

Paired Exchange Results Quarterly Report

As of September 30, 2017

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Message from the Founder

We are pleased to report that we facilitated 309 transplants as of the close of 3rd quarter, up 9% over the 283 transplants completed during the same period of last year.

We have seen a significant drop in swap failures over the past six months with failure rates dropping from 57% last year to 30% - 35% in the last two quarters. These declines in swap failure rates have been primarily driven by rapid cryo cross matching, online CT scans and ongoing improvements in compliance with the member center requirements.

We continue to streamline all aspects of the donor intake process. We recently automated the process for shipping 24-hour urine collection jugs to donor candidates, providing an option for candidates to complete pre-workup lab tests at local labs before referral to a transplant center. This enhancement has made the process more convenient for donor candidates while screening out donor candidates who do not complete the lab testing required for kidney donation surgery. This new automated process is now available to all centers utilizing our DASH platform for online donor intake.

This quarter we launched the Remote Donation Network which facilitates the shipment of kidneys for direct donation cases where the donor does not want to travel to a distant city to undergo kidney donation surgery. We have successfully completed two remote donation cases and are now automating the remote donation process across all of our donor intake platforms. The remote donation capability leverages all of the existing battle tested procedures and technologies developed over the past decade to support paired exchange. Center interest in supporting remote donation is growing rapidly - we launched the Remote Donation Network with 8 participating centers and already that number has doubled to 16 participating centers.

The NKR medical board recently approved a policy change that prioritizes all NKR donors for a living donor kidney in the remote case they may need a transplant in the future. We plan to continue to expand donor protections and benefits to eliminate as many dis-incentives to living kidney donation as possible.

With the continued success of the Center Liquidity Contribution (CLC) program, we are thrilled to report that we have no matchable pairs waiting more than 6 months at centers with positive CLC scores. Centers that enroll NDDs and favorable blood type compatible and incompatible pairs are continuing to see wait times drop for their patients as a direct result of their center's liquidity contribution.

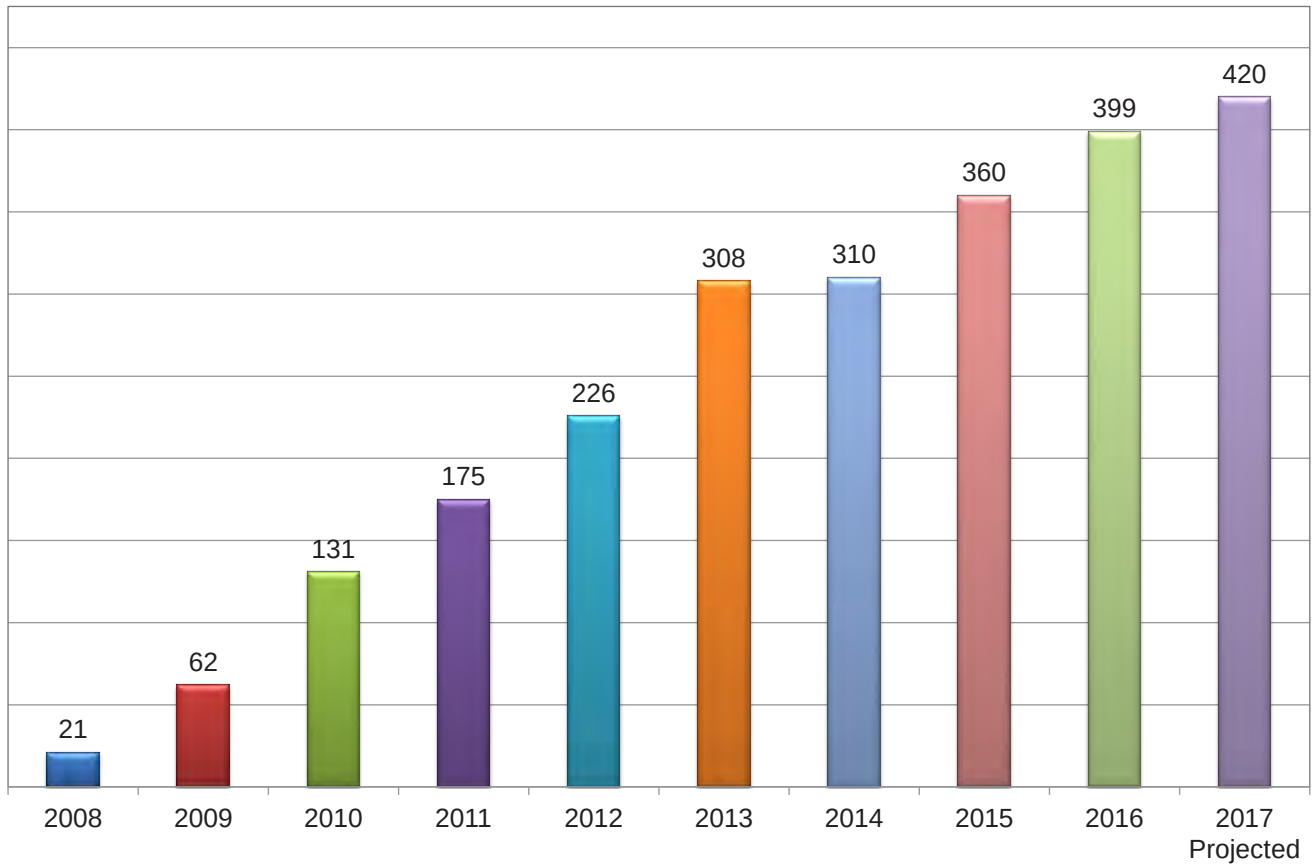
It is the ongoing dedication and effort of our Member Centers that enables us to continue breaking records and achieving new milestones. Thank you for your support and keep up the great work.

Sincerely,

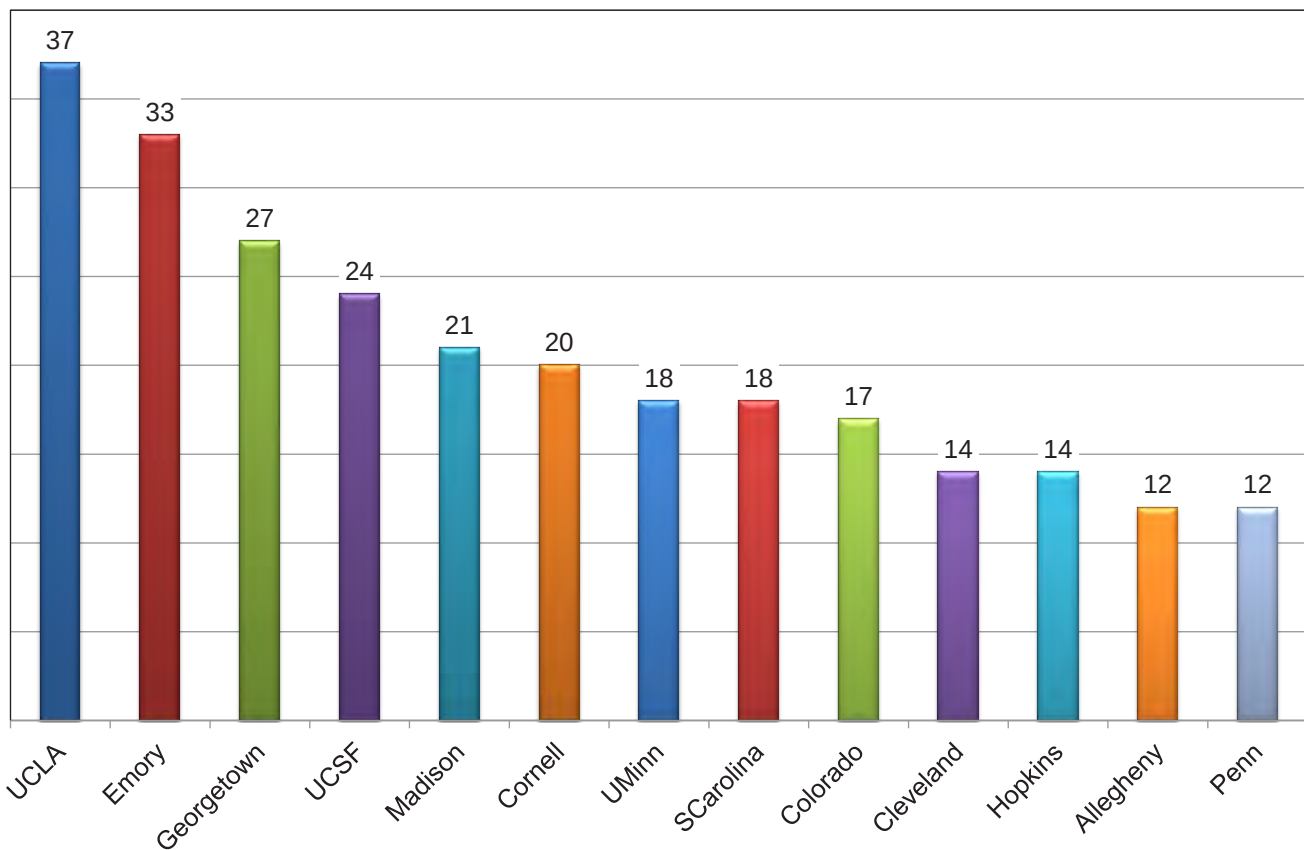
A stylized, handwritten signature in blue ink, appearing to read 'G Hil'.

Garet Hil
Founder & CEO
National Kidney Registry

Transplants Facilitated

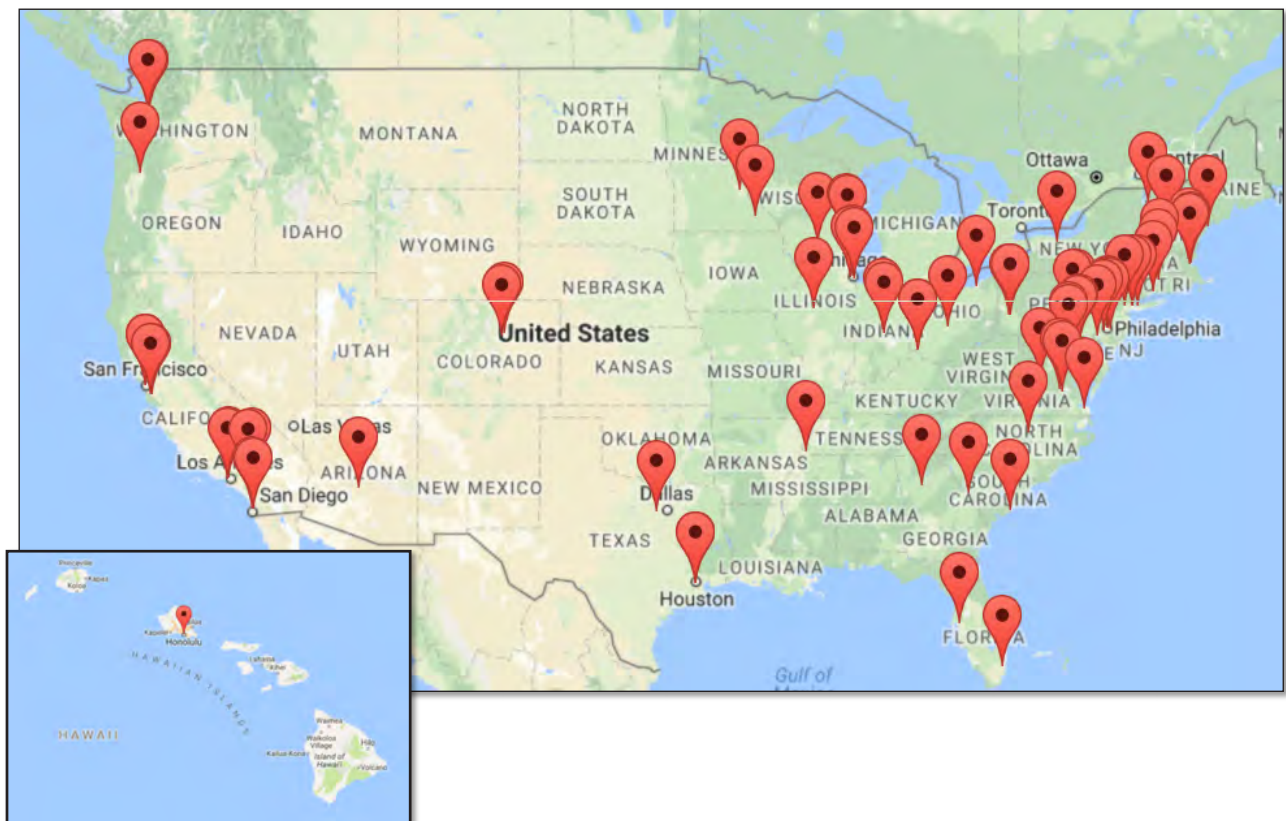


Top Centers Transplants Last 12 Months



NKR Member Centers

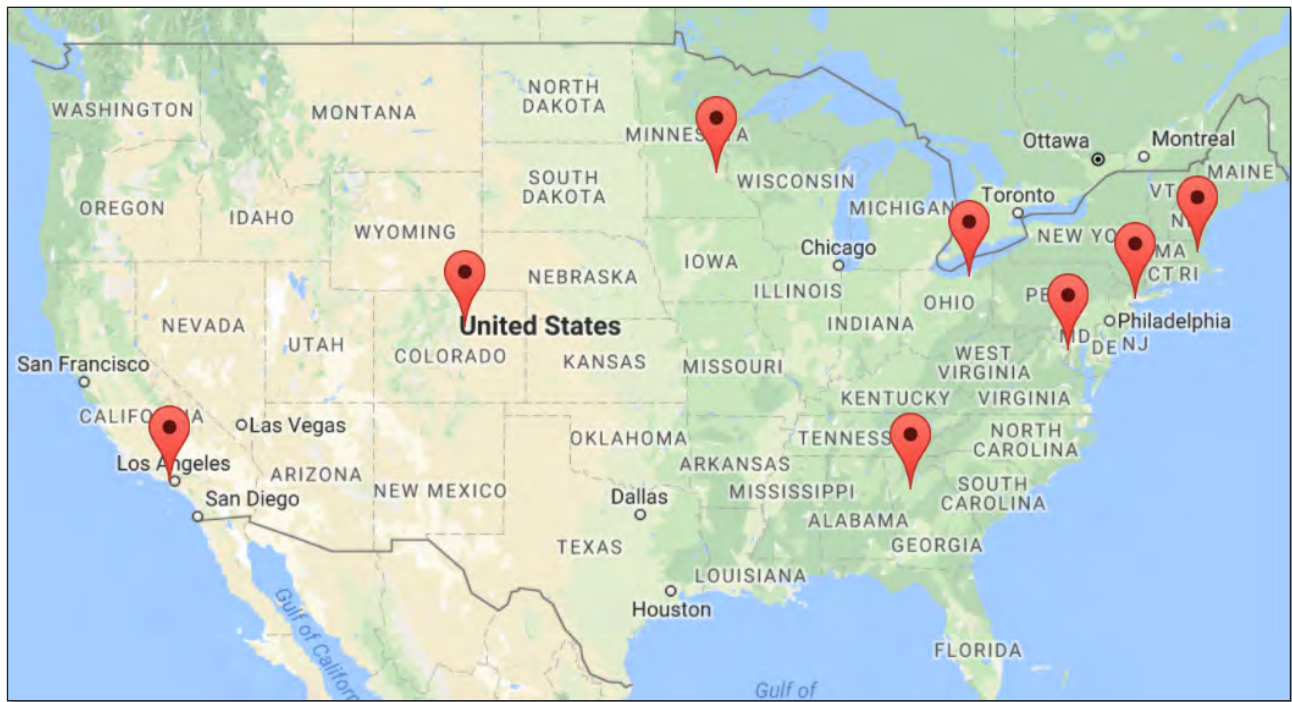
As of 9/30/2017



Donor Care Network Centers of Excellence

The mission of the [Donor Care Network](#) is to ensure all living kidney donors are treated with courtesy and respect at Donor Care Network Centers of Excellence that share and implement best practices making donation safer, easier and more convenient.

