

Paired Exchange Results Quarterly Report

As of March 31, 2018

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Message from the Founder and CEO

We are pleased to report a 47% increase in transplants facilitated in the first quarter in 2018 with 147 transplants completed in Q1 2018, up from 100 transplants in Q1 2017. If we sustain this strong growth rate, we will pass the 3,000 transplant milestone by the end of the year.

We are now able to provide 7 year graft and patient survival rates for the first time. The 7 year numbers, not only indicate an NKR graft and patient survival advantage, but this advantage appears to increase over time, indicating that NKR facilitated transplant outcomes are better over the longer term. We will be conducting research into why we are seeing this NKR graft survival advantage even though the NKR patients transplanted are more highly sensitized and have more time on dialysis than the typical U.S. living donor transplants.

Our private label automated donor intake platform (DASH) continues to expand with 16 centers now using the platform. A fully automated donor follow-up module has recently been completed and is in pilot at a major transplant center. We have also deployed the Donor Shield product that provides donor life insurance, disability insurance, lost wage reimbursement, travel & lodging reimbursement, donor legal support and coverage for uncovered complication costs, for all donors at a Donor Shield center. The Donor Shield product is currently being piloted at three Donor Care Network Centers of Excellence.

We continue to see the pool of unmatched pairs shrink and wait times drop due to the impact of the Center Liquidity Contribution program and the Advanced Donation Program. The CLC program has reduced the number of NDDs and easy to match pairs being withheld from the NKR to facilitate internal swaps. The Advanced Donation Program is reducing wait times and pool size because it is increasing the number of NKR chain starts. These two factors are allowing us to match/transplant nearly all sensitized patients with a true cPRA of less than 99% in under six months while reducing the wait time for all pairs.

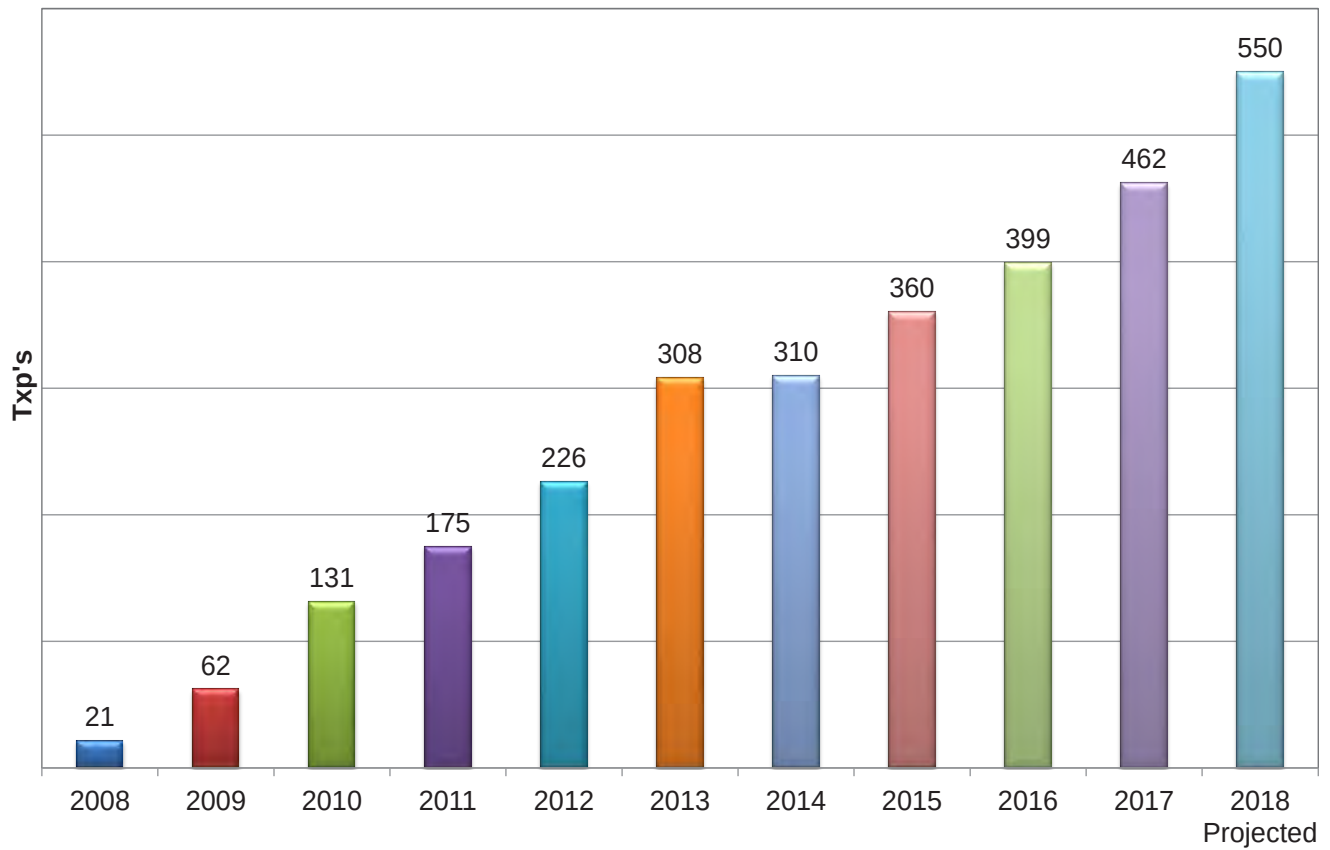
It is the ongoing dedication and effort of our Member Centers that enable us to continue breaking records and achieving new milestones. Thank you for your support and keep up the great work.

