NATIONAL KIDNEY REGISTRY®
FACILITATING LIVING DONOR TRANSPLANTS

Paired Exchange Results Quarterly Report

As of March 31, 2016

Table of Contents

Message From the Founder 1

Transplants Facilitated 2
Patient Referrals 2

Top Centers 3
Top 5 CLC Centers 3

NKR Graft Survival Advantage 4
NKR Patient Survival Advantage 4

Patients Waiting > 1 Year 5
Patients Waiting > 1 Year by Center 5

Wait Time Distribution 6
Cumulative Wait Time Distribution 6

Patients Waiting > 1 Year by cPRA 7

Pool Composition by cPRA 8
Transplanted Patient Median Wait Time 8

Transplanted Patients with cPRA > 80% 9
Transplanted Patients by cPRA 9

Percent of Pool Matched and/or Transplanted 10
New Pair Enrollments 10

Pool Size 11
Non-Directed Donor Registrations 11

Non-Directed Donor Referrals 12
Chains Started 12

Chain and Loop Statistics 13

Great HLA Matches 14

Compatible Pairs Transplanted 15

Regular Swap Failures 16
All Swap Failures by Primary Root Cause 16

Failure Rate by Primary Root Cause 17
Patients Deleted 17

Pair Match Power is the Key to Understanding Wait Time 18
NKR Wait Times 18

Bridge Donor Median Wait Times 19
Bridge Donor Wait Times 19

NKR Transplants per Bridge Donor 20
Broken Chains 20

Summary Report 21
Detail Report 21

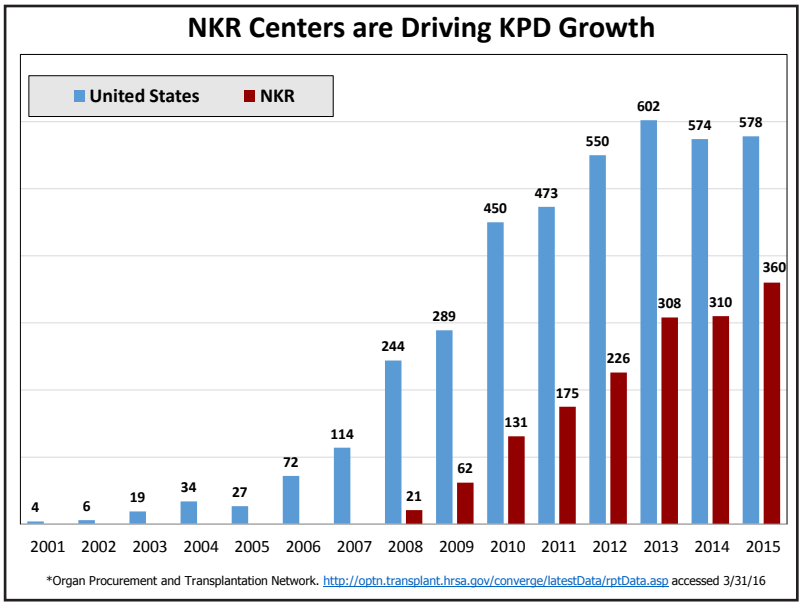
Program Statistics 22-23



Message From the Founder

I am pleased to report that we have facilitated 89 transplants in the first quarter of 2016 closing in on nearly 1700 transplants since we began organizing swaps in 2008. Based on the KPD numbers from the OPTN, NKR facilitated 62% of all the KPD Transplants in the United States and accounted for all of the growth in domestic KPD transplants since 2010.

The success of the center liquidity contribution program (CLC) program continues to drive more transplants. The CLC program rewards centers that contribute NDDs and easy to match pairs and has reversed the pair withholding trend, increasing KPD transplants and reducing KPD wait times over the past three years.



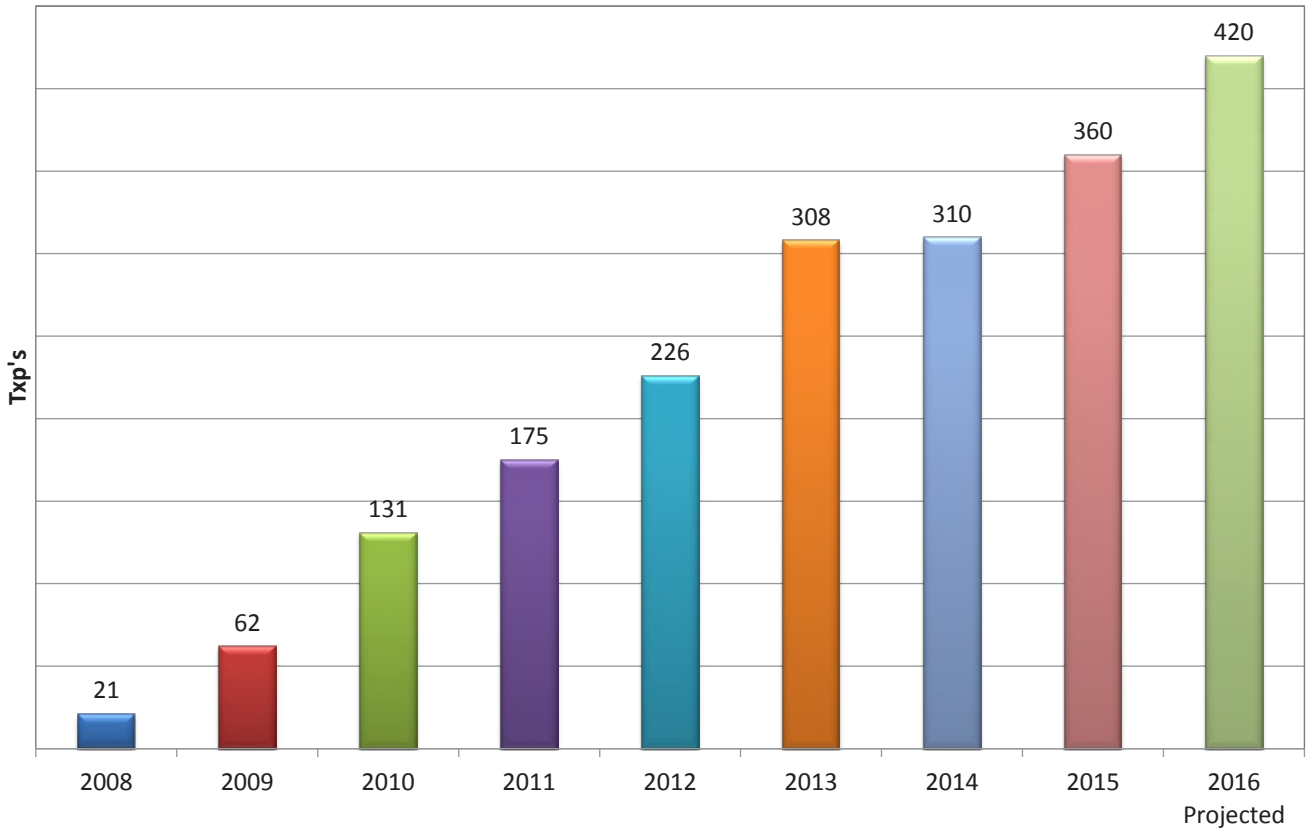
We continue to see great success with the donor cell cryo preservation initiative which, combined with exploratory cross matching, has the potential to virtually eliminate swap failures caused by unacceptable cross match results. Over 55% of the NKR centers are now accepting cryo cells and over 60% of the viable donors in the NKR have cryo cells available. This improved process reduces the cross match process from one week to one day, speeding up the paired exchange process and making donation easier for donors who no longer need to have their blood drawn multiple times for multiple cross matches.

The dedication and effort of our member centers continues to drive the NKR's results. Thank you for your continued collaboration and keep up the great work.

Sincerely,

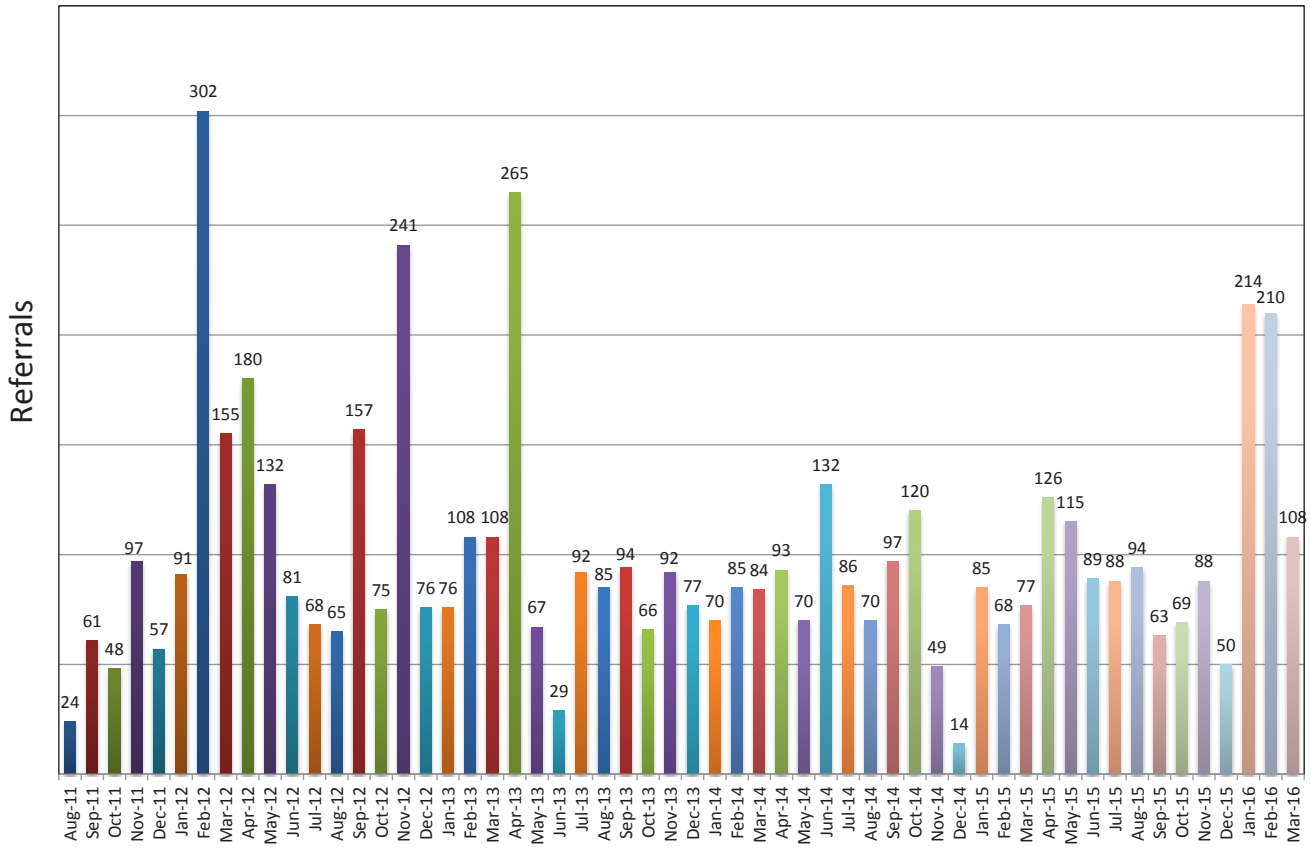
Garet Hil
Founder & CEO
National Kidney Registry