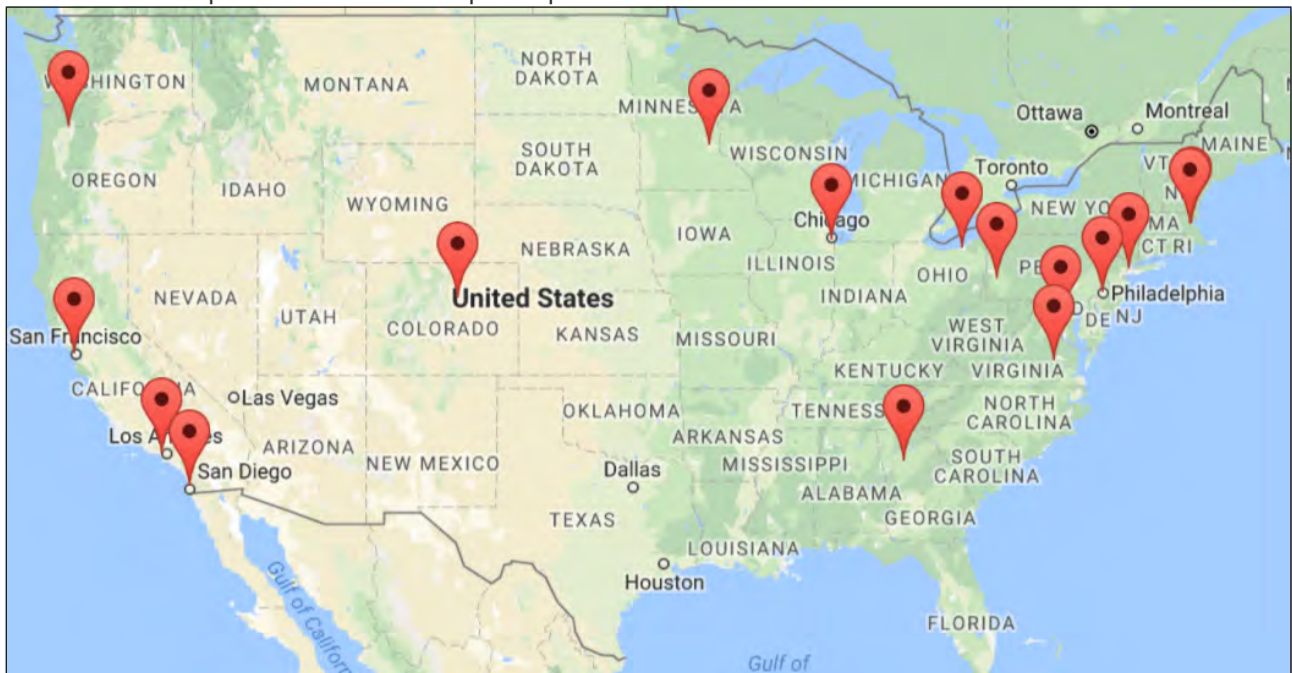
Below is a map of the Donor Care Network Centers of Excellence as of 9/30/2017.



Remote Donation Network

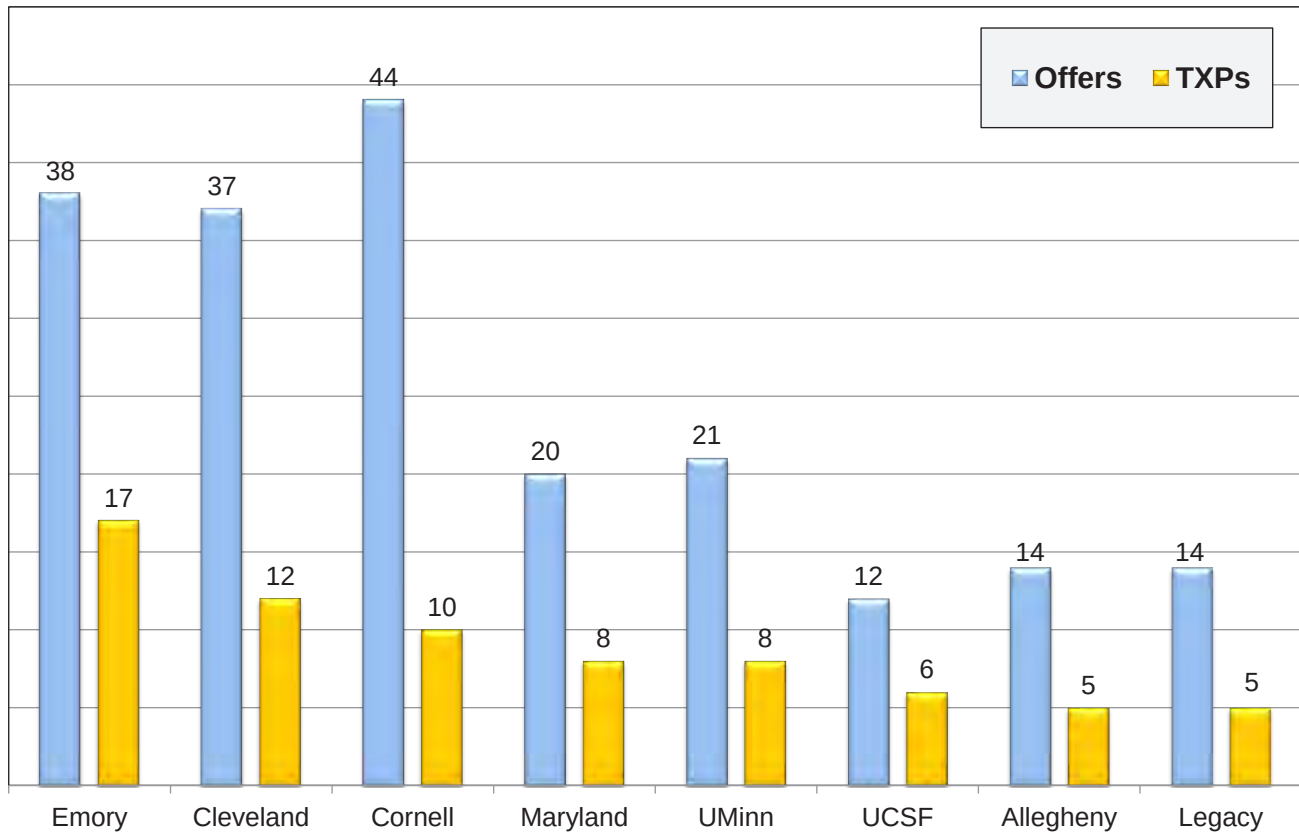
[Remote Kidney Donation](#) allows someone who wants to donate a kidney to a friend or family member in a distant city without requiring the donor to travel to the transplant center in the distant city. Remote donation utilizes proven logistics systems pioneered in kidney swaps by the National Kidney Registry over the past decade to safely transport the kidney from the donor's local hospital to the transplant center in the distant city.

Below is a map of the centers that participate in the remote donation network as of 9/30/2017.