Sincerely,

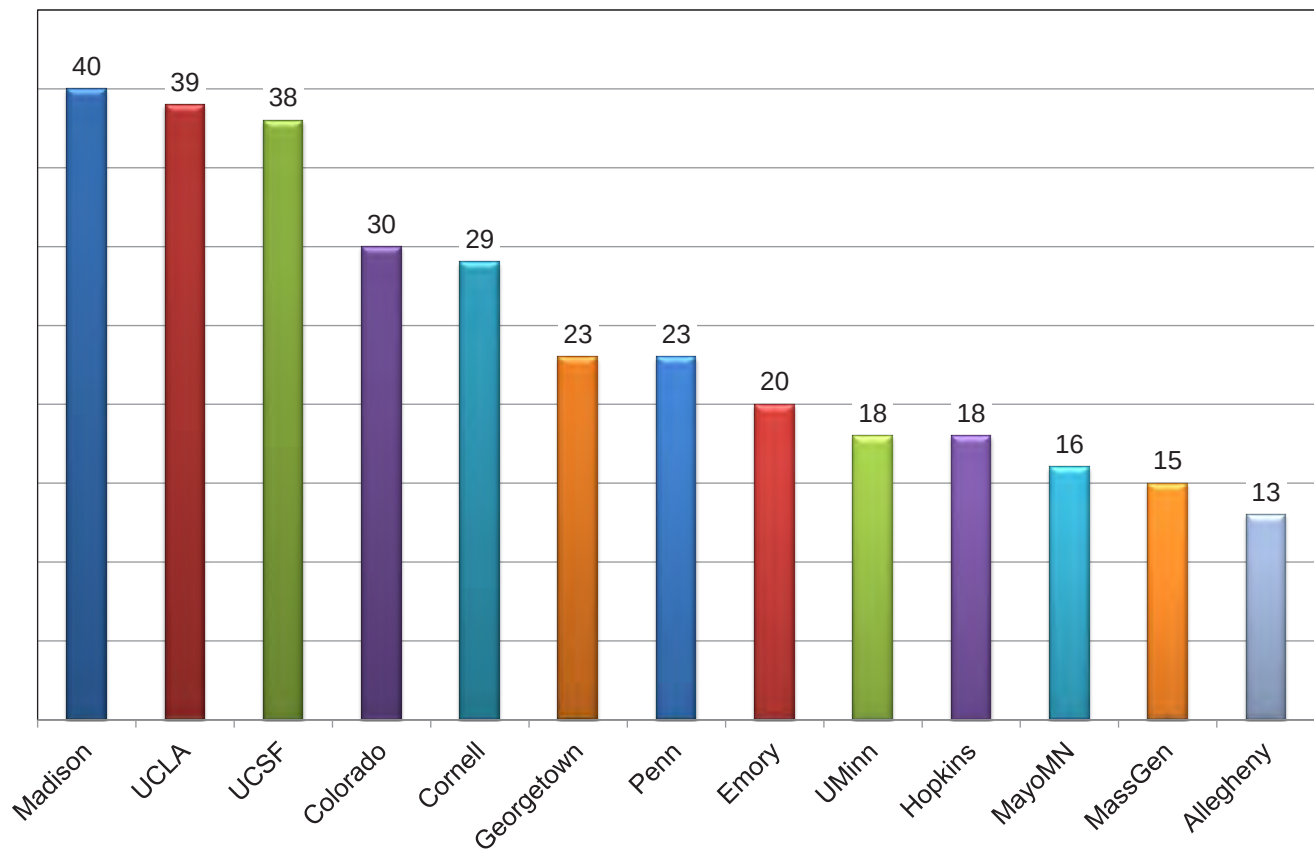
A handwritten signature in blue ink, appearing to read 'G Hil', with a long horizontal flourish extending to the right.

