

Paired Exchange Results

Quarterly Report

As of June 30, 2016

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Message from the Founder

We are pleased to report that we facilitated 97 transplants in the second quarter of 2016. As transplant volume continues to grow, we anticipate crossing the 2,000 transplant milestone by the end of the year.

Due to the success of the Center Liquidity Contribution (CLC) program, at the end of the second quarter we had no matchable pairs waiting more than 23 months in the system and only twelve matchable pairs waiting more than 12 months. Moreover, the highest CLC score for a matchable pair waiting greater than 3 months, dropped to 150 points. This means that if a center has a CLC score of 0 and the program enters an “O” NDD or a favorable blood type compatible pair, one of the center’s unfavorable blood type incompatible pairs, waiting more than 3 months, will immediately be prioritized for matching. Every 1000 CLC points is roughly equal to one prioritized match/transplant. With the continued success of the CLC program, we are projecting that, by the end of this year, no matchable pair will wait more than 12 months for a transplant in the NKR system.

The NKR wants to ensure that no kidney donor must pay (either directly or with their health insurance) for any post-surgical complications. After a comprehensive legal review with outside counsel and select Member Center legal staff, the NKR Medical Board unanimously approved the Donor Protection Program (DPP). Member Centers that opt into the DPP agree to pay for all uncovered donor complications, for all donors that undergo donor surgery at the Member Center’s Hospital. Member Centers that do not opt into the program are charged a fee that is added to the NKR donor protection fund. The fund can be used to pay for donor complications at centers that do not opt into the program. Payment for donor complications is limited by the size of the fund. Our goal is to accumulate \$1,000,000 in this fund over time so that donors are never exposed to the financial risk of uncovered complications.

Swap failures continue to impact approximately half of all NKR swaps. One of the predominant causes of swap failures are late stage donor declines driven by information in CT scans that is unavailable when a center accepts a donor. NKR has made a significant investment in an industrial grade Picture Archiving Communications System (PACS) platform to eliminate this problem. This new CT technology is now fully integrated within NKR’s HIPPA secure data center, allowing donor CT images to be securely uploaded by all donor centers. Once the CT scan is uploaded to the donor record, it is available for online viewing by recipient surgeons. We plan to have all NKR centers fully trained and utilizing this new PACS platform by the end of August.

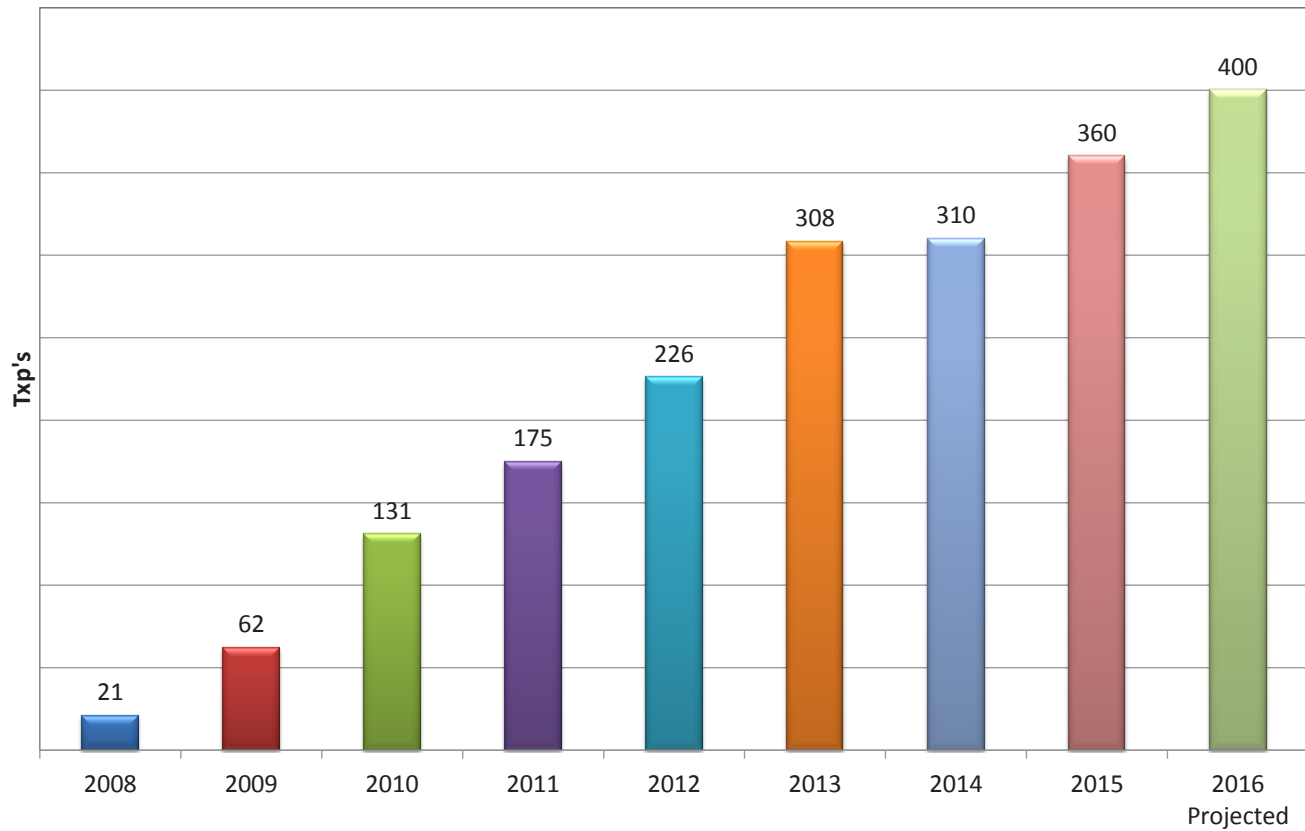
The ongoing dedication and effort of our member centers continues to drive the NKR’s results. Thank you for your continued collaboration and keep up the great work.

Sincerely,

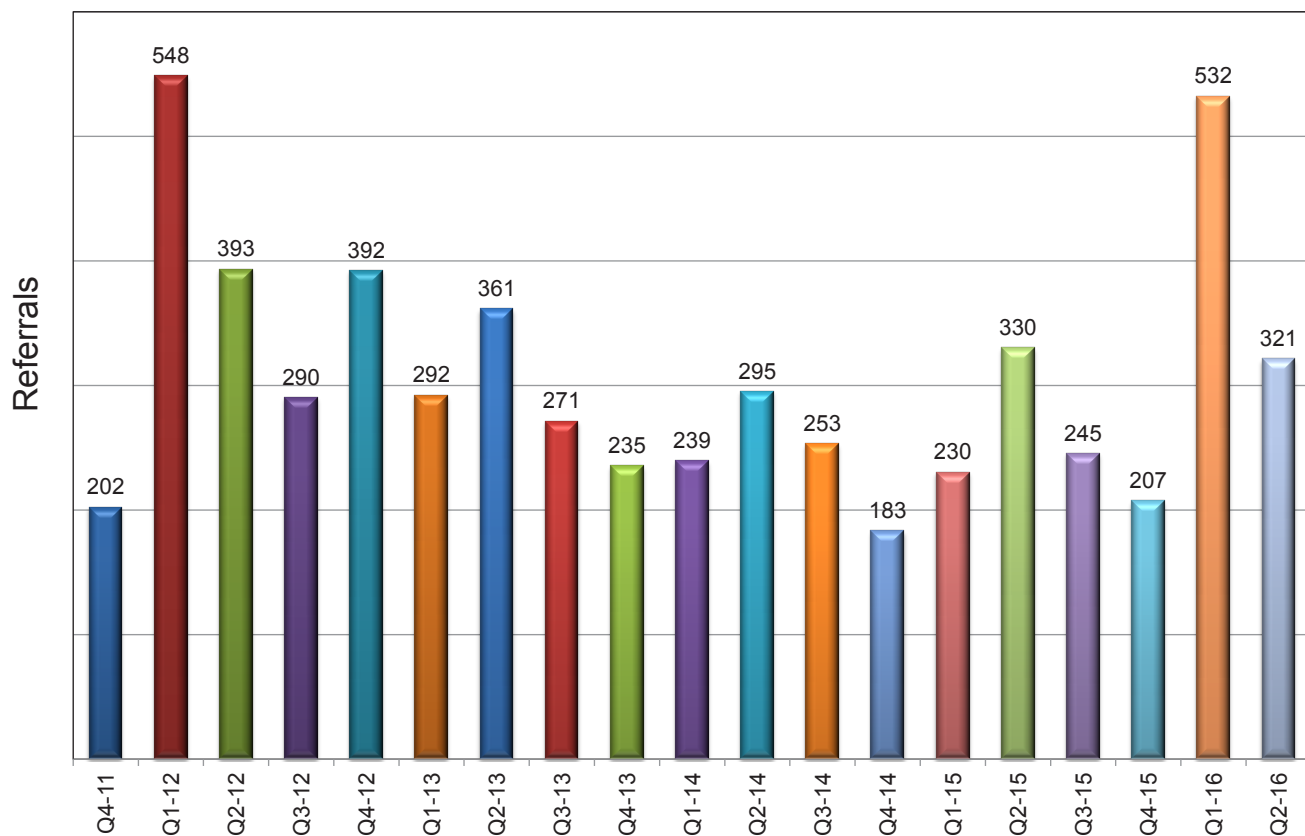
A handwritten signature in blue ink, appearing to read 'G Hil', with a stylized flourish extending from the end.