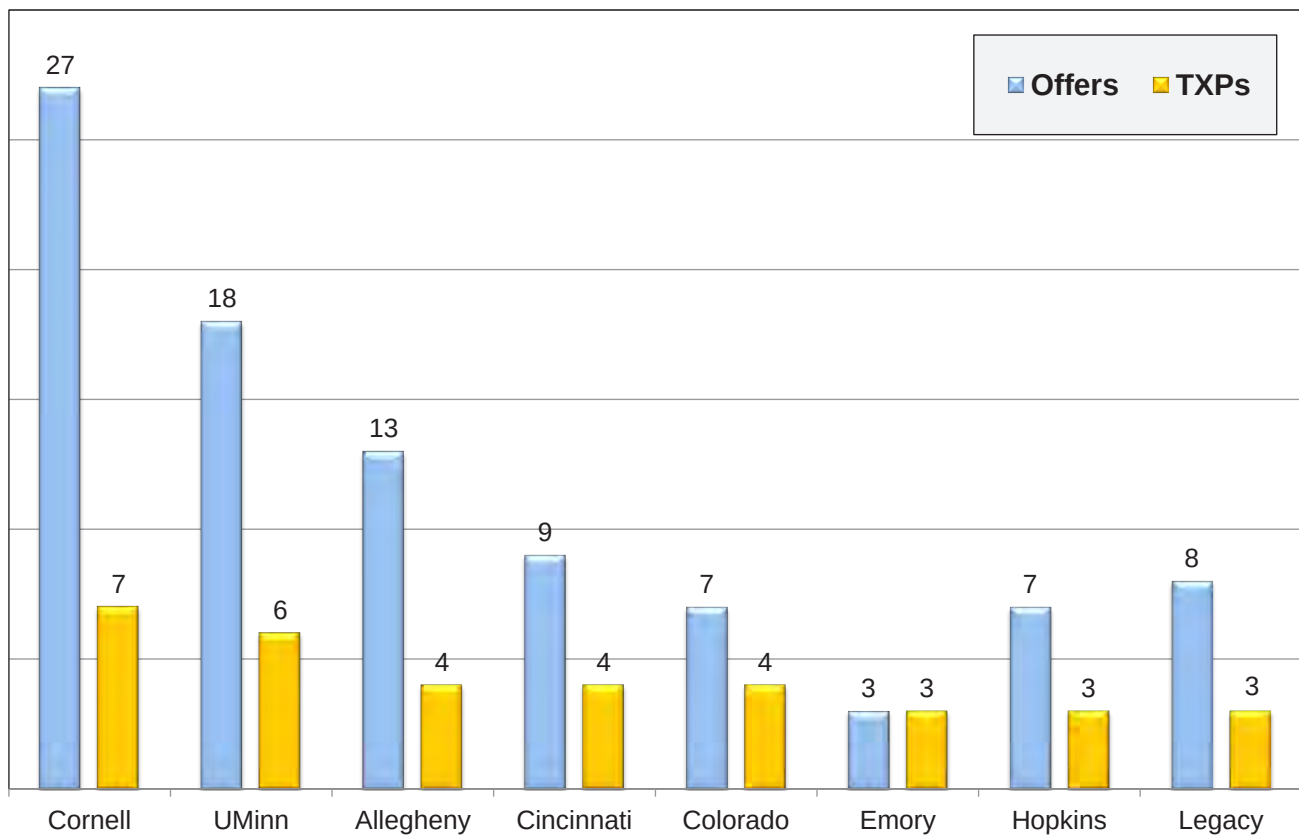
Top Center Liquidity Contributors

CLC Driven Match Offers - 4/15 - 9/17

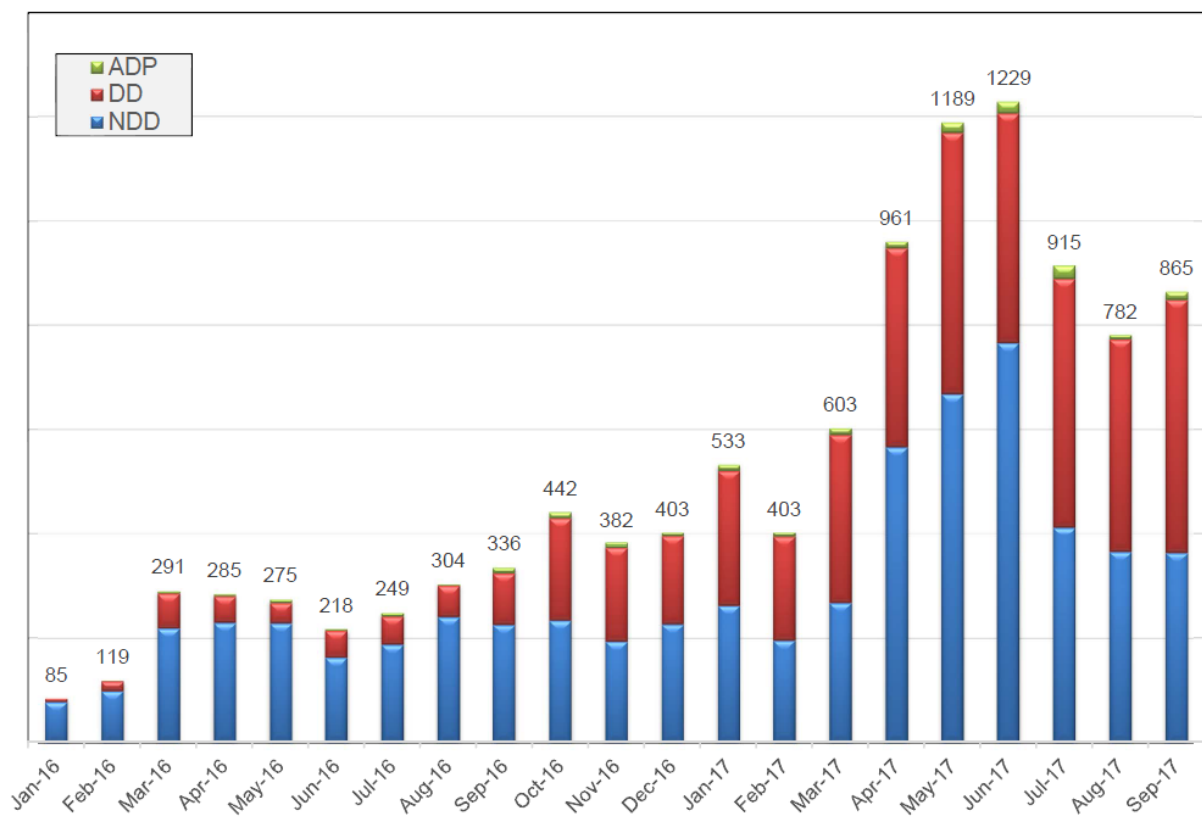


Top Center Liquidity Contributors

CLC Driven Match Offers - 10/16 - 9/17

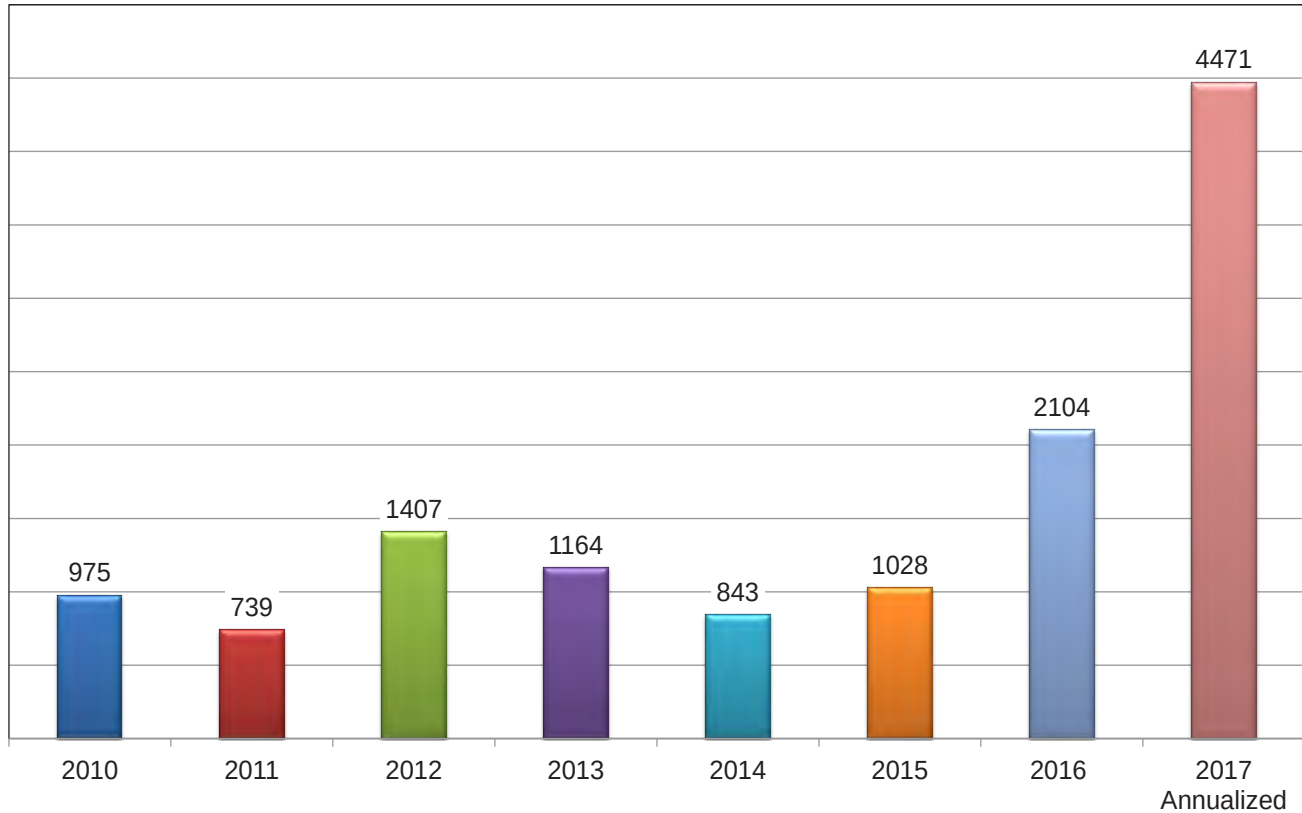


NKR & DASH Donor Contacts



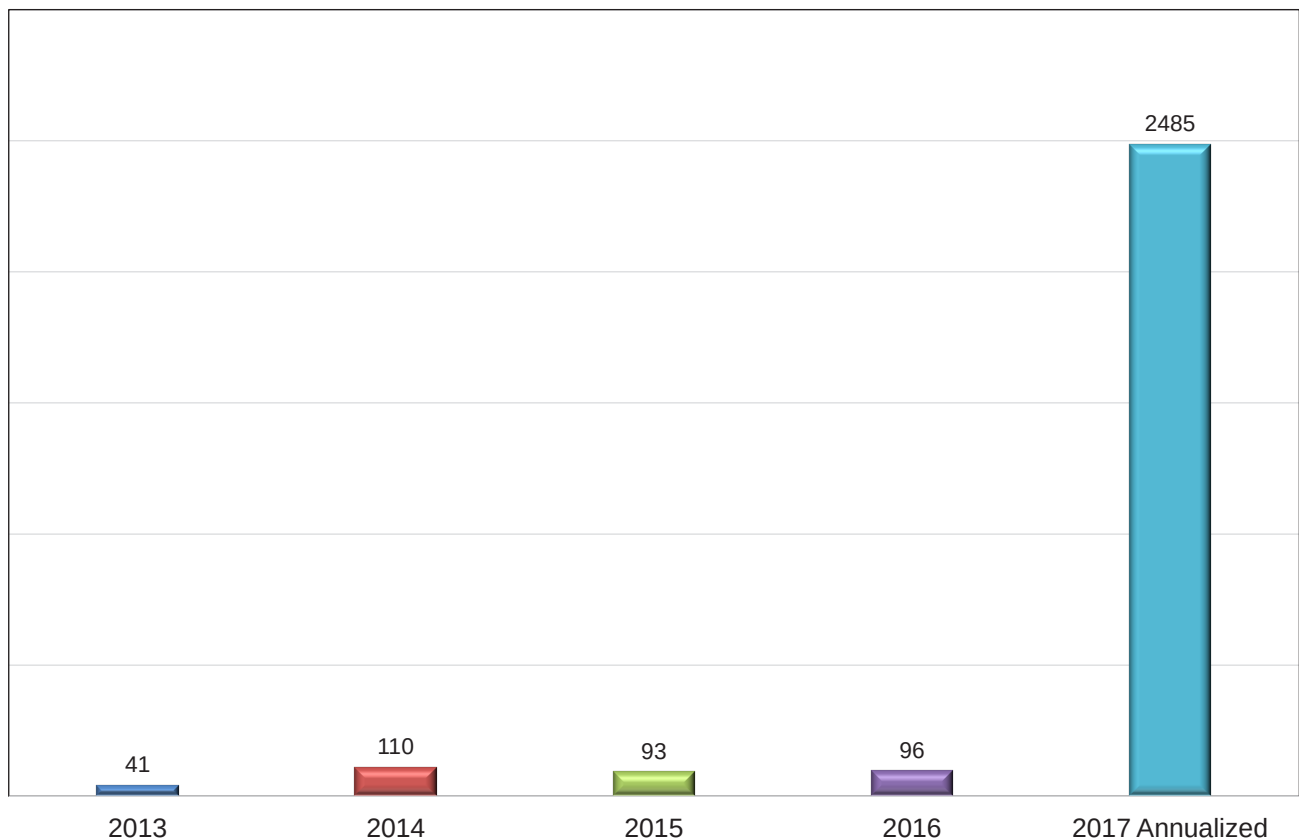
Non-Directed Donor Contacts

Via NKR Donor Intake Platform



Non-Directed Donor Referrals

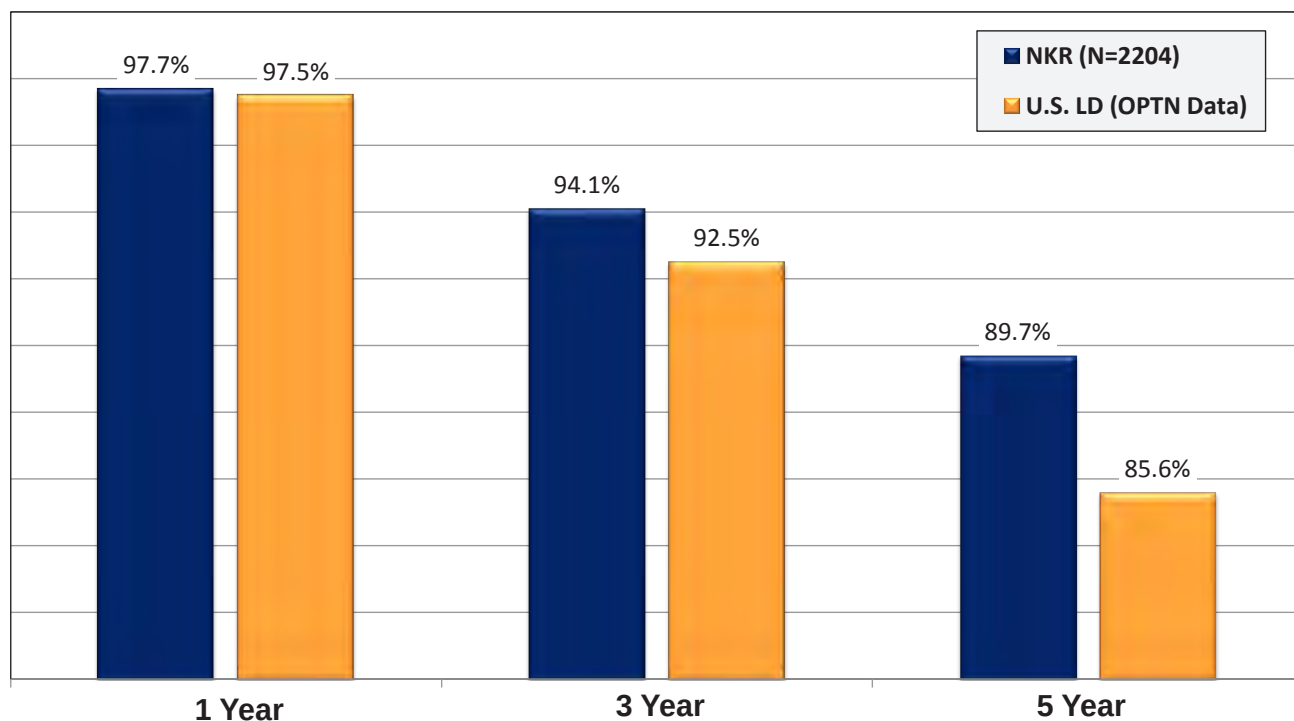
Referred to NKR Member Centers



NKR Graft Survival Advantage

NKR Transplants vs. U.S. Living Donor Transplants

As of 6/30/2017

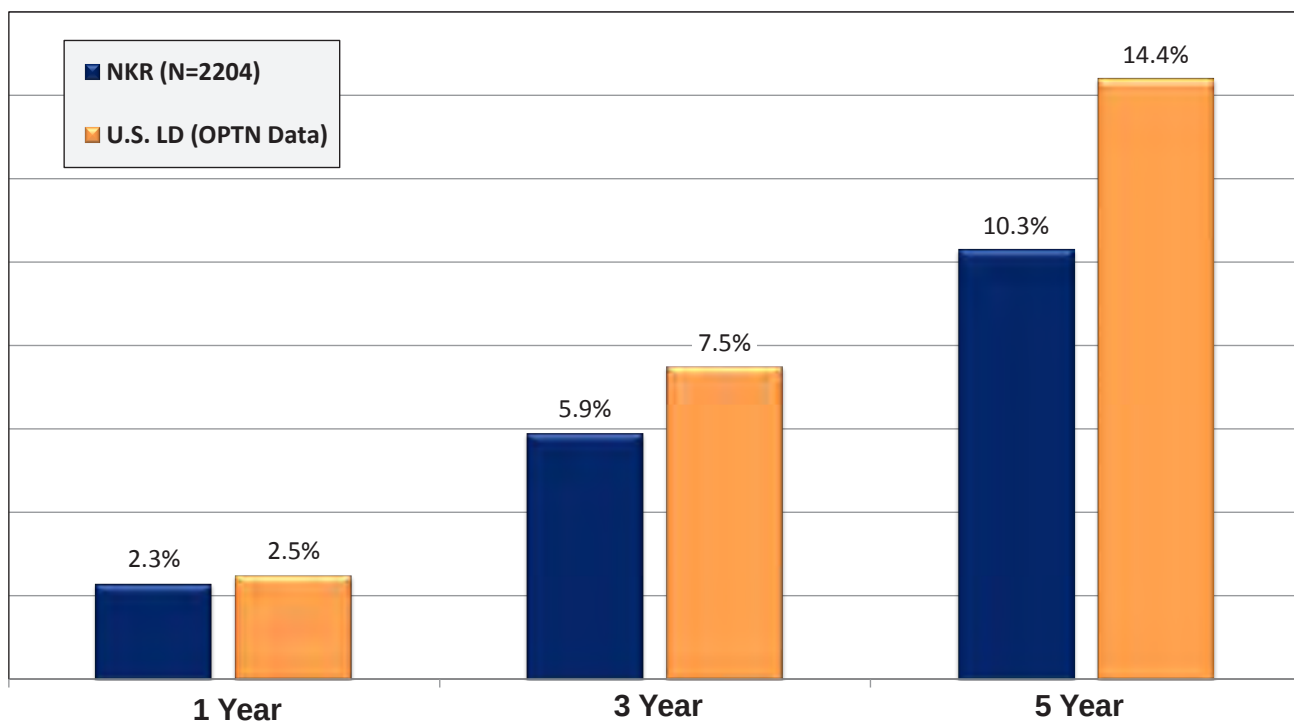


*NKR Kaplan-Meier GS calculations provided courtesy of UCLA Departments of Nephrology and Urology
 **U.S LD - Kidney Kaplan-Meier GS Rates For Transplants Performed : 2008 - 2015
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

Graft Failure Comparison

NKR Transplants vs. U.S. Living Donor Transplants

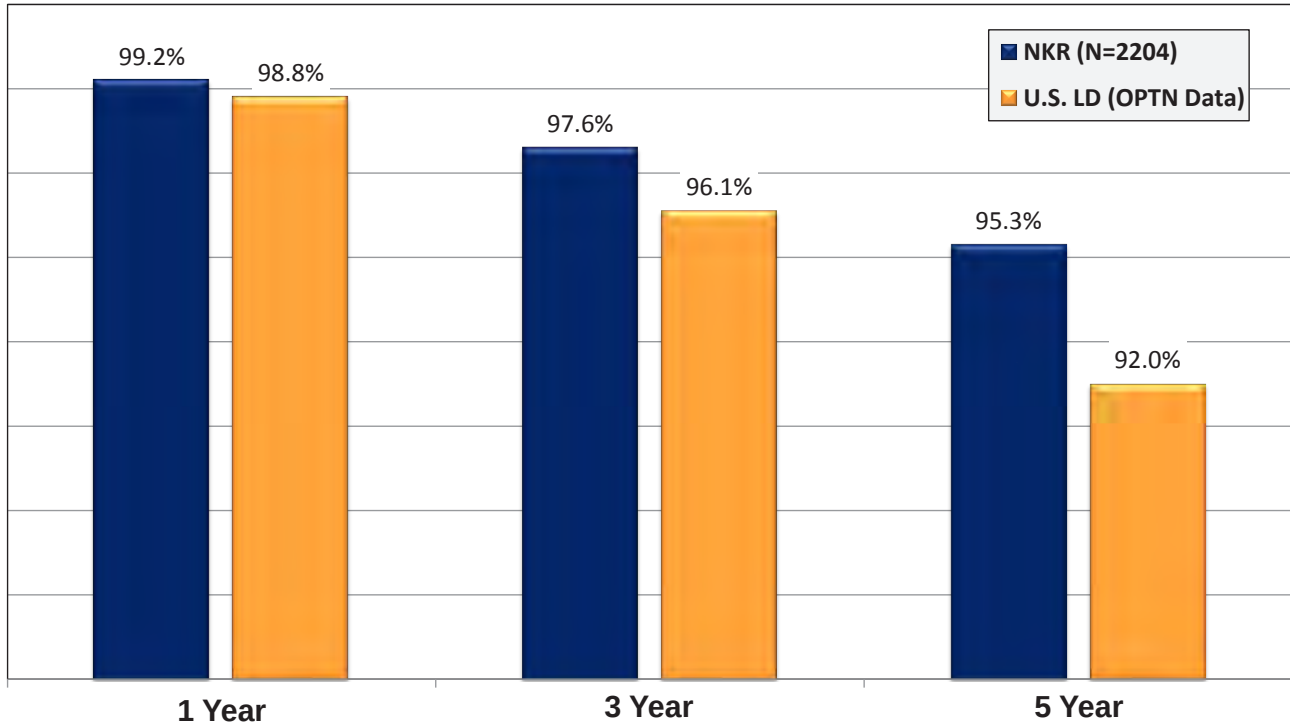
As of 6/30/2017



*NKR Kaplan-Meier GS calculations provided courtesy of UCLA Departments of Nephrology and Urology
 **U.S LD - Kidney Kaplan-Meier GS Rates For Transplants Performed : 2008 - 2015
<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

NKR Patient Survival Advantage

NKR Transplants vs. U.S. Living Donor Transplants
As of 6/30/2017



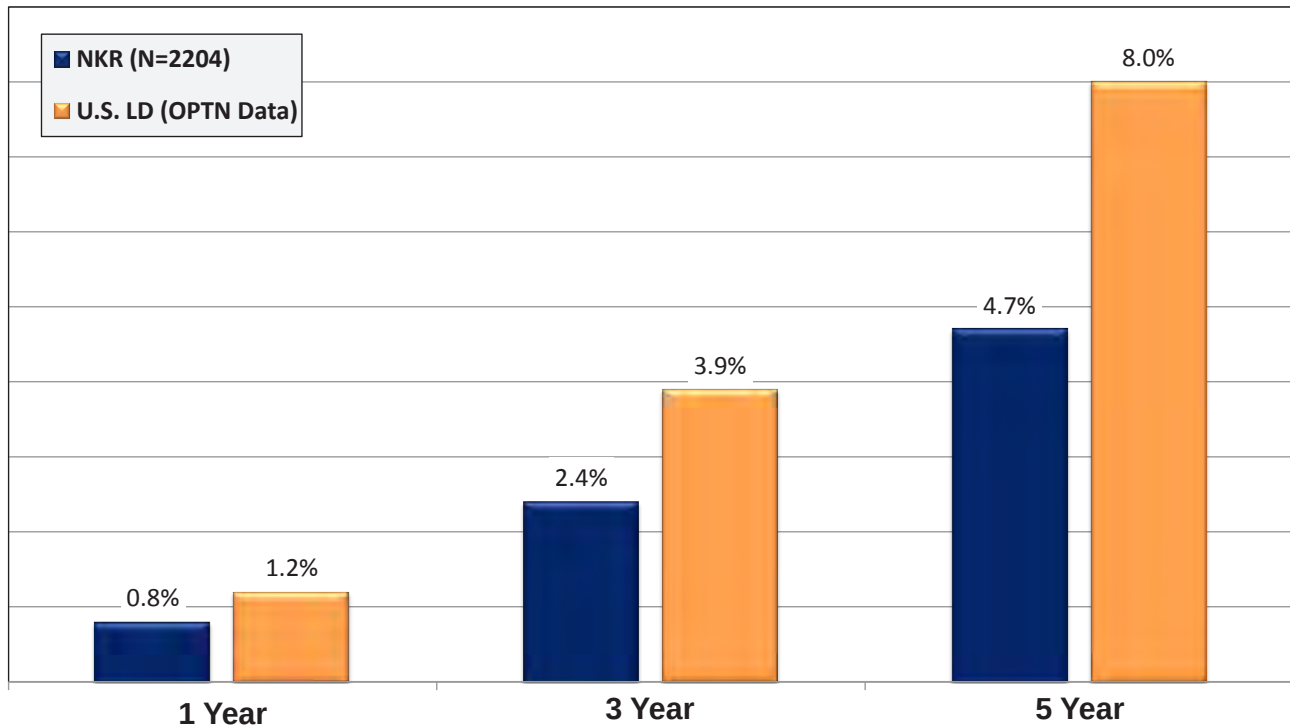
*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology

**U.S LD - Kidney Kaplan-Meier PS Rates For Transplants Performed : 2008 - 2015

<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

Mortality Rate Comparison

NKR Transplants vs. U.S. Living Donor Transplants
As of 6/30/2017



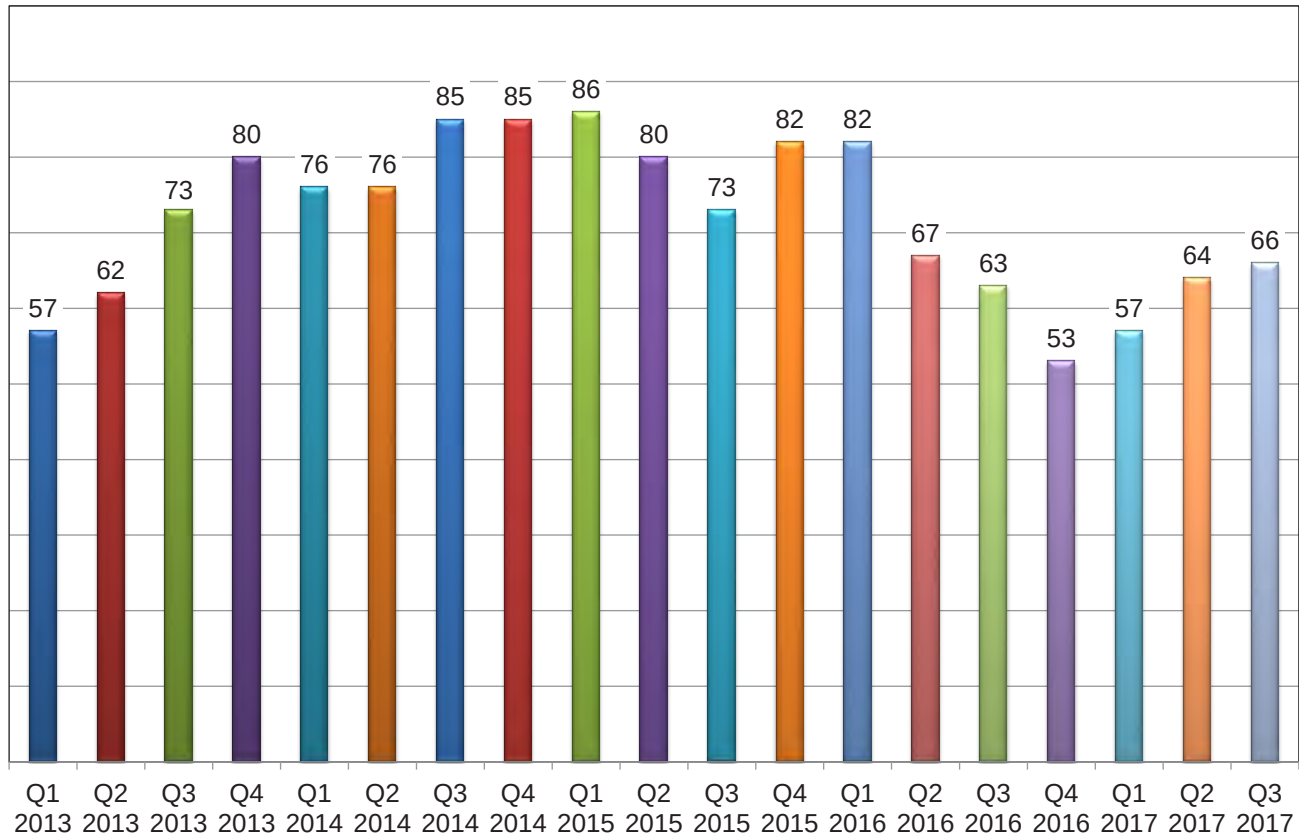
*NKR Kaplan-Meier PS calculations provided courtesy of UCLA Departments of Nephrology and Urology