Garet Hil
Founder & CEO
National Kidney Registry

Transplants Facilitated

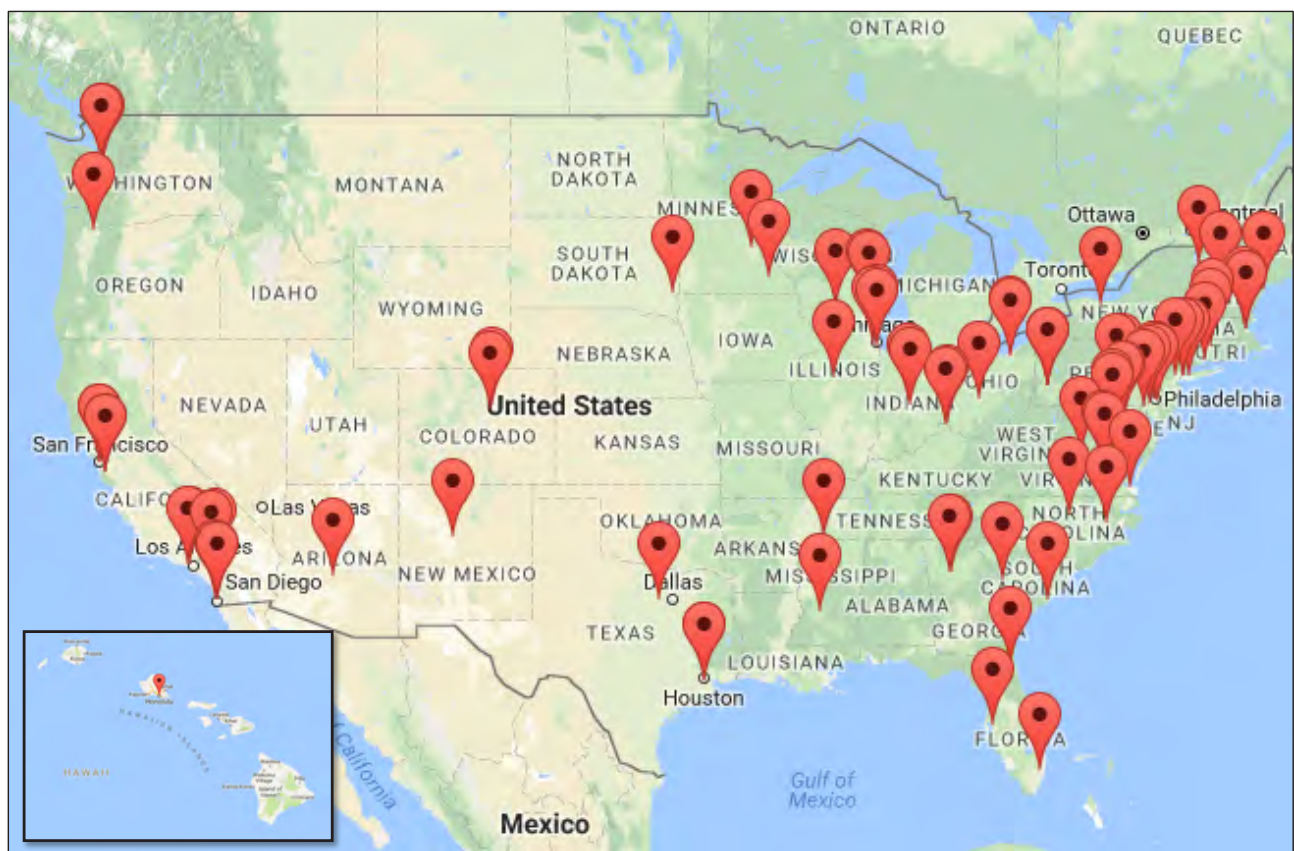