Transplants Facilitated



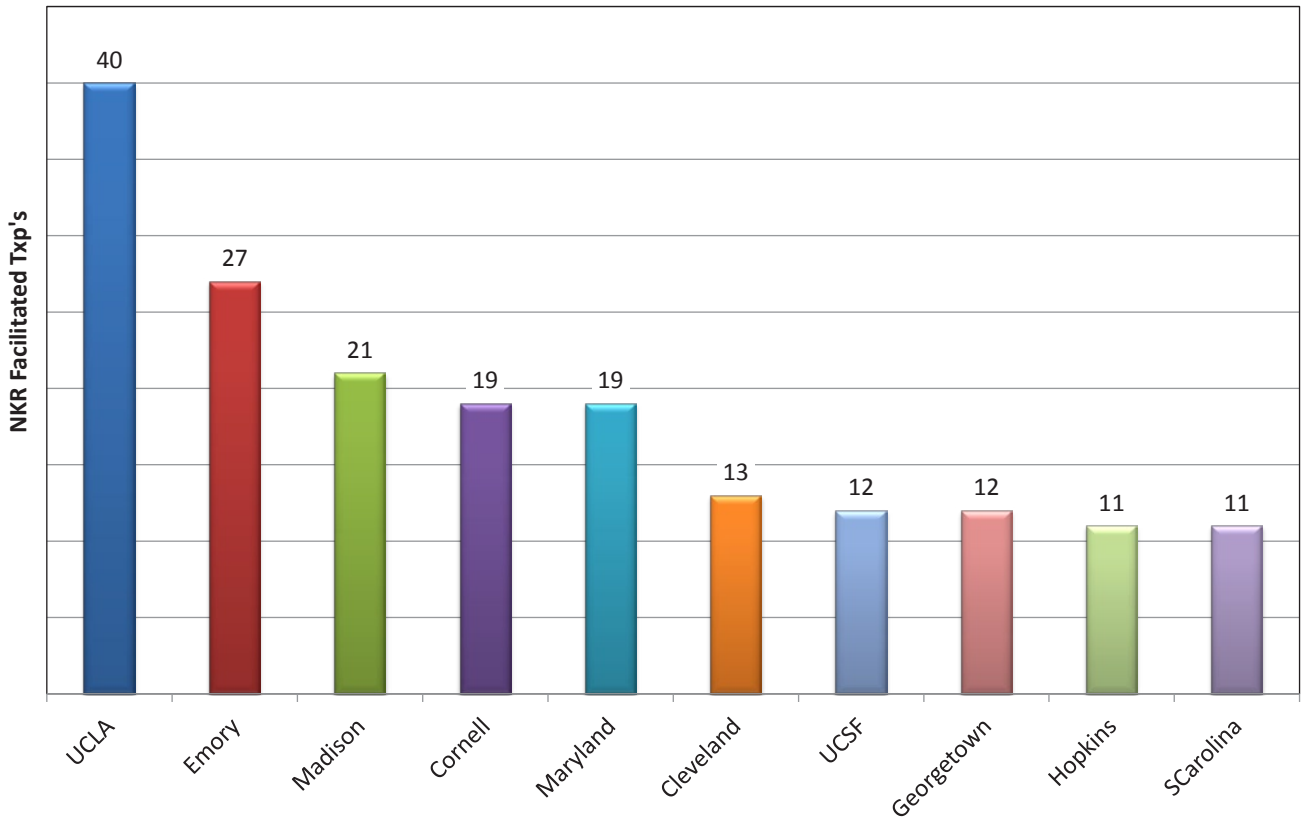
Patient Referrals

To NKR Member Centers



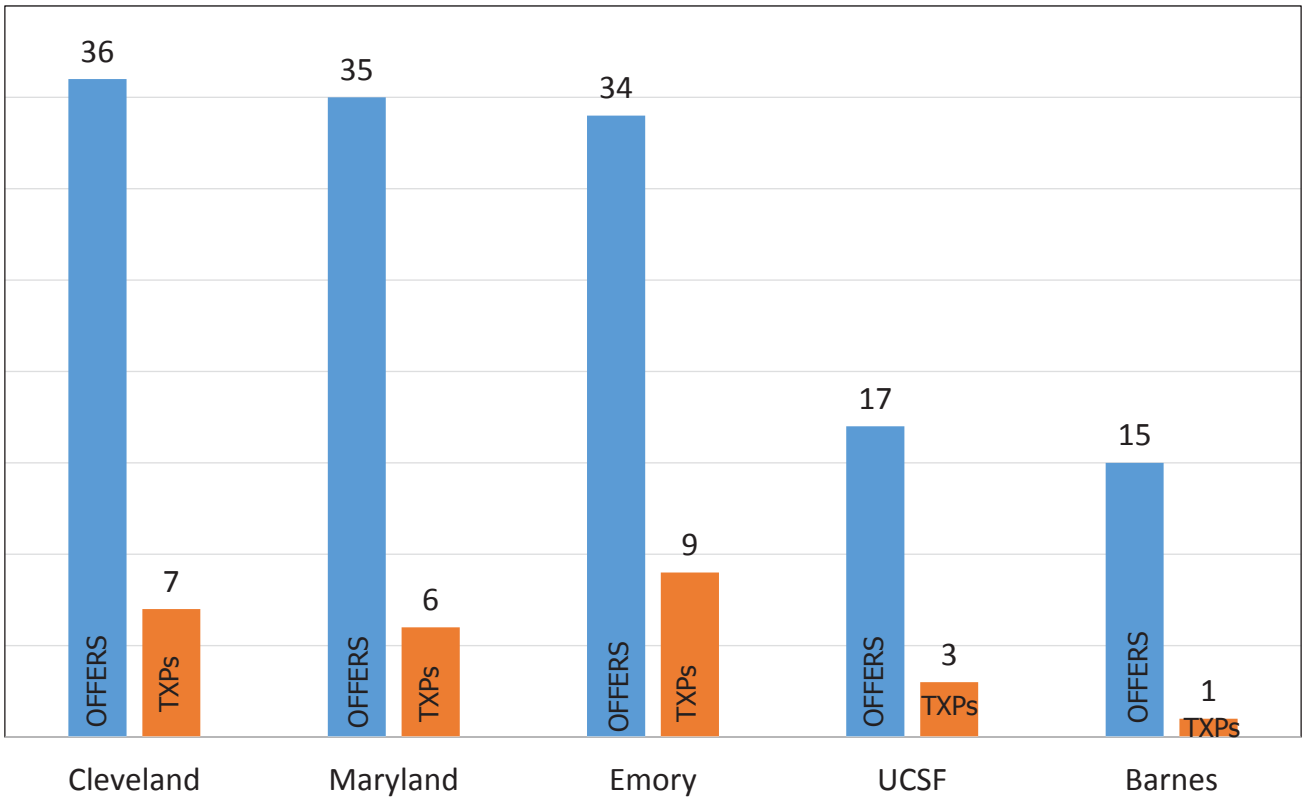
Top Centers

Transplants in Last 12 Months



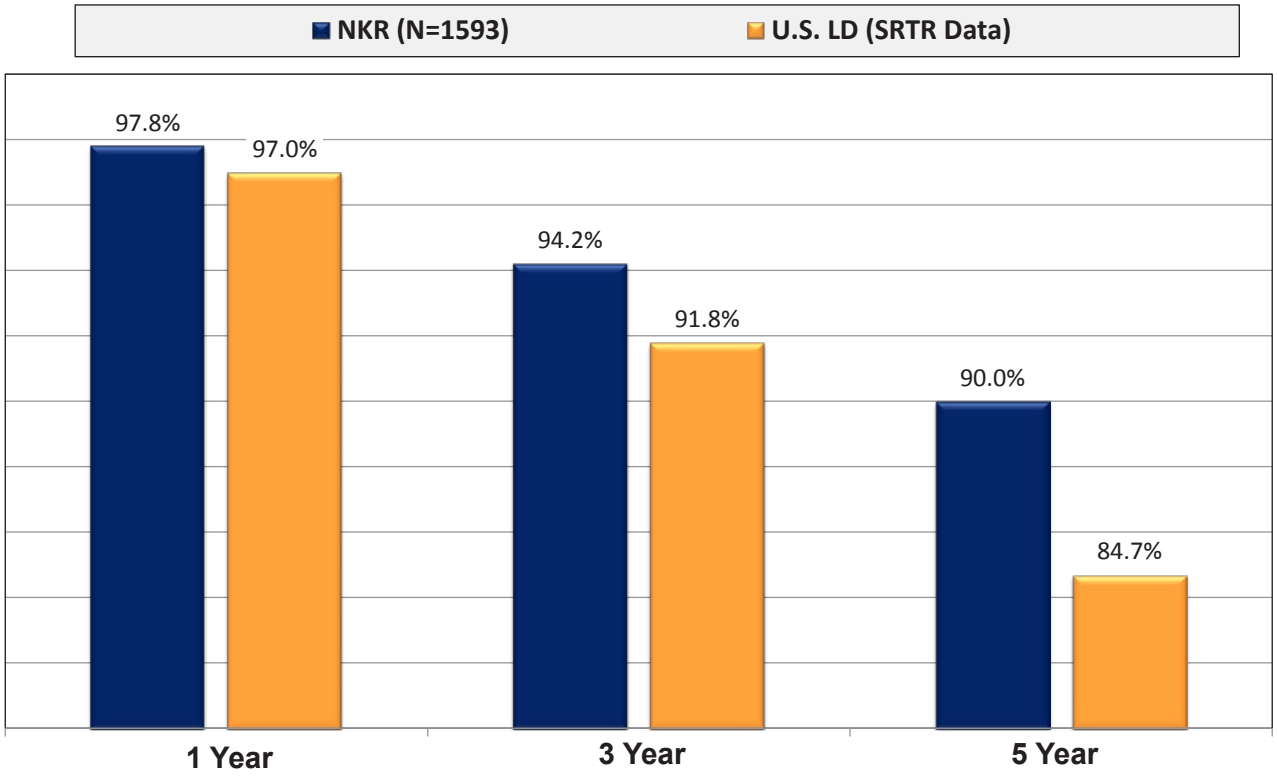
Top 5 CLC Centers

CLC Driven Match Offers – 4/15 – 4/16



NKR Graft Survival Advantage

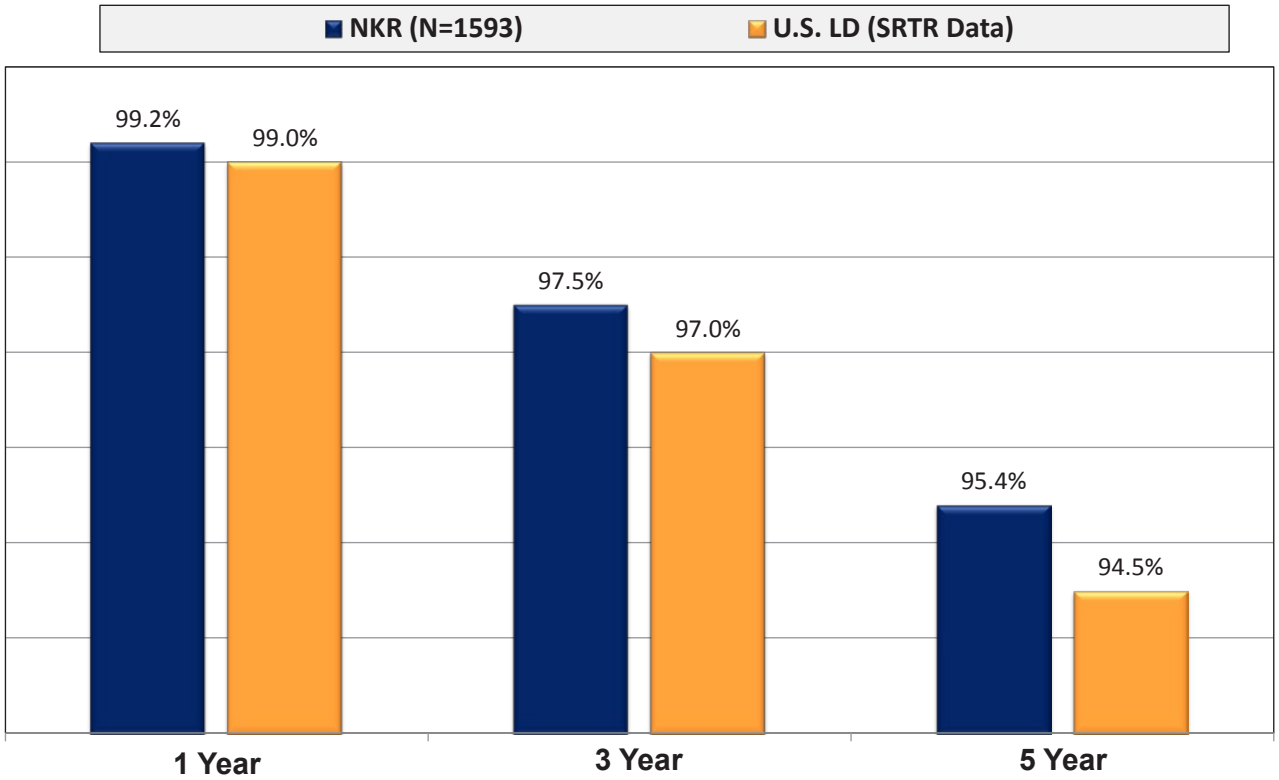
NKR Transplants vs. U.S. Living Donor Transplants
As of 12/31/2015



*NKR Kaplan-Meier GS calculations provided courtesy of UCLA Departments of Nephrology and Urology
**U.S LD - Scientific Registry of Transplant Recipients. www.srtr.org/annual_reports/2011/509d_ki.aspx Accessed 1/12/16

NKR Patient Survival Advantage

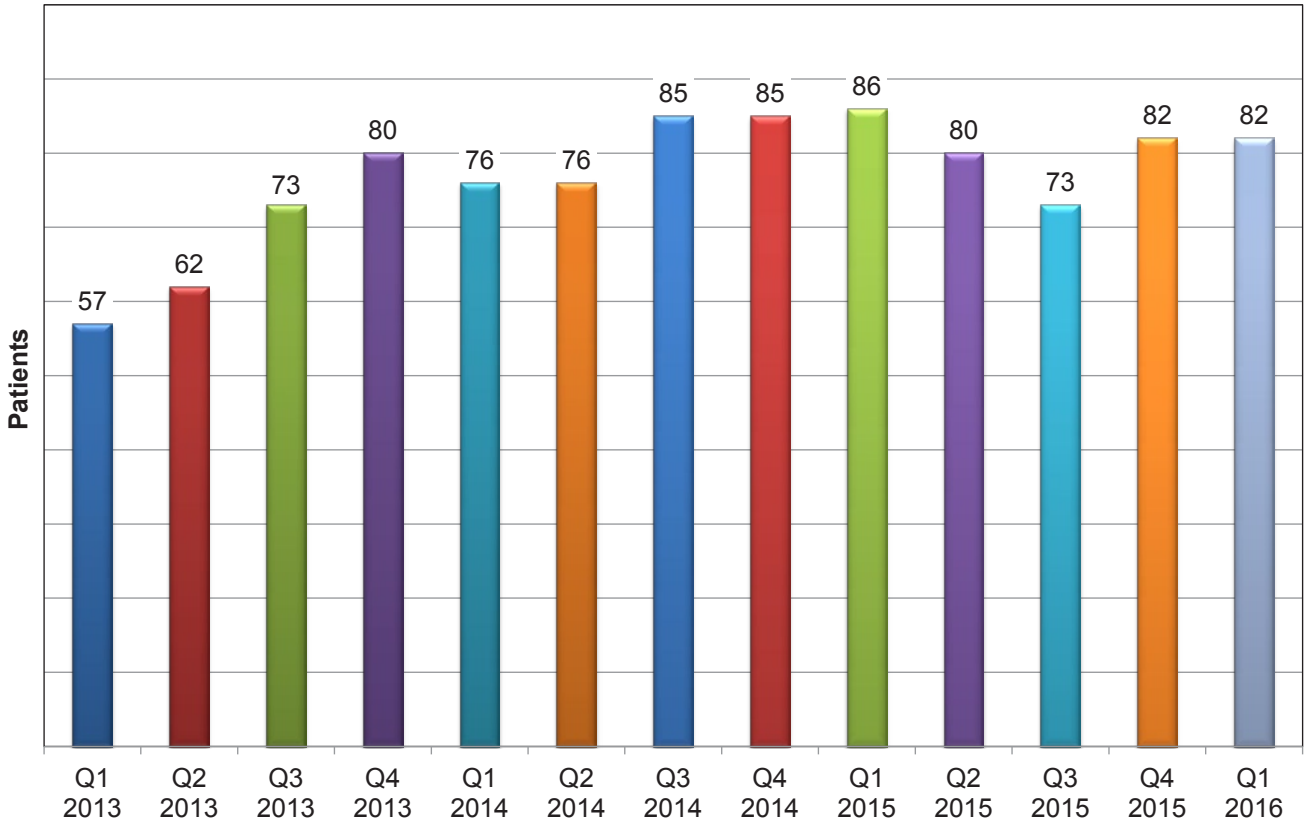
NKR Transplants vs. U.S. Living Donor Transplants
As of 12/31/2015



*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology
**U.S LD - Scientific Registry of Transplant Recipients. www.srtr.org/annual_reports/2011/513d_ki.aspx Accessed 1/12/16

