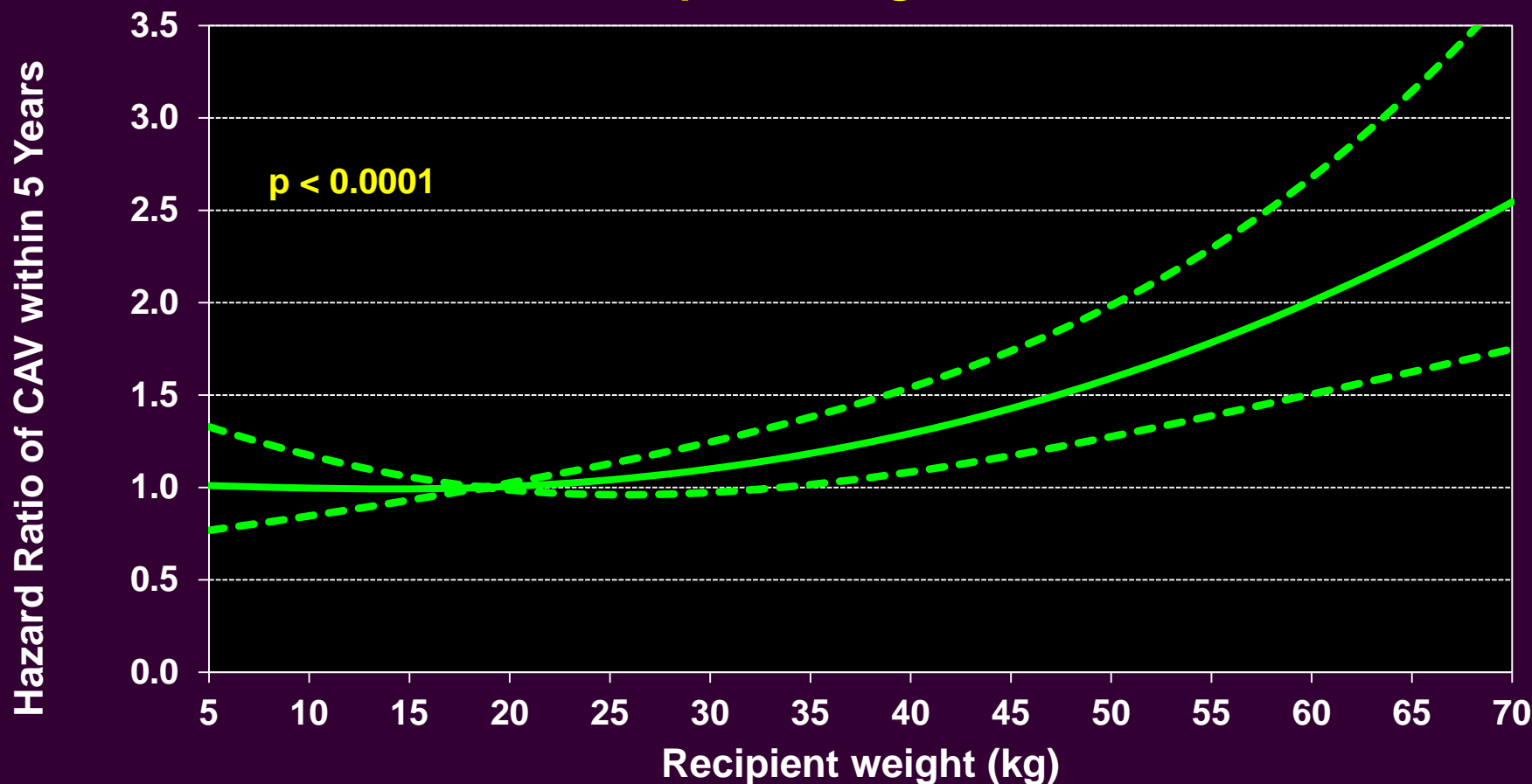
Donor/recipient age difference



PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge

Recipient Weight

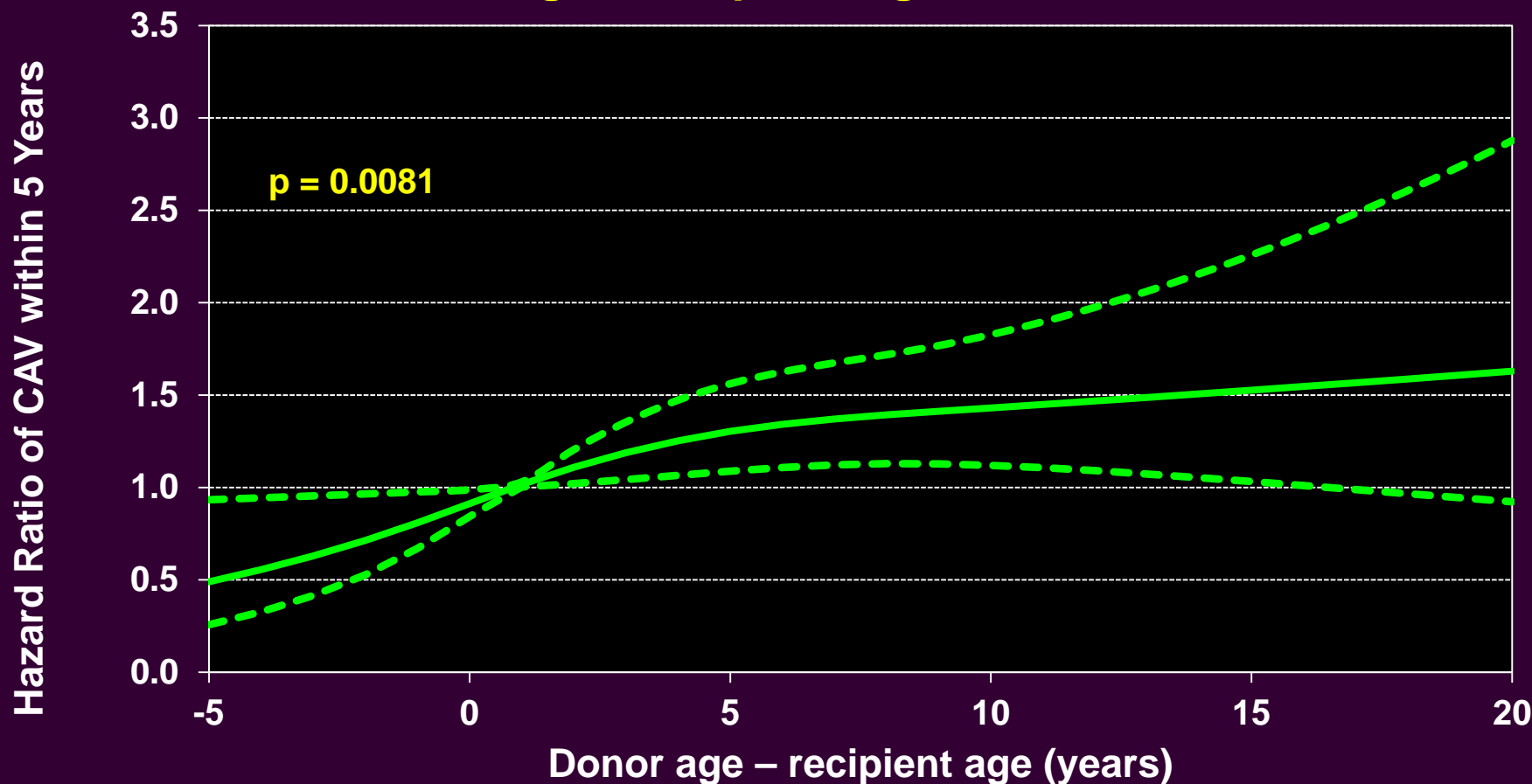




PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge

Donor Age - Recipient Age Difference

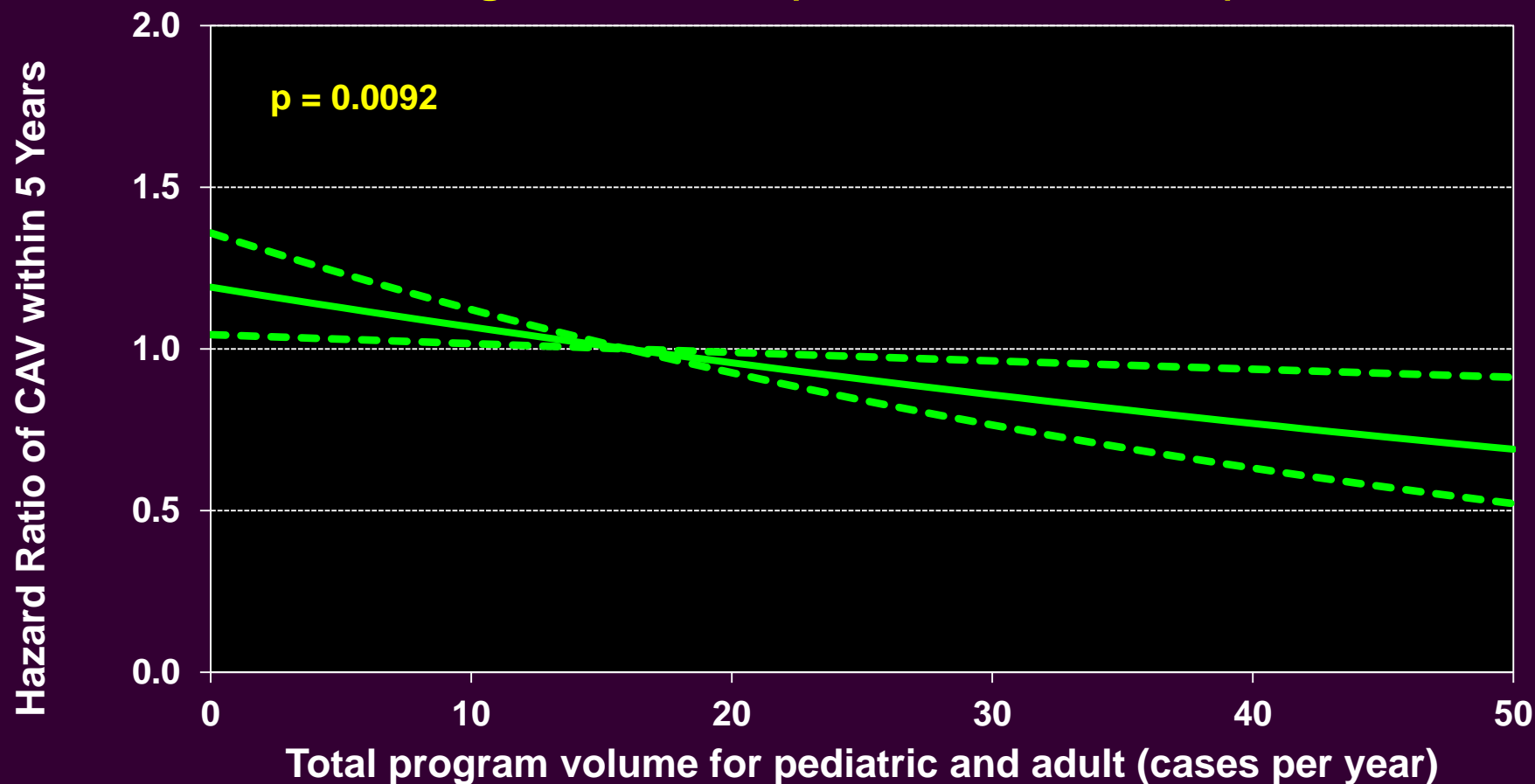




PEDIATRIC HEART TRANSPLANTS (1997-2006)

Risk Factors for Developing CAV within 5 Years
Conditional on Survival to Transplant Discharge

Total Program Volume (Pediatric and Adult)



Pediatric Heart Transplants (2000 – 6/2011)