Top Centers Transplants Last 12 Months

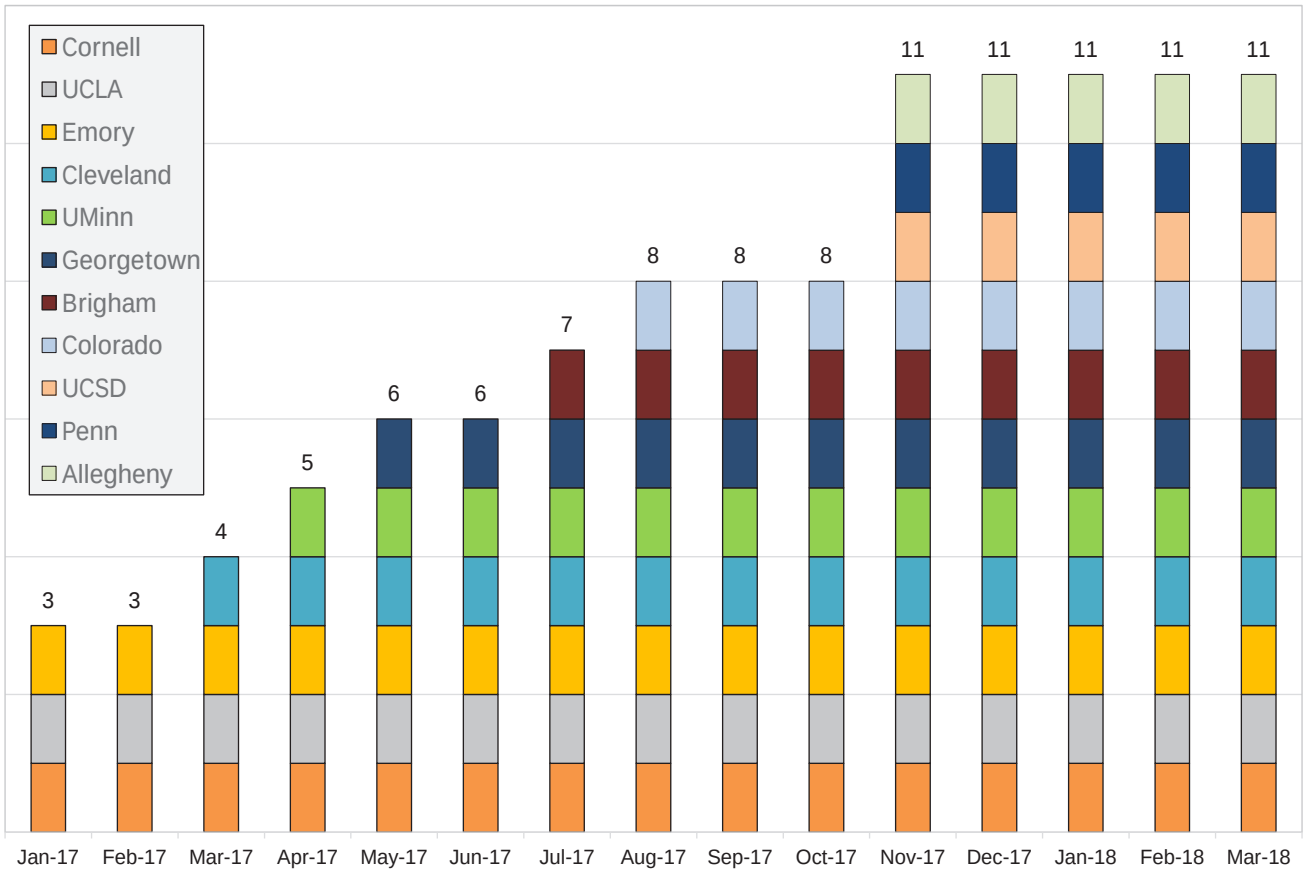


NKR Member Centers

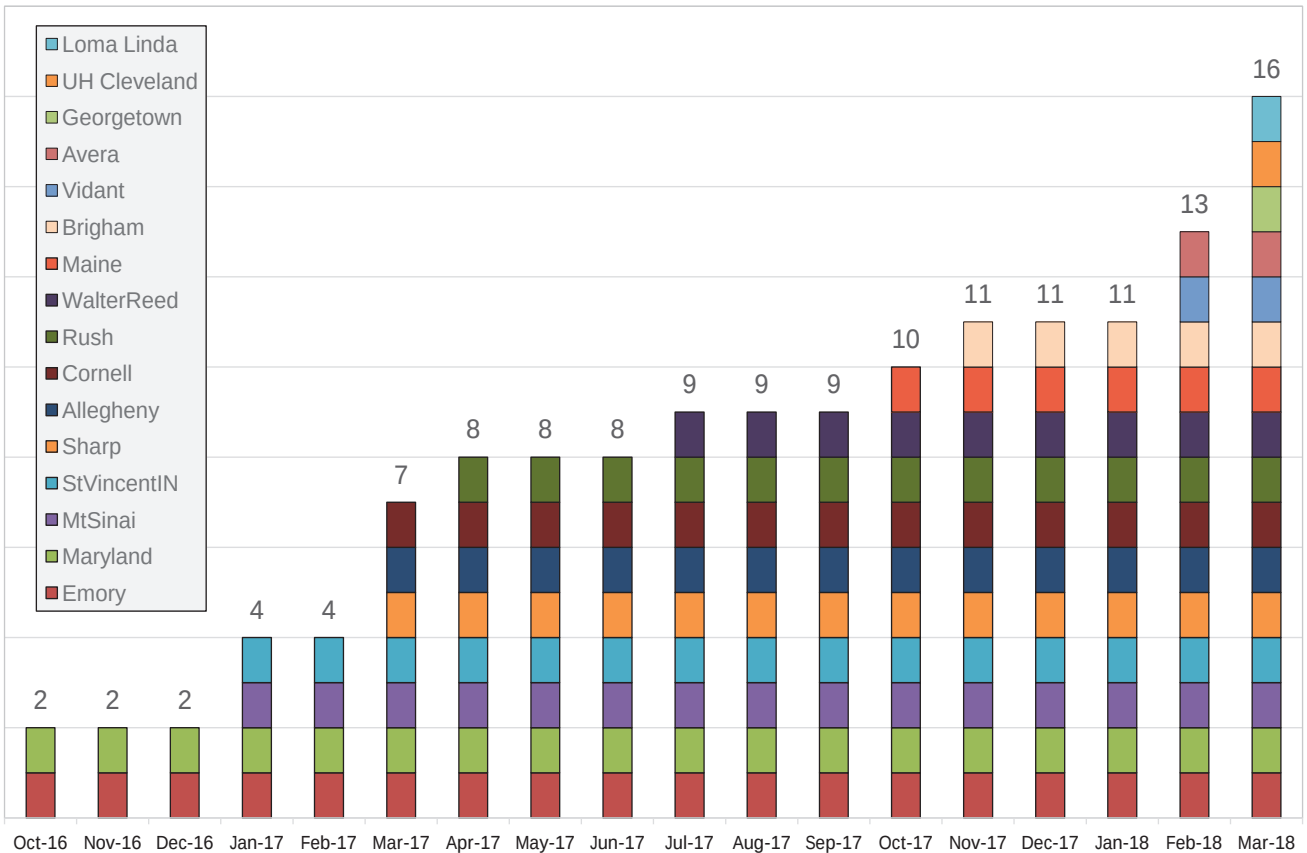