Garet Hil
Founder & CEO
National Kidney Registry

Transplants Facilitated

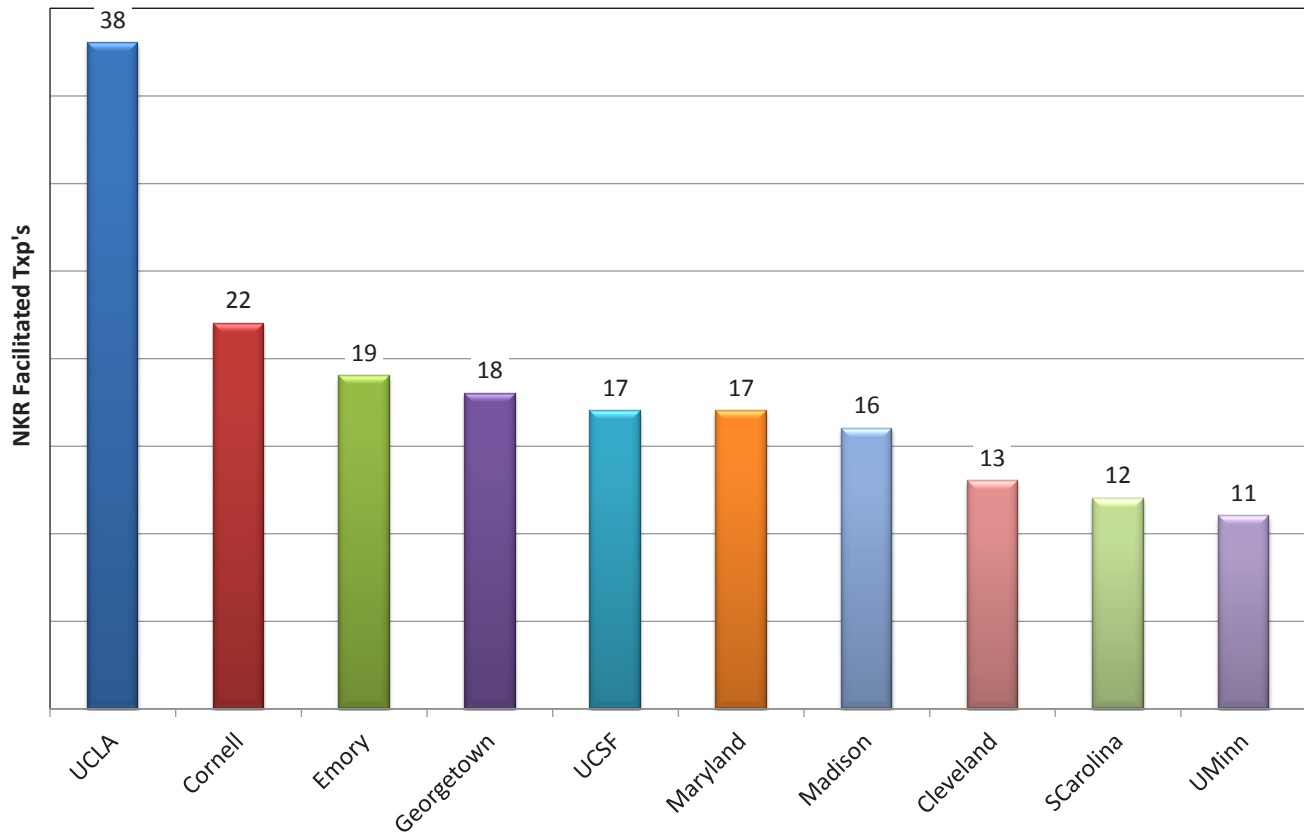


Patient Referrals To NKR Member Centers



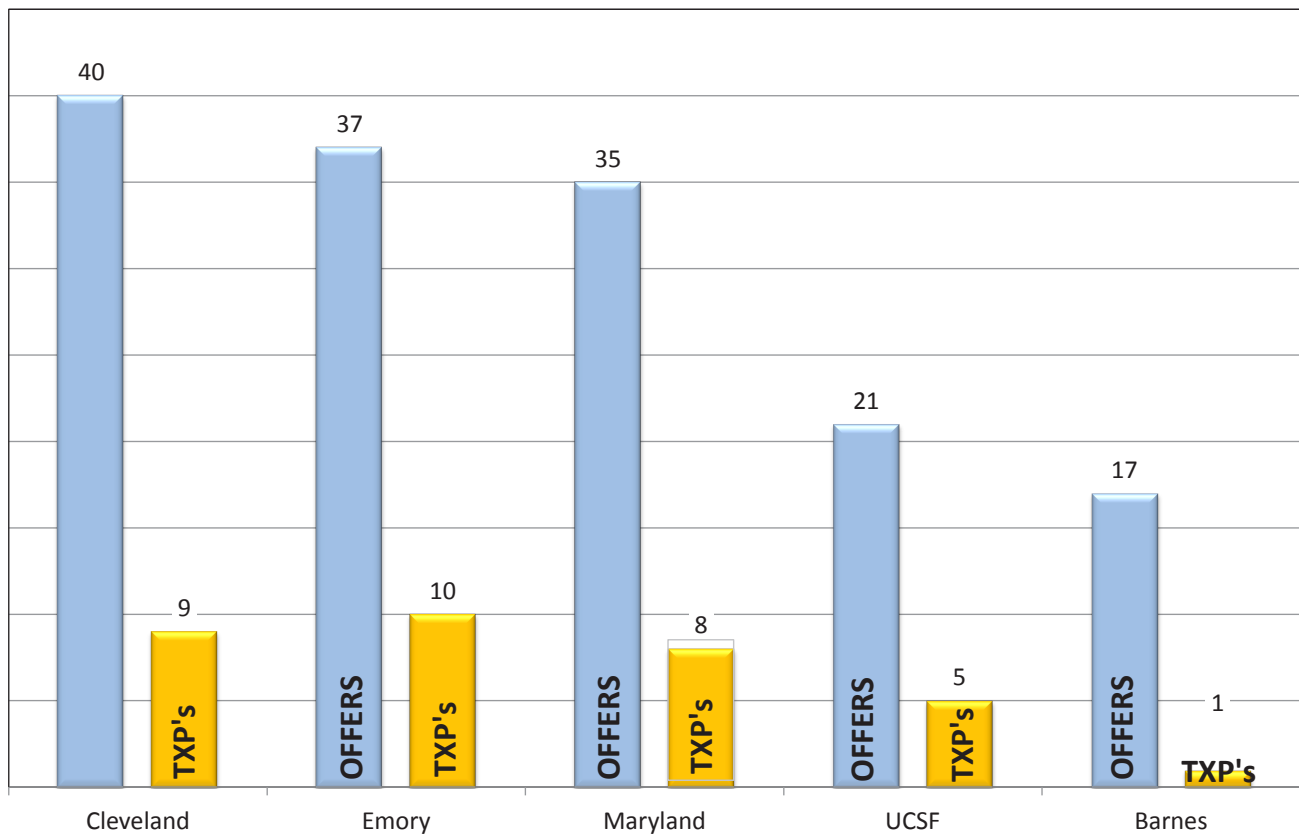
Top Centers

Transplants in Last 12 Months



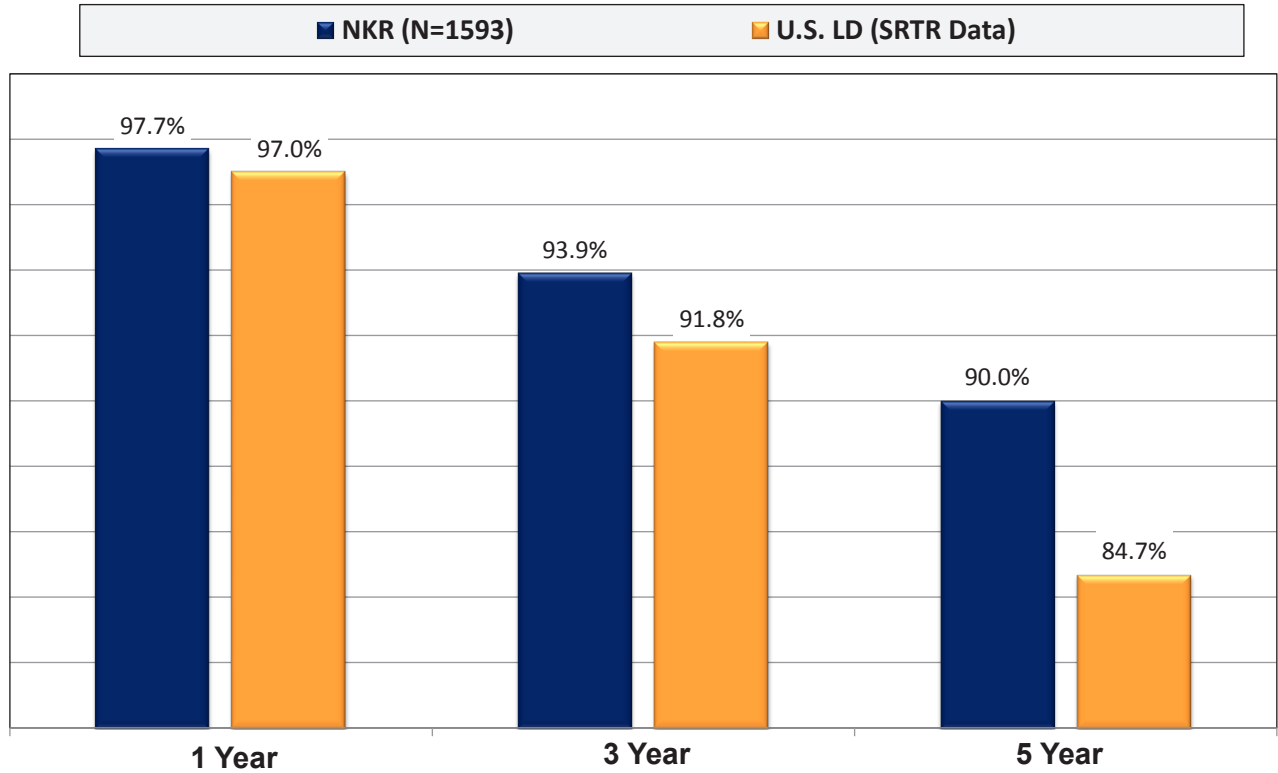
Top 5 CLC Centers

CLC Driven Match Offers – 4/15 – 7/16



NKR Graft Survival Advantage

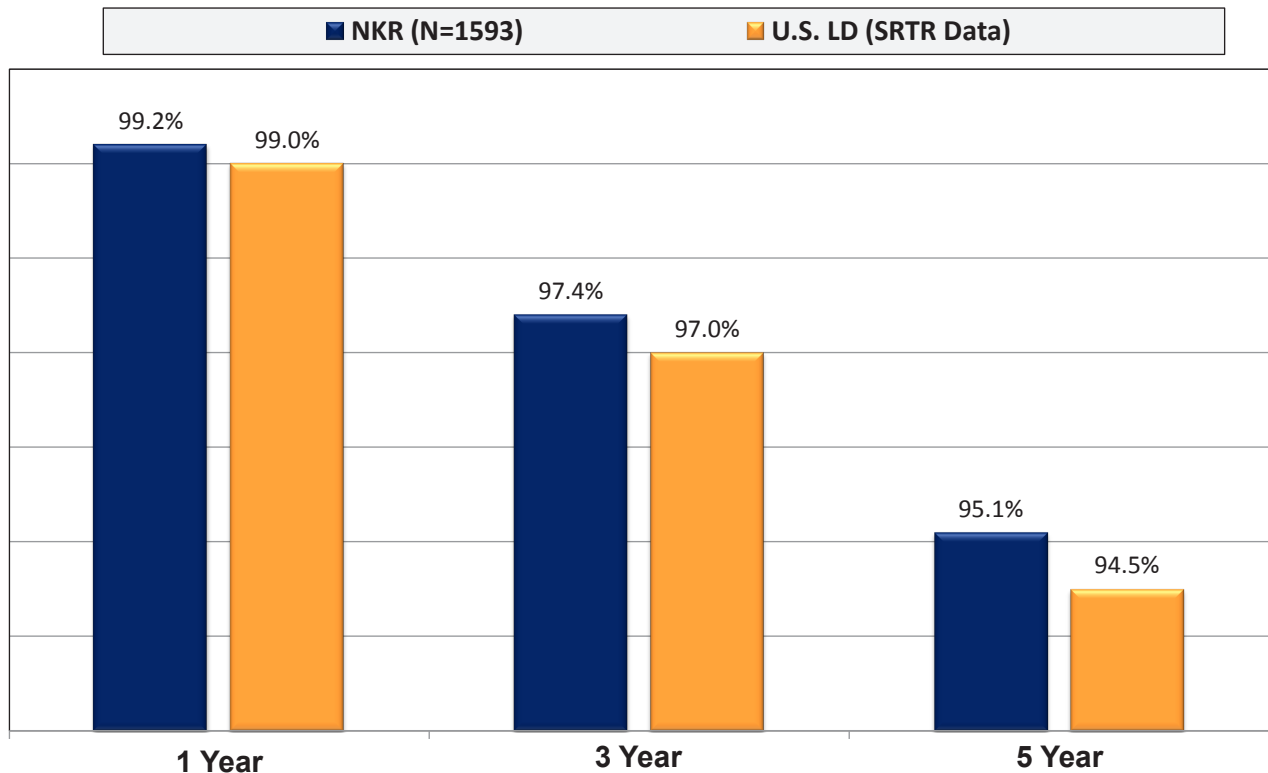
NKR Transplants vs. U.S. Living Donor Transplants
As of 6/30/2016



*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 7/25/16

NKR Patient Survival Advantage

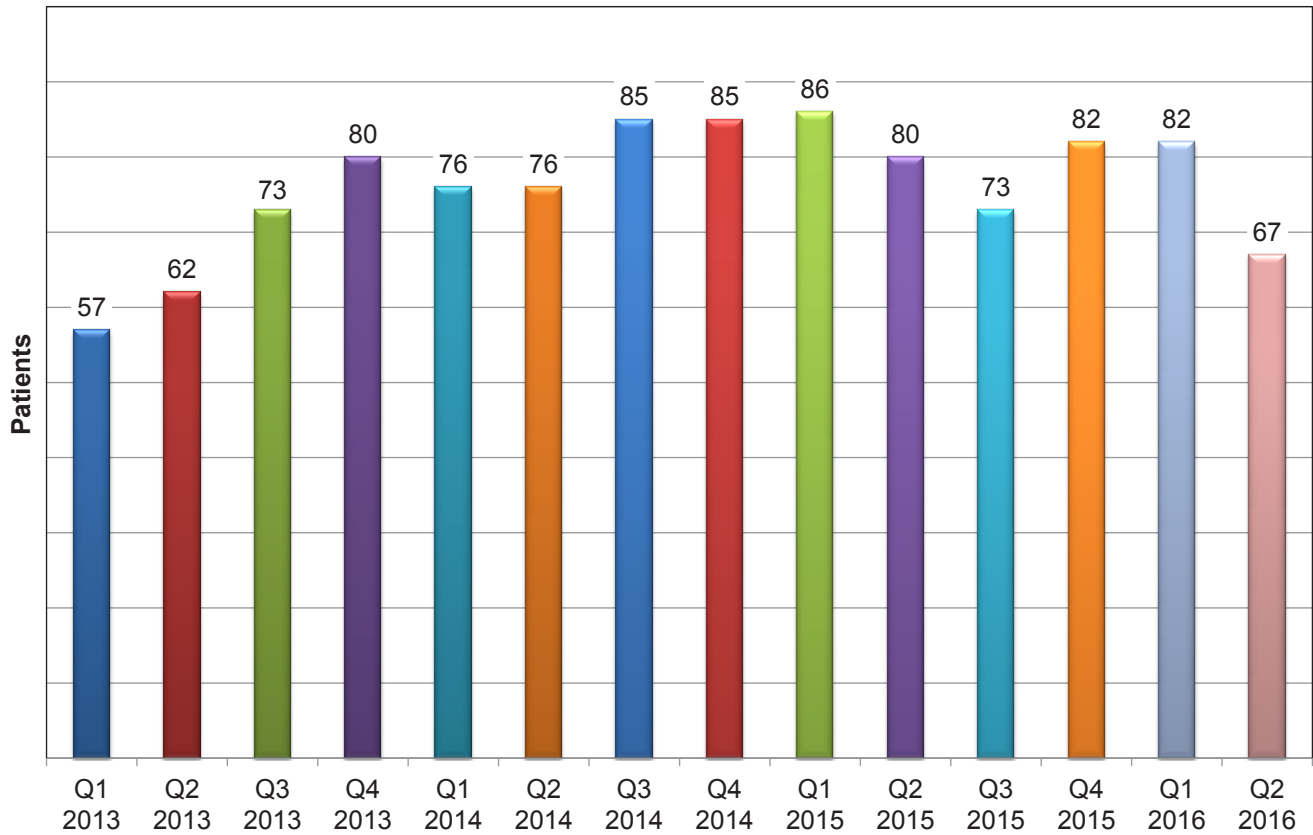
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*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology
 **U.S LD - Scientific Registry of Transplant Recipients. www.srtr.org/annual_reports/2011/513d_ki.aspx Accessed 7/25/16