**U.S LD - Kidney Kaplan-Meier PS Rates For Transplants Performed : 2008 - 2015

<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/> OPTN data as of July 21, 2017

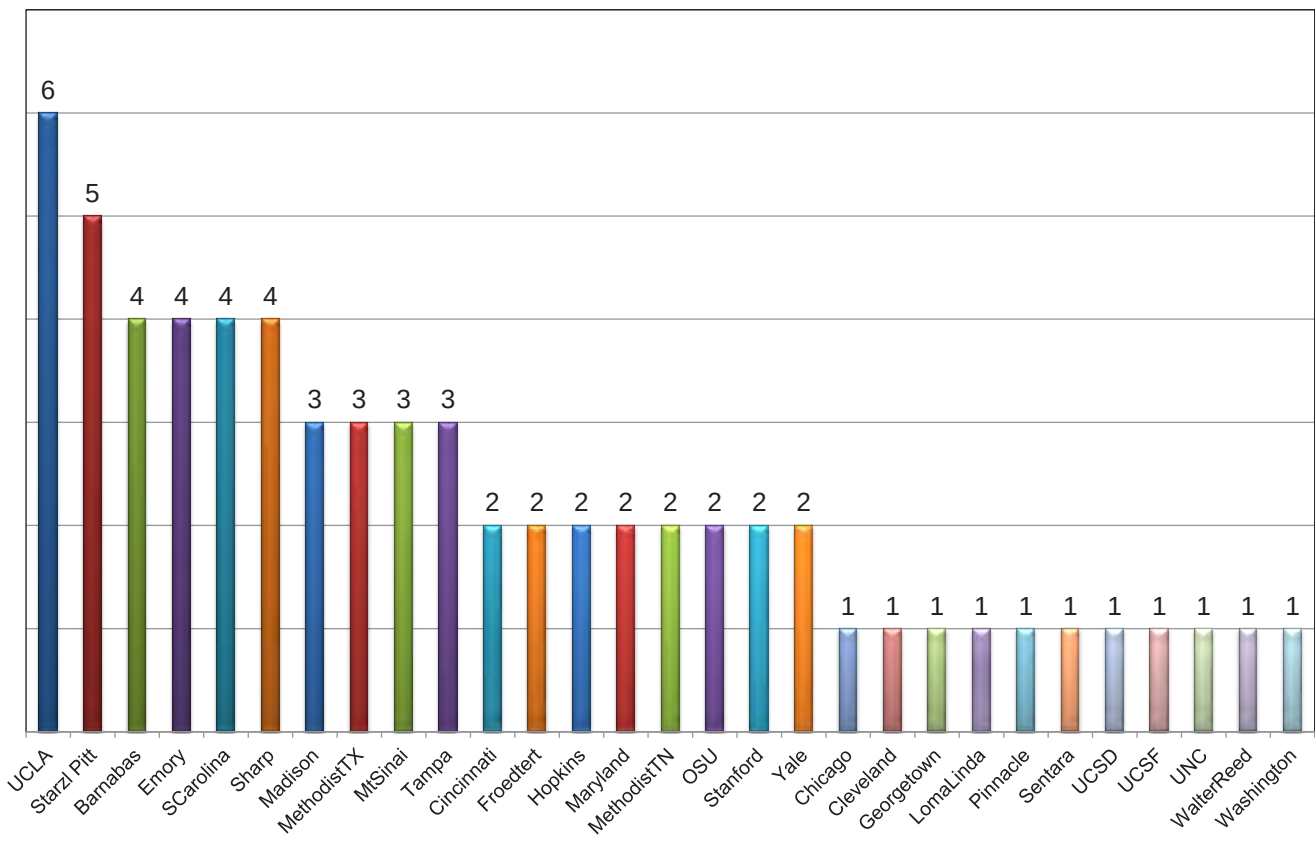
Patients Waiting > 1 Year by Quarter

As of 9/30/2017



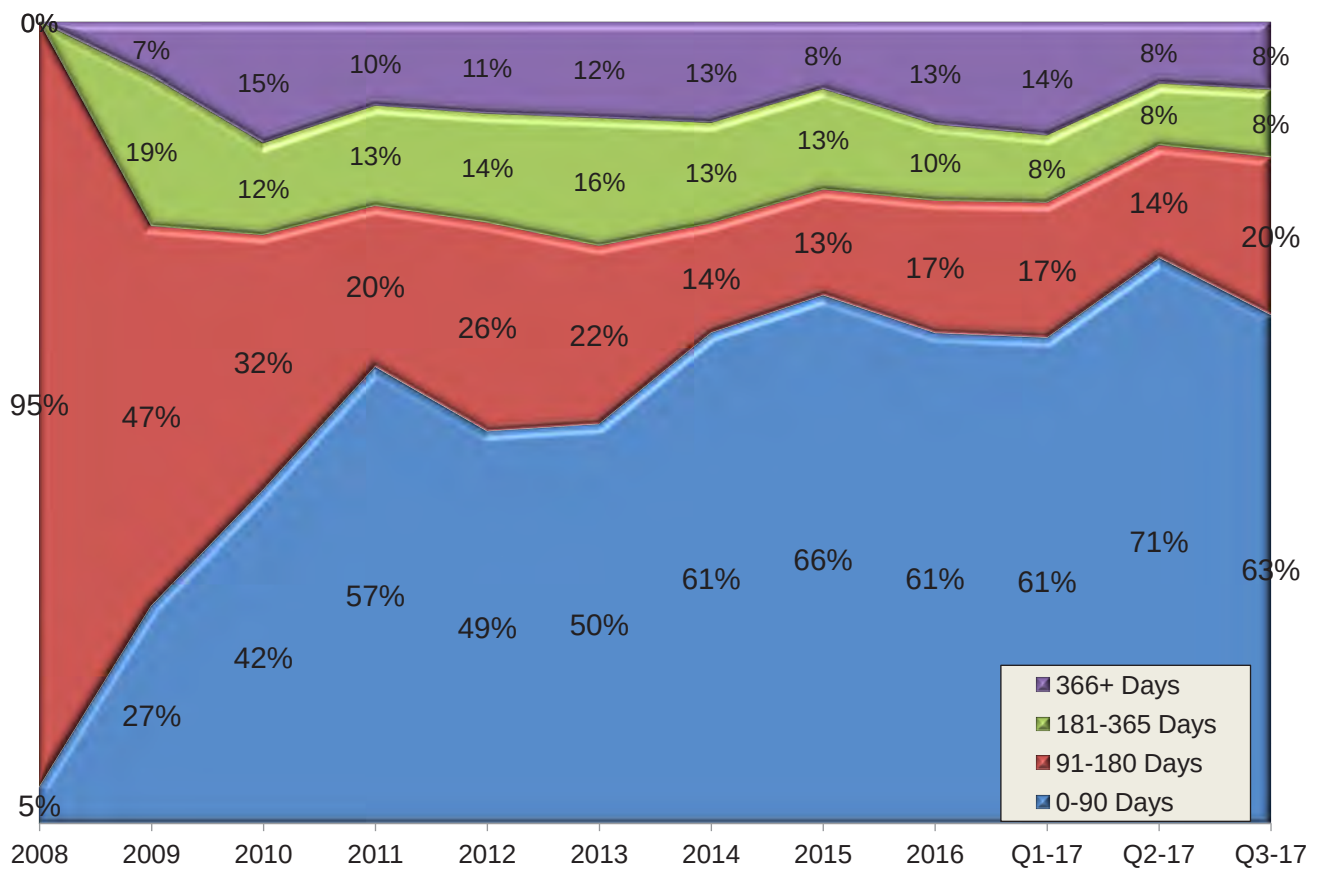
Patients Waiting > 1 Year by Center

As of 9/30/2017



Wait Time Distribution

Transplanted Pairs



CLC Pairs by Unfavorable ABO and PRA

Pairs waiting >1 year due to Unfavorable Blood Type Combination

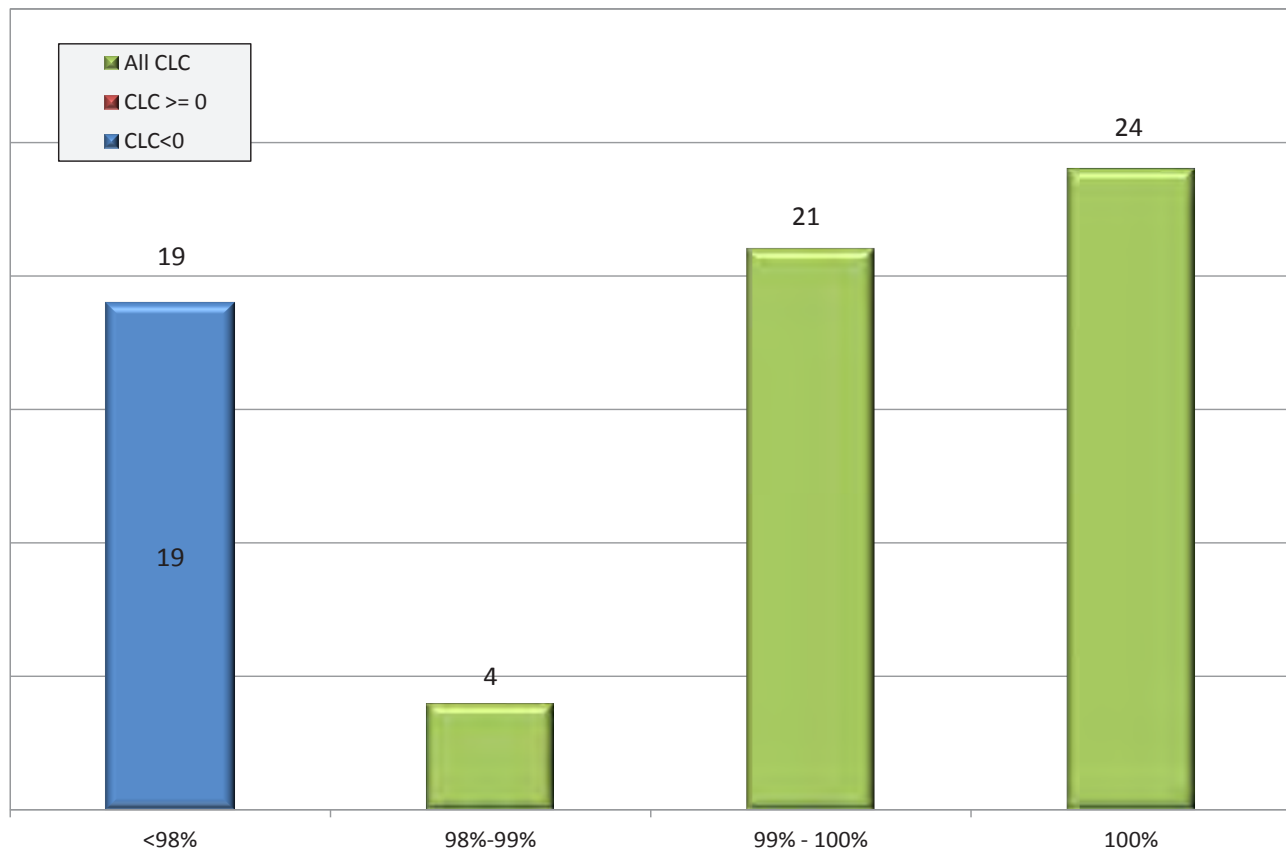
#	R Alias	R ABO	D ABO	MHP	cPRA4	R Age	D Age	PMPc	Wait (Months)	CLCu
1	RWJLORKON	O	A	0	0	62	60	118	39	-4700
2	SMHCOL	O	A	0	98.6	21	54	0	23	-490
3	R4030	O	A	0	97.4	59	62	0	22	-4930
4	CNOCK	O	A	0	0	58	35	131	21	-4850
5	D24271223C	O	A	0	20.0	66	62	66	20	-6410
6	TRA3094911	O	A	0	0	63	59	98	18	-250
7	RCCF57	O	A	0	0	40	55	102	18	-6000
8	PW64154	O	A	0	50.9	52	47	7	18	-4160
9	CHERLRE	O	AB	0	89.0	49	32	10	18	-6920
10	R146RT	O	B	0	97.6	59	28	0	18	-7710
11	SMHVALD	O	A	0	0.0	67	66	125	16	-490
12	CAME819	O	A	0	92.7	47	52	13	16	-5460
13	MART51	O	A	0	98.6	65	47	0	16	-1780
14	LS971190	O	AB	0	0	44	45	118	15	-9070
15	VALD1963	O	A	0	16.5	53	51	105	15	-490
16	R4140	O	A	0	25.8	58	43	69	14	-4930
17	UC03154184	O	A	0	95.7	24	26	3	14	-2000

Pairs waiting >1 year due to High cPRA

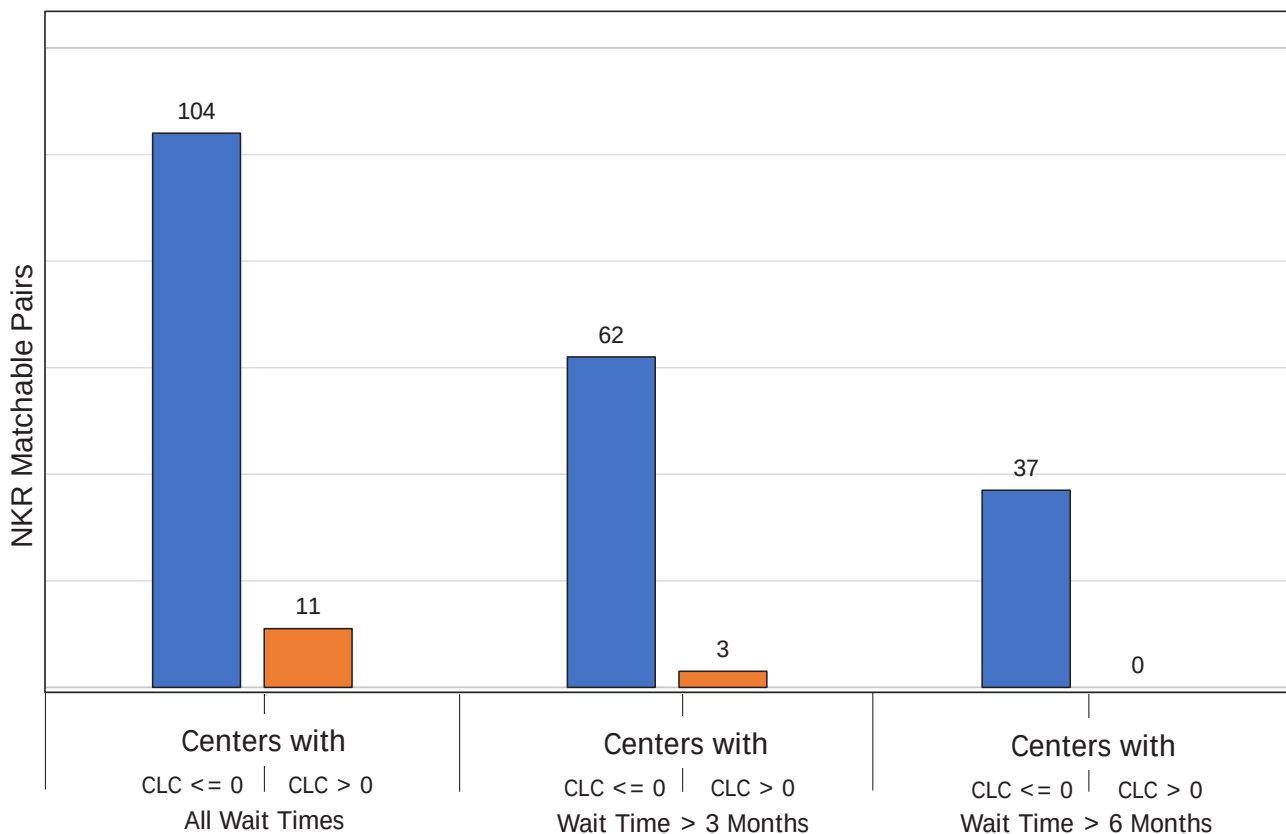
#	R Alias	R ABO	D ABO	MHP	cPRA4	R Age	D Age	PMPc	Wait (Months)
1	SMHHUT	O	A	0	100	55	62	0	65
2	SMIT93	A	A	0	100	23	49	0	59
3	STORB	O	A	0	100	60	65	0	58
4	MAB2003	AB	B B O	0	100	13	49 36 49	0	51
5	NL2157	O	A	0	100	67	34	0	49
6	ES1862172	O	B	0	100	68	42	0	38
7	JFOR468	O	B	0	100	62	63	0	32
8	SOYYOO	O	A	0	100	47	41	3	30
9	M9303W	O	O	0	100	58	49	0	27
10	R303348	B	AB	0	100	57	40	0	24
11	AMESJ78	O	A A	0	100	38	44 37	0	23
12	FD809142R	O	A	0	100	15	47	0	22
13	JR1434064	B	O	0	100	43	42	0	20
14	R3148	A	AB	0	100	38	33	0	18
15	JF61593	A	O	0	100	49	34	0	18
16	FM516883	B	O	0	100	56	45	0	17
17	DM8150868	A	A	0	100	29	27	0	17
18	MIRROS	A	A	0	100	63	39	0	16
19	EBKPR	A	O	0	100	35	25	0	13
20	JJ1978	B	O O	0	100	38	46 35	0	50
21	FOXJOH	O	O	0	100	33	31	0	27
22	GM8784	B	O	0	100	22	30	0	24
23	J36760809G	O	O	50	100	36	26	0	19
24	UC06142609	O	O	0	100	65	48	0	13
25	J24548992N	B	O	50	99.9	38	36	0	27
26	MAFLO	O	A	0	99.9	42	42	0	22
27	BURCHD77	B	B B	0	99.9	39	43 37	0	23
28	HB04252008	O	O O	0	99.9	8	43 35	0	14
29	BC1946	O	A	0	99.8	70	43	0	65
30	MO75472142	B	O	0	99.8	18	35	0	23
31	CLICGRE	B	B O O	0	99.8	58	36 54 45	0	32
32	LCL2183933	O	O O	0	99.8	22	56 33	0	17
33	DP1961	O	O	0	99.7	55	36	0	56
34	AD0043	O	O	0	99.7	49	52	0	34
35	GABCAR8979	O	O	0	99.7	27	45	0	13
36	KHBHR	A	O	0	99.1	65	38	0	16
37	ER2208907	A	A A	0	98.4	38	62 40	0	13