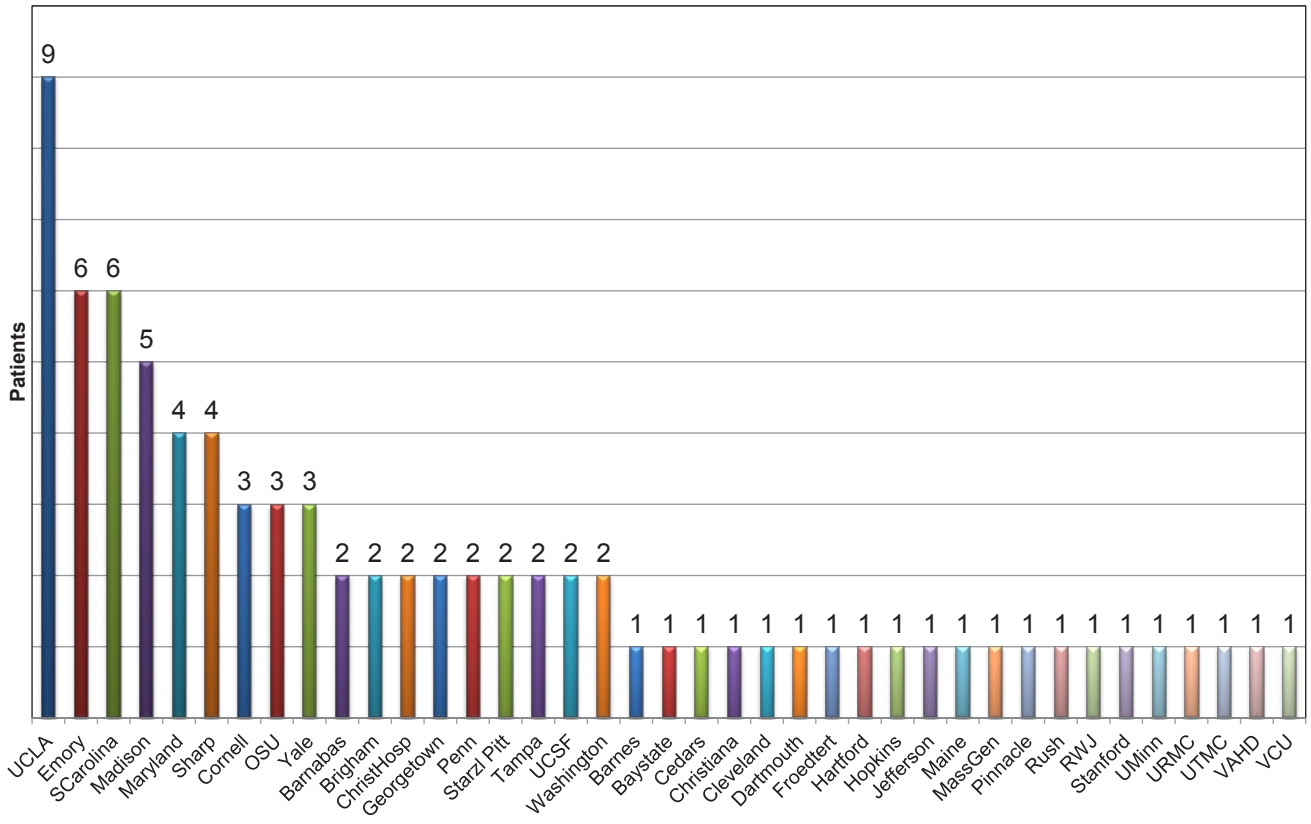
Patients Waiting > 1 Year

As of 3/31/2016



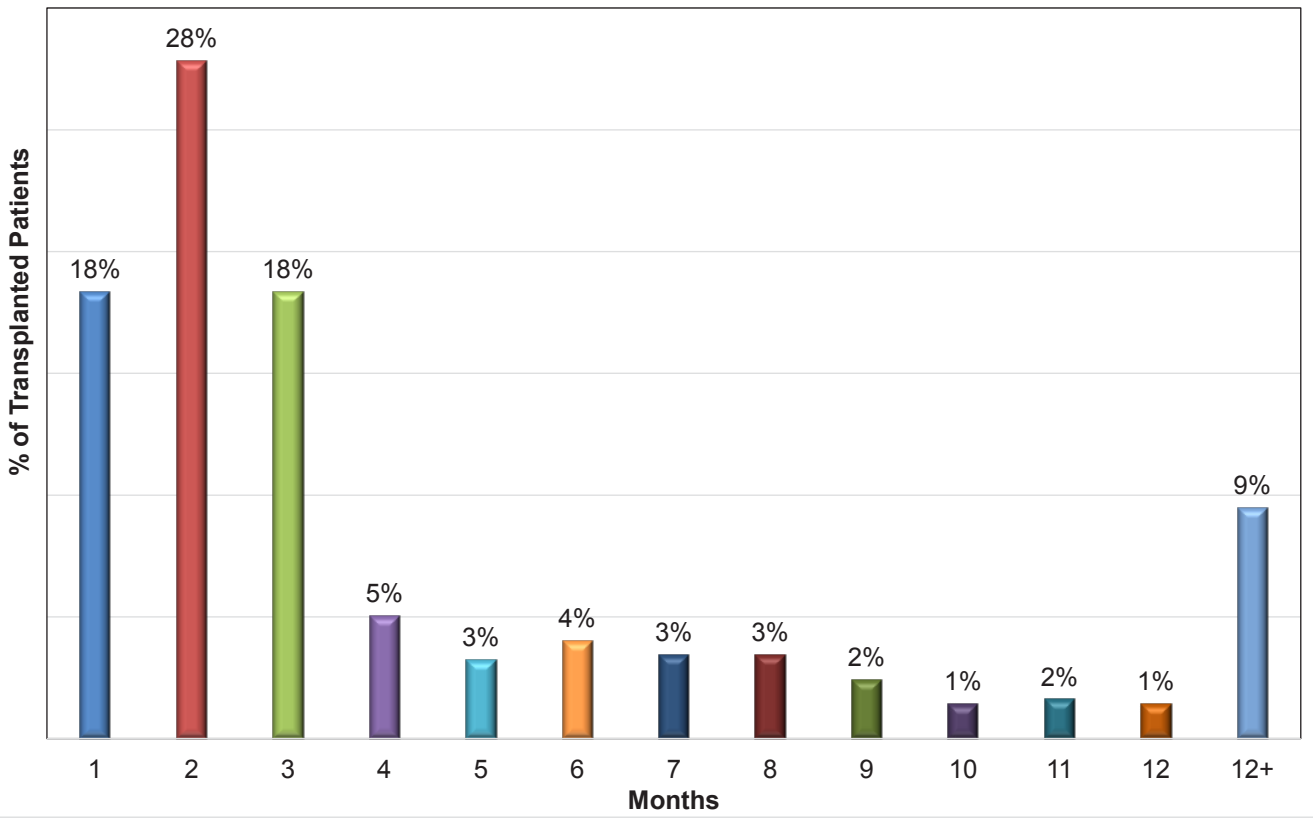
Patients Waiting > 1 Year by Center

As of 3/31/2016



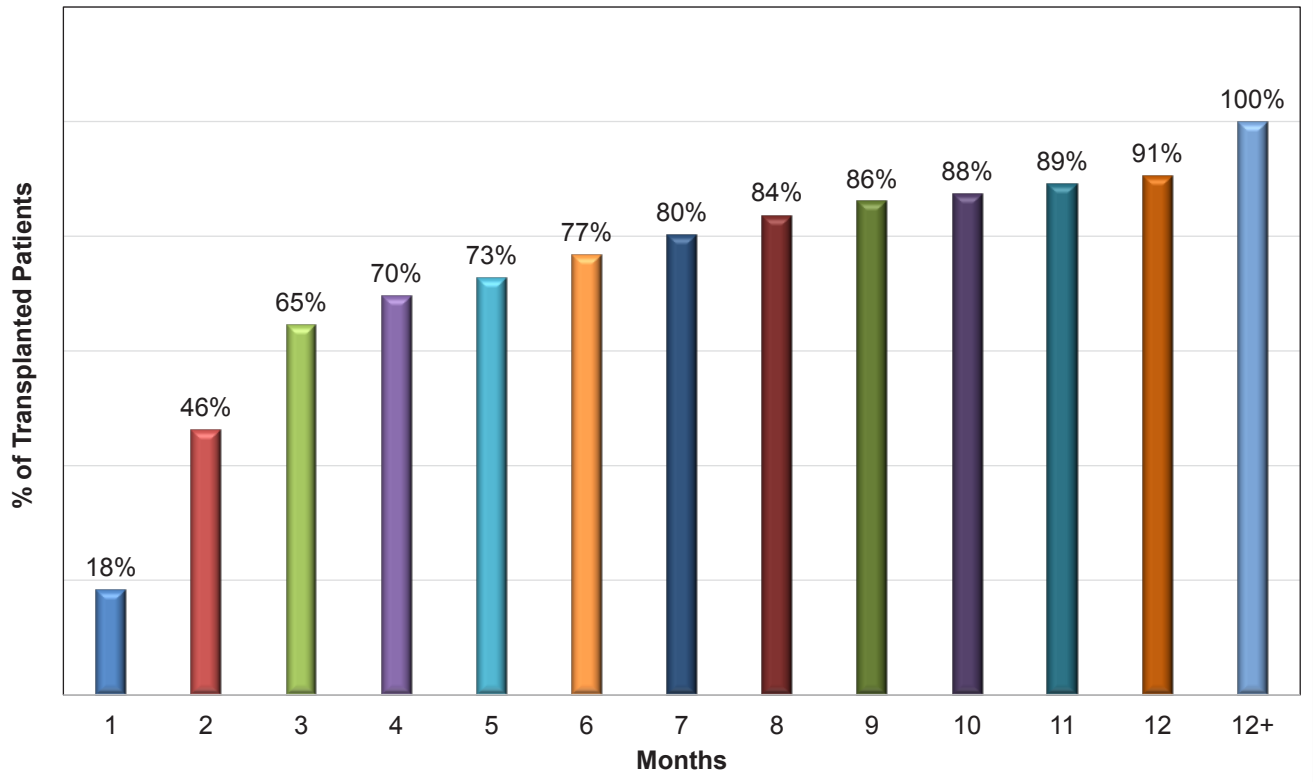
Wait Time Distribution

Transplanted Pairs 7/1/14 – 3/31/16



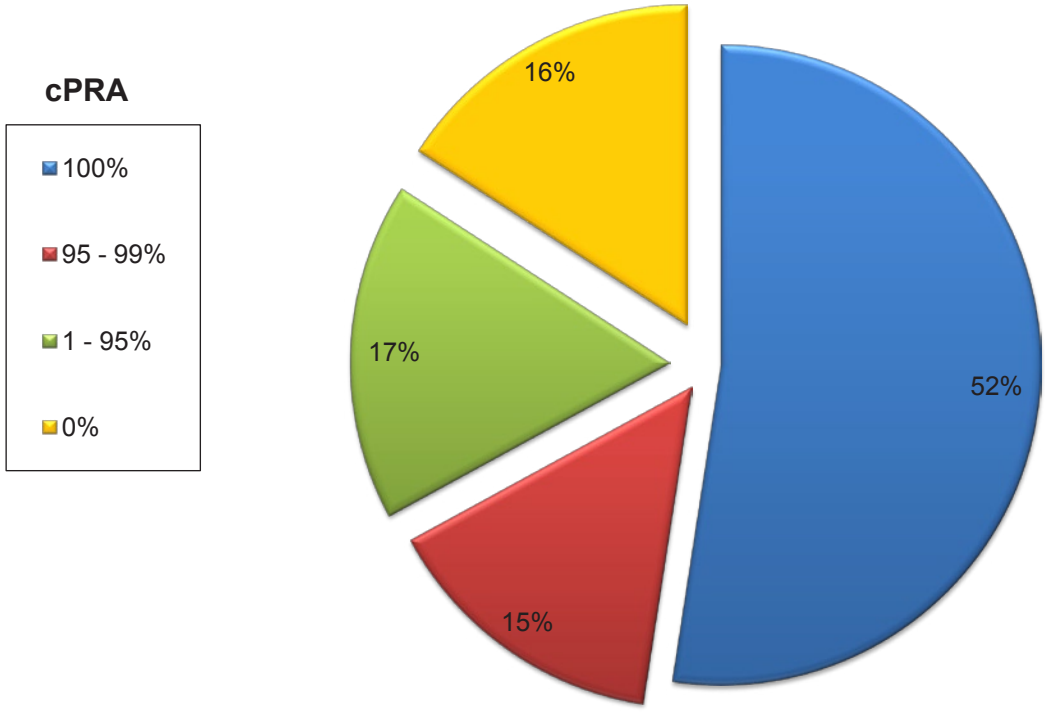
Cumulative Wait Time Distribution

Transplanted Pairs 7/1/14 – 3/31/16



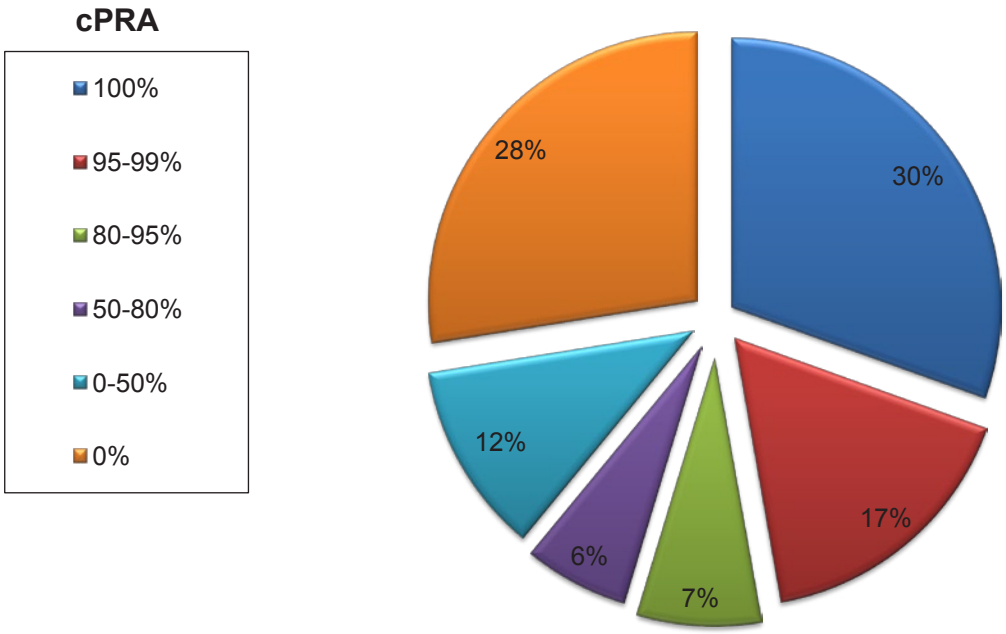
Patients Waiting > 1 Year by cPRA

As of 3/31/2016



Pool Composition by cPRA

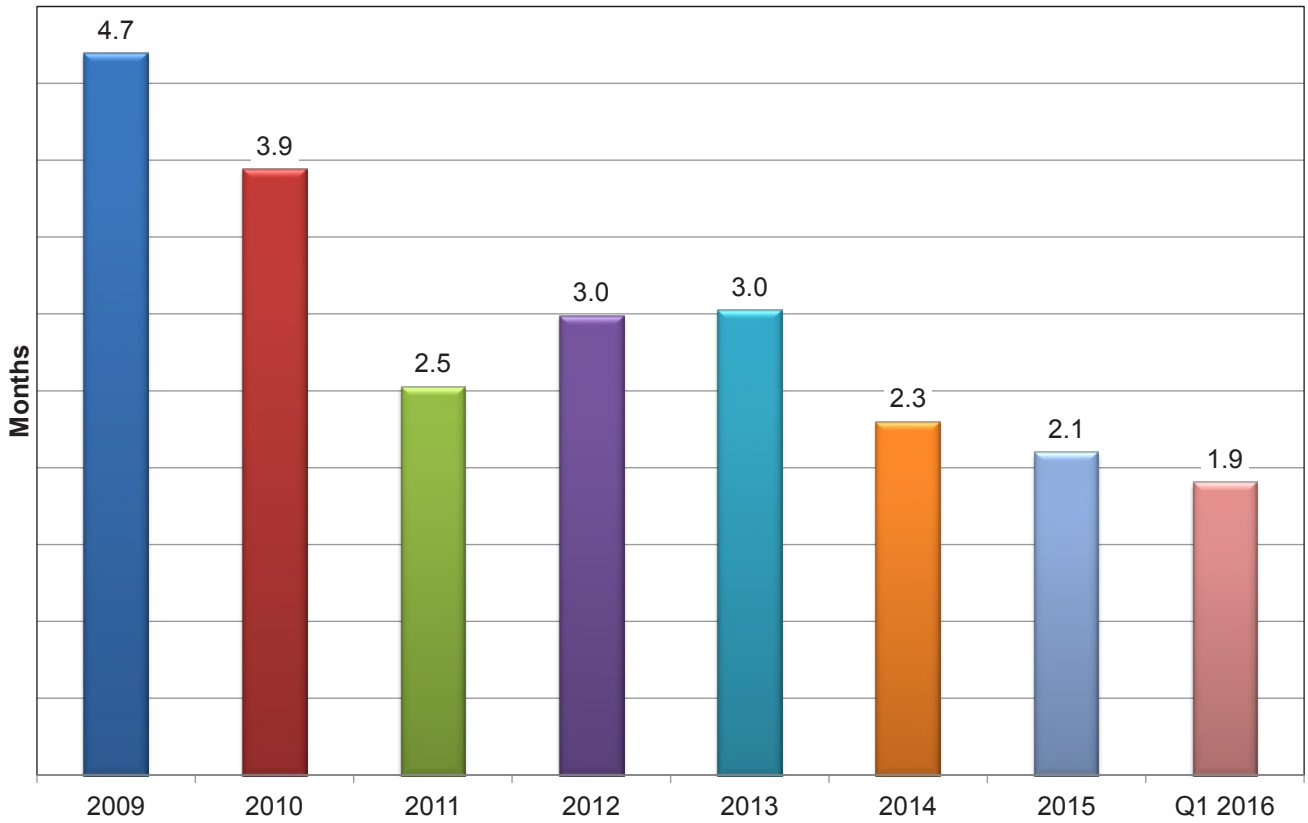