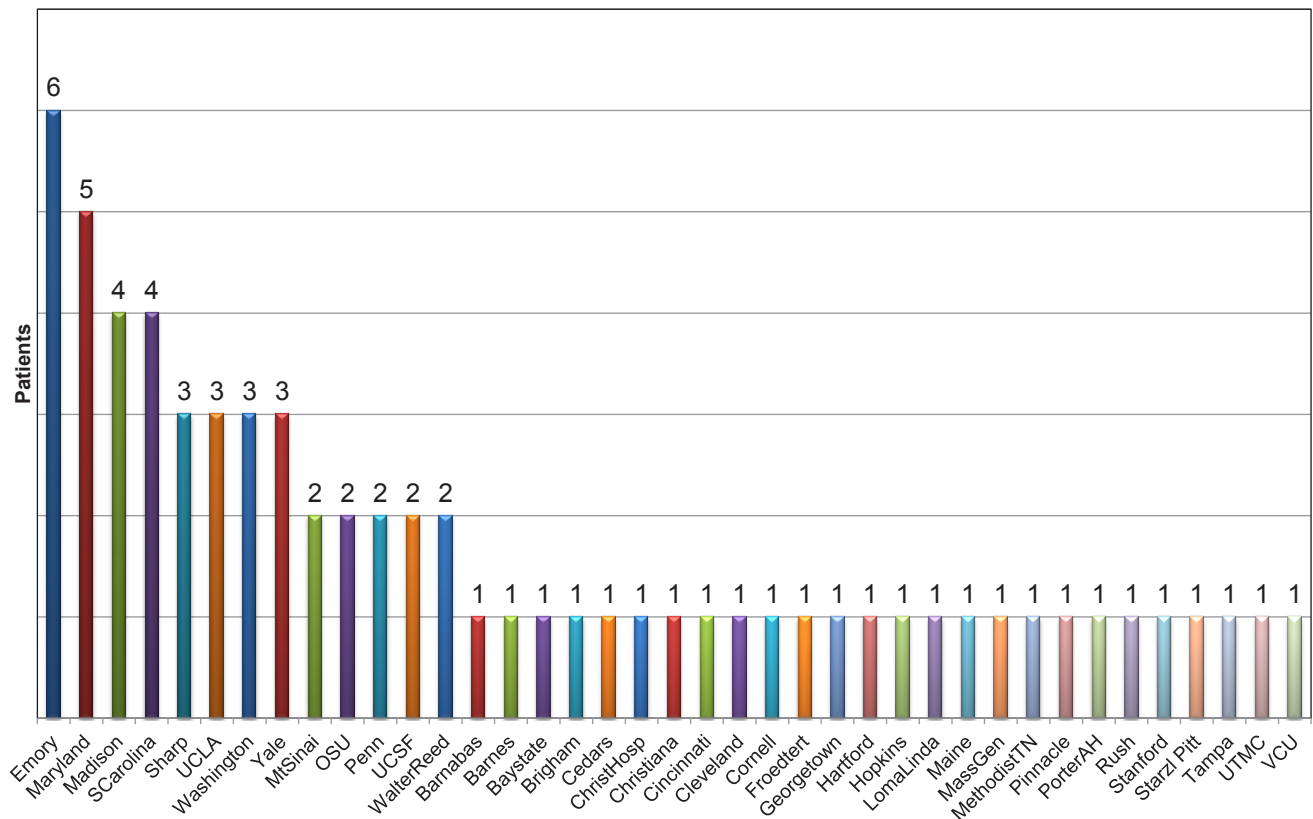
Patients Waiting > 1 Year

As of 6/30/2016



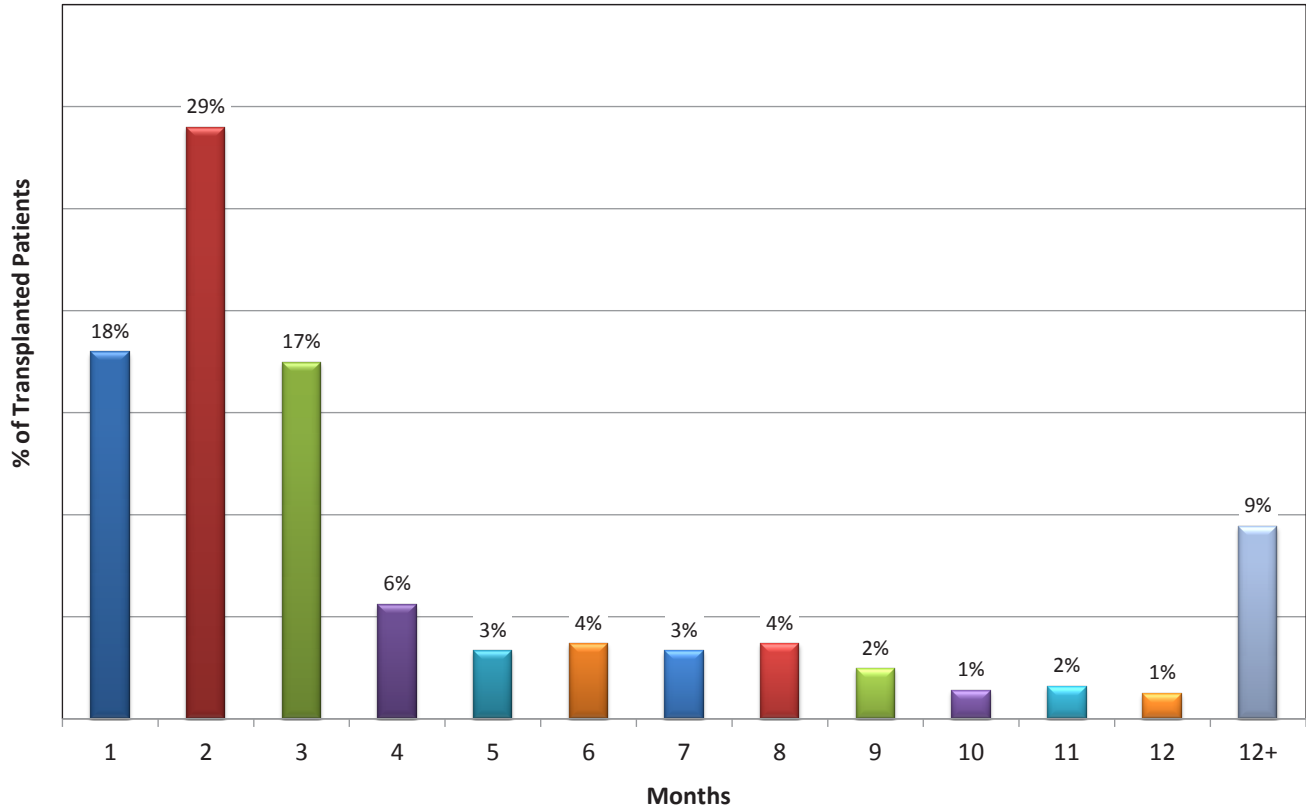
Patients Waiting > 1 Year by Center

As of 6/30/2016



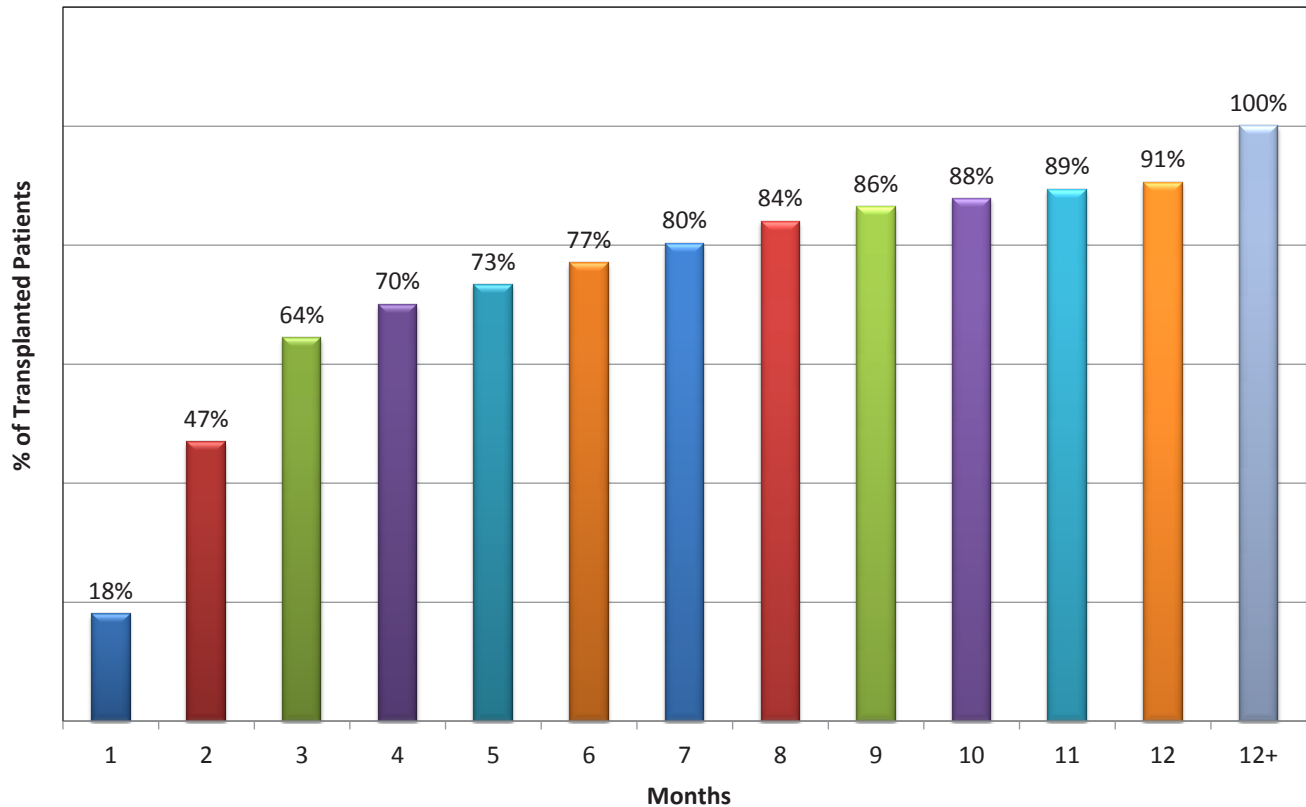
Wait Time Distribution

Transplanted Pairs 7/1/14 – 6/30/16



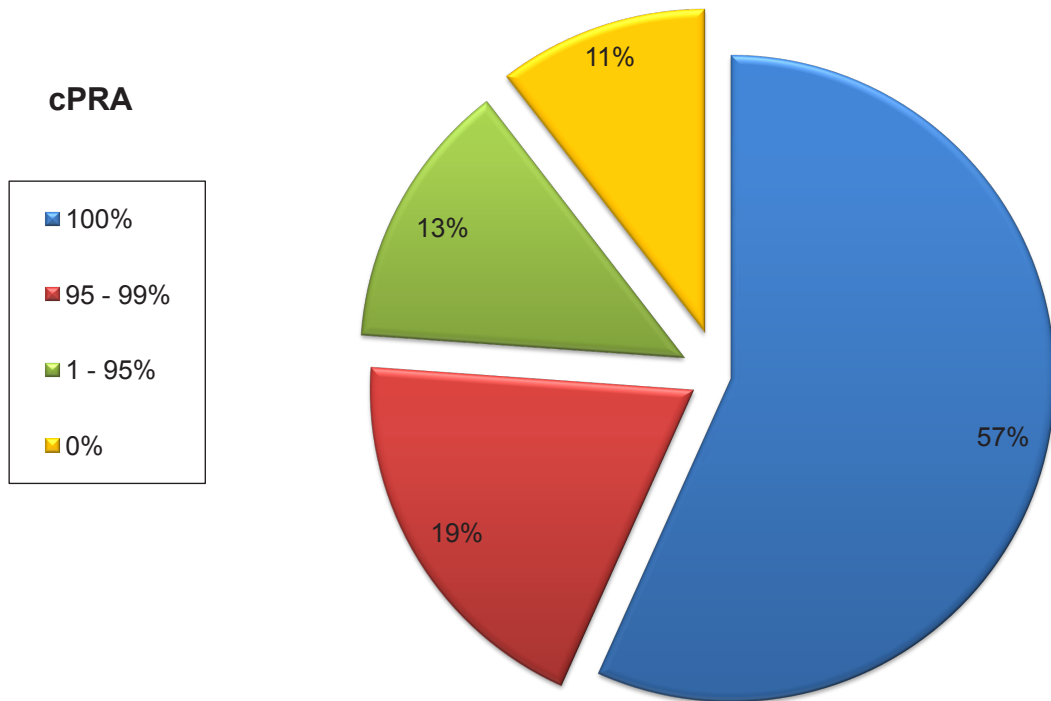
Cumulative Wait Time Distribution

Transplanted Pairs 7/1/14 – 6/30/16



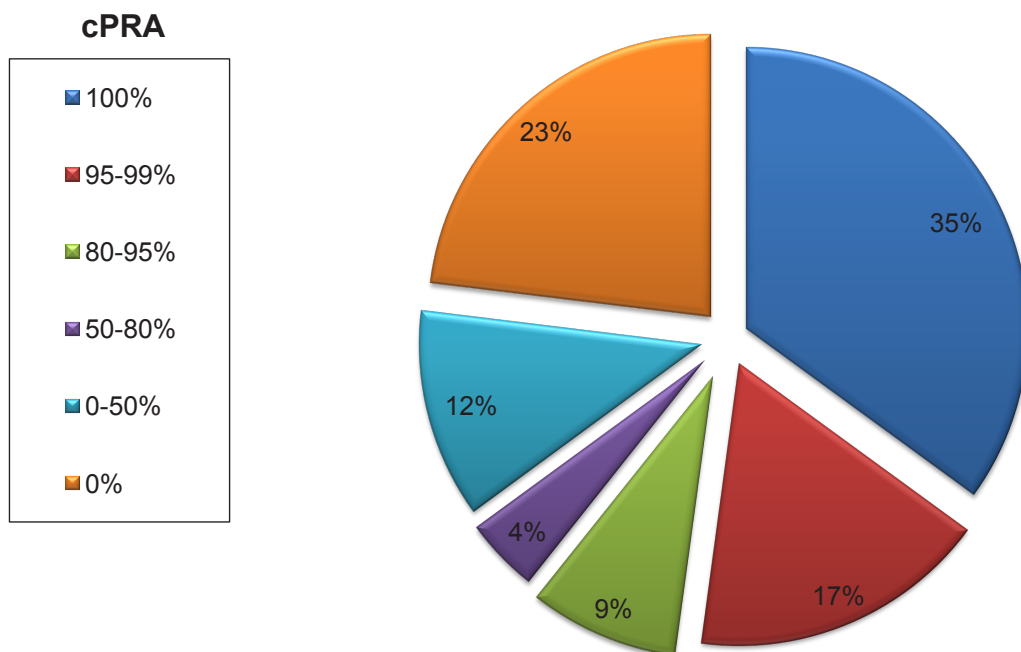
Patients Waiting > 1 Year by cPRA

As of 6/30/2016



Pool Composition by cPRA

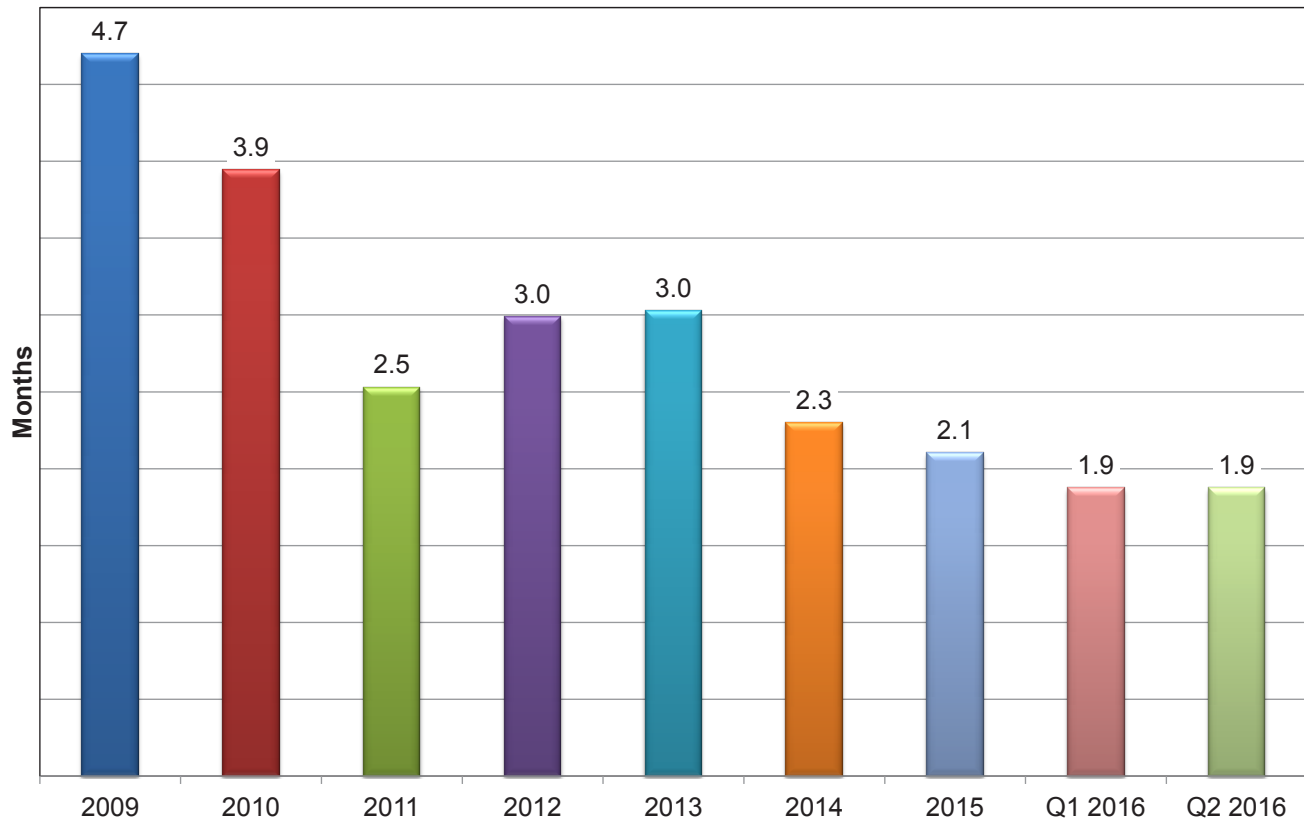
As of 6/30/2016



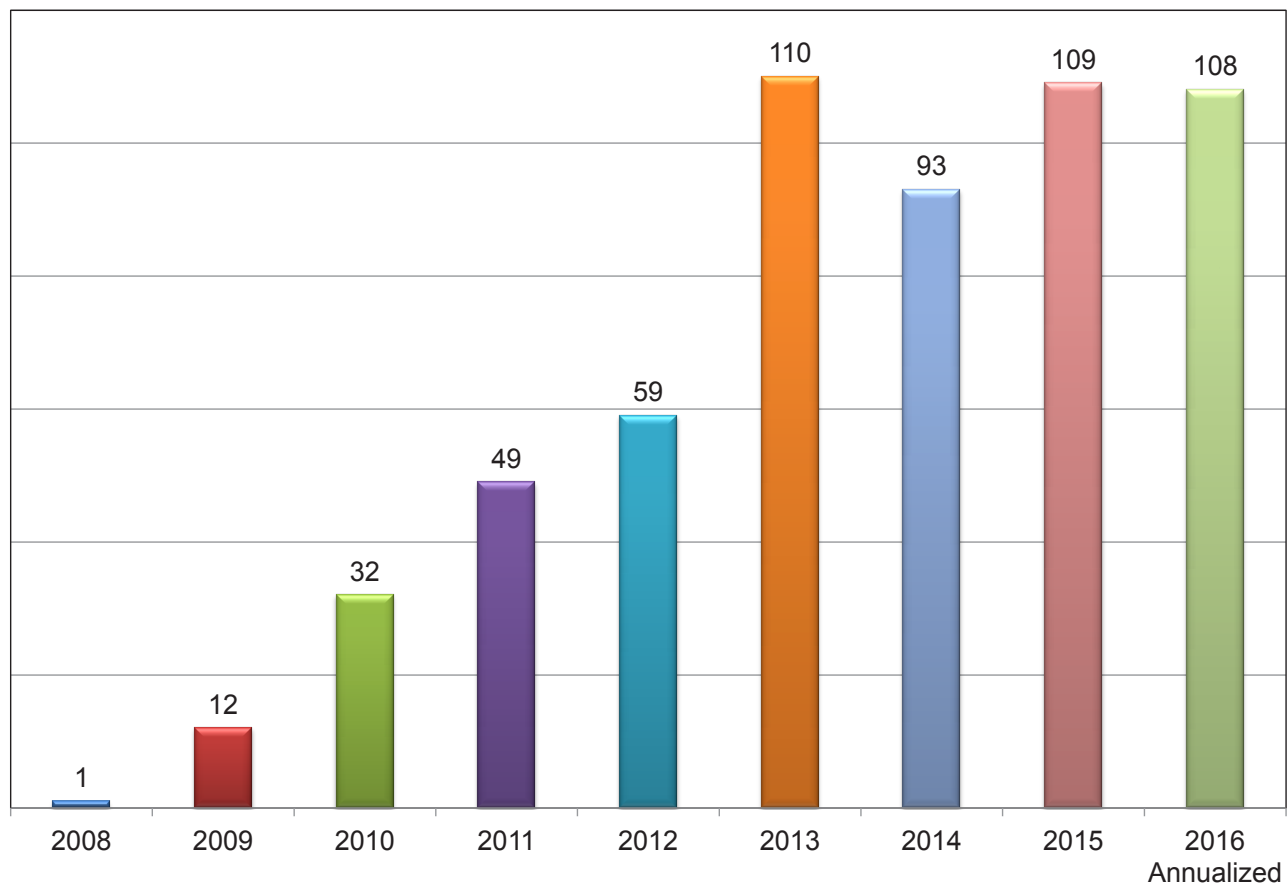
Transplanted Patient Median Wait Time

Wait times of patients transplanted during prior 12 months

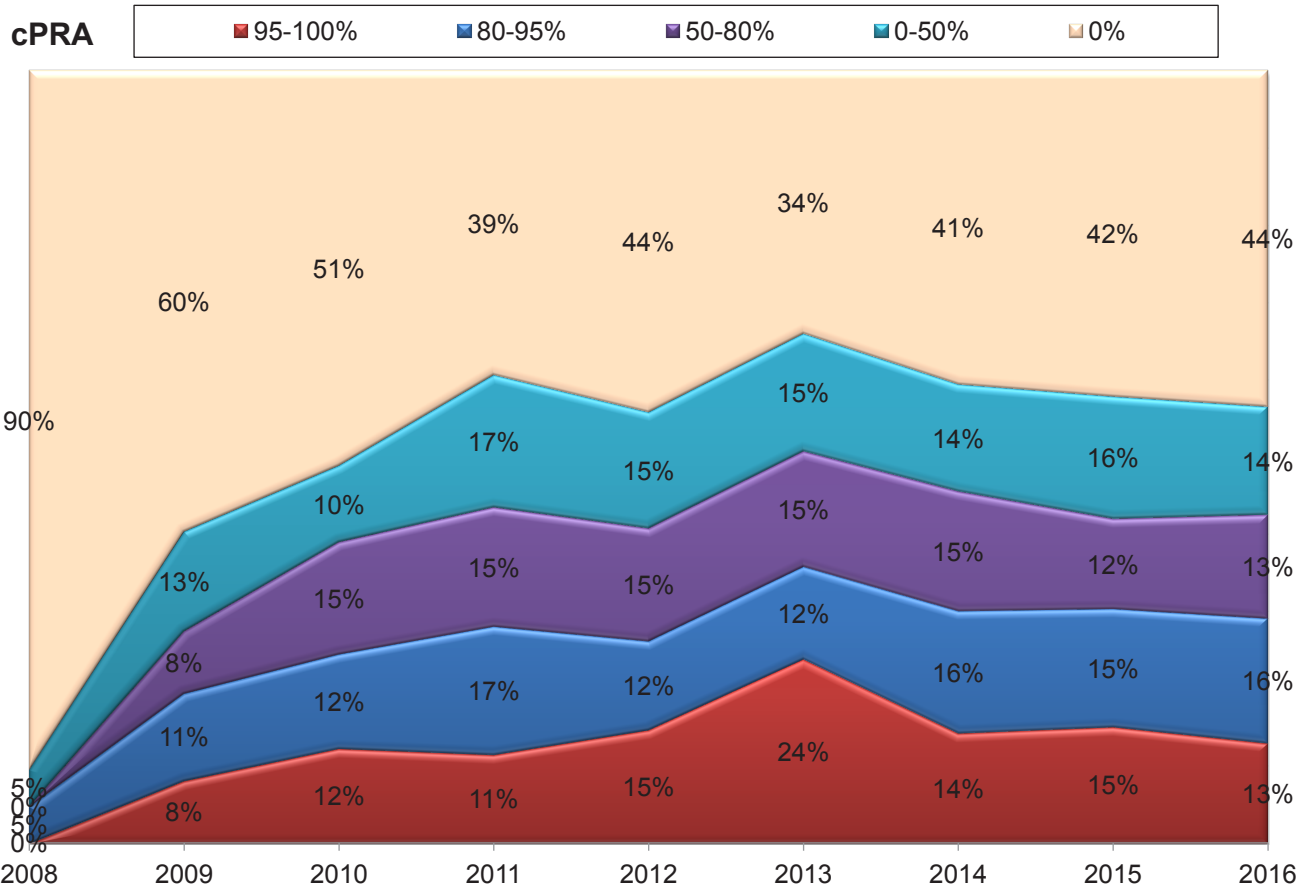
As of 6/30/2016



Transplanted Patients with cPRA > 80%

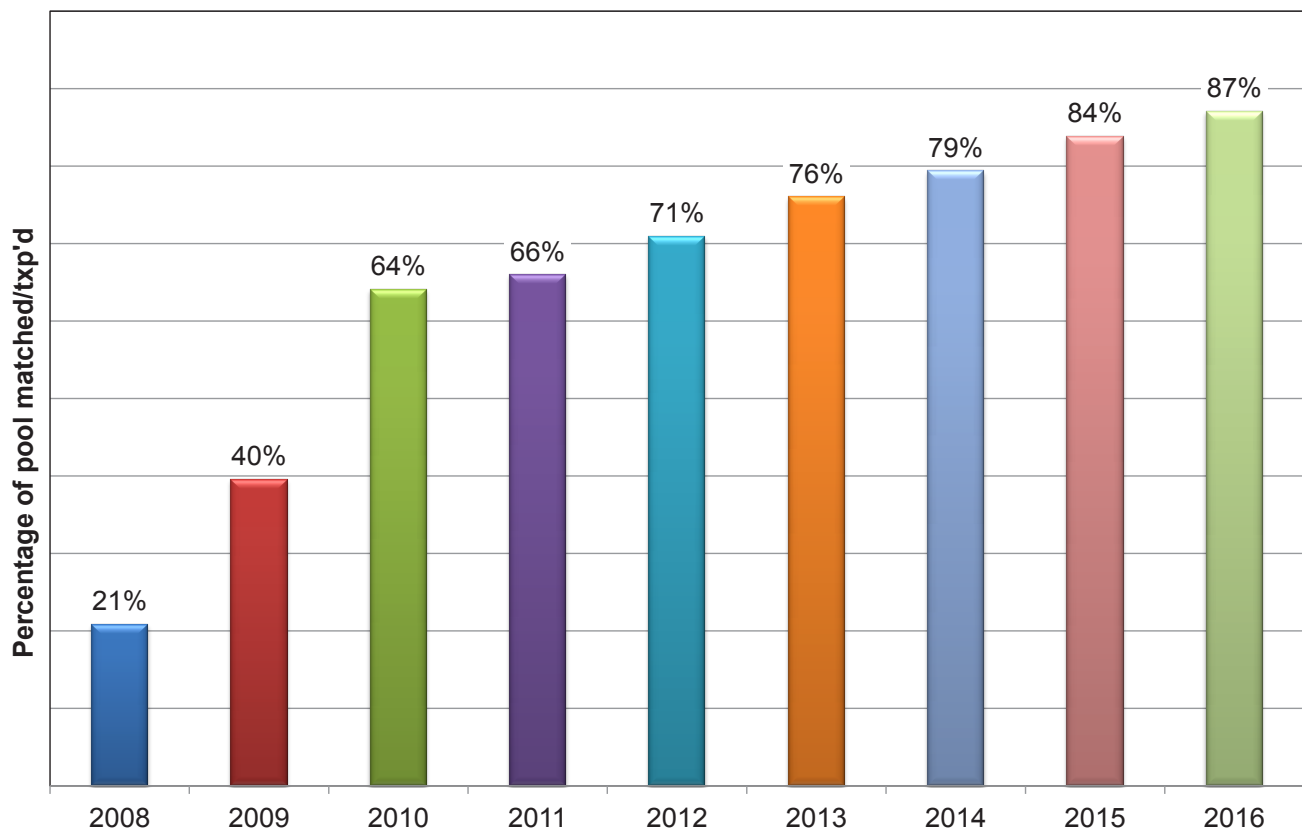


Transplanted Patients by cPRA



Percent of Pool Matched and/or Transplanted