Unmatched Target Pairs

Waiting more than 12 Months as of 9/30/17



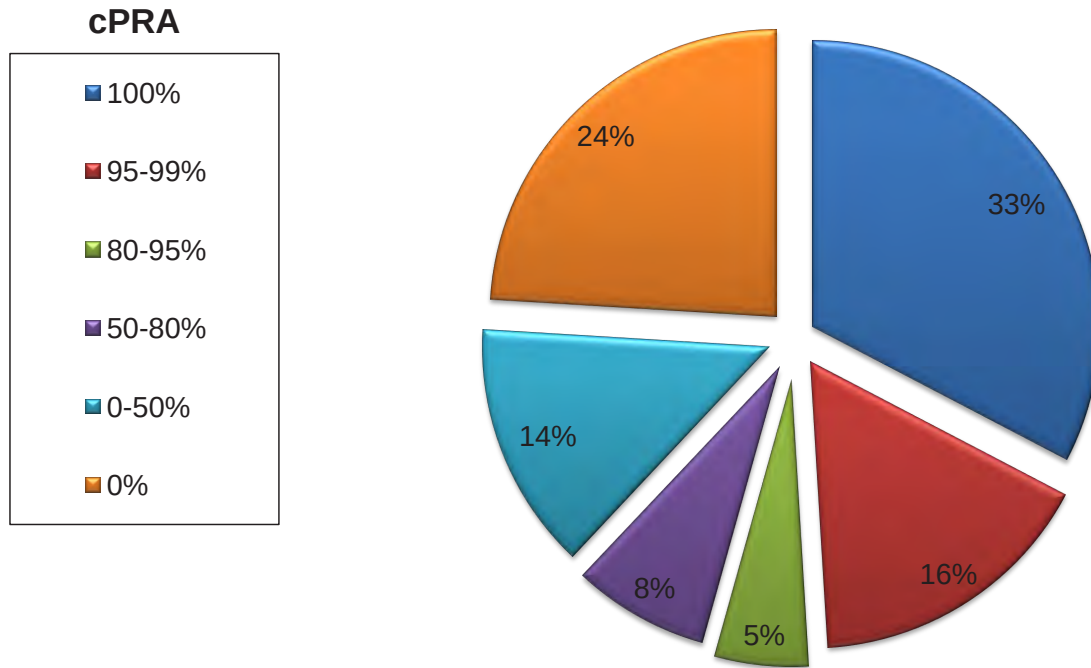
Pair Wait Time Analysis



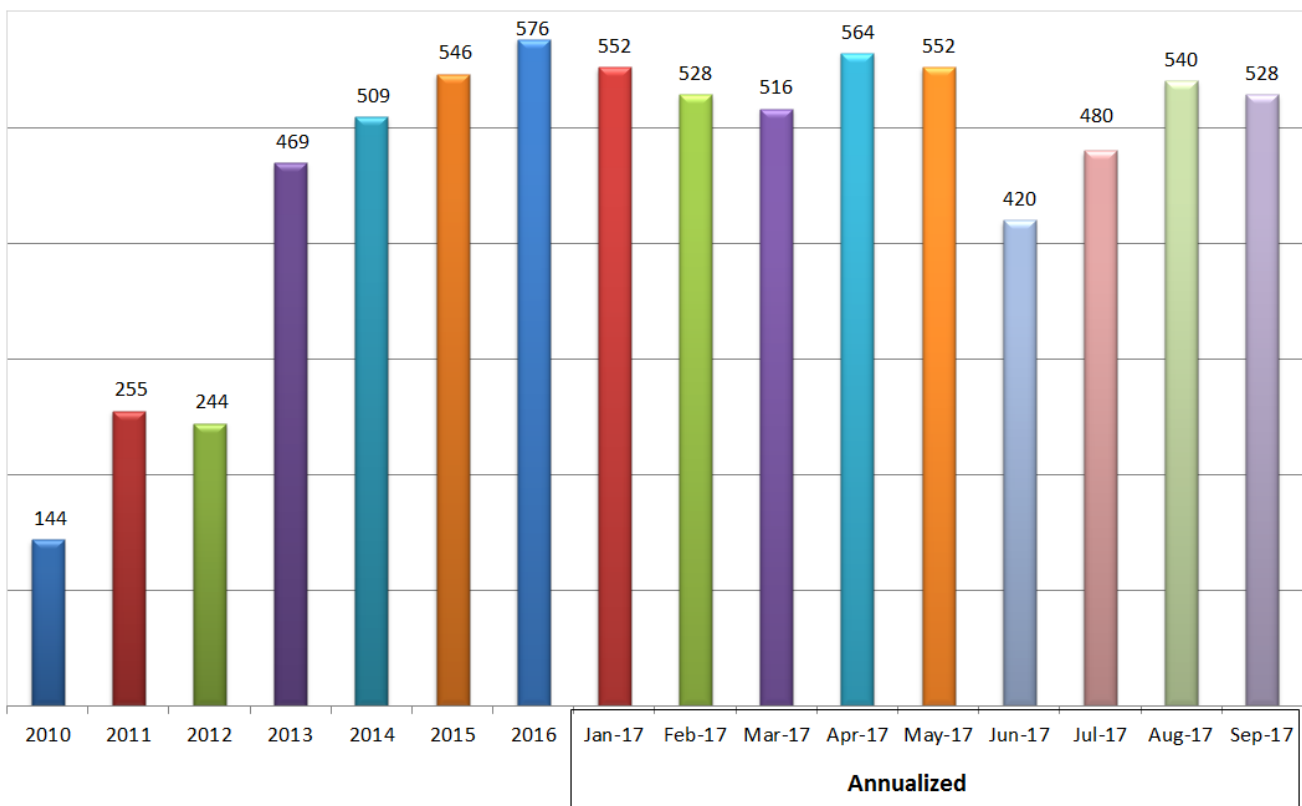
* Data as of 10/10/17 10:50 ET

Pool Composition by cPRA

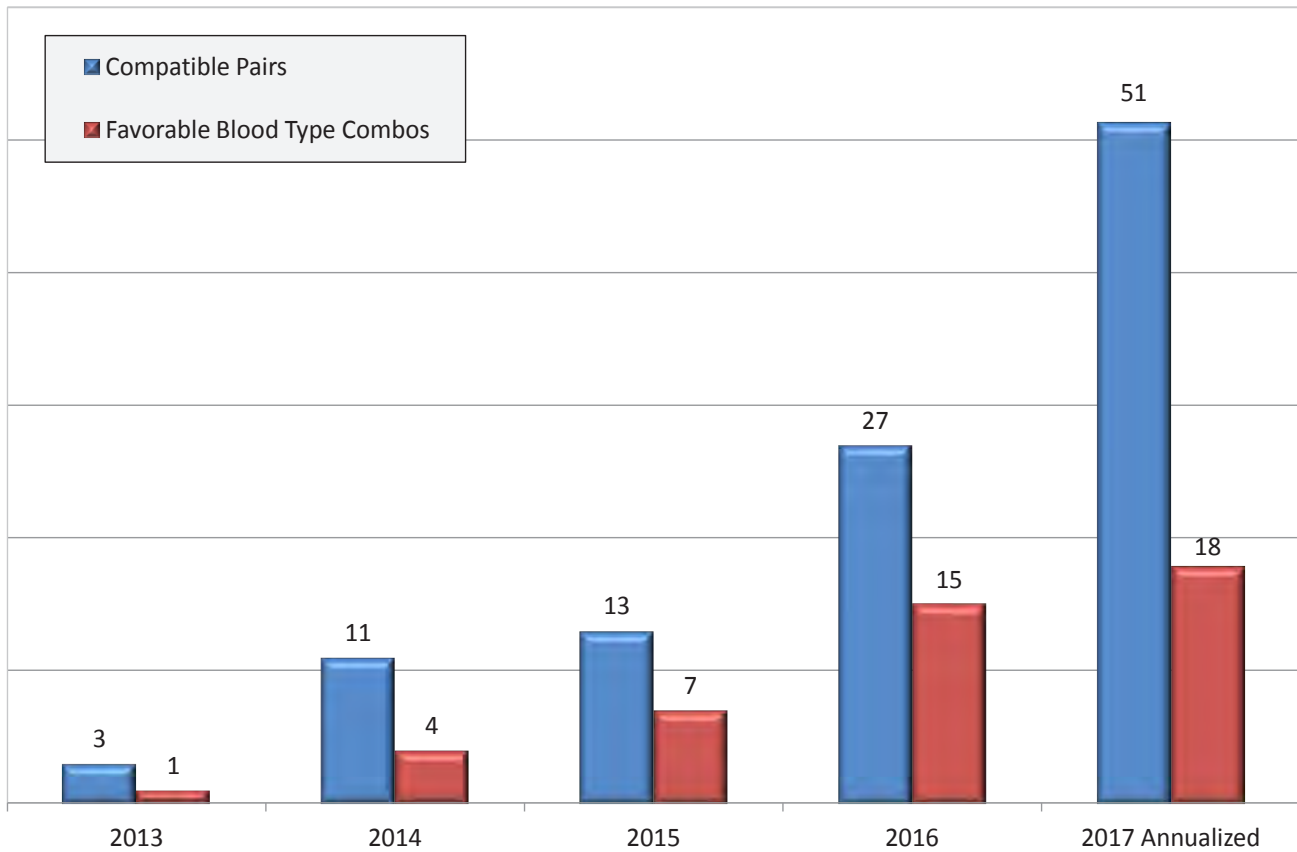
As of 9/30/2017



New Exportable Pairs

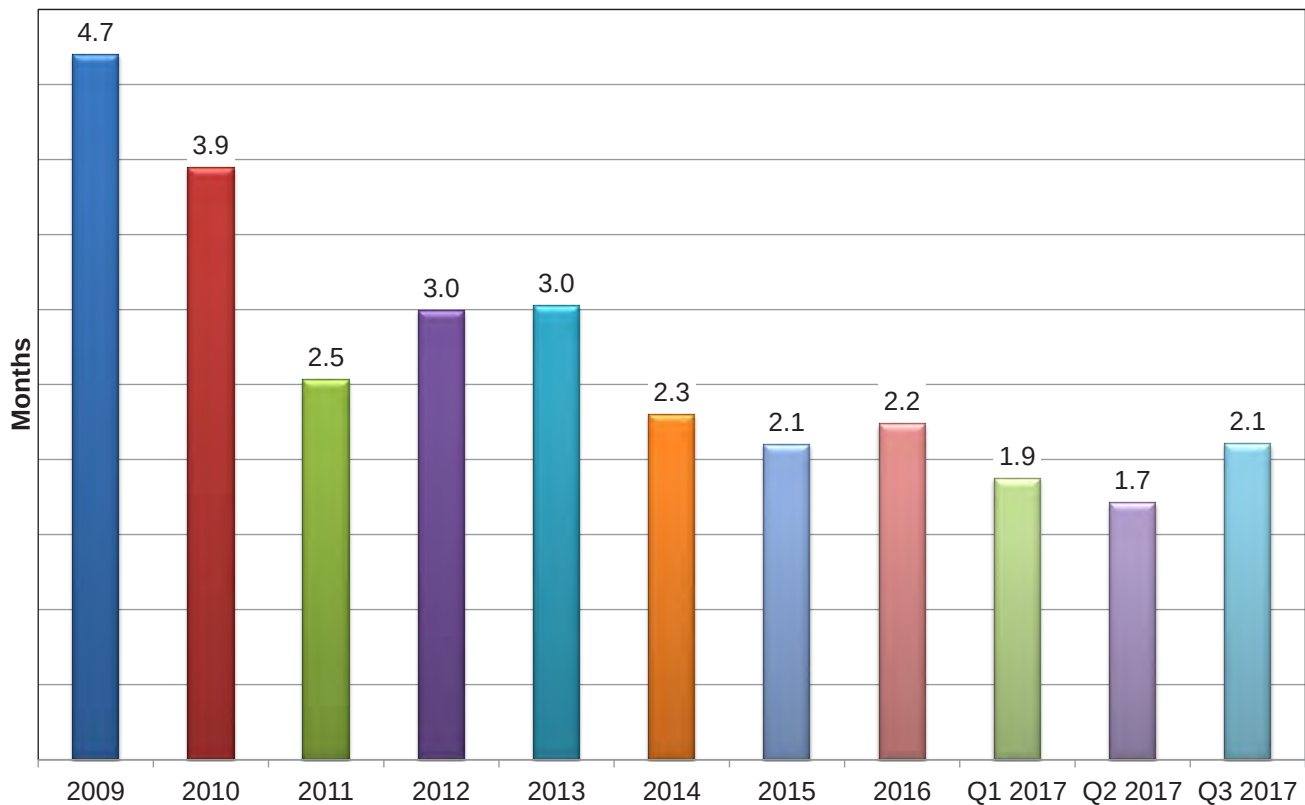


Compatible Pairs Transplanted

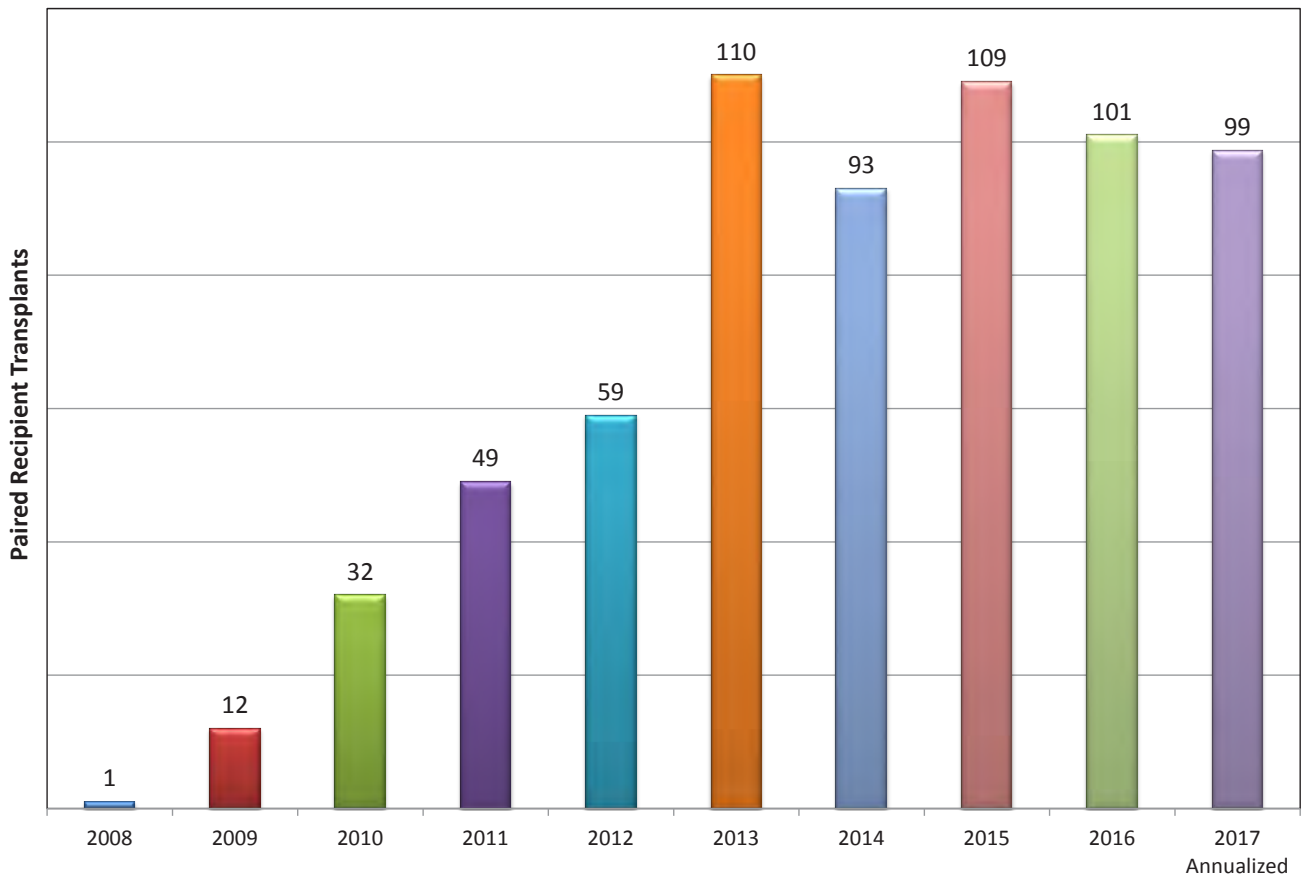


Transplanted Patient Median Wait Time

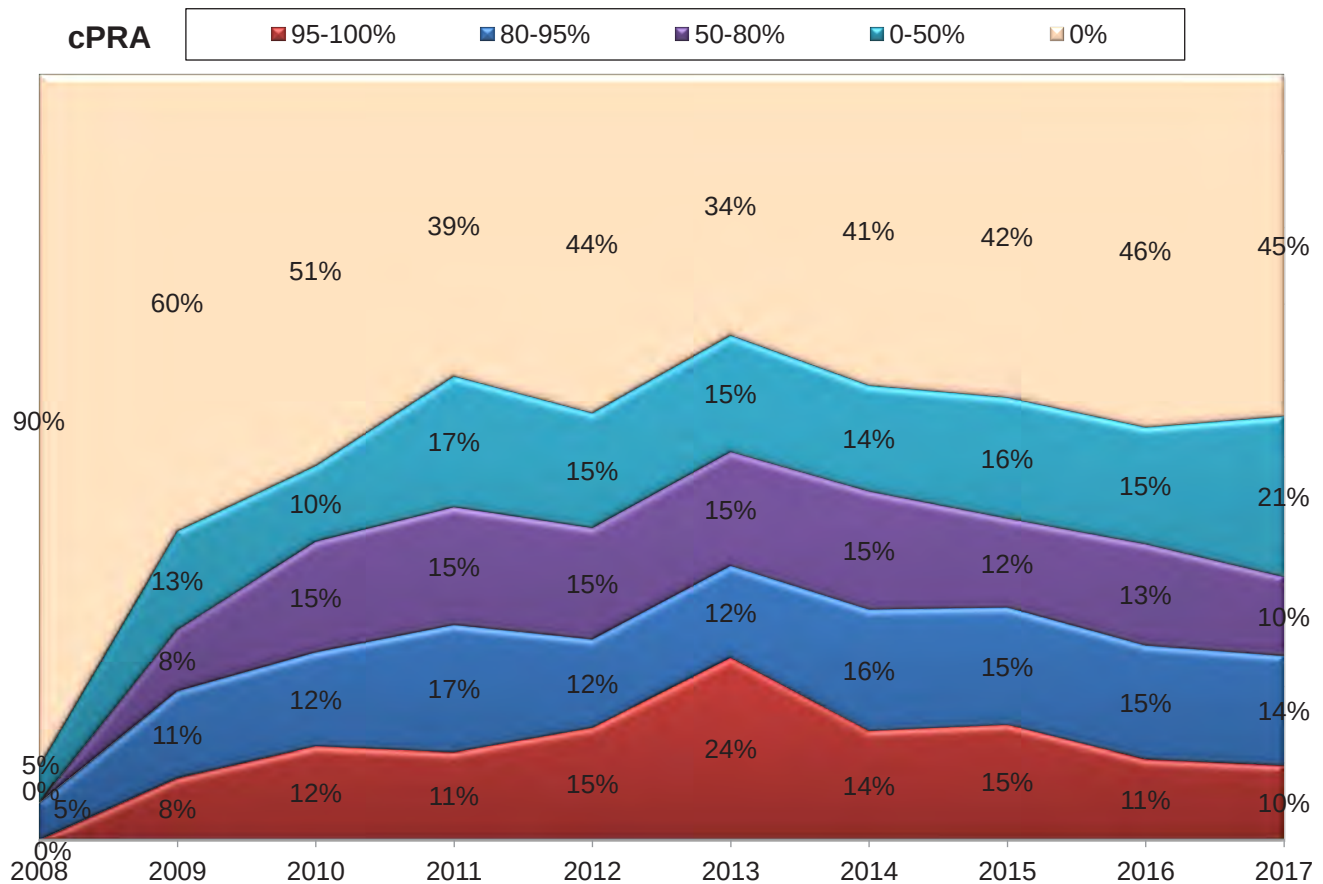
Wait times of patients transplanted during prior 12 months
As of 9/30/2017



Transplanted Patients with cPRA > 80%



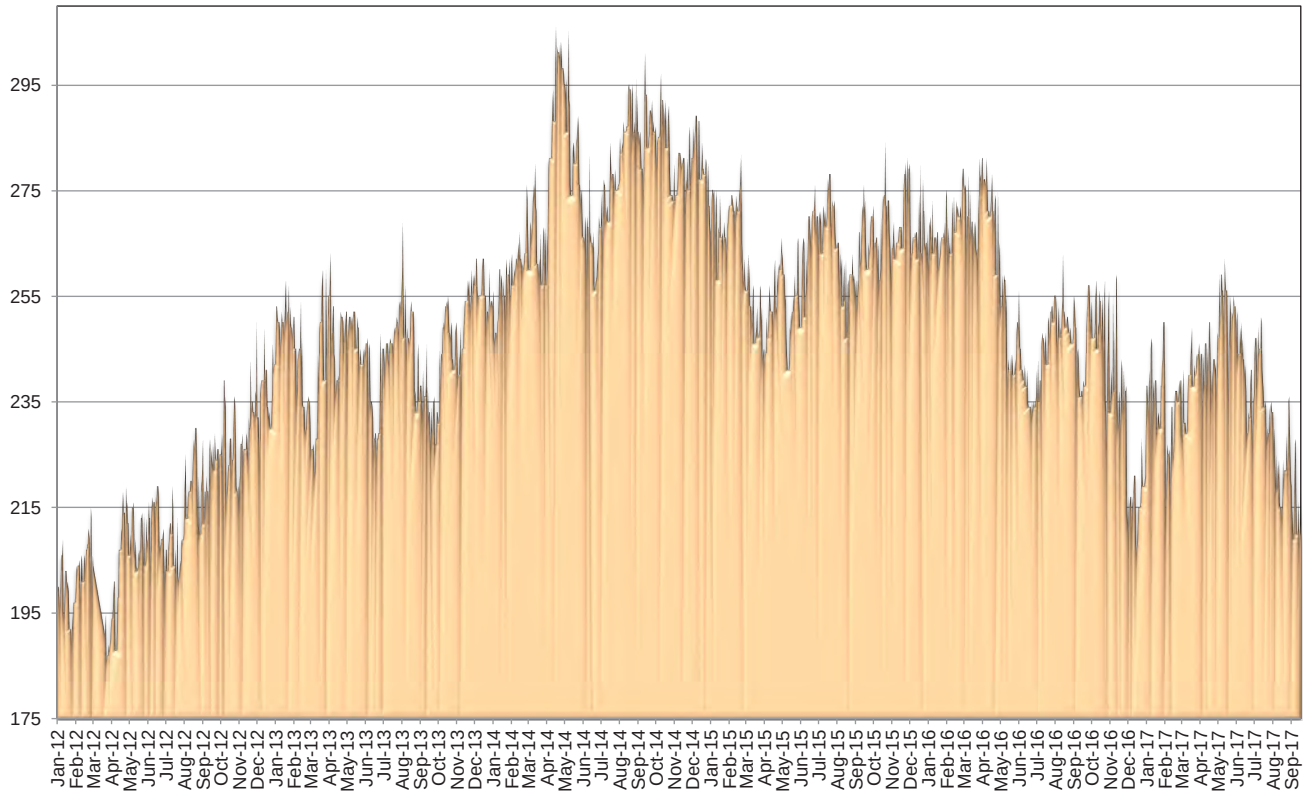
Transplanted Patients by cPRA



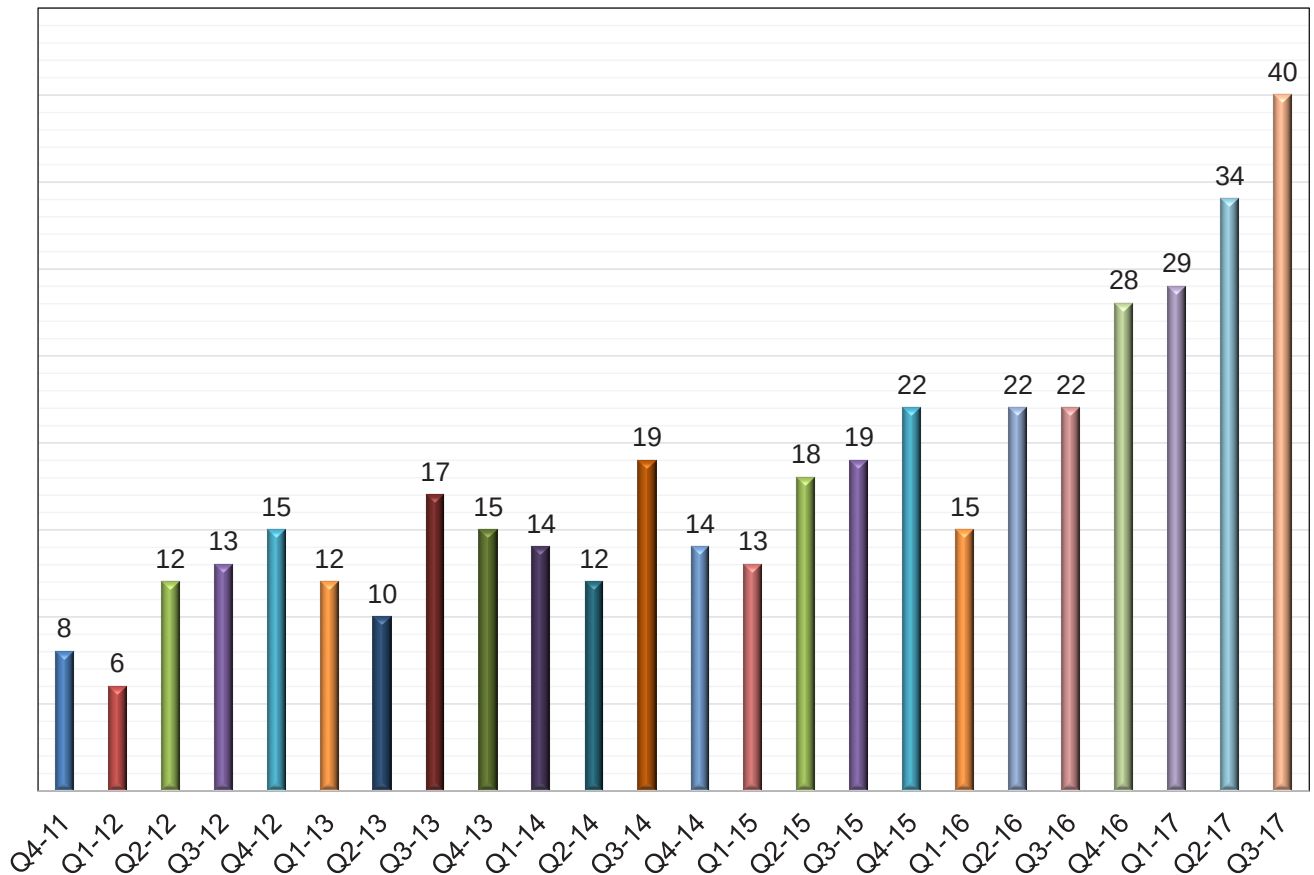
Pool Size

Unmatched Patients by Day

1/14/2012 – 9/30/2017



Chains Started



Chain and Loop Statistics

Category	Count	Mean Length	Transplants
Ended	463	4.25	1967
Broken	21	4.29	90
Active	4	1.5	6