As of 3/31/2016



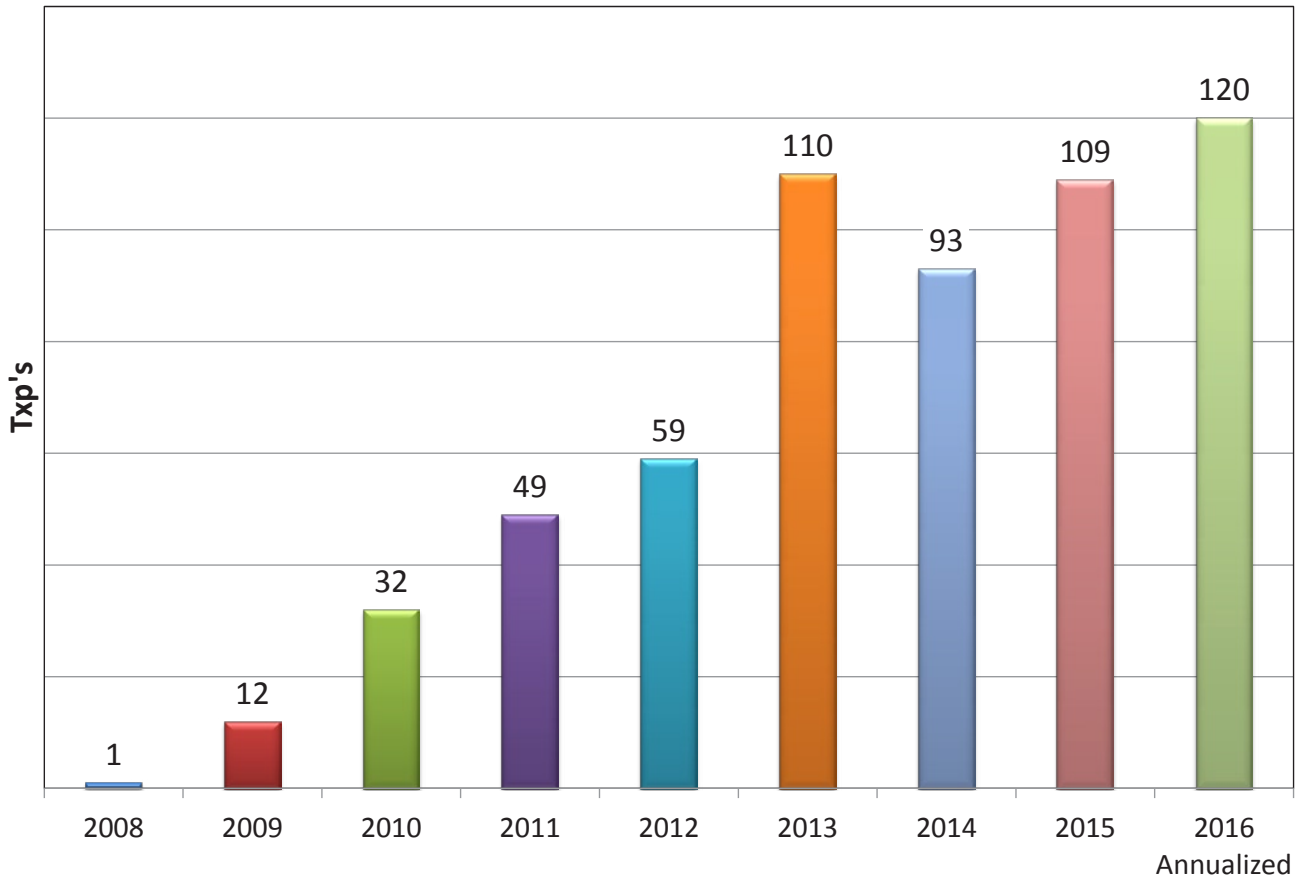
Transplanted Patient Median Wait Time

Wait times of patients transplanted during the year

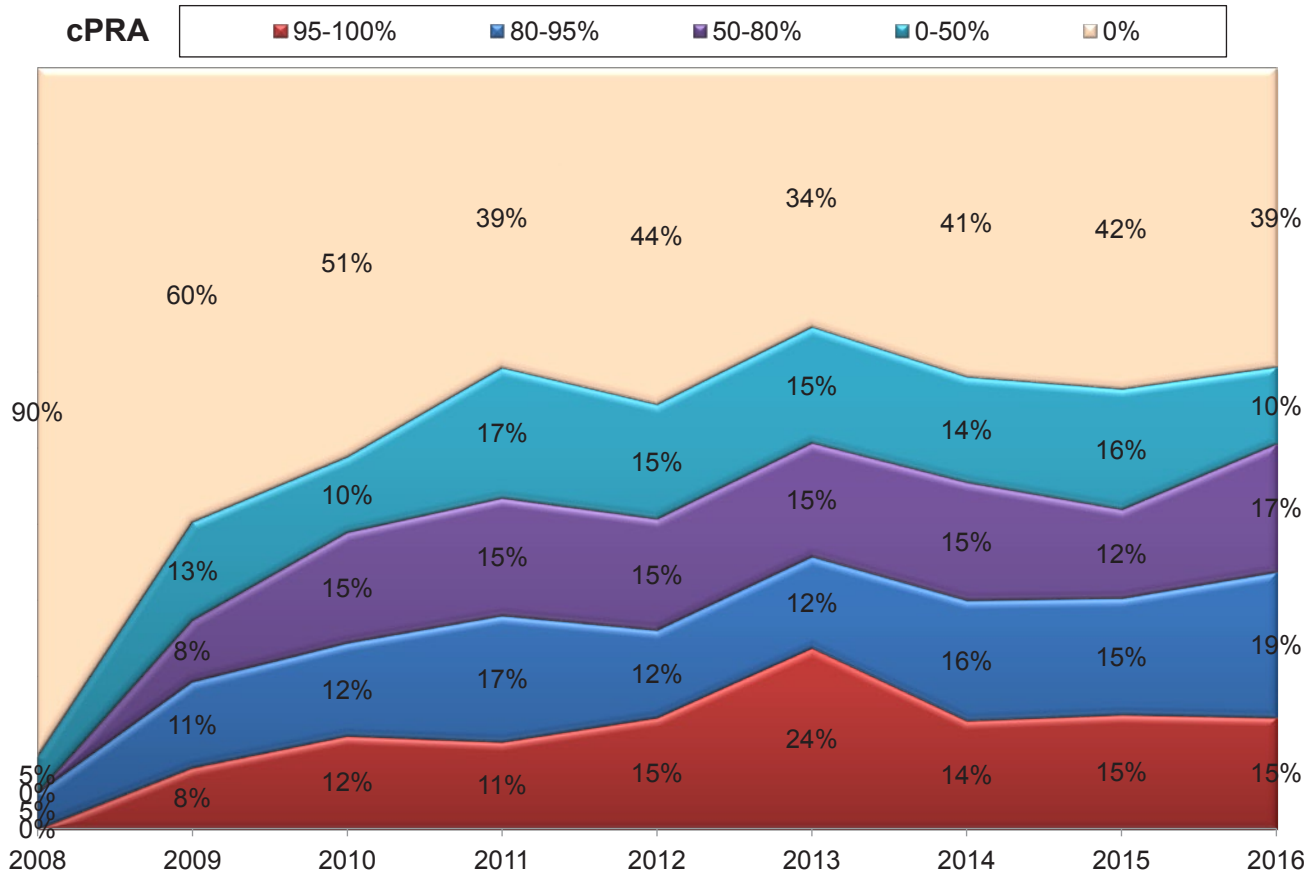
As of 3/31/2016



Transplanted Patients with cPRA > 80%

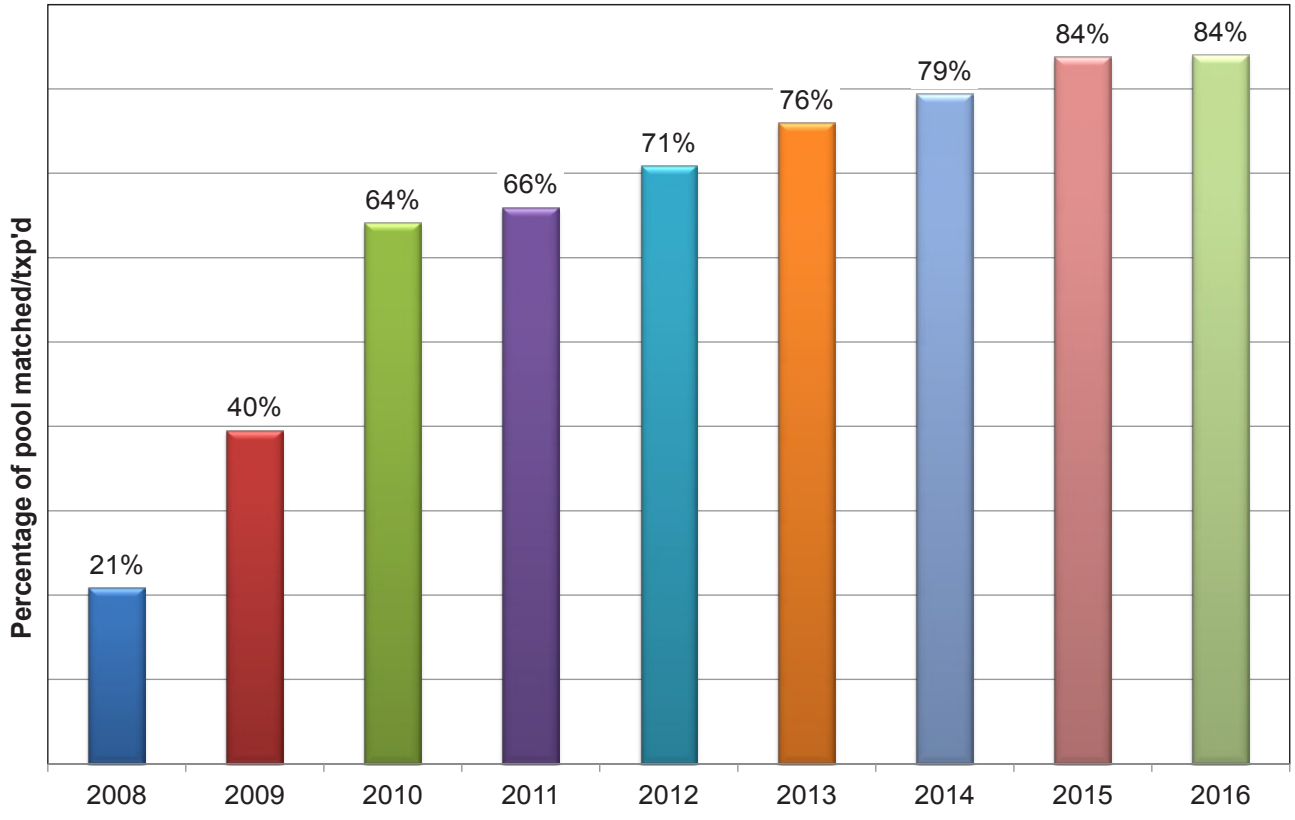


Transplanted Patients by cPRA



Percent of Pool Matched and/or Transplanted

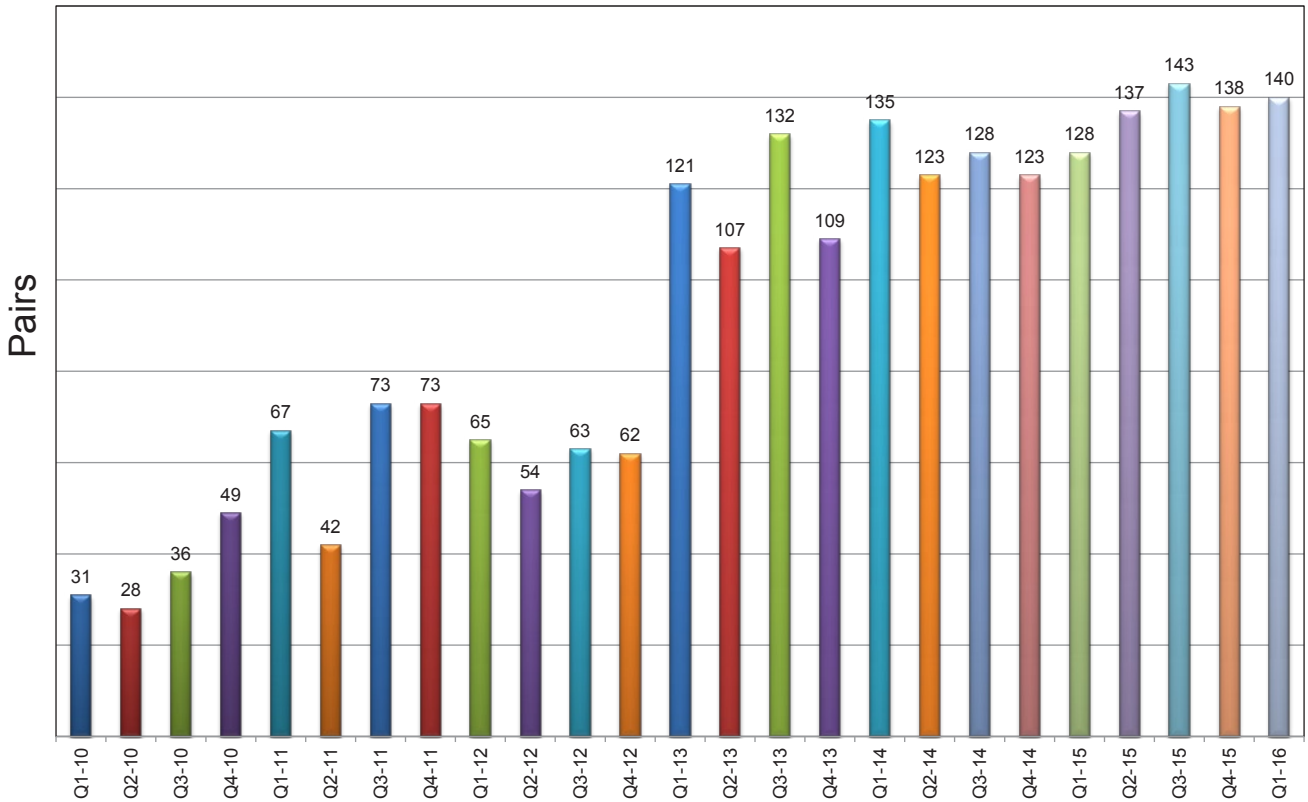
As of 3/31/2016



*2013 through 2015 adjusted based on additional historical pool variables recently added to the calculation.