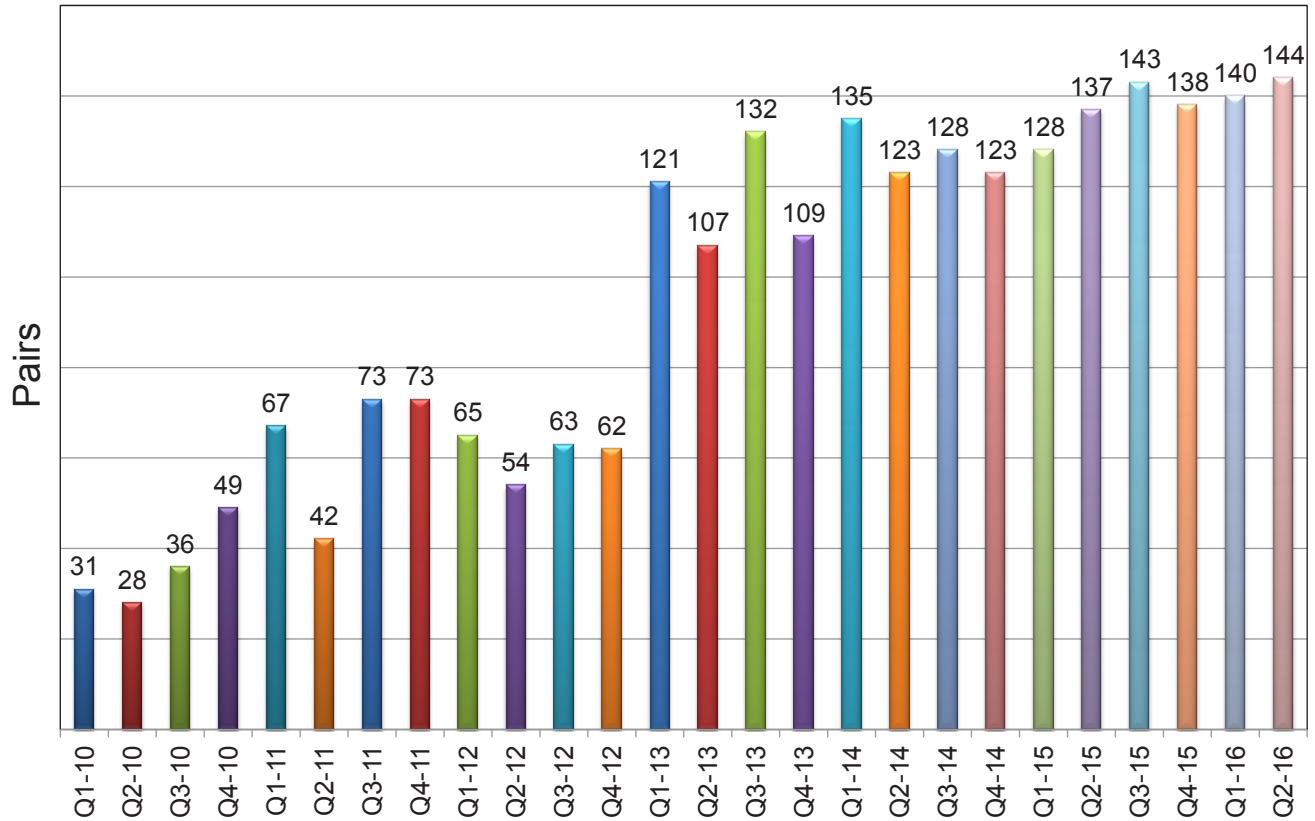
As of 6/30/2016



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

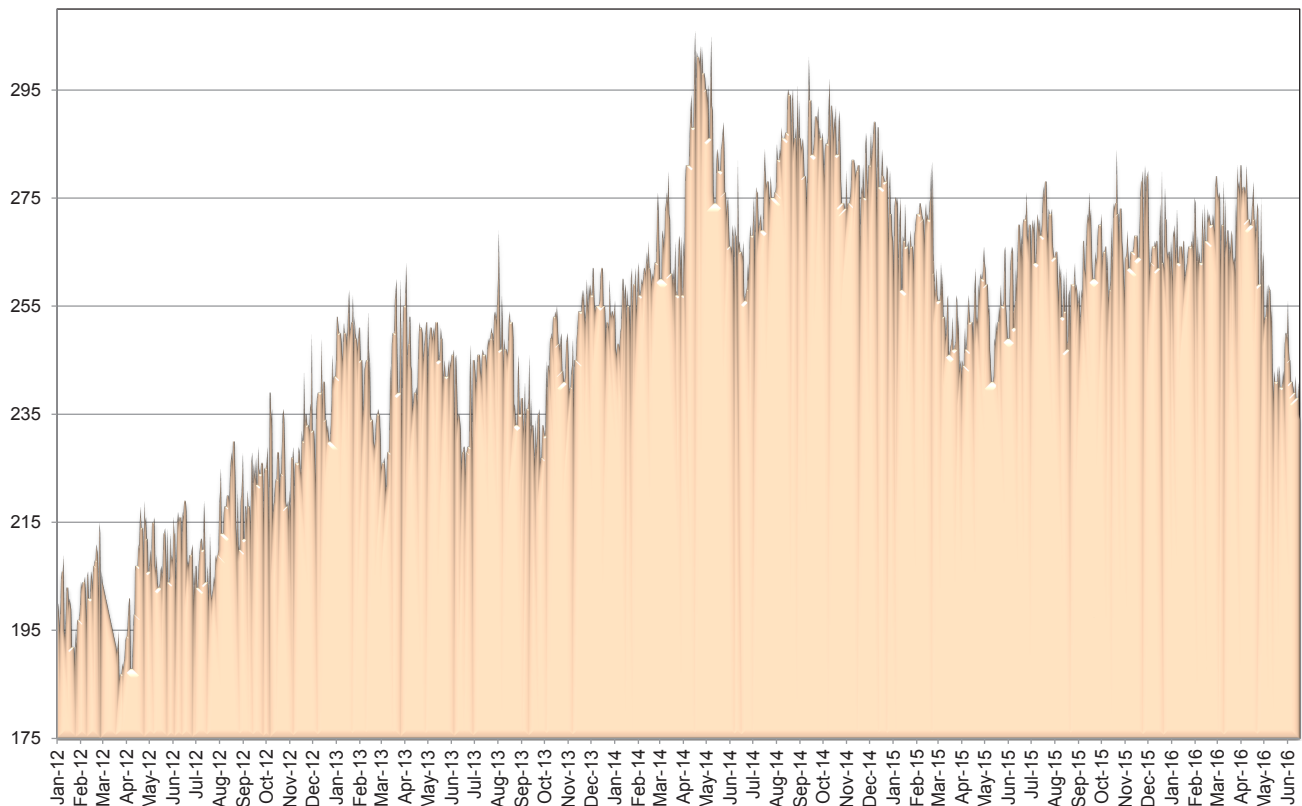
New Pair Enrollments

Patients available for match runs



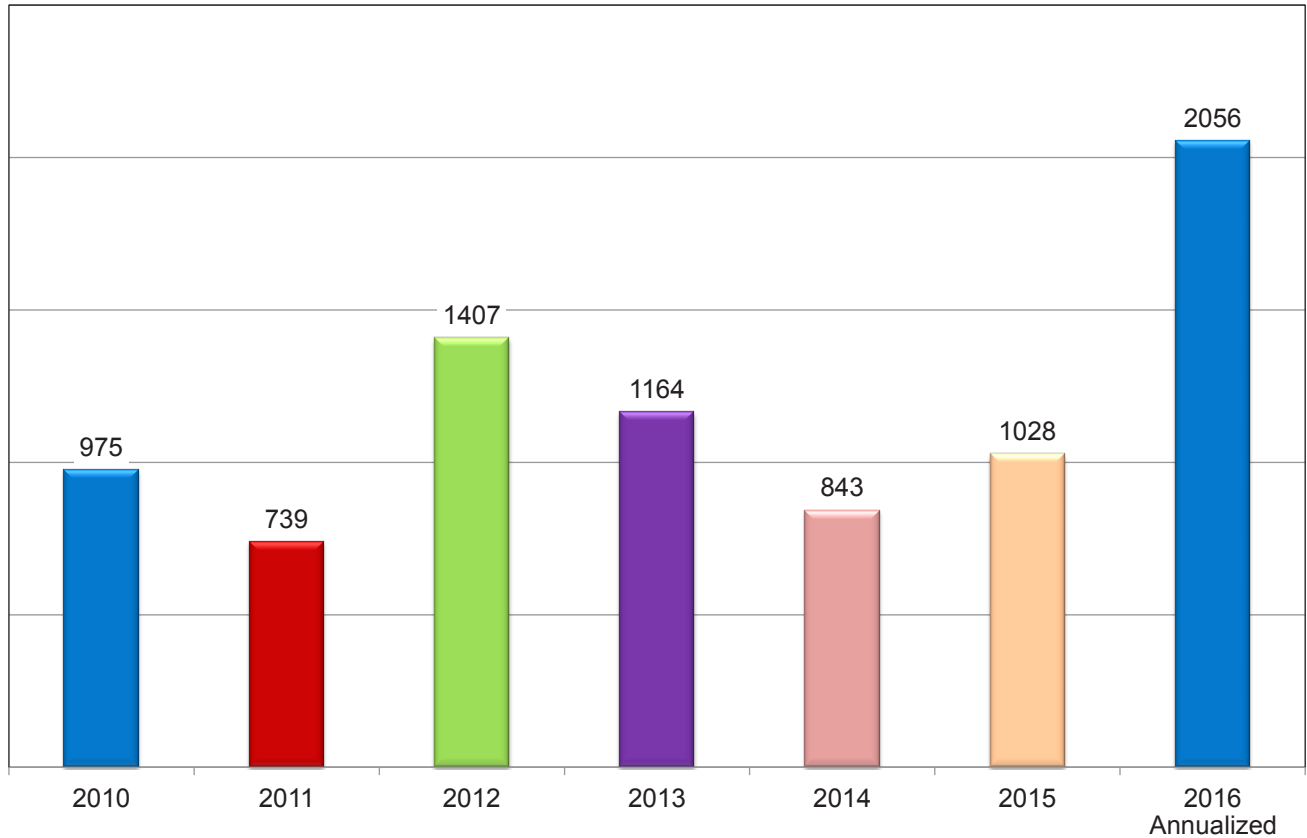
Pool Size

Unmatched patients by day
1/1/2012 – 6/30/2016



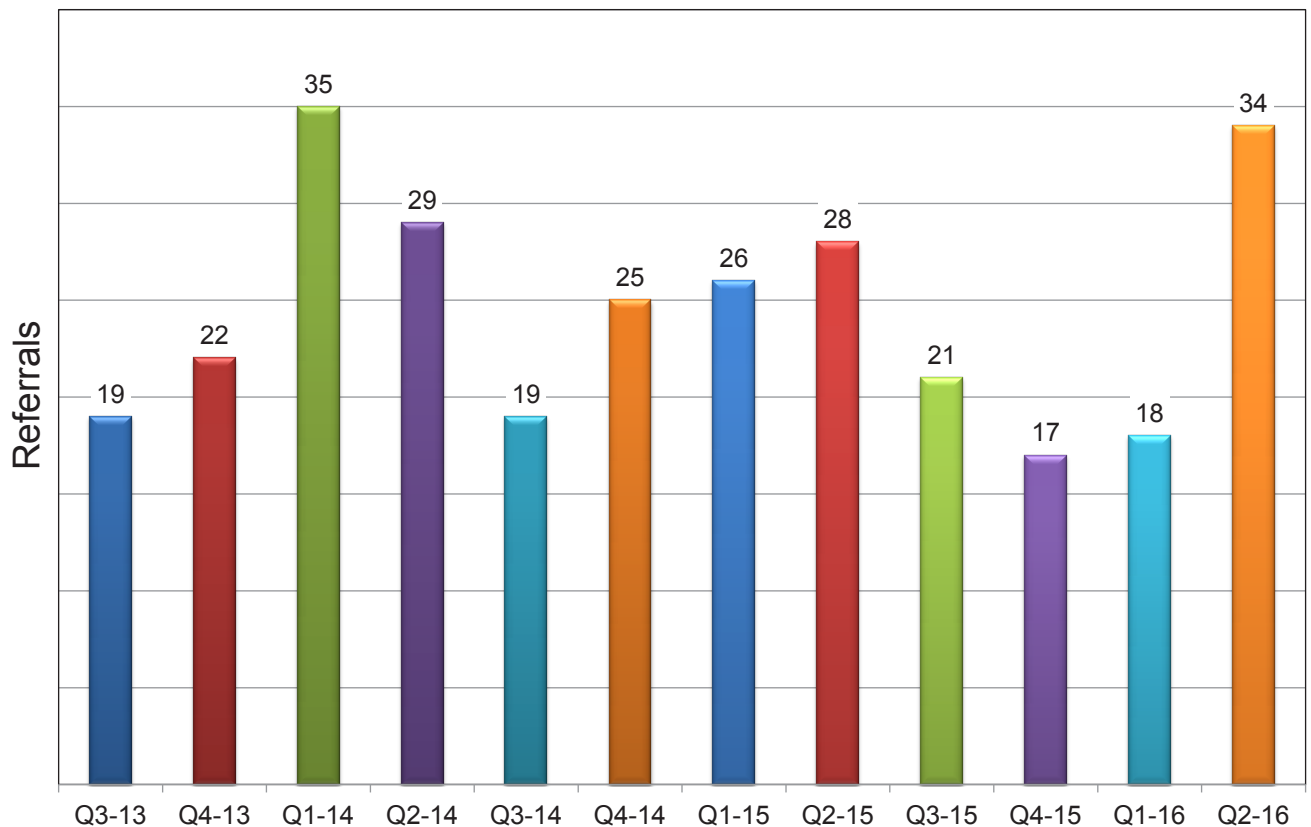
Non-Directed Donor Registrations

Via NKR Web Site



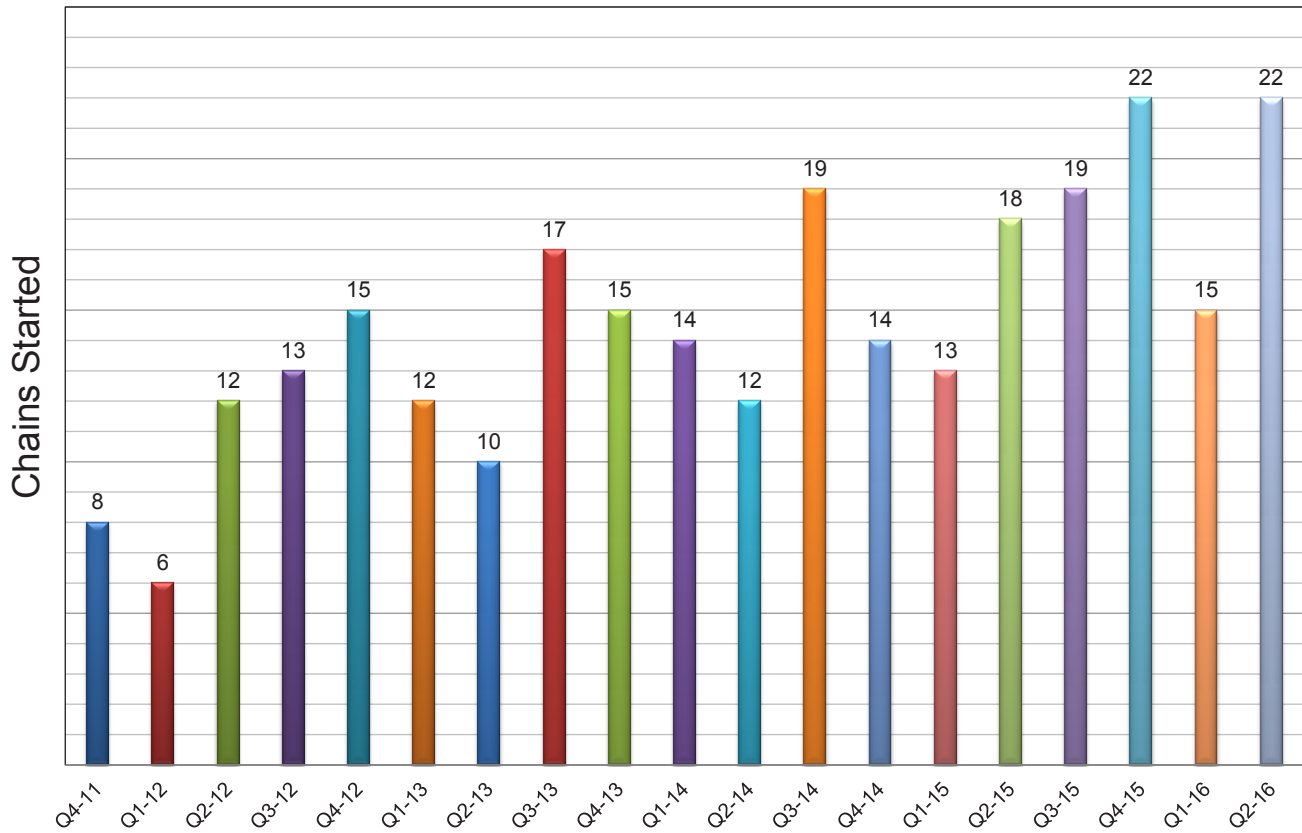
Non-Directed Donor Referrals

Referred to NKR member centers



Chains Started

Via non-directed donors



Chain and Loop Statistics

Category	Count	Mean Length	Transplants
Ended	323	4.60	1485
Broken	19	4.05	77
Active	5	4.20	21
Chain Total	347	4.56	1583
Loops	84	2.33	196
Total	431	4.13	1779

**Updates as of 7/1/16

Great HLA Matches

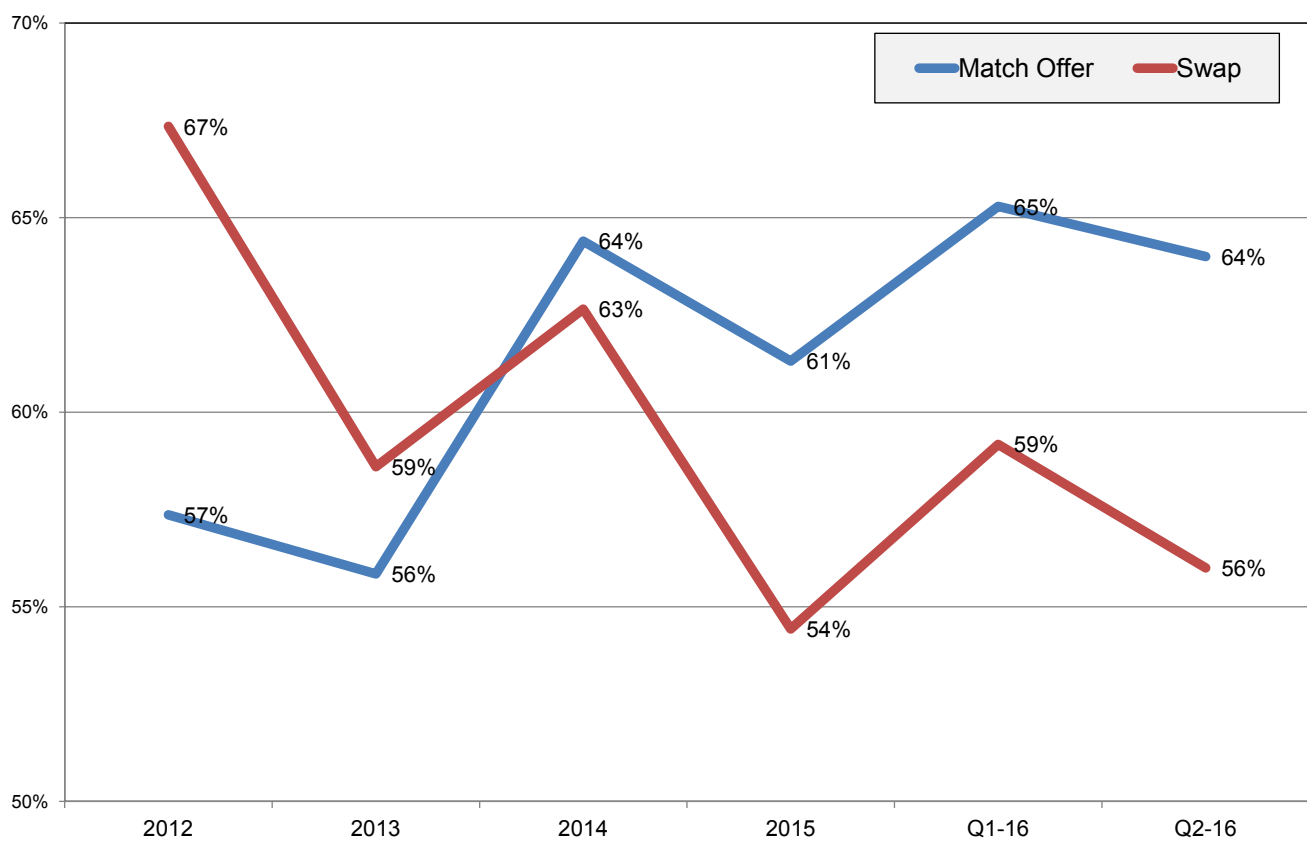
> 80 Match Points

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	SCarolina	4/3/1901	2/11/2016	A	A	100	3	64	53	100