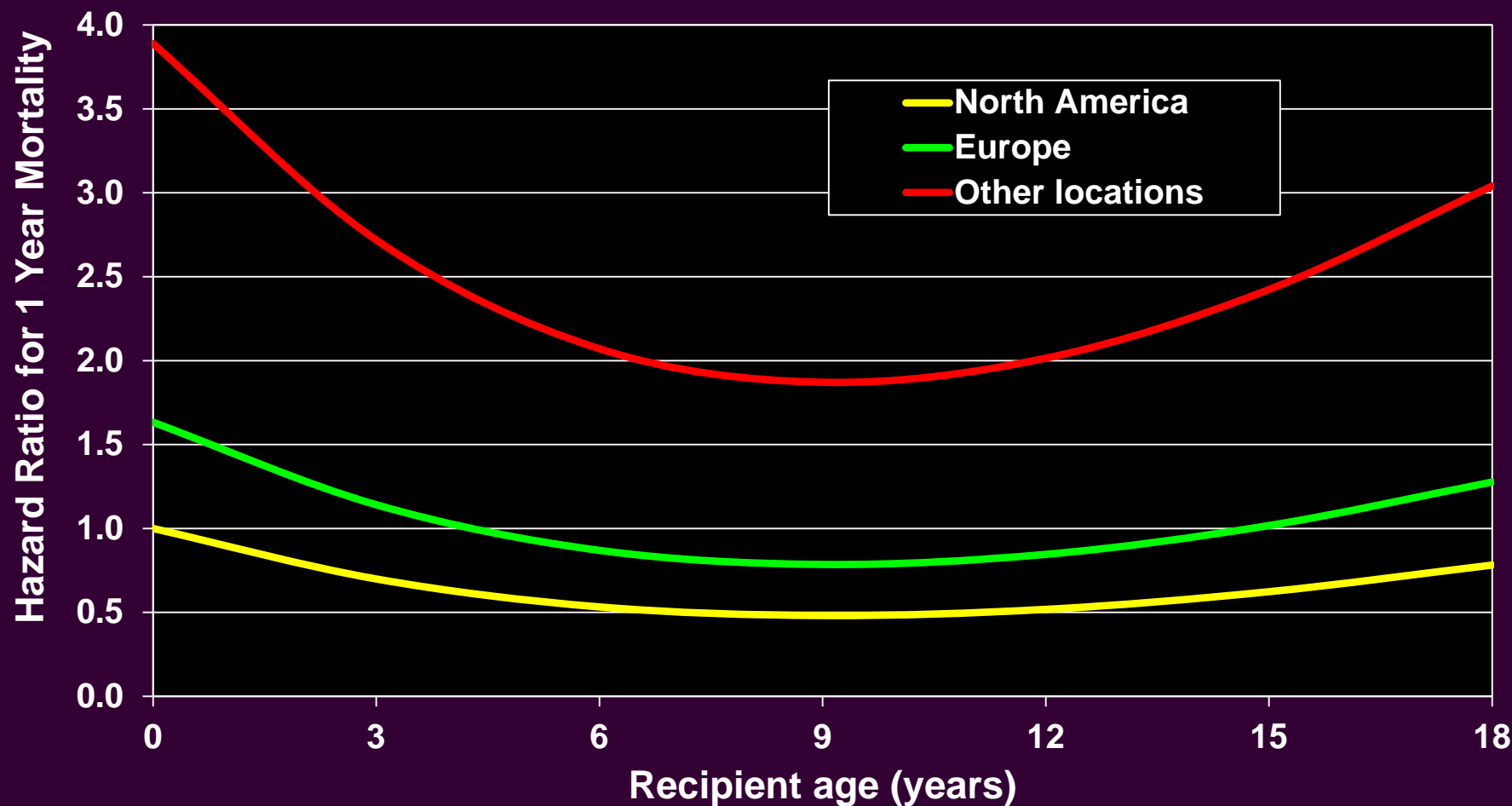
Risk Factors For 1 Year Mortality for Diagnosis = Cardiomyopathy*

VARIABLE		Hazard Ratio	P-value	95% Confidence Interval
Geographic location (reference = North America)	Europe	1.633	0.0007	1.230-2.167
	Other	3.889	<.0001	2.461-6.146
Type of cardiomyopathy (reference = idiopathic dilated cardiomyopathy)	Restrictive	1.438	0.0755	0.963-2.145
	Hypertrophic	1.694	0.056	0.987-2.908
	Familial	1.053	0.8474	0.620-1.789
	Myocarditis	1.019	0.9499	0.572-1.813
	Other type	1.024	0.9114	0.680-1.541
Year of transplant (reference = 2000-2001)	2002-2003	0.947	0.8162	0.600-1.496
	2004-2005	0.938	0.7825	0.594-1.480
	2006-2007	0.815	0.3766	0.517-1.283
	2008-2009	0.888	0.5925	0.575-1.371
	2010-6/2011	0.714	0.1921	0.431-1.184
Continuous variable	Recipient age	-	0.0044	-



Pediatric Heart Transplants (2000 – 6/2011)

Risk Factors For 1 Year Mortality for Diagnosis = Cardiomyopathy*
Combined effect of age and geography



Pediatric Heart Transplants (2000 – 6/2011)

Risk Factors For 1 Year Mortality for Diagnosis = Congenital*

VARIABLE		Hazard Ratio	P-value	95% Confidence Interval
Geographic location (reference = North America)	Europe	**	**	
	Other	1.424	0.5923	0.579-3.505
Year of transplant (reference = 2000-2001)	2002-2003	0.867	0.4552	0.595-1.262
	2004-2005	1.211	0.2792	0.856-1.711
	2006-2007	0.844	0.3758	0.579-1.229
	2008-2009	0.748	0.1243	0.516-1.083
	2010-6/2011	0.576	0.0143	0.370-0.896
Continuous variables	Recipient age	-	**	-
	Interaction between recipient age and Europe	-	0.0287	-

* *The hazard ratio and p-value for the main effect for Europe and for age can not be interpreted in isolation; they must be interpreted in combination with the interaction between recipient age and Europe. The simultaneous test of the main effect of Europe + the interaction between Europe and recipient age has a p-value of 0.0331. The simultaneous test of the main effect for recipient age + the interaction between Europe and recipient age has a p-value of 0.0002.



Pediatric Heart Transplants (2000 – 6/2011)

Risk Factors For 1 Year Mortality for Diagnosis = Congenital*

Combined effect of age, geography and age*geography interaction