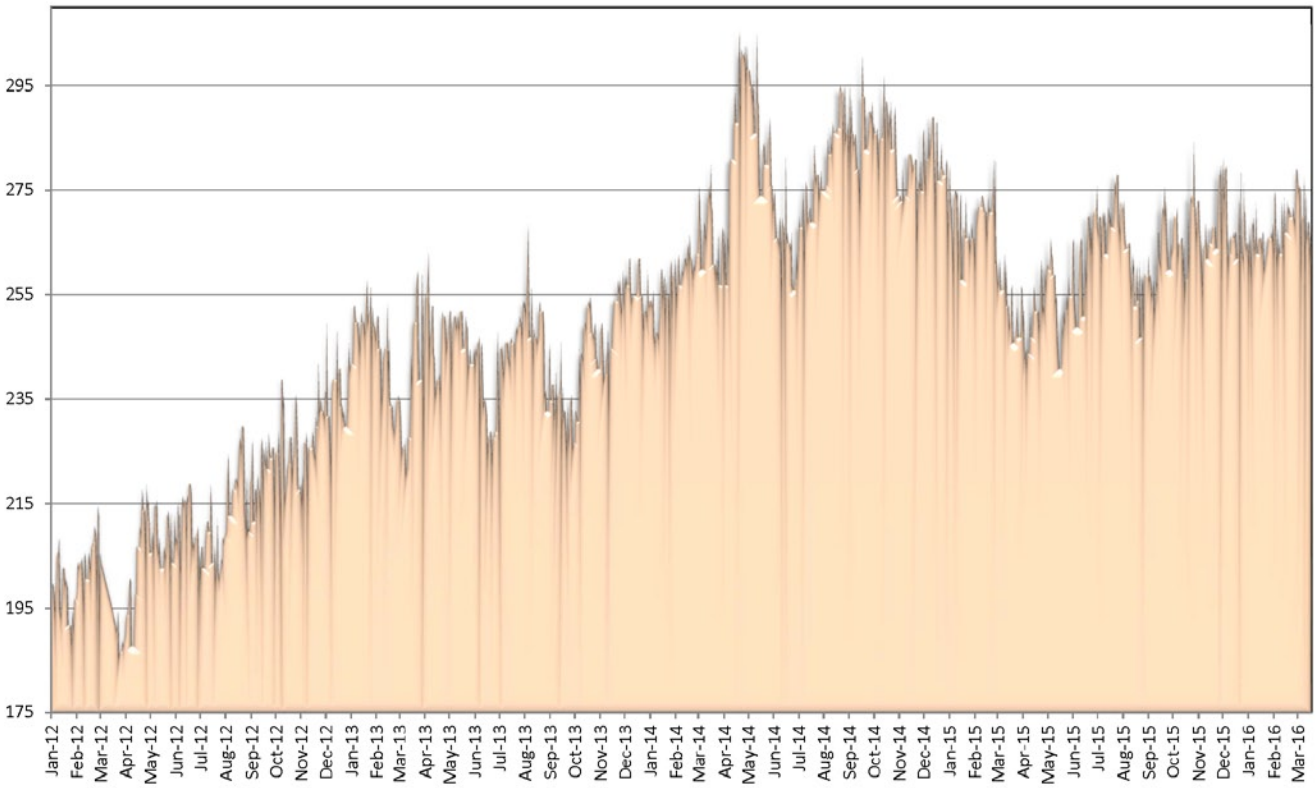
New Pair Enrollments

Patients available for match runs



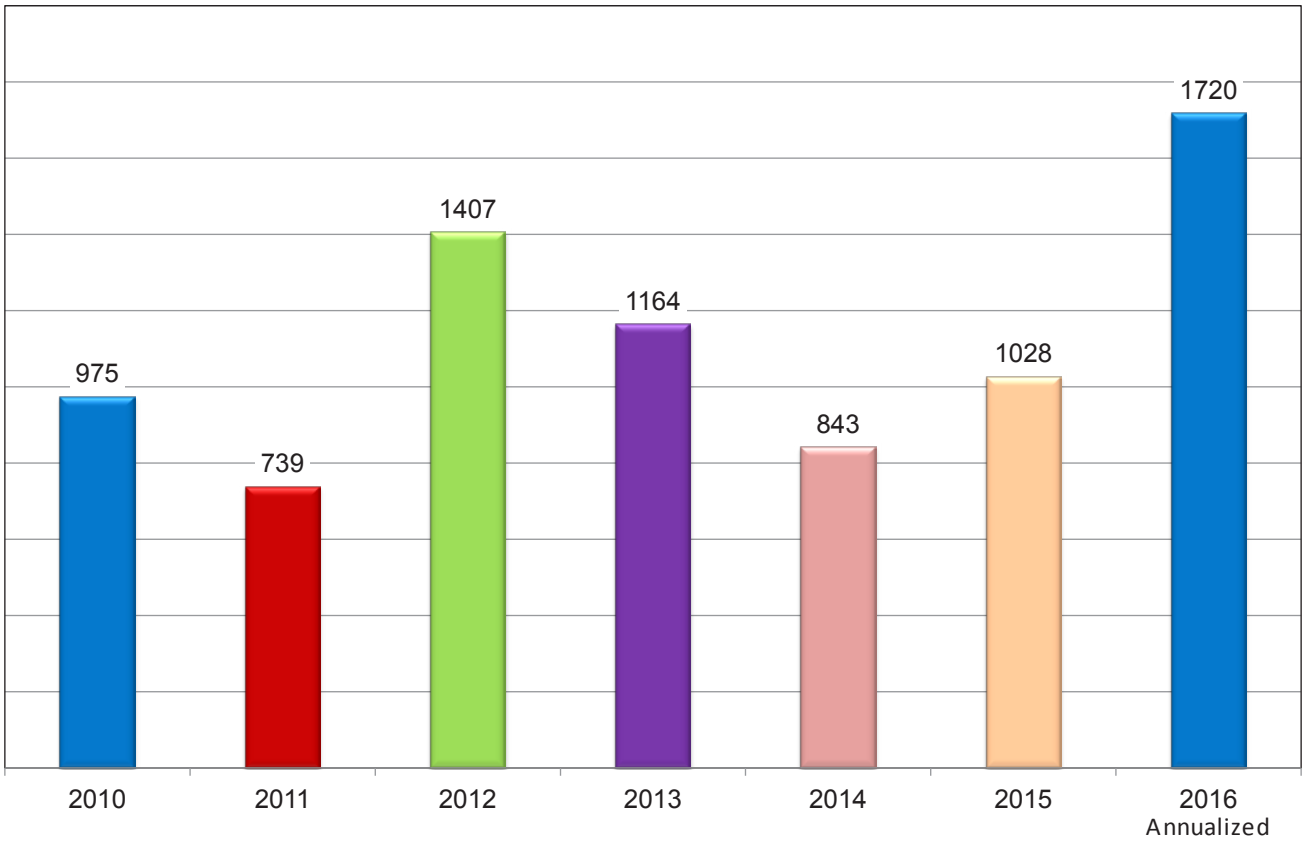
Pool Size

Unmatched patients by day
1/1/2012 – 3/31/2016



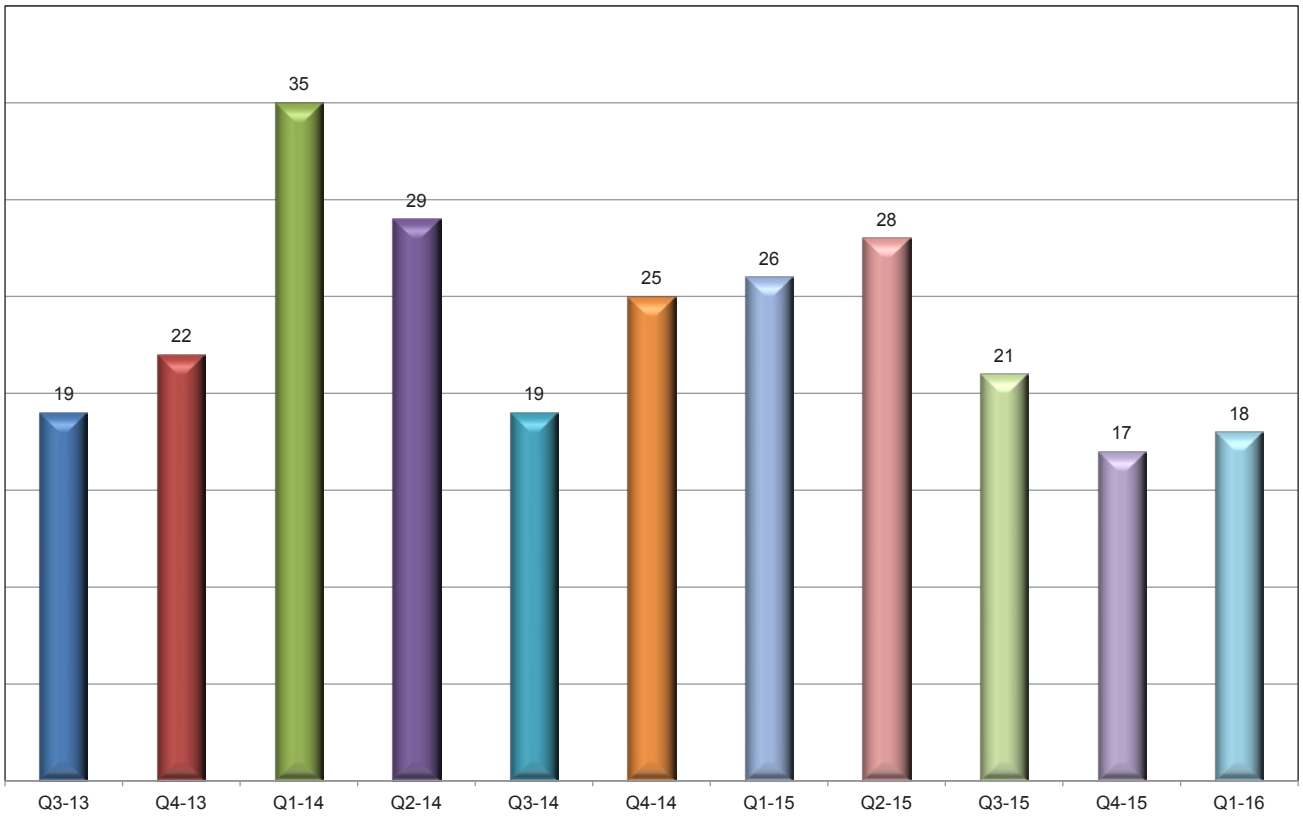
Non-Directed Donor Registrations

Via NKR Web Site



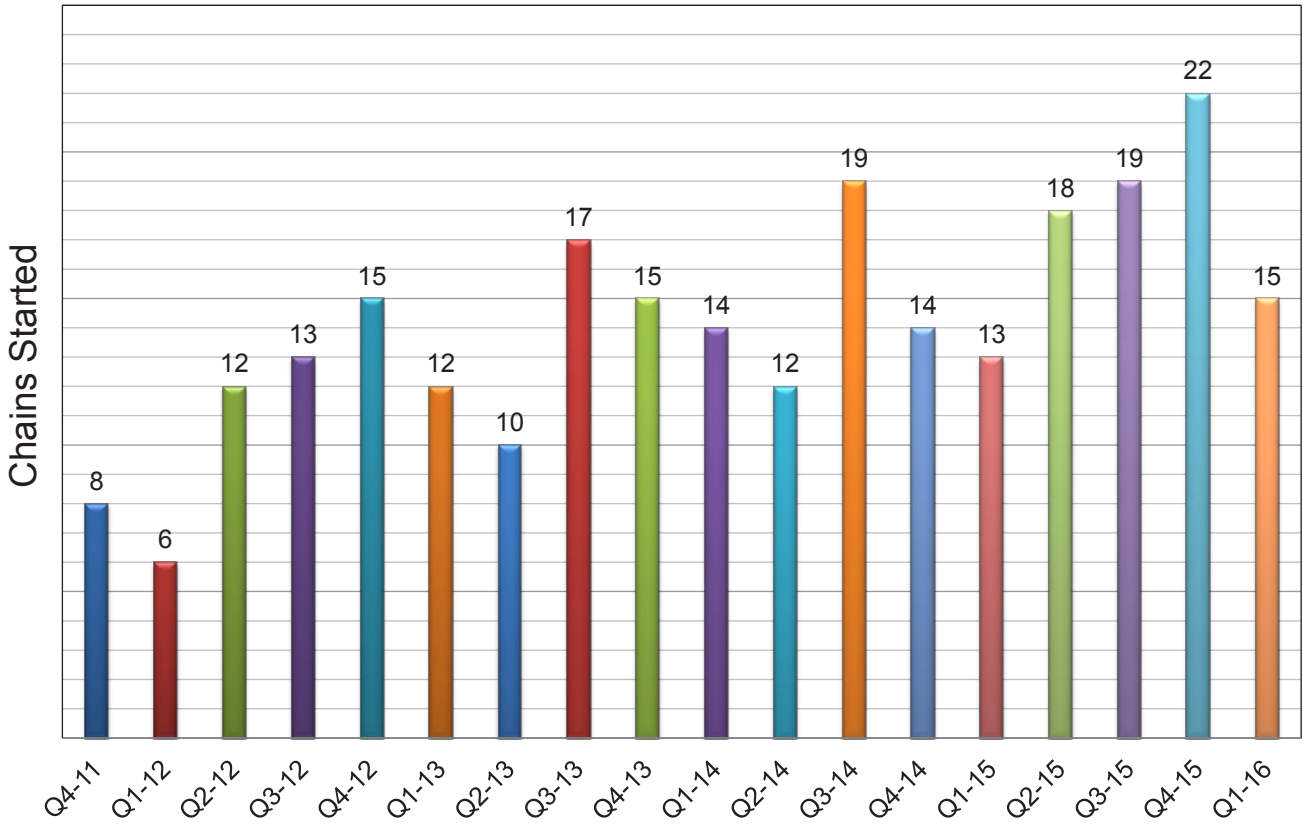
Non-Directed Donor Referrals

Referred to NKR member centers



Chains Started

Via non-directed donors



Chain and Loop Statistics

Category	Count	Mean Length	Transplants
Ended	307	4.56	1401
Broken	19	4.05	77
Active	3	11.67	35
Chain Total	329	4.60	1513
Loops	83	2.34	194
Total	412	4.14	1707