2	Madison	442	12/22/2015	A	A	97	6	22	63	100
3	UMinn	440	11/19/2015	O	O	100	5	23	20	100
4	UCLA	357	2/17/2015	A	A	100	34	39	52	100
5	Emory	351	12/11/2014	A	A	100	5	25	33	100
6	Hopkins	330	11/13/2014	A	O	96	1	41	38	100
7	Loyola	324	8/5/2014	A	A	100	1	37	55	100
8	Madison	674	1/9/2014	O	A	99	5	29	33	100
9	Barnabas	182	10/3/2012	A	A	92	4	51	50	100
10	Barnes	105	3/31/2011	A	A	100	7	60	32	100
11	UCSF	58	6/15/2010	A	A	100	6	47	58	100
12	OSU	497	7/12/2016	A	A	99	5	62	48	90
13	Pinnacle	473	4/5/2016	A	A	96	1	30	54	90
14	Cornell	447	12/9/2015	A	A	7	2	31	14	90
15	Emory	780	3/12/2015	O	O	7	6	46	21	90
16	MethodistTN	266	1/29/2014	A	A	89	2	44	66	90
17	Barnabas	266	1/16/2014	O	O	99	23	54	67	90
18	Madison	221	4/30/2013	O	O	99	17	45	52	90
19	Barnabas	187	12/4/2012	A	A	94	2	48	45	90
20	VAHD	161	6/12/2012	O	O	100	7	29	62	90
21	MethodistTX	124	12/7/2011	A	A	99	14	39	68	90
22	UCLA	124	8/31/2011	O	O	100	12	33	22	90
23	CPMC	115	6/22/2011	B	B	33	1	44	62	90
24	Starzl Pitt	109	4/21/2011	A	A	70	2	59	49	90