As of 3/31/2018



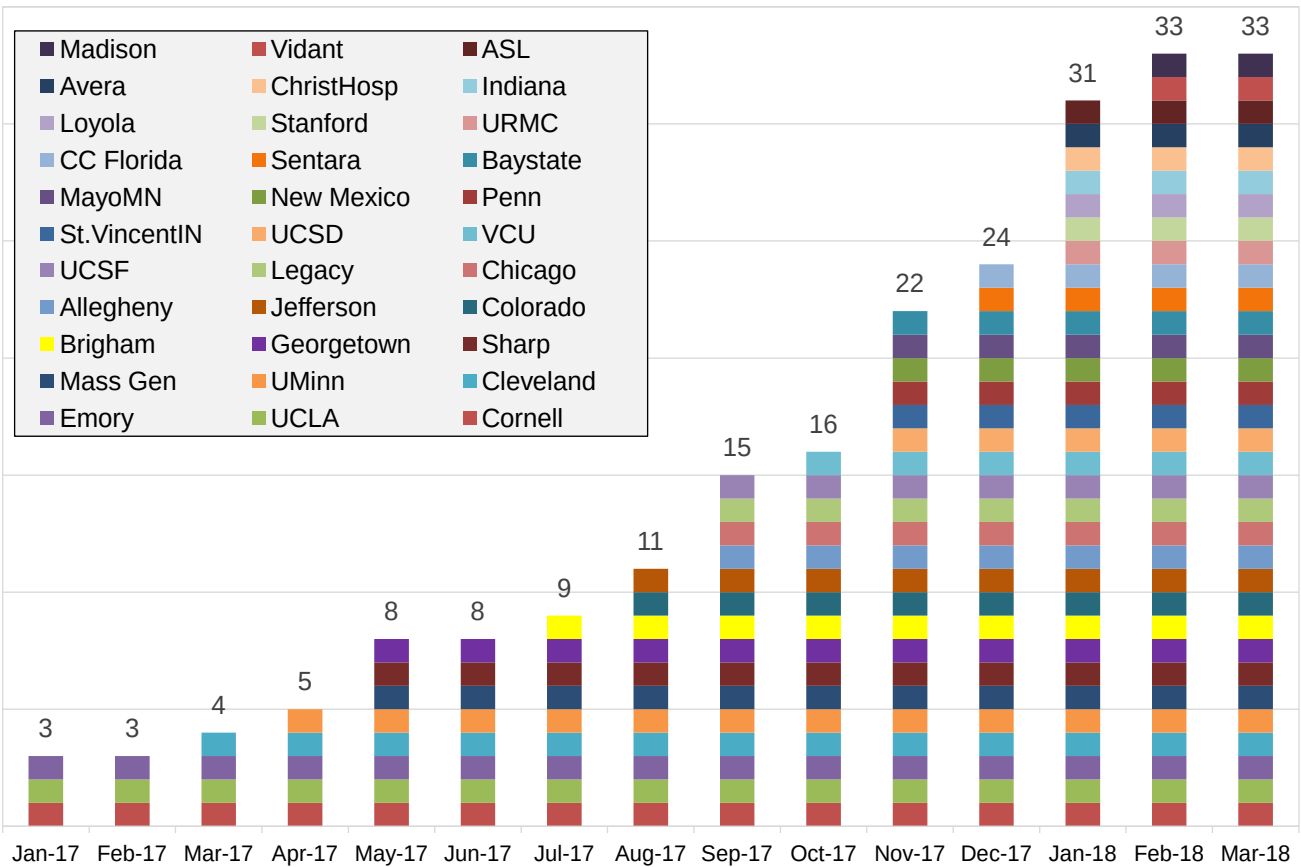
Donor Care Network® Centers of Excellence