Chain Total	488	4.23	2063
Loops	104	2.34	243
Total	592	3.9	2306

**Updates as of 10/13/17

Great HLA Matches

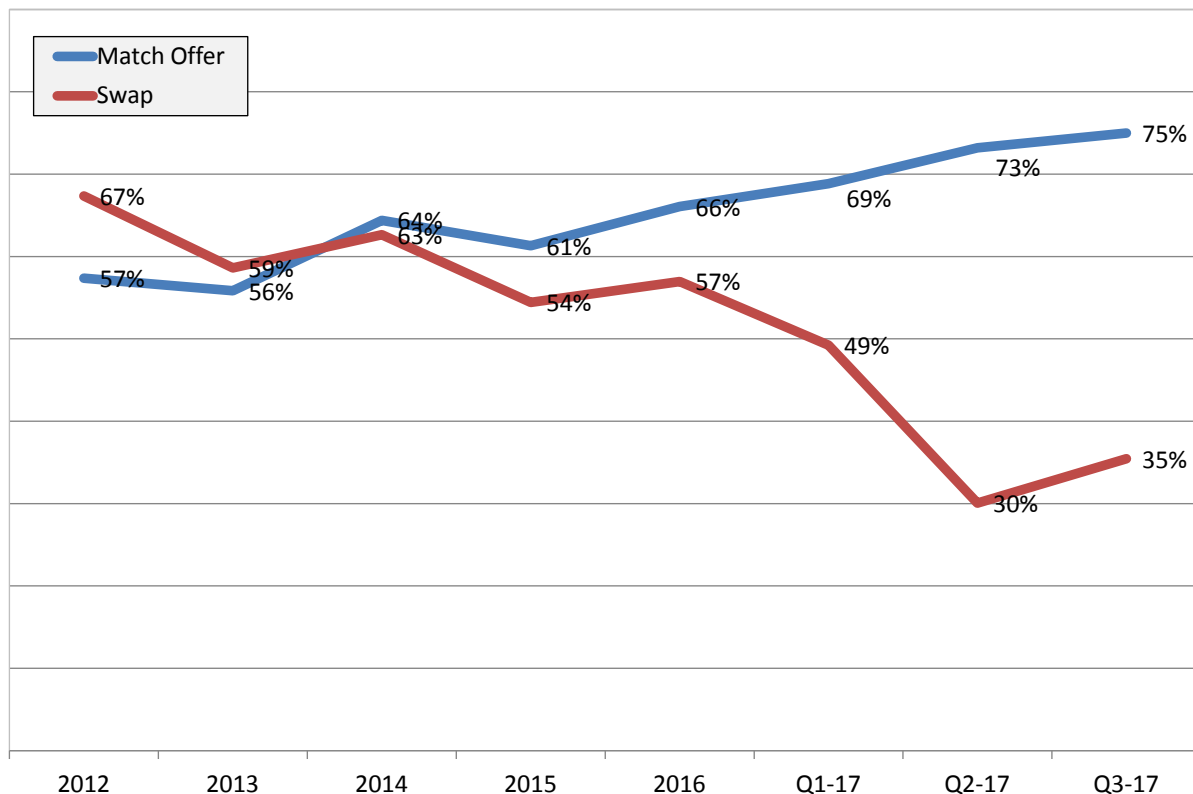
Zero Mismatch

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	Hopkins	1019	6/1/2017	A	AB	0	2	40	55	100
2	Brigham	1026	5/24/2017	A	A	95	2	58	33	100
3	ChristHosp	952	1/18/2017	A	A	99	1	57	34	100
4	UMinn	928	11/8/2016	A	A	100	4	66	12	100
5	Cincinnati	884	8/31/2016	A	A	73	1	28	40	100
6	OSU	509	8/30/2016	A	A	91	1	38	67	100
7	SCarolina	459	2/11/2016	A	A	100	3	64	53	100
8	Madison	442	12/22/2015	A	A	97	6	22	63	100
9	UMinn	440	11/19/2015	O	O	100	5	23	20	100
10	UCLA	357	2/17/2015	A	A	100	34	39	52	100
11	Emory	351	12/11/2014	A	A	100	5	25	33	100
12	Hopkins	330	11/13/2014	A	O	96	1	41	38	100
13	Loyola	324	8/5/2014	A	A	100	1	37	55	100
14	Madison	674	1/9/2014	O	A	99	5	29	33	100
15	Barnabas	182	10/3/2012	A	A	92	4	51	50	100
16	Barnes	105	3/31/2011	A	A	100	7	60	32	100
17	UCSF	58	6/15/2010	A	A	100	6	47	58	100