25	UCLA	521	7/20/2016	A	A	89	2	45	63	85
26	MethodistTX	442	1/20/2016	O	O	94	7	46	49	85
27	LomaLinda	406	8/18/2015	A	A	100	1	53	50	85
28	Barnabas	393	7/16/2015	A	A	100	1	37	64	85
29	Madison	792	6/3/2015	A	A	94	3	49	54	85
30	Madison	383	5/19/2015	O	O	98	6	44	47	85
31	MethodistTN	365	3/4/2015	B	B	100	4	53	51	85
32	Barnabas	330	11/13/2014	O	O	96	2	33	49	85
33	PorterAH	322	9/3/2014	O	O	27	5	29	24	85
34	Barnabas	304	7/17/2014	O	O	99	1	53	62	85
35	Cornell	733	7/8/2014	A	A	0	1	57	67	85
36	Barnes	266	1/16/2014	A	A	100	13	33	40	85
37	SCarolina	266	1/14/2014	O	O	89	3	55	44	85
38	UCLA	659	10/24/2013	O	O	100	25	54	56	85
39	Penn	199	12/11/2012	B	B	87	5	47	52	85
40	Madison	169	7/25/2012	B	B	97	3	30	62	85
41	UCLA	538	5/22/2012	A	O	88	7	28	12	85
42	Intermtn	118	6/29/2011	O	O	96	16	27	27	85
43	Allegheny	62	5/6/2010	A	A	0	5	60	70	85
44	Madison	332	11/4/2014	O	O	96	20	63	42	80
45	UCLA	258	10/3/2013	A	A	98	1	47	36	80
46	CPMC	19	7/31/2009	A	A	0	5	51	54	80