**Updates as of 4/15/16

Great HLA Matches

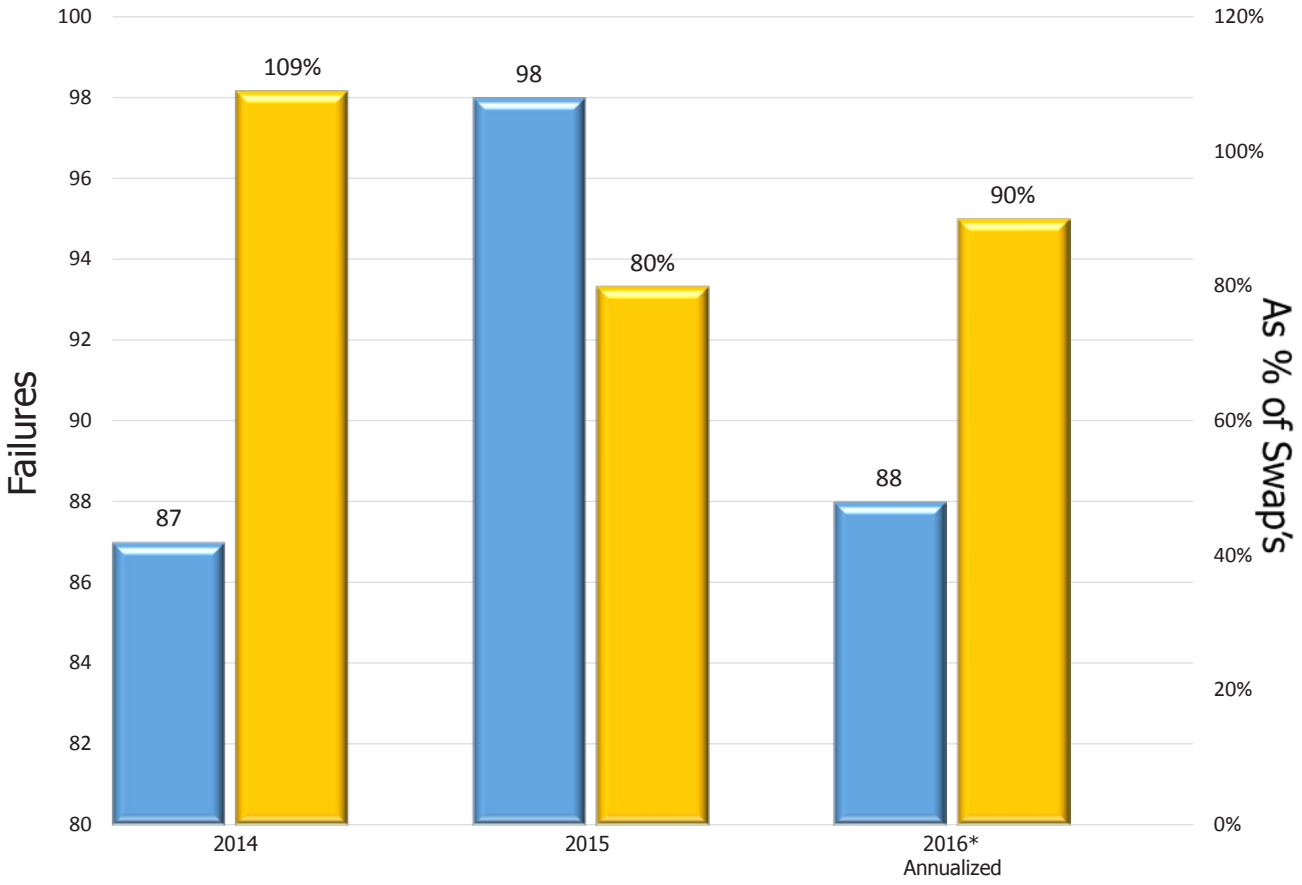
> 80 Match Points

Count	Recipient Center	Swap #	XP Date	Donor ABO	Recipient ABO	NKR cPRA	Wait Time In Months	Donor Age ATOT	Recipient Age ATOT	HLA Points
1	UCLA	357	2/17/2015	A	A	100	34	39	52	100
2	Emory	351	12/11/2014	A	A	100	5	25	33	100
3	Hopkins	330	11/13/2014	A	O	96	1	41	38	100
4	Loyola	324	8/5/2014	A	A	100	1	37	55	100
5	Madison	674	1/9/2014	O	A	99	5	29	33	100
6	Barnabas	182	10/3/2012	A	A	92	4	51	50	100
7	Barnes	105	3/31/2011	A	A	100	7	60	32	100
8	UCSF	58	6/15/2010	A	A	100	6	47	58	100
9	Emory	780	3/12/2015	O	O	7	6	46	21	90
10	MethodistTN	266	1/29/2014	A	A	89	2	44	66	90
11	Barnabas	266	1/16/2014	O	O	99	23	54	67	90
12	Madison	221	4/30/2013	O	O	99	17	45	52	90
13	Barnabas	187	12/4/2012	A	A	94	2	48	45	90
14	VAHD	161	6/12/2012	O	O	100	7	29	62	90
15	MethodistTX	124	12/7/2011	A	A	99	14	39	68	90
16	UCLA	124	8/31/2011	O	O	100	12	33	22	90
17	CPMC	115	6/22/2011	B	B	33	1	44	62	90
18	Starzl Pitt	109	4/21/2011	A	A	70	2	59	49	90
19	LomaLinda	406	8/18/2015	A	A	100	1	53	50	85
20	Barnabas	393	7/16/2015	A	A	100	1	37	64	85
21	Madison	792	6/3/2015	A	A	94	3	49	54	85
22	Madison	383	5/19/2015	O	O	98	6	44	47	85
23	MethodistTN	365	3/4/2015	B	B	100	4	53	51	85
24	Barnabas	330	11/13/2014	O	O	96	2	33	49	85
25	PorterAH	322	9/3/2014	O	O	27	5	29	24	85
26	Barnabas	304	7/17/2014	O	O	99	1	53	62	85
27	Cornell	733	7/8/2014	A	A	0	1	57	67	85
28	Barnes	266	1/16/2014	A	A	100	13	33	40	85
29	SCarolina	266	1/14/2014	O	O	89	3	55	44	85
30	UCLA	659	10/24/2013	O	O	100	25	54	56	85
31	Penn	199	12/11/2012	B	B	87	5	47	52	85
32	Madison	169	7/25/2012	B	B	97	3	30	62	85
33	UCLA	538	5/22/2012	A	O	88	7	28	12	85
34	Intermtn	118	6/29/2011	O	O	96	16	27	27	85
35	Allegheny	62	5/6/2010	A	A	0	5	60	70	85
36	Madison	332	11/4/2014	O	O	96	20	63	42	80
37	UCLA	258	10/3/2013	A	A	98	1	47	36	80
38	CPMC	19	7/31/2009	A	A	0	5	51	54	80

Compatible Pairs Transplanted

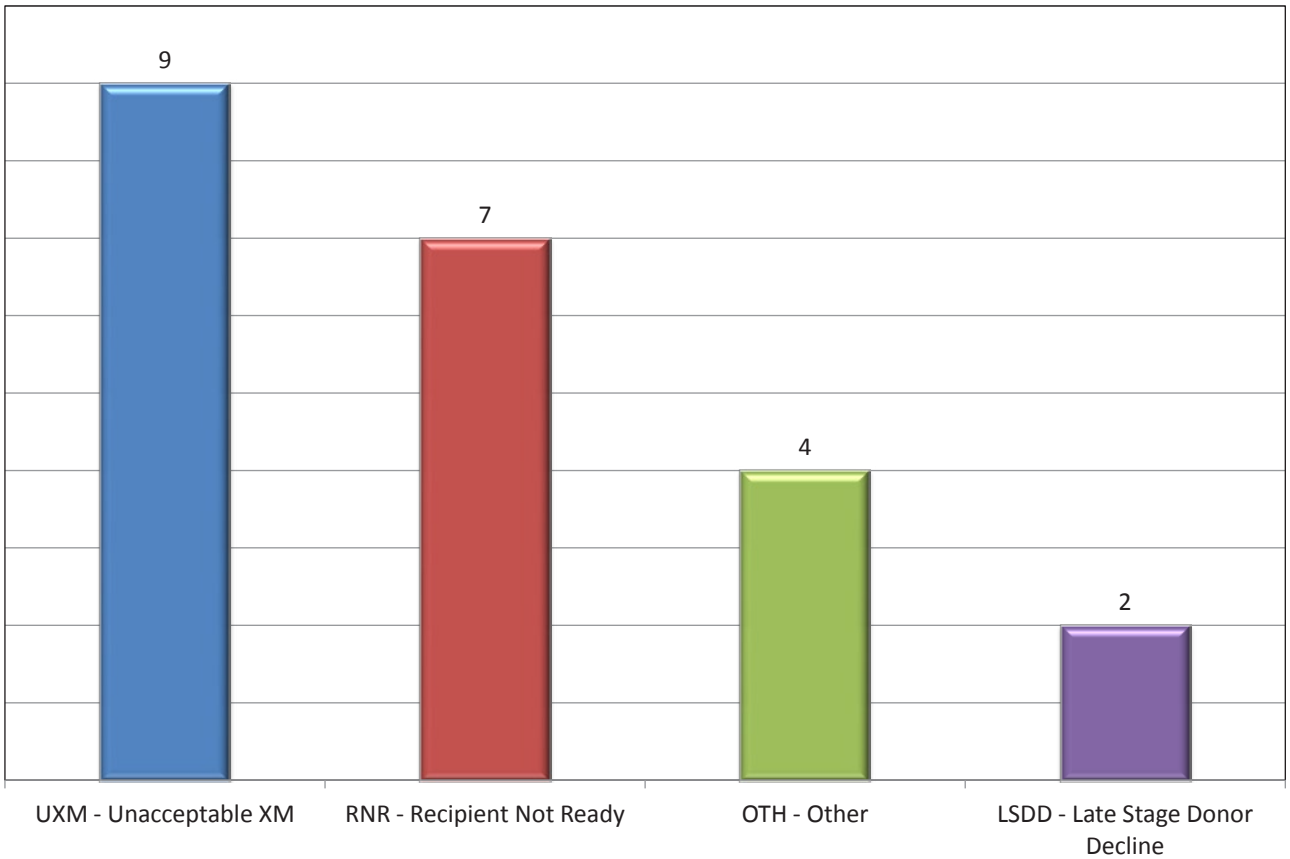
#	Recipient Center	XP Date	Recipient ABO	Paired Donor ABO	Donor ABO	Recipient Age	Paired Donor Age	Donor Age	Age Advantage	Donor HLA Pts	Paired Donor HLA Pts	HLA Points Advantage	Paired Donor Relationship	Additional XP's	Additional XP's cPRA >80
1	Colorado	5/11/2016	O	O	O	64	50	45	5	25	25	0	Spouse	3	0
2	Madison	4/20/2016	A	O	A	58	46	45	1	35	25	10	Spouse	5	0
3	Emory	4/20/2016	B	O	B	23	70	46	24	0	65	-65	Other	0	0
4	Cornell	4/13/2016	AB	O	A	52	51	30	21	35	0	35	Friend	1	0
5	Rush	4/12/2016	A	A	A	42	46	36	10	35	35	0	Spouse	2	0
6	Cornell	12/9/2015	A	A	A	14	55	31	24	90	15	75	Father	2	0
7	MassGen	12/1/2015	O	O	O	22	50	32	18	0	0	0	Friend	1	0
8	GARegents	12/1/2015	A	O	A	51	63	47	16	35	0	35	Friend	5	1
9	Maryland	11/11/2015	A	O	A	65	60	51	9	60	25	35	Spouse	2	0
10	Maine	10/21/2015	A	A	A	34	21	30	-9	10	10	0	Met on Facebook	2	0
11	Barnabas	10/14/2015	B	O	B	36	48	40	8	0	0	0	Aunt	2	1
12	Barnabas	9/24/2015	AB	O	A	58	54	22	32	25	35	-10	Spouse	2	0
13	Penn	6/25/2015	A	O	A	28	56	19	37	65	50	15	Mother	2	0
14	Penn	6/9/2015	B	O	B	41	43	44	-1	10	0	10	Spouse	2	0
15	Indiana	5/28/2015	A	A	A	32	57	48	9	25	65	-40	Mother	1	0
16	Stanford	5/21/2015	A	A	A	61	61	25	36	25	25	0	Spouse	2	0
17	Emory	5/13/2015	A	O	A	12	50	28	22	0	50	-50	Father	2	0
18	Georgetown	4/28/2015	O	O	O	41	43	30	13	0	0	0	Spouse	2	2
19	Loyola	11/11/2014	A	O	A	42	43	48	-5	25	25	0	Spouse	2	1
20	Emory	9/30/2014	A	A	A	18	52	37	15	50	65	-15	Father	2	0
21	MassGen	8/28/2014	A	O	A	69	51	33	18	60	0	60	niece through marriage	1	0
22	UCSF	8/26/2014	O	O	O	28	57	22	35	10	85	-75	Father	5	1
23	Barnabas	6/11/2014	B	O	B	69	57	41	16	10	40	-30	Significant Other	3	0
24	Madison	4/28/2014	O	O	O	62	57	39	18	45	10	35	Friend	6	2
25	Cornell	4/23/2014	O	O	O	3	24	43	-19	0	0	0	Cousin	0	0
26	Stanford	4/23/2014	O	O	O	29	66	24	42	25	50	-25	Father	2	0
27	Dartmouth	4/9/2014	O	O	O	45	37	43	-6	35	50	-15	Friend	2	1
28	UCLA	1/29/2014	A	A	A	7	34	37	-3	60	50	10	Mother	3	0
29	Maine	1/28/2014	A	O	A	43	40	53	-13	75	10	65	Spouse	4	0
30	Cleveland	12/18/2013	O	O	O	43	41	55	-14	25	0	25	internet friend	4	2
31	Cornell	11/20/2013	O	O	O	34	37	59	-22	75	25	50	Spouse	3	1
32	Hopkins	10/3/2013	A	O	A	19	65	38	27	25	50	-25	Other	2	0
													Totals	**77**	**12**