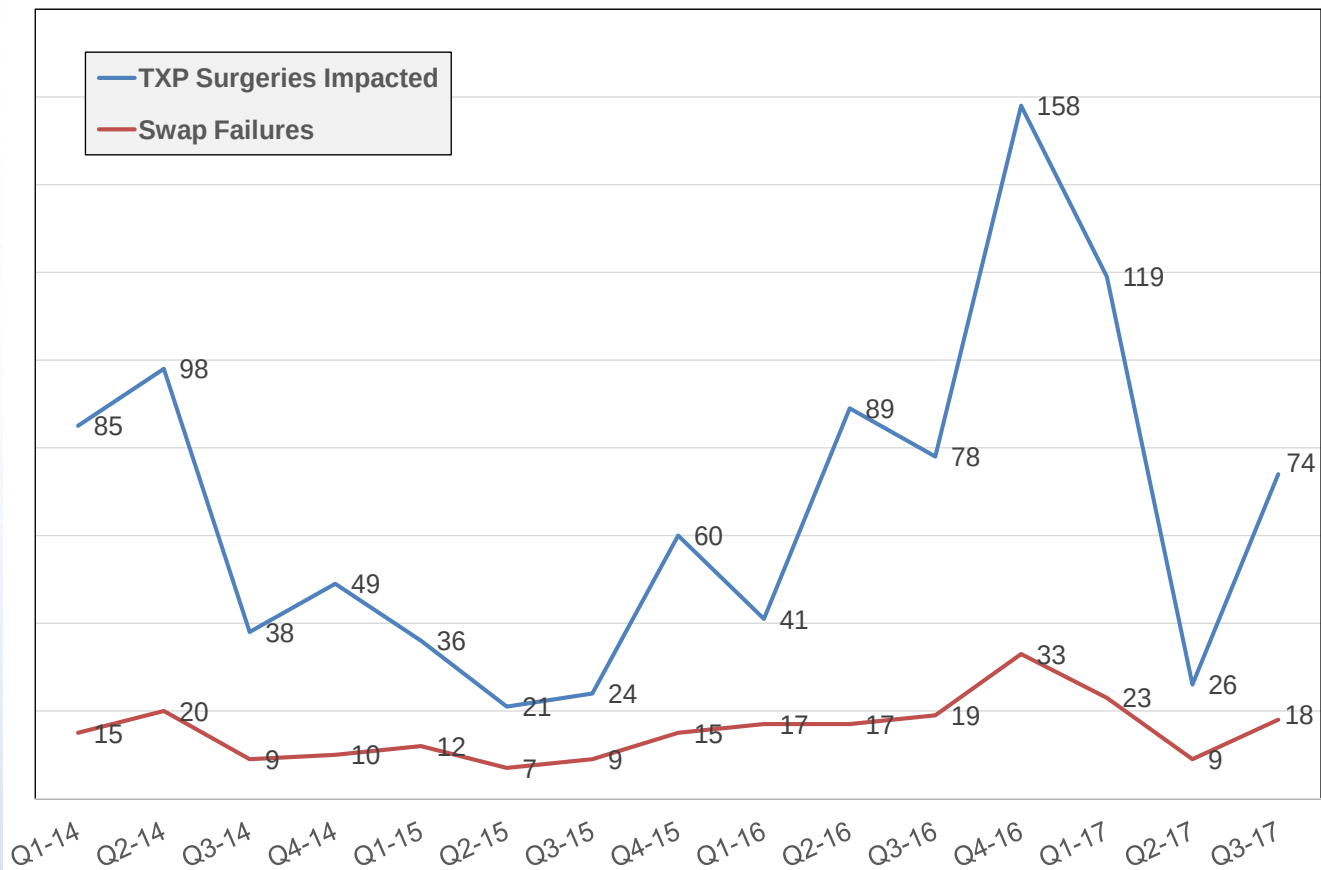
Failure Rates

MO Rate = $1 - (XM/MO)$

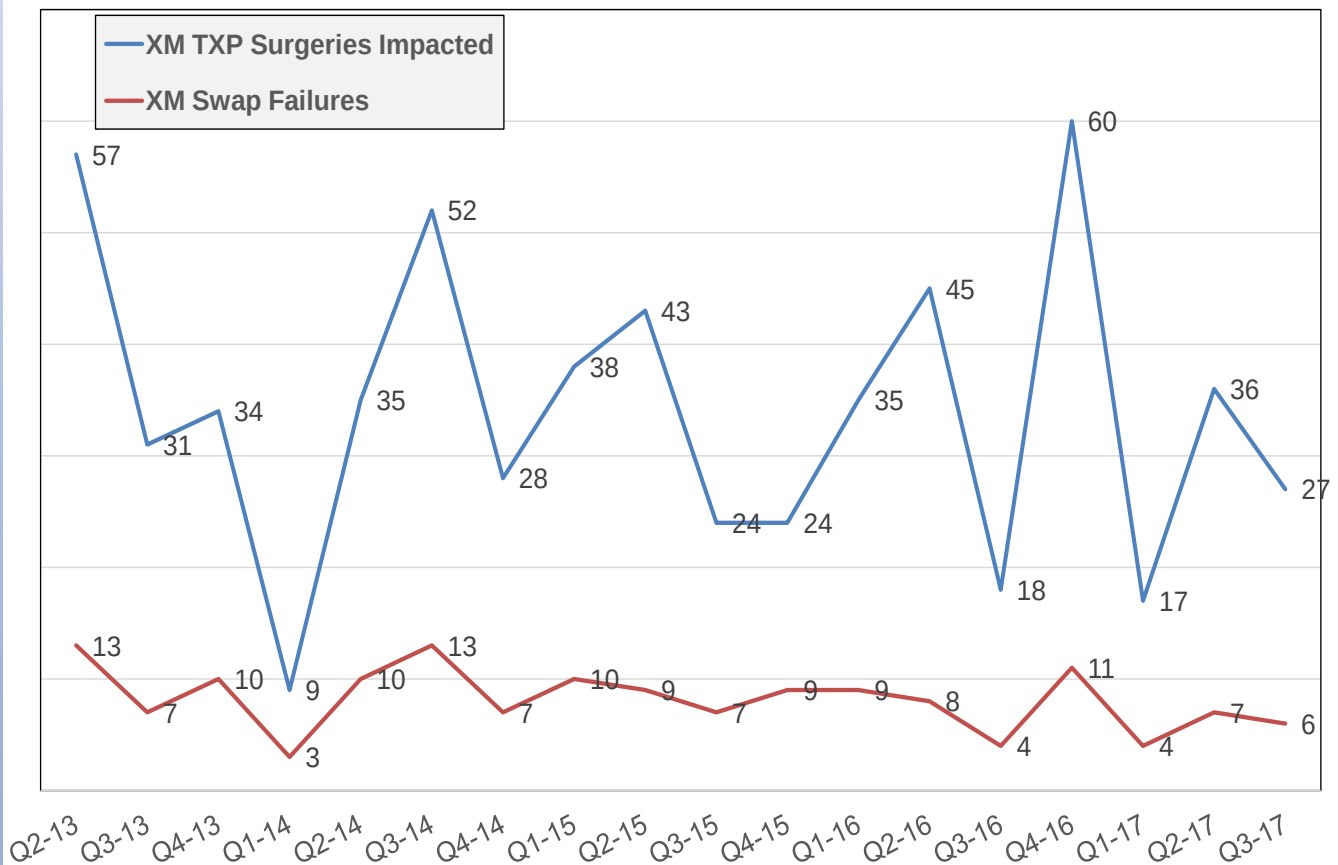
Swap Rate = $1 - (TXP/XM)$



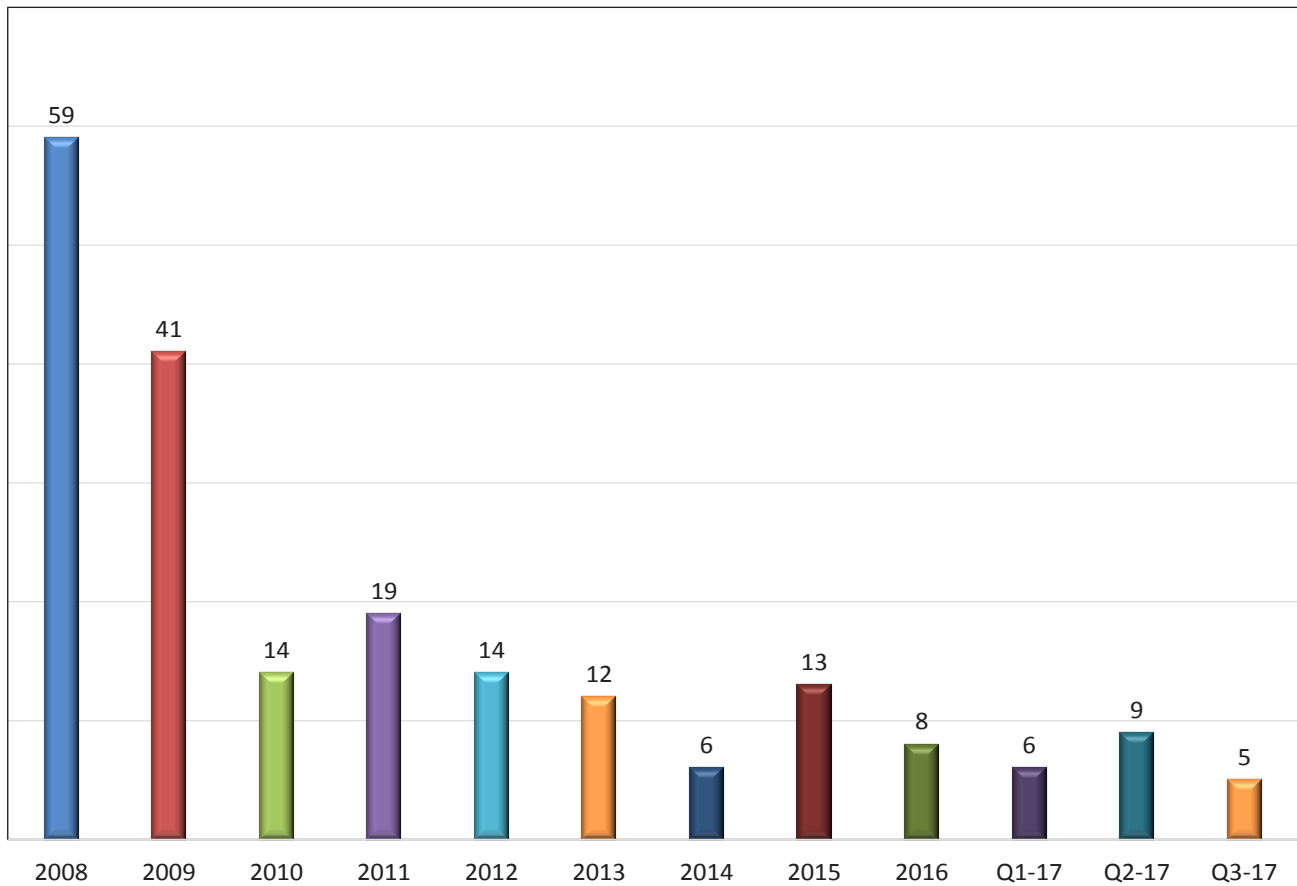
Non-XM Swap Failures & TXP Surgeries Impacted



XM Swap Failures & TXP Surgeries Impacted



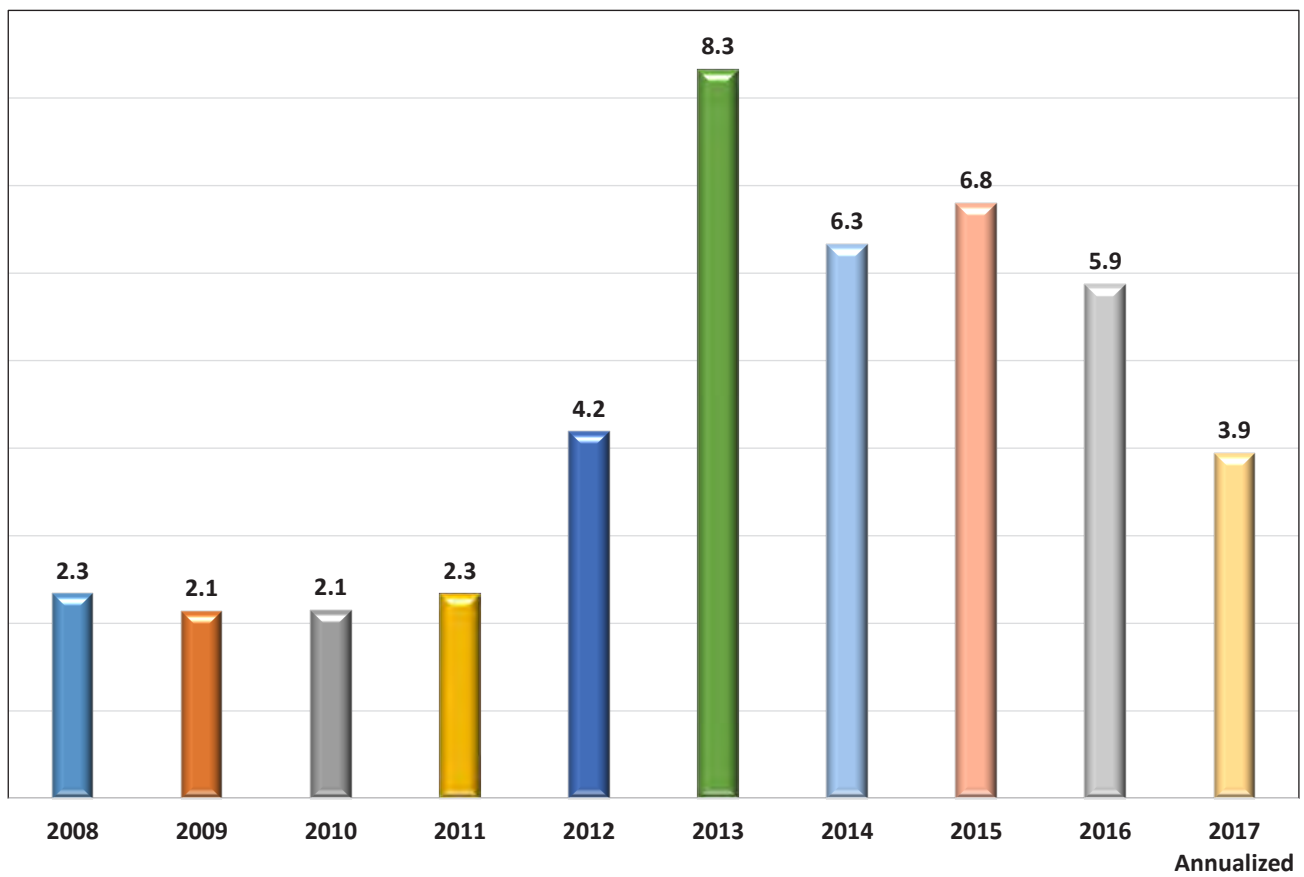
Bridge Donor Median Wait Times in Days



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
Q1-17	6	7	29	2
Q2-17	9	15	65	2
Q3-17	5	8	35	1

Transplants per Bridge Donor



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	68	1	2	3%
2017	52	1	1	2%
Total	487	9	22	

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
22	Donor reneged		✓	Maryland	8/8/16
23	Donor reneged		✓	SCarolina	1/10/17
24	Kidney Declined by Recipient Surgeon	✓	--	Indiana/UNC	9/27/2017
Total		9	21		

Advanced Donation Program

Summary

As of 9/30/2017

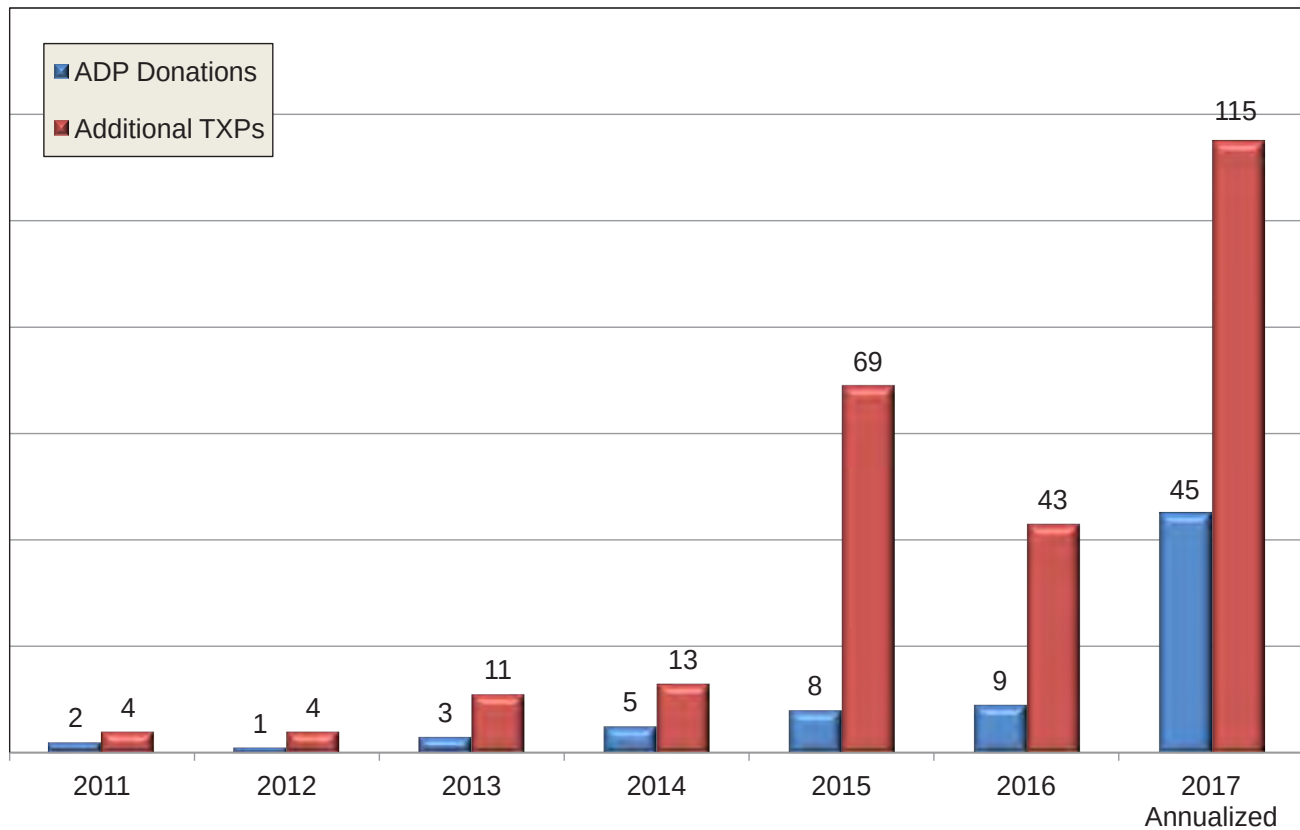
Type	Cases	Add'l TXPs Facilitated	80 % + cPRA TXPs Facilitated	95 % + cPRA TXPs Facilitated
Short-Term*	38	146	51	29
Voucher**	24	84	15	6
Total	62	230	66	35

*Short-Term– At time of advanced donation the intended ADP Recipient is in need of transplant.