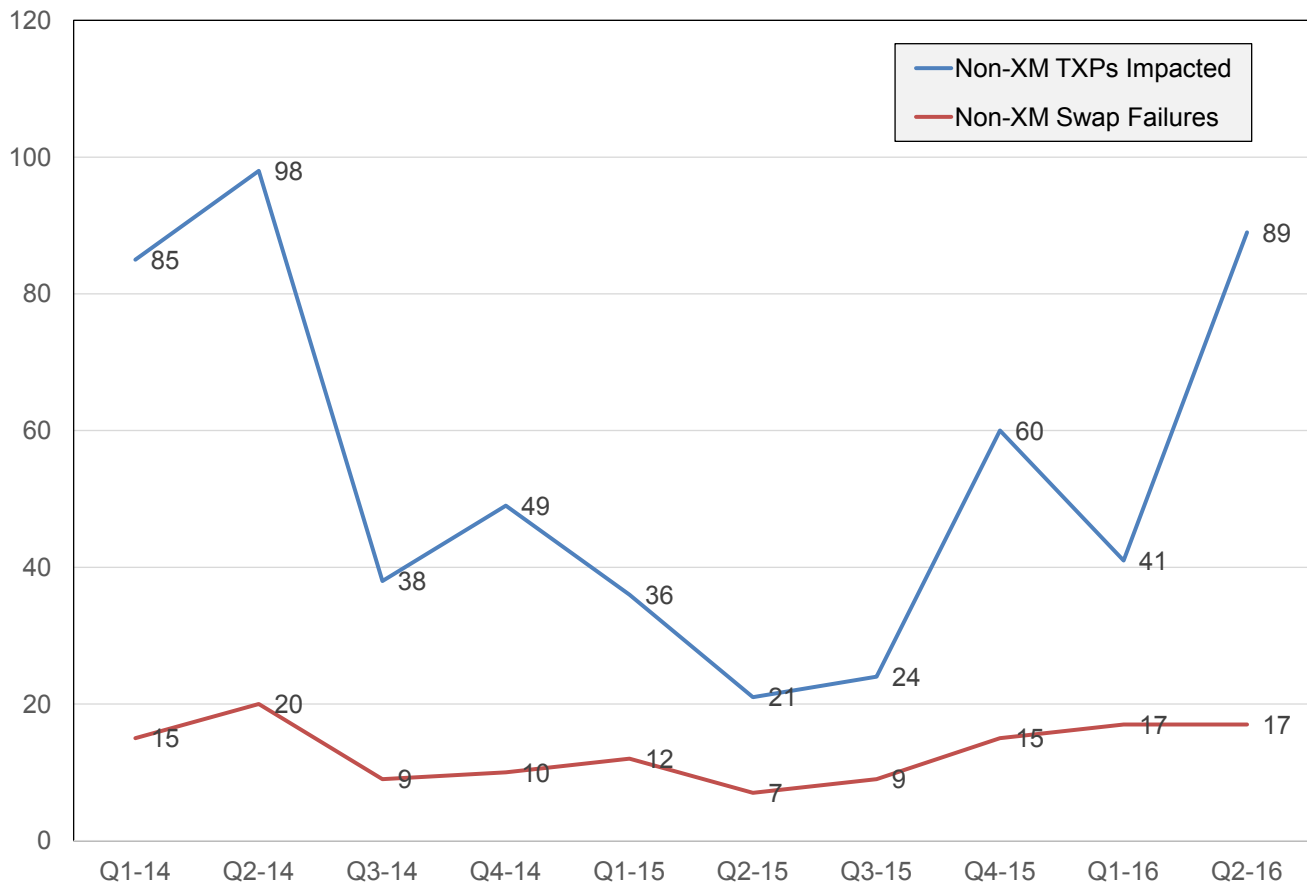
Compatible Pairs Transplanted

#	Recipient Center	Txp 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 Txp's	Additional Txp's cPRA >80
1	Hopkins	10/3/2013	A	O	A	19	65	38	27	25	50	-25	Other	2	0
2	Cornell	11/20/2013	O	O	O	34	37	59	-22	75	25	50	Spouse	3	1
3	Cleveland	12/18/2013	O	O	O	43	41	55	-14	25	0	25	internet friend	4	2
4	Maine	1/28/2014	A	O	A	43	40	53	-13	75	10	65	Spouse	4	0
5	UCLA	1/29/2014	A	A	A	7	34	37	-3	60	50	10	Mother	3	0
6	Dartmouth	4/9/2014	O	O	O	45	37	43	-6	35	50	-15	Friend	2	1
7	Cornell	4/23/2014	O	O	O	3	24	43	-19	0	0	0	Cousin	0	0
8	Stanford	4/23/2014	O	O	O	29	66	24	42	25	50	-25	Father	2	0
9	Madison	4/28/2014	O	O	O	62	57	39	18	45	10	35	Friend	6	2
10	Barnabas	6/11/2014	B	O	B	69	57	41	16	10	40	-30	Significant Other	3	0
11	UCSF	8/26/2014	O	O	O	28	57	22	35	10	85	-75	Father	5	1
12	MassGen	8/28/2014	A	O	A	69	51	33	18	60	0	60	niece through marriage	1	0
13	Emory	9/30/2014	A	A	A	18	52	37	15	50	65	-15	Father	2	0
14	Loyola	11/11/2014	A	O	A	42	43	48	-5	25	25	0	Spouse	2	1
15	Georgetown	4/28/2015	O	O	O	41	43	30	13	0	0	0	Spouse	2	2
16	Emory	5/13/2015	A	O	A	12	50	28	22	0	50	-50	Father	2	0
17	Stanford	5/21/2015	A	A	A	61	61	25	36	25	25	0	Spouse	2	0
18	Indiana	5/28/2015	A	A	A	32	57	48	9	25	65	-40	Mother	1	0
19	Penn	6/9/2015	B	O	B	41	43	44	-1	10	0	10	Spouse	2	0
20	Penn	6/25/2015	A	O	A	28	56	19	37	65	50	15	Mother	2	0
21	Barnabas	9/24/2015	AB	O	A	58	54	22	32	25	35	-10	Spouse	2	0
22	Barnabas	10/14/2015	B	O	B	36	48	40	8	0	0	0	Aunt	2	1
23	Maine	10/21/2015	A	A	A	34	21	30	-9	10	10	0	Met on Facebook	2	0
24	Maryland	11/11/2015	A	O	A	65	60	51	9	60	25	35	Spouse	2	0
25	MassGen	12/1/2015	O	O	O	22	50	32	18	0	0	0	Friend	1	0
26	GARegents	12/1/2015	A	O	A	51	63	47	16	35	0	35	Friend	5	1
27	Cornell	12/9/2015	A	A	A	14	55	31	24	90	15	75	Father	2	0
28	Rush	4/12/2016	A	A	A	42	46	36	10	35	35	0	Spouse	2	0
29	Cornell	4/13/2016	AB	O	A	52	51	30	21	35	0	35	Friend	1	0
30	Emory	4/20/2016	B	O	B	23	70	46	24	0	65	-65	Other	0	0
31	Madison	4/20/2016	A	O	A	58	46	45	1	35	25	10	Spouse	5	0
32	Colorado	5/11/2016	O	O	O	64	50	45	5	25	25	0	Spouse	3	0
33	Emory	6/17/2016	A	O	A	30	62	47	15	25	75	-50	Mother	1	0
													Totals	78	12

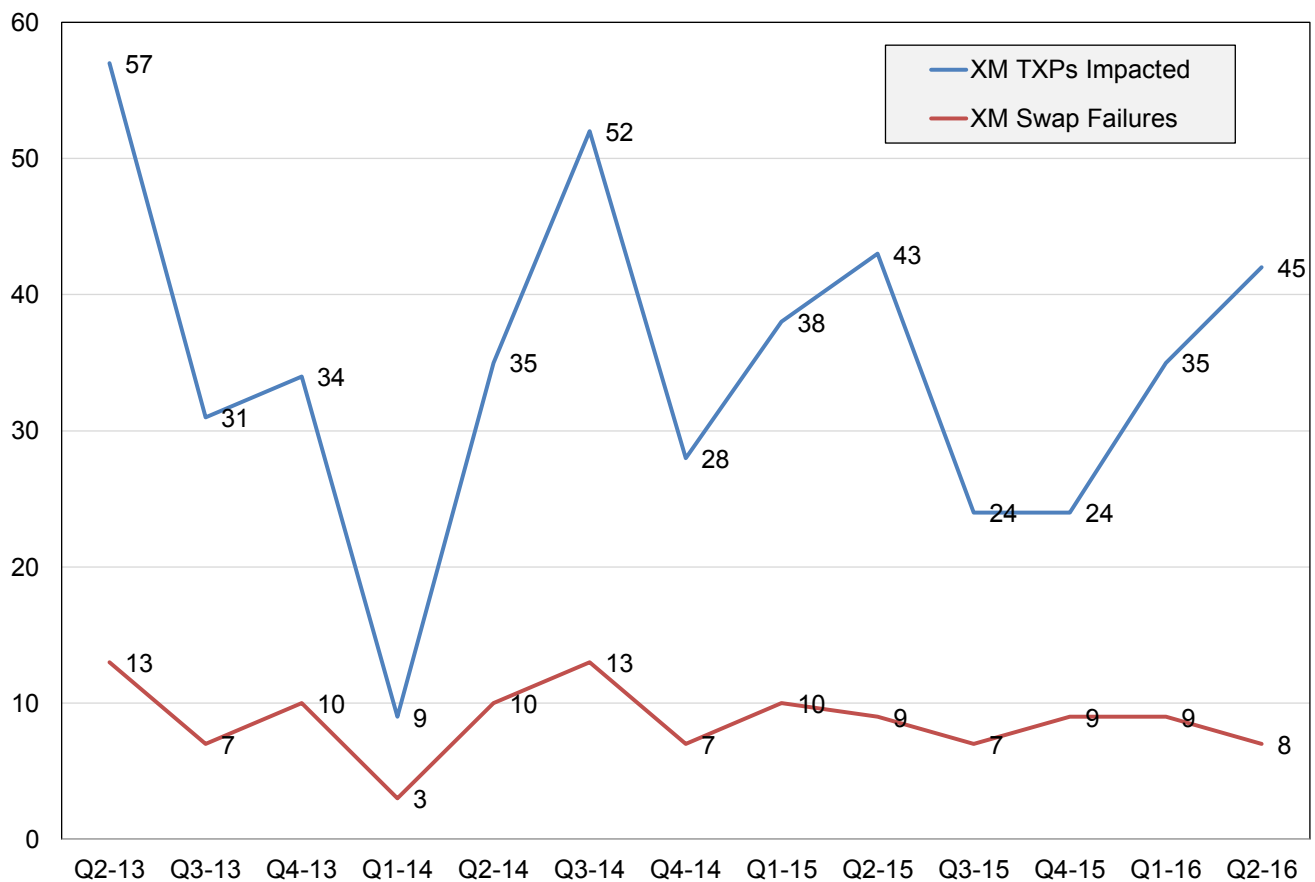
Failure Rates



Non XM Swap Failures & Transplants Impacted

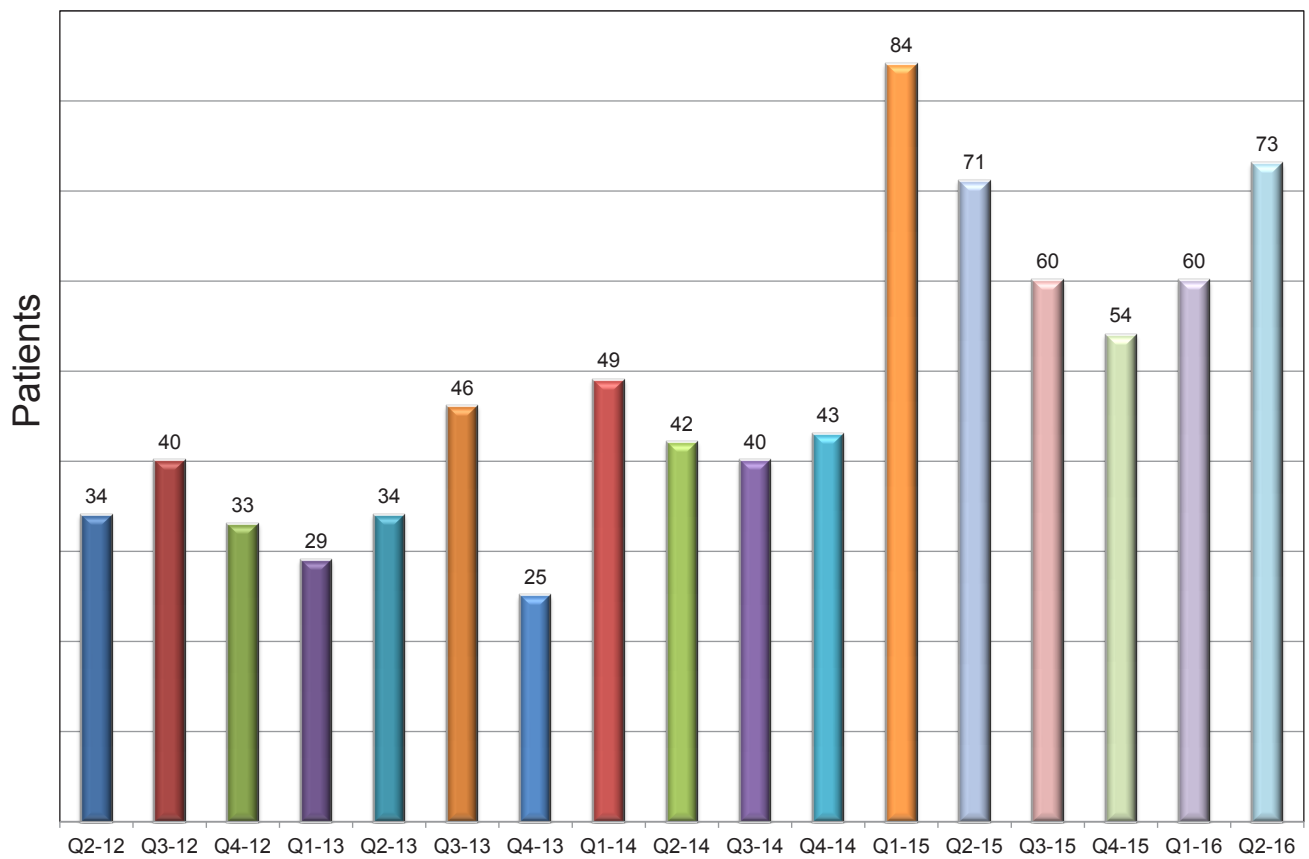


XM Swap Failures & Transplants Impacted



Patients Deleted

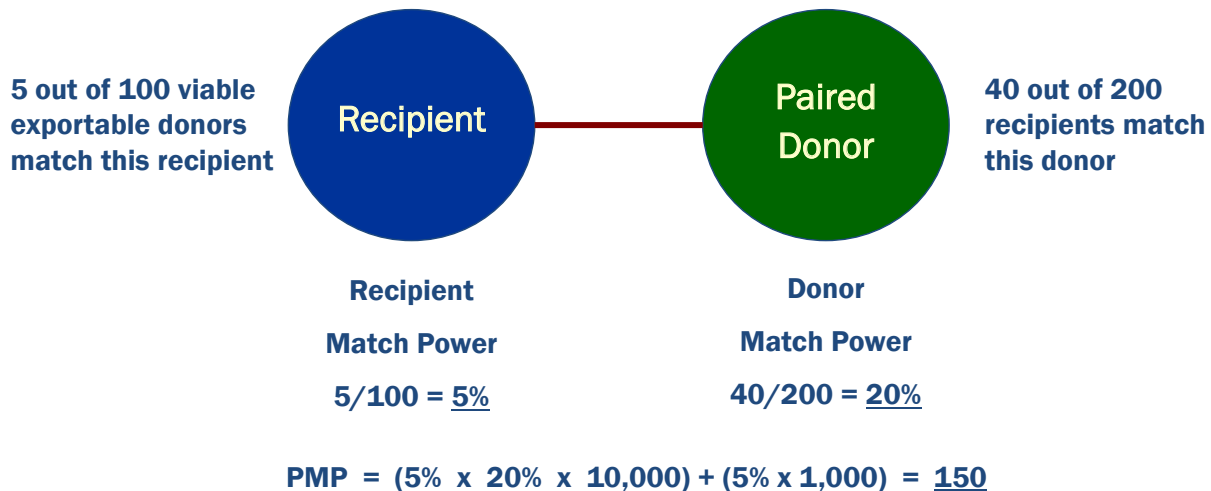
As of 6/30/2016



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



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.