Regular Swap Failures



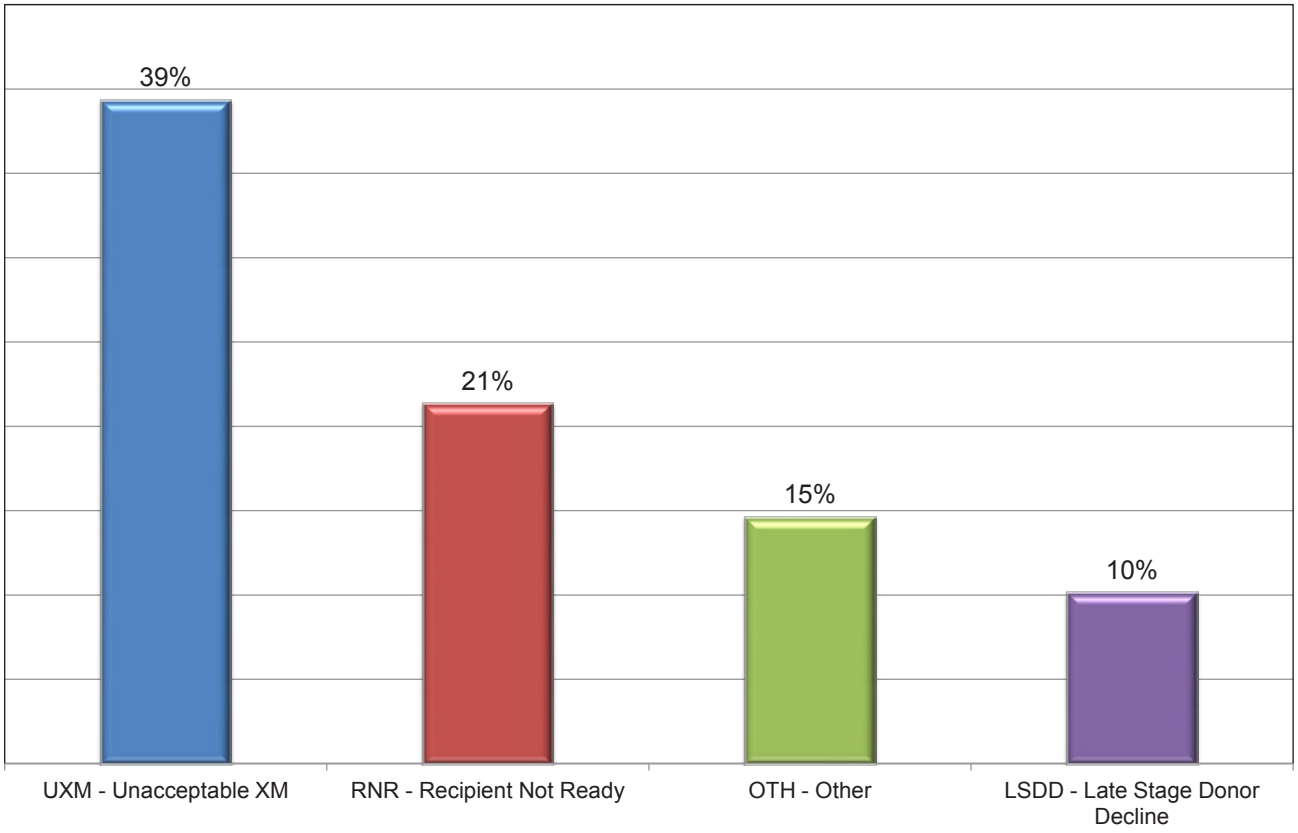
All Swap Failures by Primary Root Cause

Q1 2016



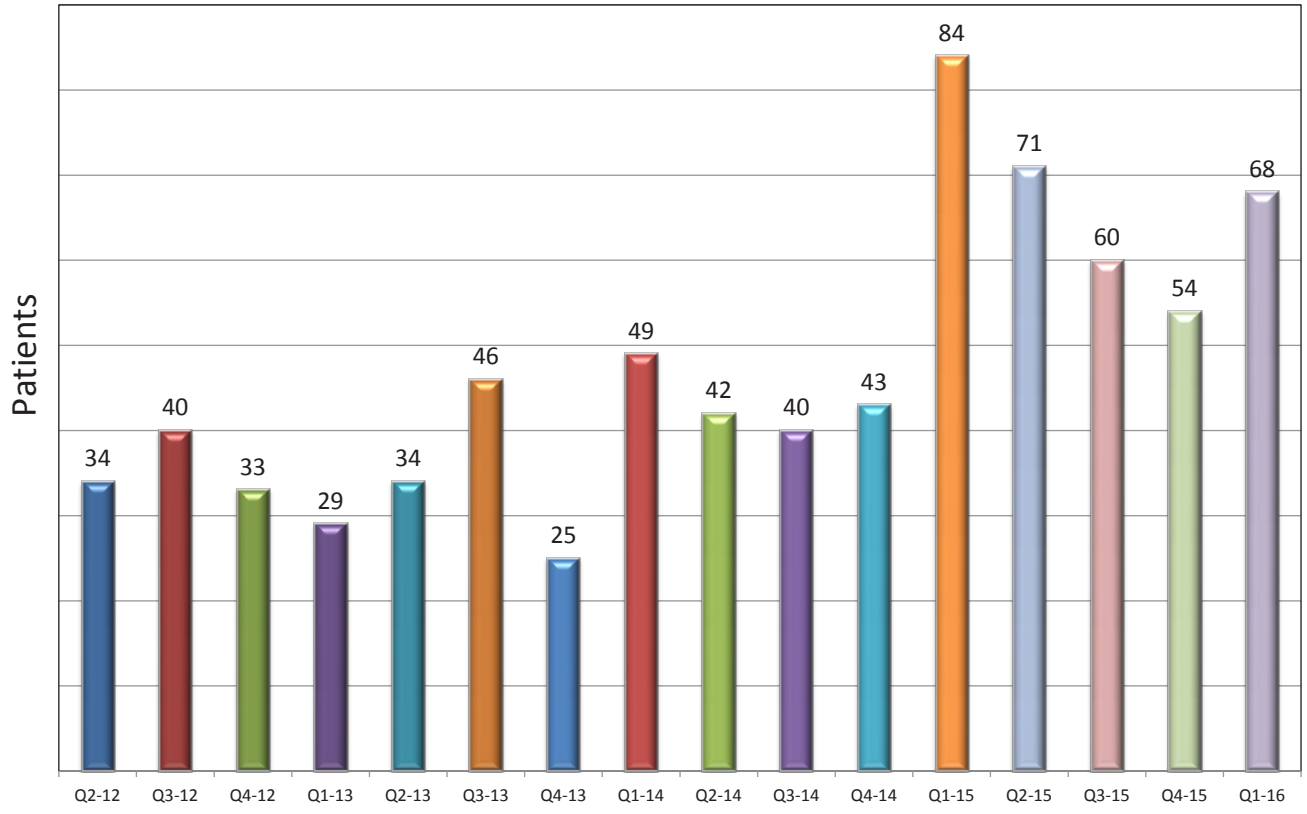
Failure Rate by Primary Root Cause

Q1 2016



Patients Deleted

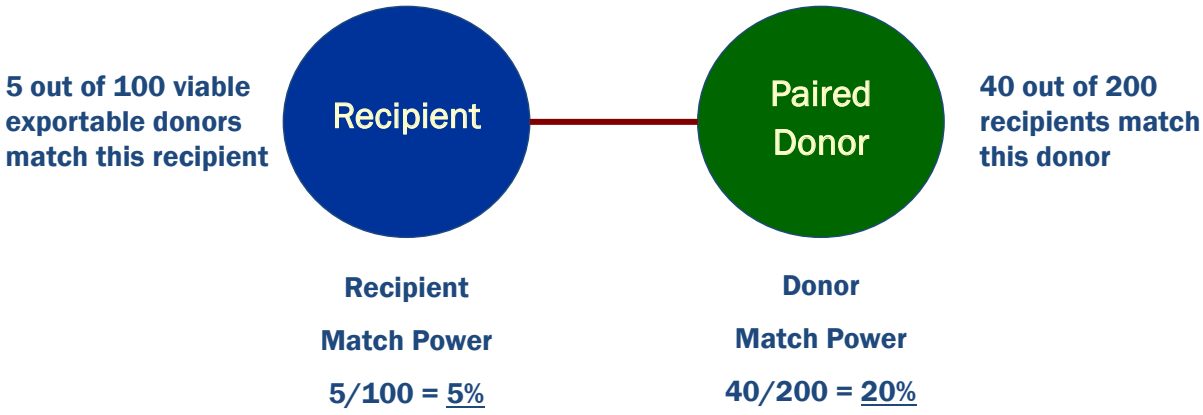
As of 3/31/2016



Pair Match Power is the Key to Understanding Wait Time

Pair Match Power (a.k.a. PMP) along with pair blood type combination is the most accurate predictor of paired exchange wait time and should be used by patients and clinicians to develop individual matching strategies for all pairs enrolling in the NKR program

How is PMP Calculated



PMP = (5% x 20% x 10,000) + (5% x 1,000) = 150

NKR Wait Times

Matching Ease	ABO Combination	PMPc
1-Very Easy	Any	> 125
2-Easy	Favorable	31 to 125
3-Hard	Favorable	1 to 30
4-Very Hard	Unfavorable	31 to 125
5-Ext Hard	Unfavorable	1 to 30
6-No Match	Any	0

ABO Combination: Patients with a non-O blood type are favorable. Patients with an O blood type who are paired to at least 1 exportable donor with an O blood type are favorable. All others are unfavorable and CHIP patients are excluded from this population.

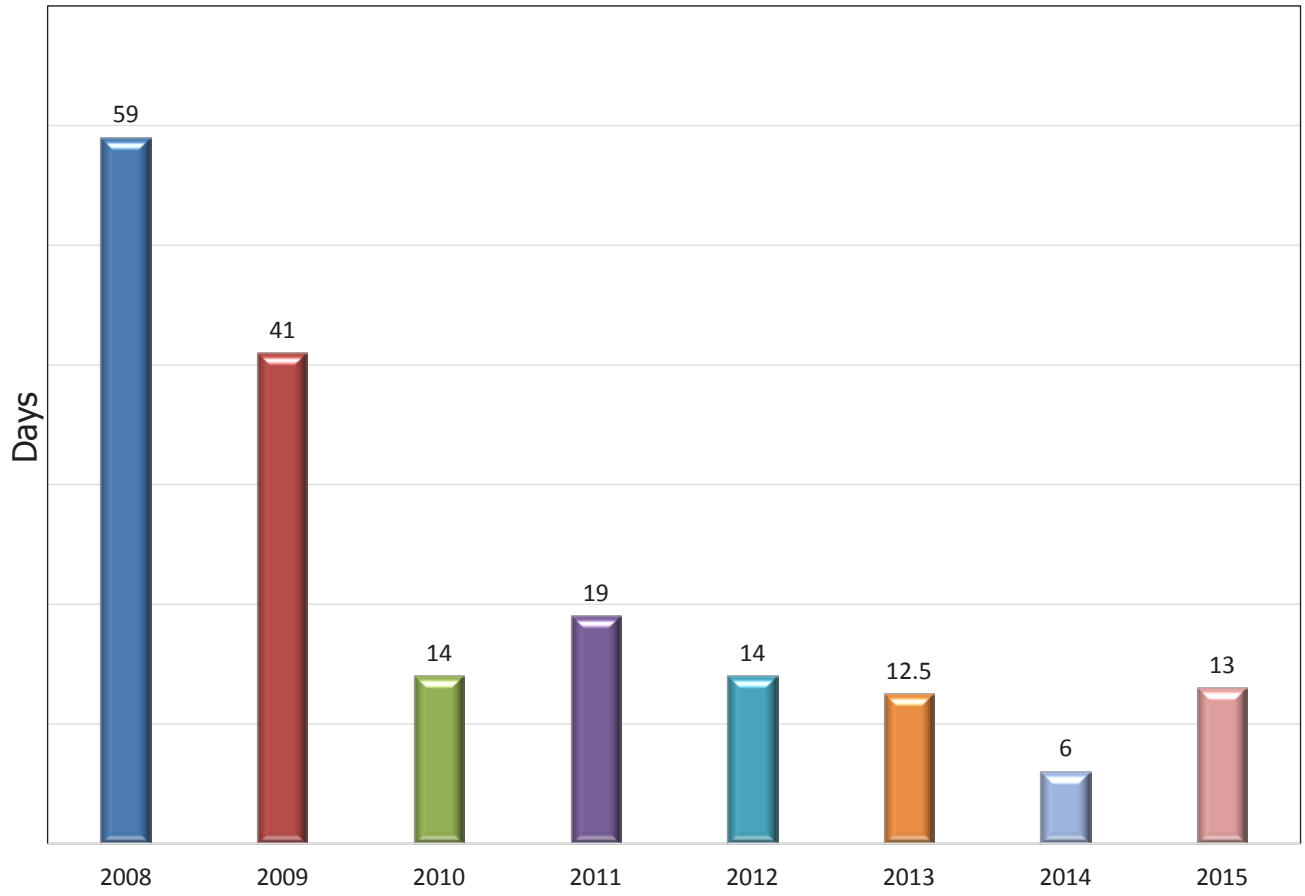
Paired Transplants Completed Between 3/31/2015 and 3/31/2016

Match Ease	Pairs	%	Mean	Median	Std Dev	Range Min	Range Max
1-Very Easy	41	15	40	35	19	15	91
2-Easy	60	22	60	48	52	7	291
3-Hard	95	34	103	64	113	4	630
4-Very Hard	44	16	203	146	183	15	677
5-Ext Hard	38	14	242	232	152	22	561
6-No Match	0	---	---	---	---	---	---
7-ALL	**278**	**100**	**119**	**60**	**135**	**4**	**677**

Paired Patients Waiting 6 Months or Greater as of 3/31/2016

Match Ease	Pairs	%	Mean	Median	Std Dev	Range Min	Range Max
1-Very Easy	0	---	---	---	---	---	---
2-Easy	0	---	---	---	---	---	---
3-Hard	2	2	435	435	244	191	679
4-Very Hard	18	14	399	317	208	207	988
5-Ext Hard	28	22	494	436	234	229	1060
6-No Match	80	62	609	498	392	193	1629
7-ALL	**128**	**100**	**552**	**451**	**349**	**191**	**1629**