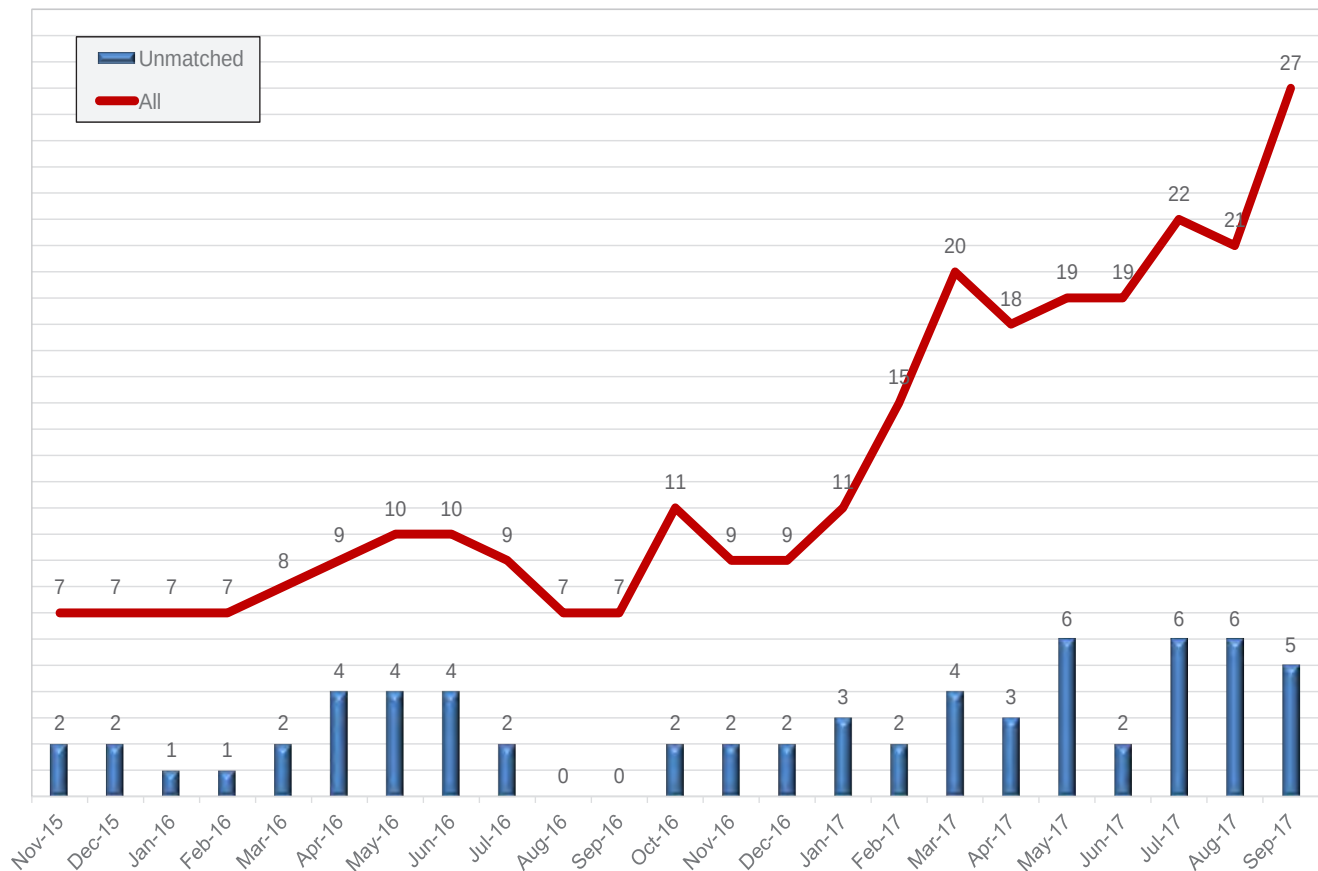
**Voucher - At time of advanced donation the intended ADP Recipient is not in need and may never be in need of transplant.

Advanced Donation Program

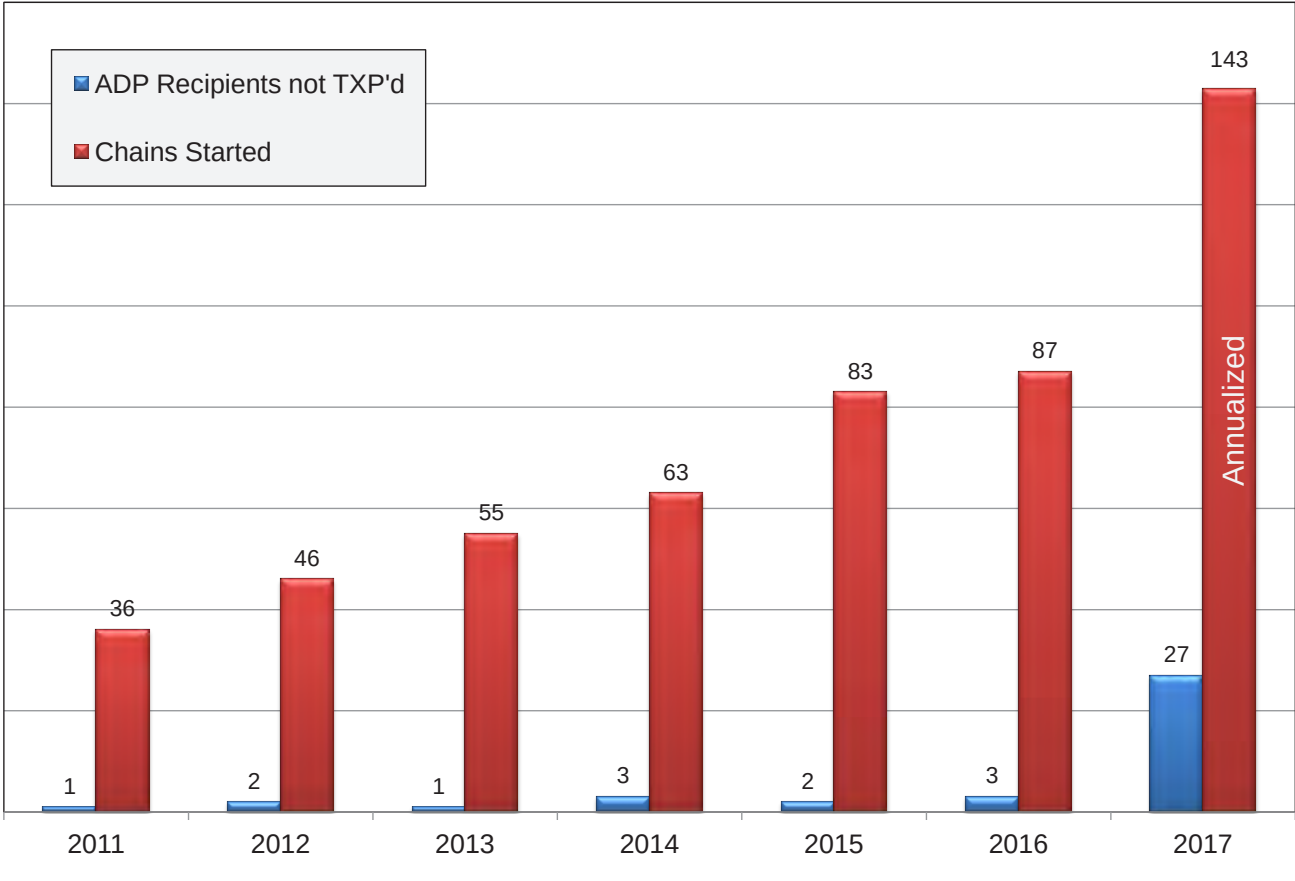
Donations & Additional TXPs Facilitated



ADP Recipient Pool

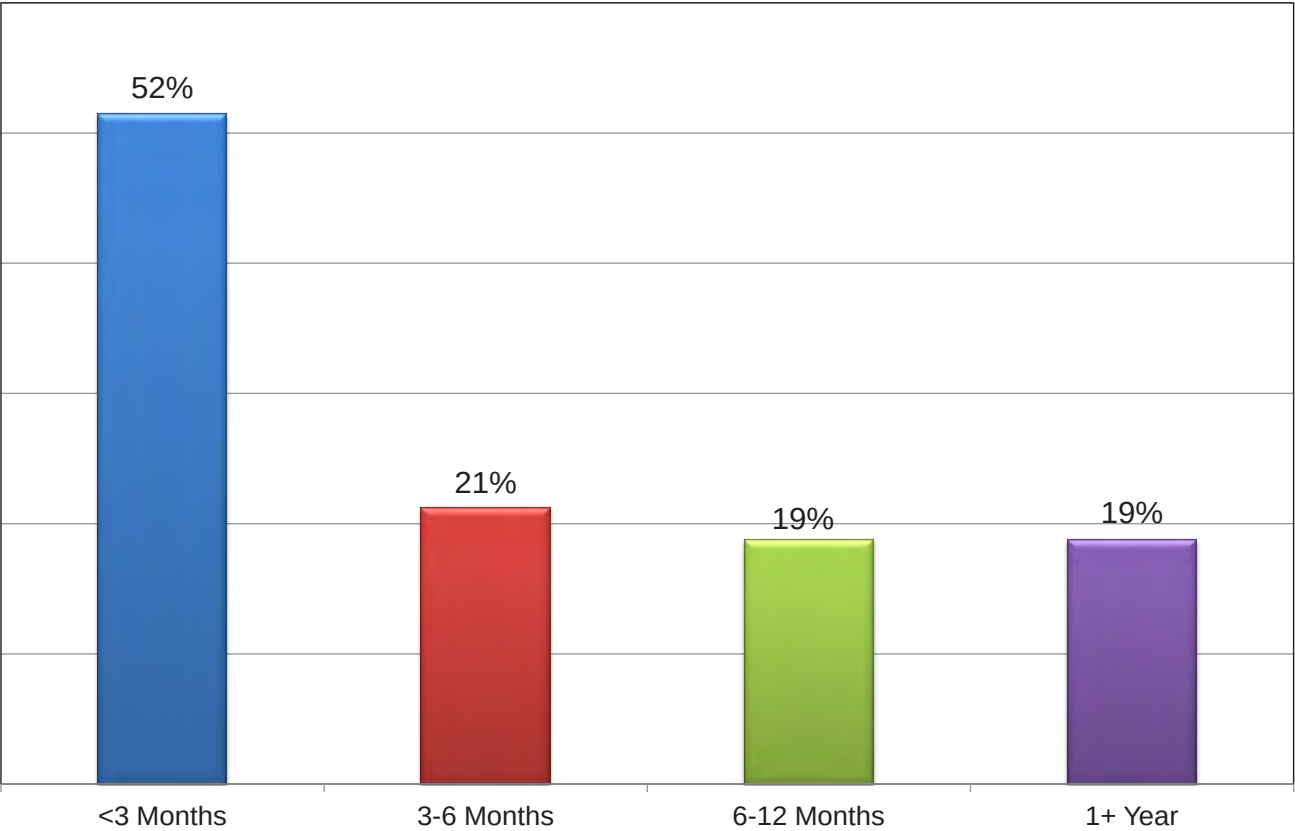


ADP Recipients Outstanding vs. Overall Chains Started



ADP Wait Time Analysis

As of 9/30/17



Program Statistics

As of 9/30/2017

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Transplants Facilitated	21	62	131	175	226	308	310	360	399	309
2	Paired Transplants Facilitated	21	39	91	131	164	252	255	288	315	220
3	Chip Transplants Facilitated	0	23	40	44	62	56	55	72	84	89
4	Ending Unmatched Patient Pool	80	127	120	201	241	255	279	280	215	208
5	Cumulative Transplants	21	83	214	389	615	923	1233	1593	1992	2301
6	Cumulative Paired Transplants	21	60	150	280	526	777	1030	1316	1630	1848
7	Cumulative Chip Transplants	0	23	64	109	89	146	203	277	362	453
8	Cumulative Paired Patient Pool	101	210	334	590	805	1062	1351	1615	1877	2096
9	Percent of Pool Transplanted (Paired Recipients)	21%	40%	64%	66%	71%	76%	79%	84%	89%	90%
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	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	4.7	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	2.2	2.1
13	Mean cPRA of Transplanted Patients	4.1%	25.9%	34.5%	40.3%	44.1%	54.0%	48.3%	48.9%	42.8%	41.4%
14	Number of Transplants Completed by cPRA										
15	100%	0	1	4	10	4	5	3	7	3	3
16	95-100%	0	4	12	10	29	68	41	47	39	27
17	80-95%	1	7	16	29	26	37	49	55	59	44
18	50-80%	0	5	19	27	33	46	48	42	53	32
19	0-50%	1	8	13	30	34	47	43	57	61	65
20	0%	19	37	67	69	100	105	126	152	184	138
21	Sub-total	21	62	131	175	226	308	310	360	399	309
22	Percent of Transplants Completed by cPRA										
23	100%	0%	2%	3%	6%	2%	2%	1%	2%	1%	1%
24	95-100%	0%	6%	9%	6%	13%	22%	13%	13%	10%	9%
25	80-95%	5%	11%	12%	17%	12%	12%	16%	15%	15%	14%
26	50-80%	0%	8%	15%	15%	15%	15%	15%	12%	13%	10%
27	0-50%	5%	13%	10%	17%	15%	15%	14%	16%	15%	21%
28	0%	90%	60%	51%	39%	44%	34%	41%	42%	46%	45%
29	Sub-total	100%	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	101	74
31	Percent of Transplanted Patients with cPRA >80%	5%	19%	24%	28%	26%	36%	30%	30%	26%	24%

Program Statistics

As of 9/30/2017

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
32	Number of Unmatched Patients by cPRA										
33	100%				79	73	83	81	80	80	68
34	95-99%				73	73	61	61	53	37	34
35	80-95%				15	15	24	19	22	12	11
36	50-80%				14	11	14	13	25	13	16
37	0-50%				14	10	22	37	35	28	29
38	0%				50	59	51	68	65	45	50
39	Sub-total				245	241	255	279	280	215	208
40	Percent of Unmatched Patients by cPRA										
41	100%				32%	30%	33%	29%	29%	37%	33%
42	95-99%				30%	30%	24%	22%	19%	17%	16%
43	80-95%				6%	6%	9%	7%	8%	6%	5%
44	50-80%				6%	5%	5%	5%	9%	6%	8%
45	0-50%				6%	4%	9%	13%	13%	13%	14%
46	0%				20%	24%	20%	24%	23%	21%	24%
47	Sub-total				100%	100%	100%	100%	100%	100%	100%
48	Number of Transplants Completed by Wait Time										
49	< 6 months	21	42	74	106	180	232	243	298	327	264
50	6-12 months	0	10	14	19	24	44	35	38	30	22
51	1-2 years	0	4	15	14	20	25	27	22	32	19
52	2+ years	0	0	2	2	2	7	5	2	10	4
53	Sub-total	21	56	105	141	226	308	310	360	399	309
54	Percent of Transplants Completed by Wait Time										
55	< 6 months	100%	75.0%	70.5%	75.2%	79.6%	75.3%	78.4%	82.8%	82.0%	85.4%
56	6-12 months	0.0%	17.9%	13.3%	13.5%	10.6%	14.3%	11.3%	10.6%	7.5%	7.1%
57	1-2 years	0.0%	7.1%	14.3%	9.9%	8.8%	8.1%	8.7%	6.1%	8.0%	6.1%
58	2+ years	0.0%	0.0%	1.9%	1.4%	0.9%	2.3%	1.6%	0.6%	2.5%	1.3%
59	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60	Total Chains Started	4	9	28	36	46	55	63	83	99	107
61	Total Loops Completed	0	3	2	3	12	24	17	15	7	14
62	Number of broken chains	3	2	2	0	4	3	4	1	2	2
63	Bridge Donors Held (2017 Annualized)	9	29	61	75	54	37	49	53	68	17
64	Percent of broken chains	33%	7%	3%	0%	7%	8%	8%	2%	3%	2%



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