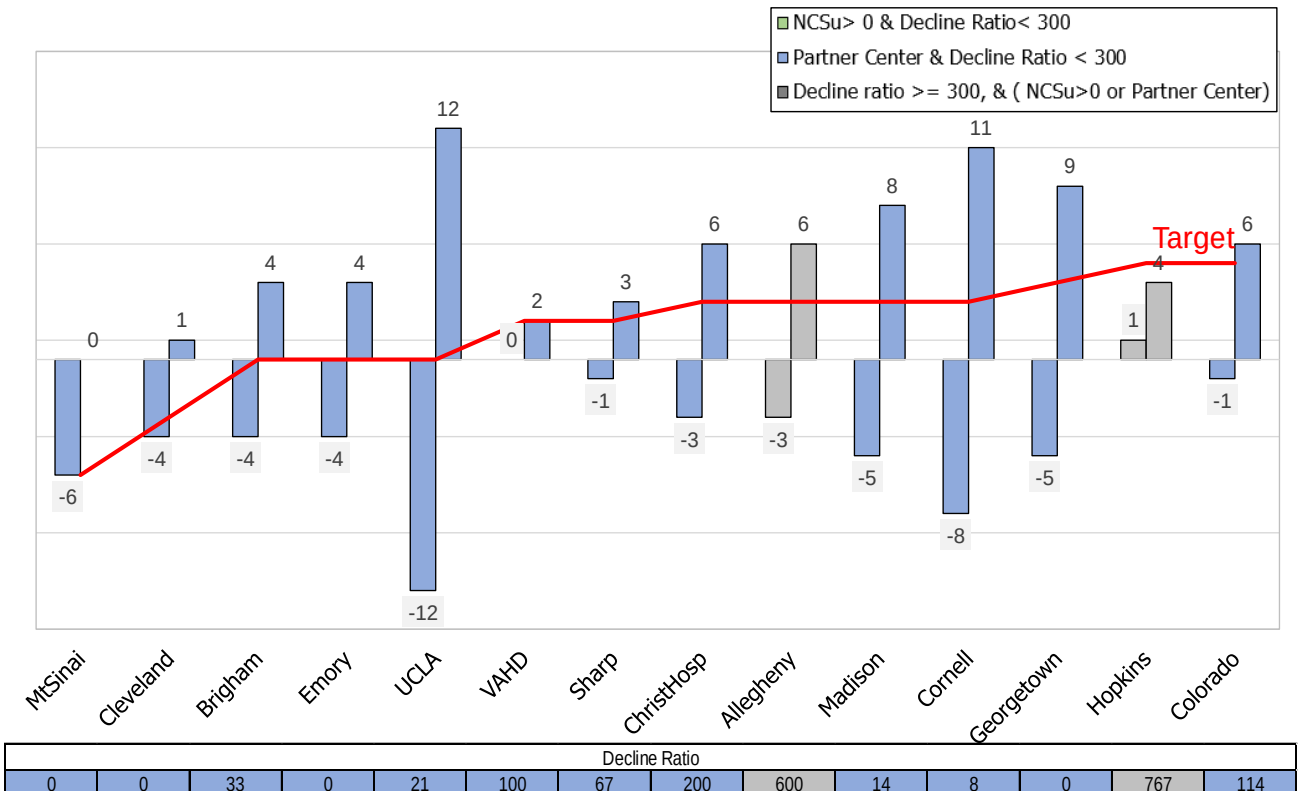
DASH Centers



Remote Donor Centers

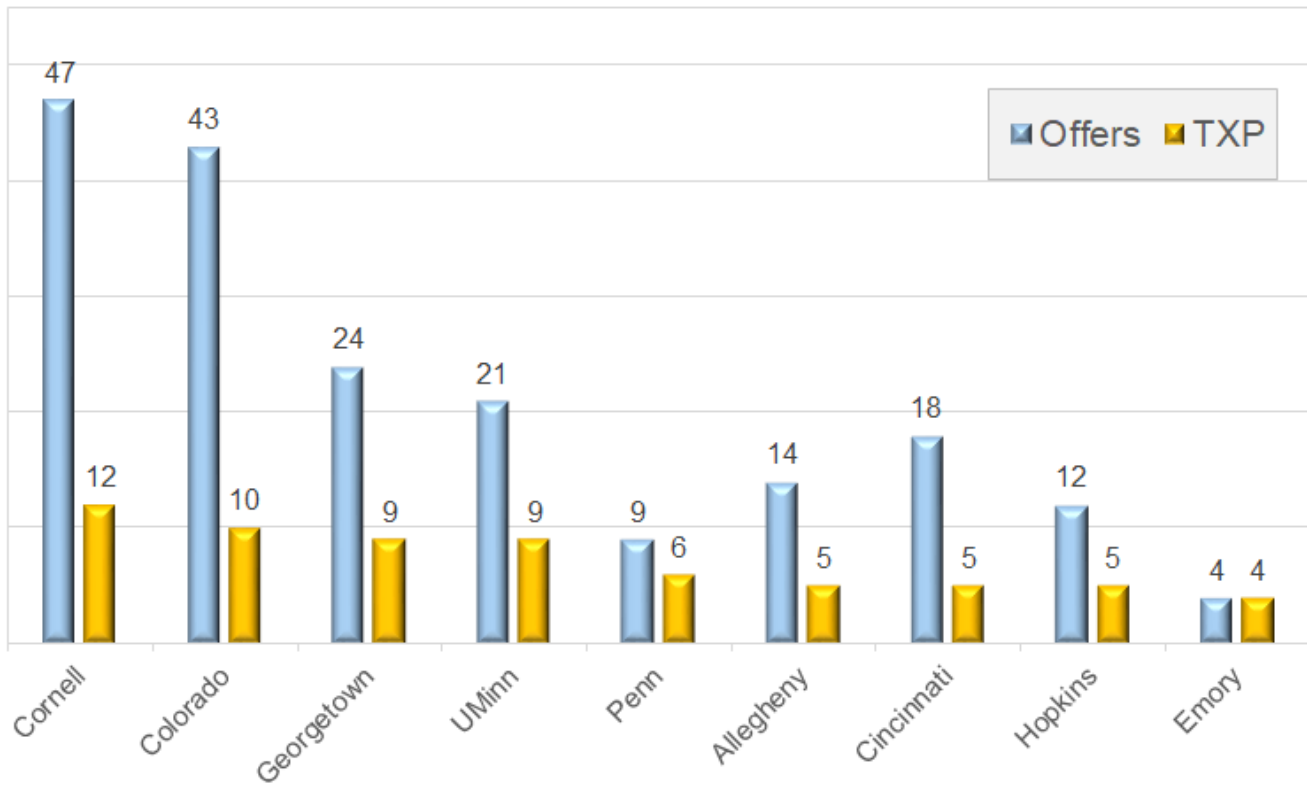