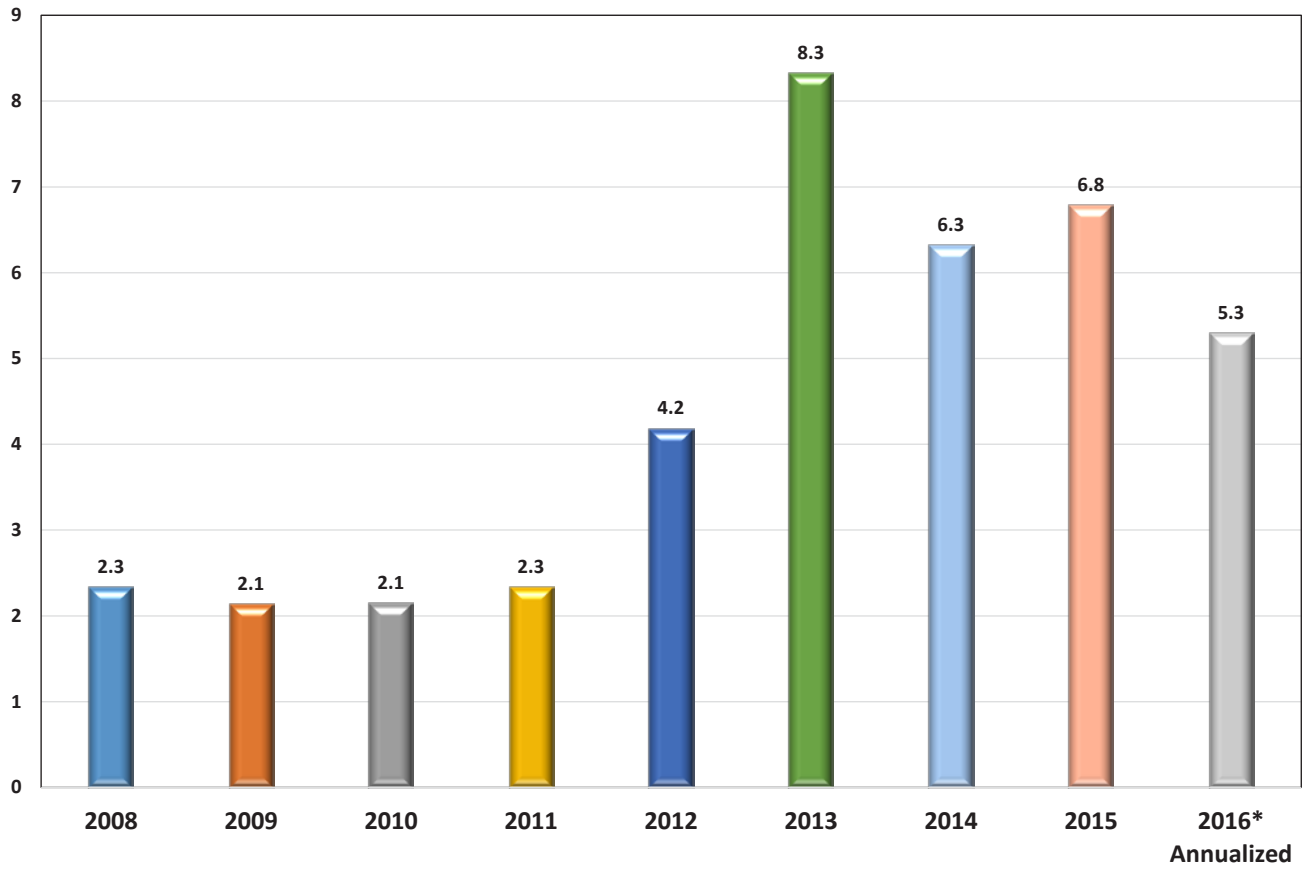
Bridge Donor Median Wait Times



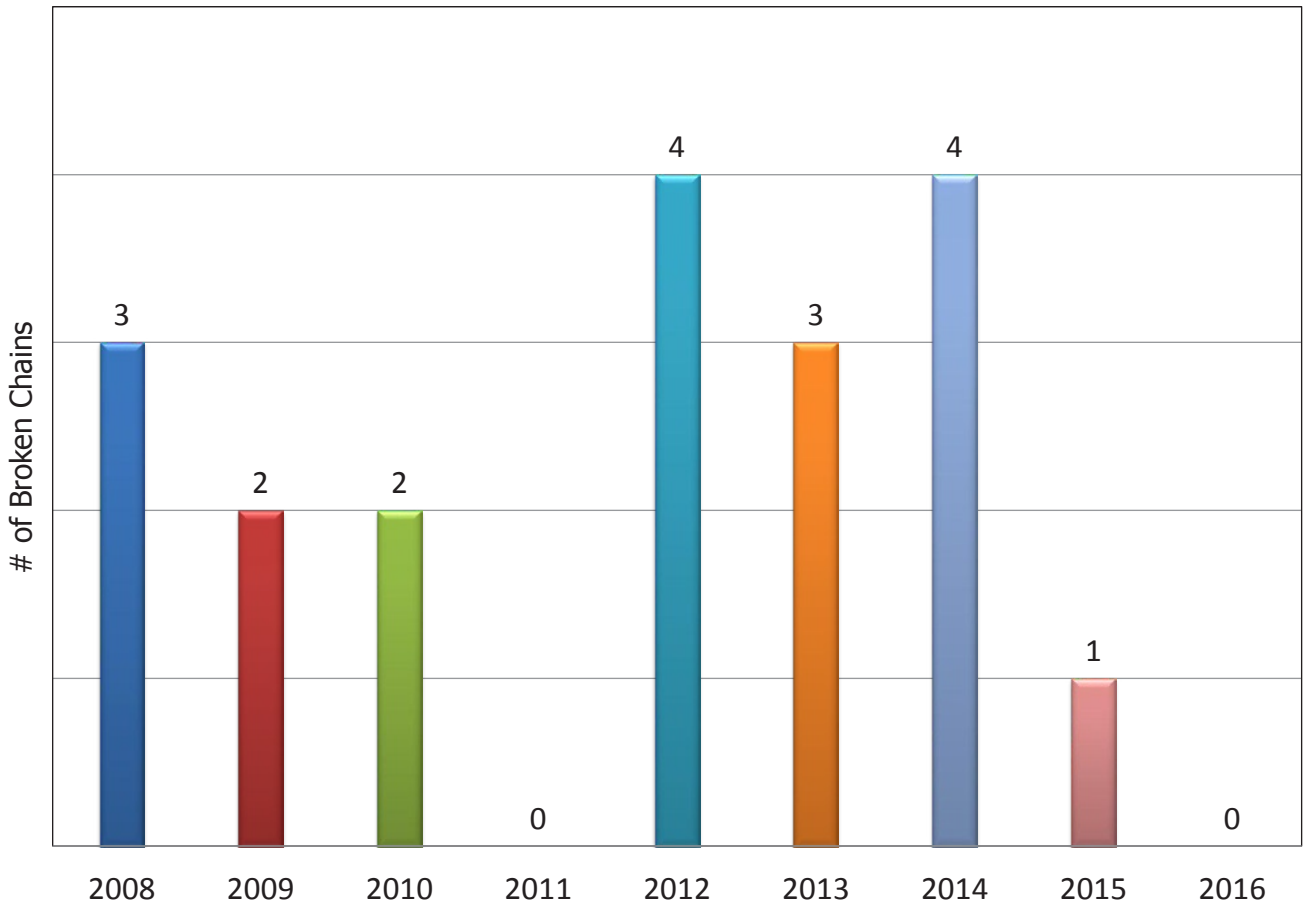
Bridge Donor Wait Times

Year	Median	Mean	Max	Min
2008	59	53	77	16
2009	41	59	187	3
2010	14	51	385	2
2011	19	23	68	4
2012	14	29	314	2
2013	12	20	92	2
2014	6	11	97	2
2015	13	26	175	2
2016	8	14	71	2

NKR Transplants per Bridge Donor



Broken Chains



Summary Report

Broken Chains & Real Time Swap Failures

Year	# Bridge Donors	# Real Time Swap Failures	# Broken Chains	% Broken Per Year
2008	9	--	3	**33%**
2009	29	1	2	**7%**
2010	61	--	2	**3%**
2011	75	--	0	**0%**
2012	54	--	4	**7%**
2013	37	3	3	**8%**
2014	49	2	4	**8%**
2015	54	1	1	**2%**
2016		1	0	**0%**
Total Bridge Donors	**368**	**8**	**19**	

Detail Report

Broken Chains & Real Time Swap Failures

#	Reason Given	Real Time Swap Failures	Broken Chains	Center	Date
1	Job Issues/ long wait time/ many failed XMs		✓	Cornell	5/1/2008
2	No Reason		✓	Cornell	8/21/2008
3	No Reason		✓	CPMC	11/19/2008
4	Donor sick for swap then reneged later	✓	✓	UTMC	6/9/2009
5	Medical		✓	UCSF	11/10/2009
6	Medical		✓	UCLA	3/16/2010
7	Second nuclear GFR test < 80 (79 down from 82)		✓	AGH	9/16/2010
8	No Reason		✓	MethodistTX	2/3/2012
9	No Reason		✓	UCSF	4/4/2012
10	Medical		✓	UCLA	6/28/2012
11	Medical/Surgical		✓	Washington	11/5/2012
12	Aborted donor surgery	✓	✓	CPMC	6/27/2013
13	Kidney declined by recipient surgeon	✓	✓	RWJ/UPenn	7/23/2013
14	Recipient Medical Issue	✓	✓	Porter	10/16/13
15	Kidney Declined by Recipient Surgeon	✓	✓	Porter/Jefferson	1/9/14
16	Medical		✓	UCLA	3/4/14
17	Recipient Medical Issue	✓	Loop	ChristHosp	3/11/14
18	Medical		✓	Hopkins	7/15/14
19	Medical		✓	Hopkins	10/9/14
20	Kidney Declined by Recipient Surgeon	✓	✓	Tampa/Hopkins	7/7/15
21	Kidney Declined by Recipient Surgeon	✓	--	Porter/Aurora St Lukes	3/17/16
	Totals	**8**	**19**		

Program Statistics

As of 3/31/2016

		2008	2009	2010	2011	2012	2013	2014	2015	*2016*
1	Transplants Facilitated	21	62	131	175	226	308	310	360	89
2	Paired Transplants Facilitated	21	39	91	131	164	252	255	288	74
3	Chip Transplants Facilitated	0	23	40	44	62	56	55	72	15
4	Ending Unmatched Patient Pool	80	127	120	201	241	255	279	280	269
5	Cumulative Transplants	21	83	214	389	615	923	1233	1593	1682
6	Cumulative Paired Transplants	21	60	150	280	526	777	1030	1316	1390
7	Cumulative Chip Transplants	0	23	64	109	89	146	203	277	292
8	Cumulative Paired Patient Pool	101	210	334	590	805	1062	1351	1615	1690
9	Percent of Pool Transplanted (Paired Recipients)	21%	40%	64%	66%	71%	76%	79%	84%	84%
10	Enrolled Patient Mean Wait Time (years)	3.8	2.0	0.9	1.1	1.1	1.0	0.9	0.9	0.9
11	Transplanted Patient Mean Wait Time (months)	5.1	5.3	6.0	5.0	5.1	5.4	4.8	4.1	4.1
12	Transplanted Patient Median Wait Time (months)	5.3	5.3	3.9	2.5	3.0	3.0	2.3	2.1	2.1
13	Mean cPRA of Transplanted Patients	4.1%	25.9%	34.5%	40.3%	44.1%	54.0%	48.3%	48.9%	52.4%
14	Number of Transplants Completed by cPRA									
15	100%	0	1	4	10	4	5	3	7	1
16	95-100%	0	4	12	10	29	68	41	47	12
17	80-95%	1	7	16	29	26	37	49	55	17
18	50-80%	0	5	19	27	33	46	48	42	15
19	0-50%	1	8	13	30	34	47	43	57	9
20	0%	19	37	67	69	100	105	126	152	35
21	Sub-total	21	62	131	175	226	308	310	360	89
22	Percent of Transplants Completed by cPRA									
23	100%	0%	2%	3%	6%	2%	2%	1%	2%	1%
24	95-100%	0%	6%	9%	6%	13%	22%	13%	13%	13%
25	80-95%	5%	11%	12%	17%	12%	12%	16%	15%	19%
26	50-80%	0%	8%	15%	15%	15%	15%	15%	12%	17%
27	0-50%	5%	13%	10%	17%	15%	15%	14%	16%	10%
28	0%	90%	60%	51%	39%	44%	34%	41%	42%	39%
29	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%
30	Number of Transplanted Patients with cPRA >80%	1	12	32	49	59	110	93	109	30
31	Percent of Transplanted Patients with cPRA >80%	5%	19%	24%	28%	26%	36%	30%	30%	33%

Program Statistics

As of 3/31/2016

		2008	2009	2010	2011	2012	2013	2014	2015	*2016*
32	Number of Unmatched Patients by cPRA (3/31/2016)									
33	100%				79	73	83	81	80	82
34	95-99%				73	73	61	61	53	45
35	80-95%				15	15	24	19	22	20
36	50-80%				14	11	14	13	25	17
37	0-50%				14	10	22	37	35	31
38	0%				50	59	51	68	65	74
39	Sub-total				245	241	255	279	280	269
40	Percent of Unmatched Patients by cPRA									
41	100%				32%	30%	33%	29%	29%	30%
42	95-99%				30%	30%	24%	22%	19%	17%
43	80-95%				6%	6%	9%	7%	8%	7%
44	50-80%				6%	5%	5%	5%	9%	6%
45	0-50%				6%	4%	9%	13%	13%	12%
46	0%				20%	24%	20%	24%	23%	28%
47	Sub-total				100%	100%	100%	100%	100%	100%
48	Number of Transplants Completed by Wait Time (3/31/2016)									
49	< 6 months	21	42	74	106	180	232	243	298	72
50	6-12 months	0	10	14	19	24	44	35	38	10
51	1-2 years	0	4	15	14	20	25	27	22	6
52	2+ years	0	0	2	2	2	7	5	2	1
53	Sub-total	21	56	105	141	226	308	310	360	89
54	Percent of Transplants Completed by Wait Time (3/31/2016)									
55	< 6 months	100%	75.0%	70.5%	75.2%	79.6%	75.3%	78.4%	82.8%	80.9%
56	6-12 months	0.0%	17.9%	13.3%	13.5%	10.6%	14.3%	11.3%	10.6%	11.2%
57	1-2 years	0.0%	7.1%	14.3%	9.9%	8.8%	8.1%	8.7%	6.1%	6.7%
58	2+ years	0.0%	0.0%	1.9%	1.4%	0.9%	2.3%	1.6%	0.6%	1.1%
59	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%
60	Total Chains Started	4	9	28	36	46	55	63	83	20
61	Total Loops Completed	0	3	2	3	12	24	17	15	1
62	Number of broken chains	3	2	2	0	4	3	4	1	0
63	Bridge Donors Held (2016)	9	29	61	75	54	37	49	53	64
64	Percent of broken chains	33%	7%	3%	0%	7%	8%	8%	2%	0%

NATIONAL KIDNEY REGISTRY®
FACILITATING LIVING DONOR TRANSPLANTS

P.O. Box 460 • Babylon, NY 11702-0460

www.kidneyregistry.org

800-936-1627