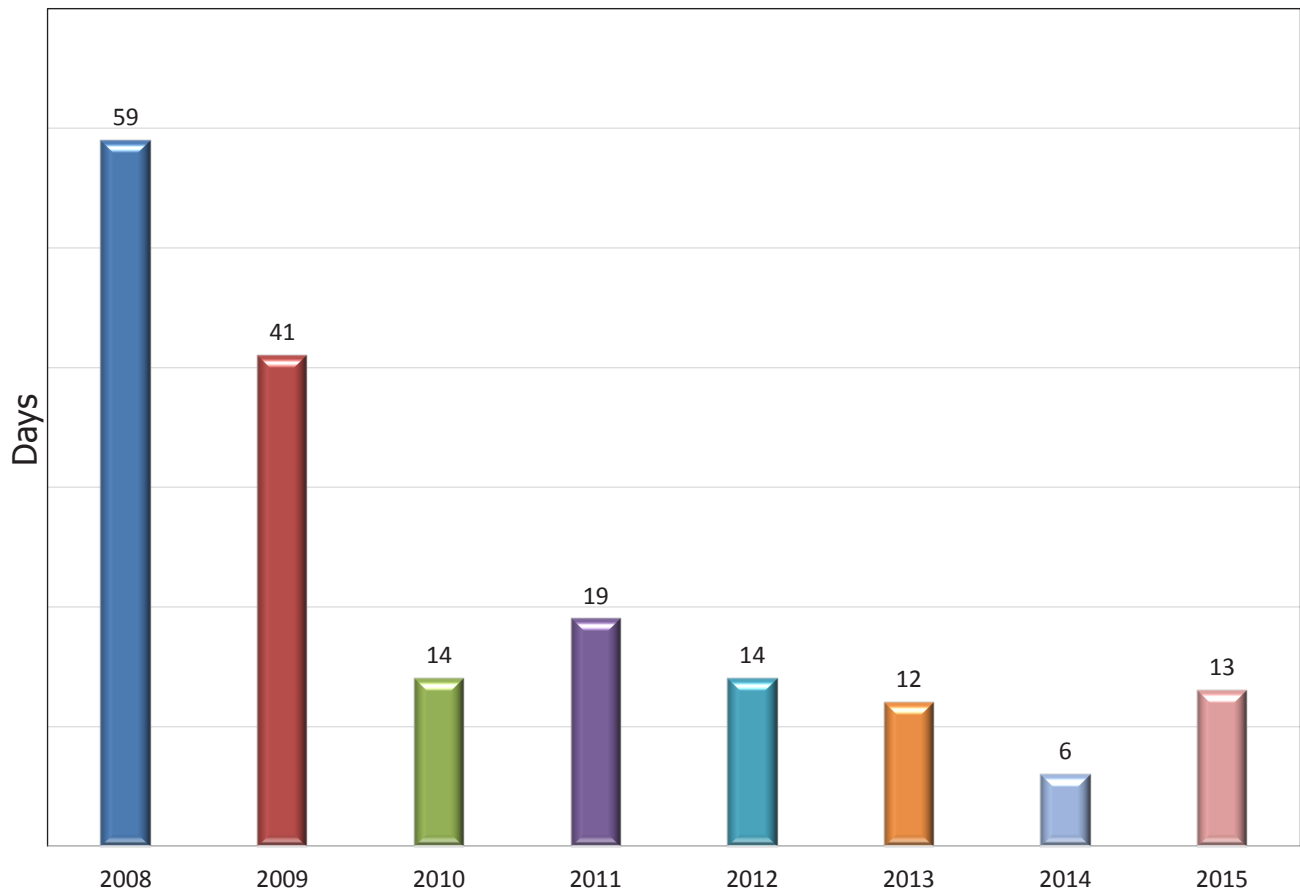
Paired Transplants Completed Between 4/1/2016 and 6/30/2016

Match Ease	Pairs	%	Mean	Median	Std Dev	Range Min	Range Max
1-Very Easy	8	11	41	38	19	8	68
2-Easy	16	22	65	45	52	11	222
3-Hard	29	40	74	51	66	15	327
4-Very Hard	12	16	182	168	115	40	392
5-Ext Hard	8	11	280	253	139	74	467
6-No Match	0	---	---	---	---	---	---
7-ALL	73	100	109	56	110	8	467

Paired Patients Waiting 6 Months or Greater as of 6/30/2016

Match Ease	Pairs	%	Mean	Median	Std Dev	Range Min	Range Max
1-Very Easy	0	---	---	---	---	---	---
2-Easy	0	---	---	---	---	---	---
3-Hard	2	2	239	239	23	216	262
4-Very Hard	14	12	292	257	107	187	580
5-Ext Hard	27	22	364	334	148	186	732
6-No Match	78	64	659	552	418	190	1700
7-ALL	121	100	544	400	379	186	1700

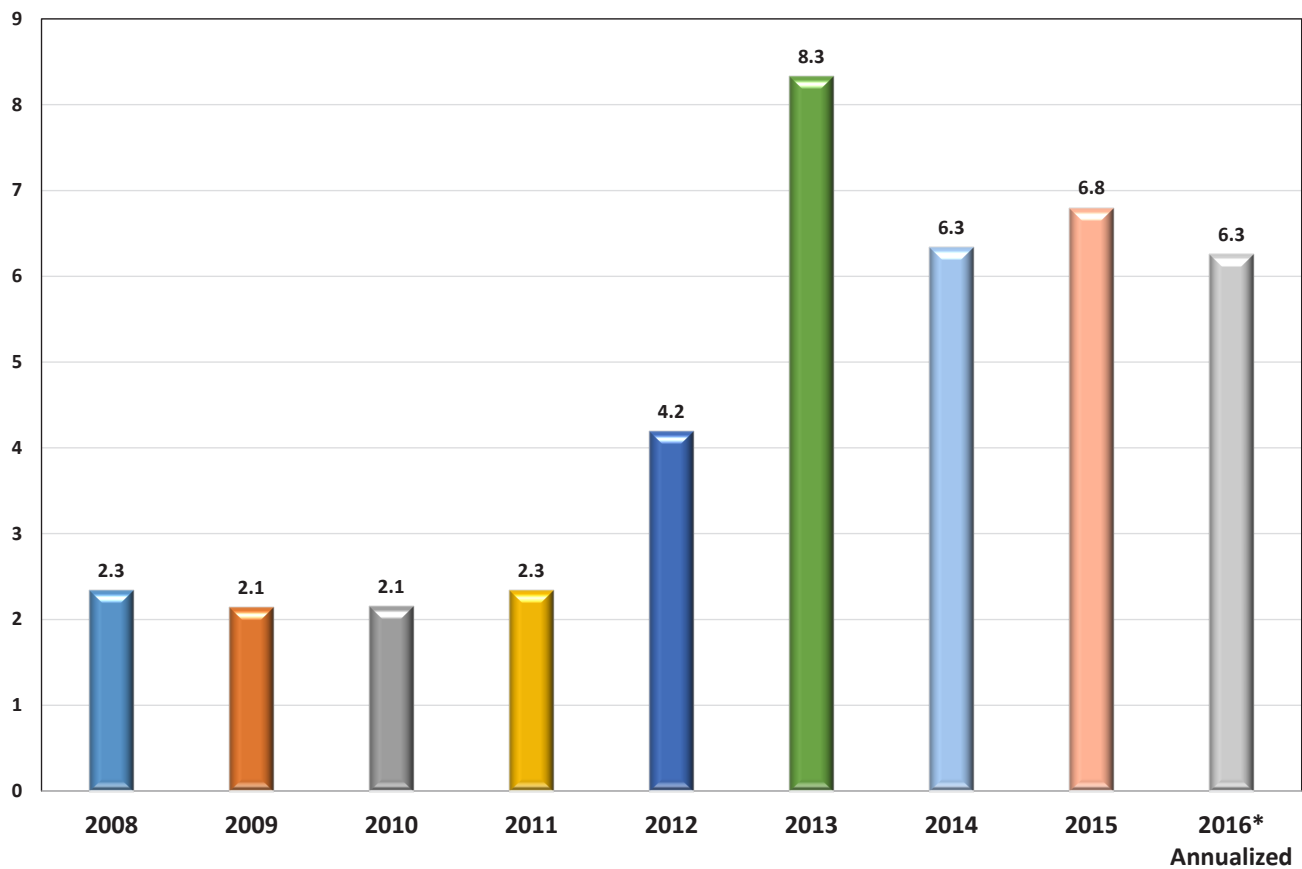
Bridge Donor Median Wait Times



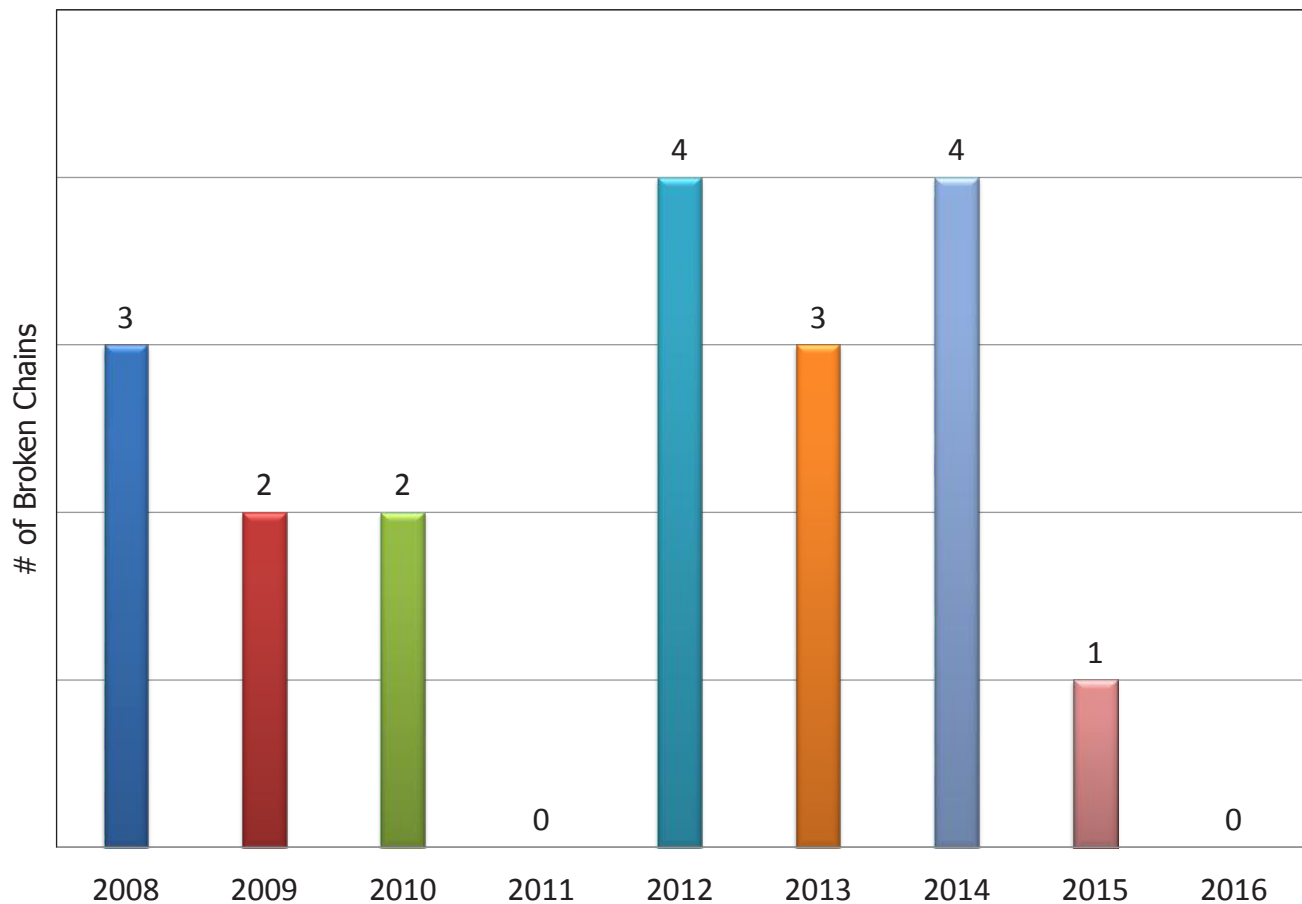
Bridge Donor Wait Times

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	53	1	1	2%
2016	64	1	0	0%
Total Bridge Donors	431	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 6/30/2016

		2008	2009	2010	2011	2012	2013	2014	2015	2016
1	Transplants Facilitated	21	62	131	175	226	308	310	360	186
2	Paired Transplants Facilitated	21	39	91	131	164	252	255	288	151
3	Chip Transplants Facilitated	0	23	40	44	62	56	55	72	35
4	Ending Unmatched Patient Pool	80	127	120	201	241	255	279	280	234
5	Cumulative Transplants	21	83	214	389	615	923	1233	1593	1779
6	Cumulative Paired Transplants	21	60	150	280	526	777	1030	1316	1467
7	Cumulative Chip Transplants	0	23	64	109	89	146	203	277	312
8	Cumulative Paired Patient Pool	101	210	334	590	805	1062	1351	1615	1755
9	Percent of Pool Transplanted (Paired Recipients)	21%	40%	64%	66%	71%	76%	79%	84%	87%
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	4.0
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%	46.4%
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	23
17	80-95%	1	7	16	29	26	37	49	55	30
18	50-80%	0	5	19	27	33	46	48	42	25
19	0-50%	1	8	13	30	34	47	43	57	26
20	0%	19	37	67	69	100	105	126	152	81
21	Sub-total	21	62	131	175	226	308	310	360	186
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%	12%
25	80-95%	5%	11%	12%	17%	12%	12%	16%	15%	16%
26	50-80%	0%	8%	15%	15%	15%	15%	15%	12%	13%
27	0-50%	5%	13%	10%	17%	15%	15%	14%	16%	14%
28	0%	90%	60%	51%	39%	44%	34%	41%	42%	44%
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	54
31	Percent of Transplanted Patients with cPRA >80%	5%	19%	24%	28%	26%	36%	30%	30%	29%

Program Statistics

As of 6/30/2016

		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	40
35	80-95%				15	15	24	19	22	20
36	50-80%				14	11	14	13	25	10
37	0-50%				14	10	22	37	35	28
38	0%				50	59	51	68	65	54
39	Sub-total				245	241	255	279	280	234
40	Percent of Unmatched Patients by cPRA									
41	100%				32%	30%	33%	29%	29%	35%
42	95-99%				30%	30%	24%	22%	19%	17%
43	80-95%				6%	6%	9%	7%	8%	9%
44	50-80%				6%	5%	5%	5%	9%	4%
45	0-50%				6%	4%	9%	13%	13%	12%
46	0%				20%	24%	20%	24%	23%	23%
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	151
50	6-12 months	0	10	14	19	24	44	35	38	20
51	1-2 years	0	4	15	14	20	25	27	22	12
52	2+ years	0	0	2	2	2	7	5	2	3
53	Sub-total	21	56	105	141	226	308	310	360	186
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%	81.2%
56	6-12 months	0.0%	17.9%	13.3%	13.5%	10.6%	14.3%	11.3%	10.6%	10.8%
57	1-2 years	0.0%	7.1%	14.3%	9.9%	8.8%	8.1%	8.7%	6.1%	6.5%
58	2+ years	0.0%	0.0%	1.9%	1.4%	0.9%	2.3%	1.6%	0.6%	1.6%
59	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%
60	Total Chains Started	4	9	28	36	46	55	63	83	44
61	Total Loops Completed	0	3	2	3	12	24	17	15	2
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%



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