Partner Center Chain End Targets



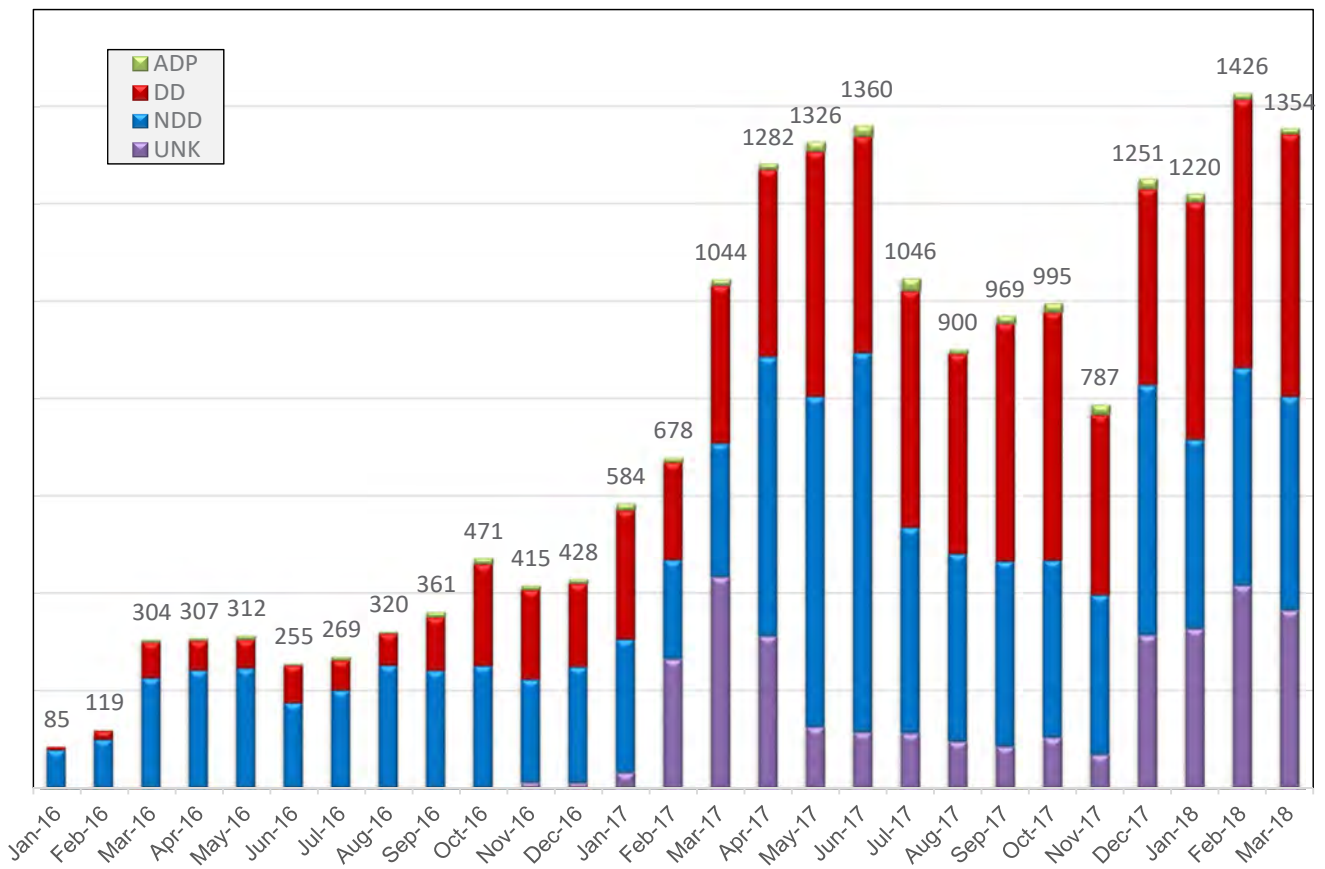
Top Center Liquidity Contributors

CLC Driven Match Offers - 3/17 - 3/18



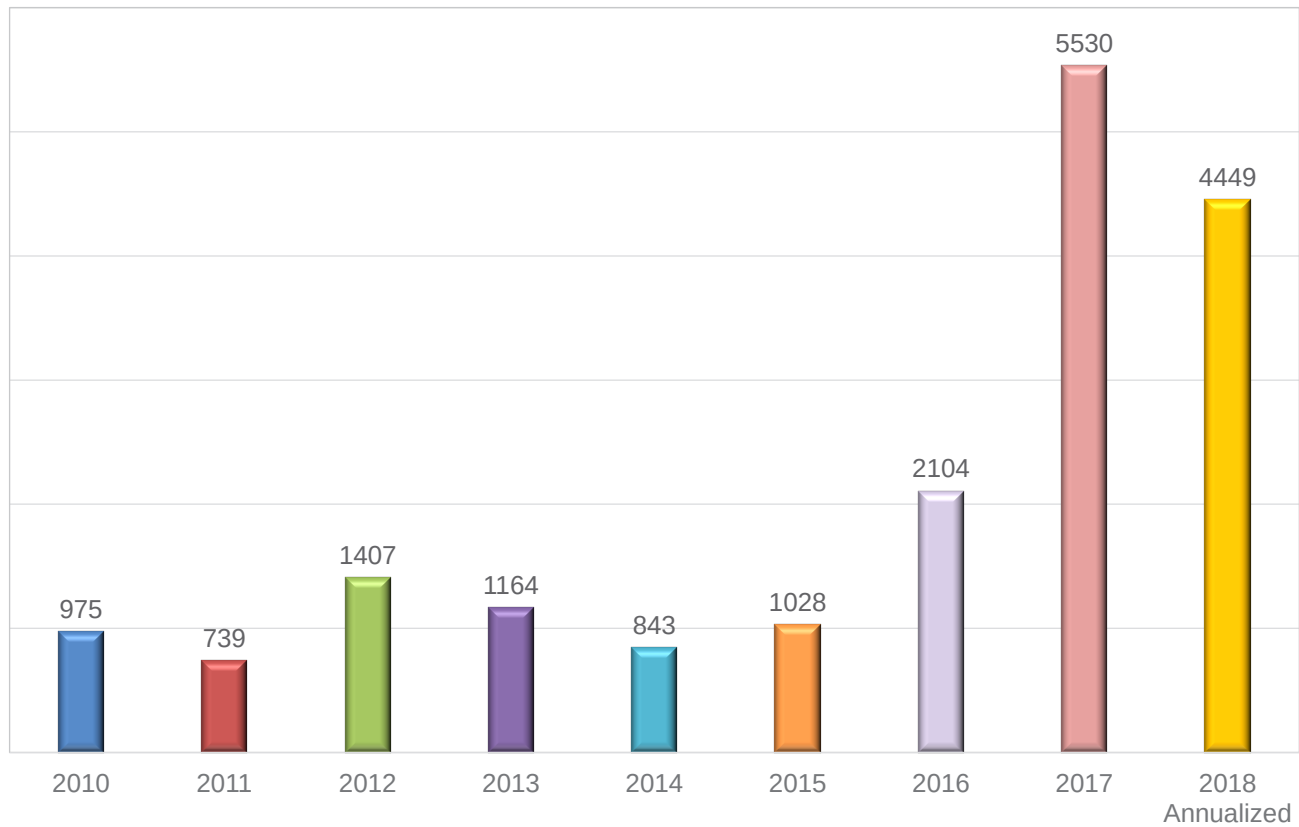
Donor Contacts

Across All Donor Intake Platforms



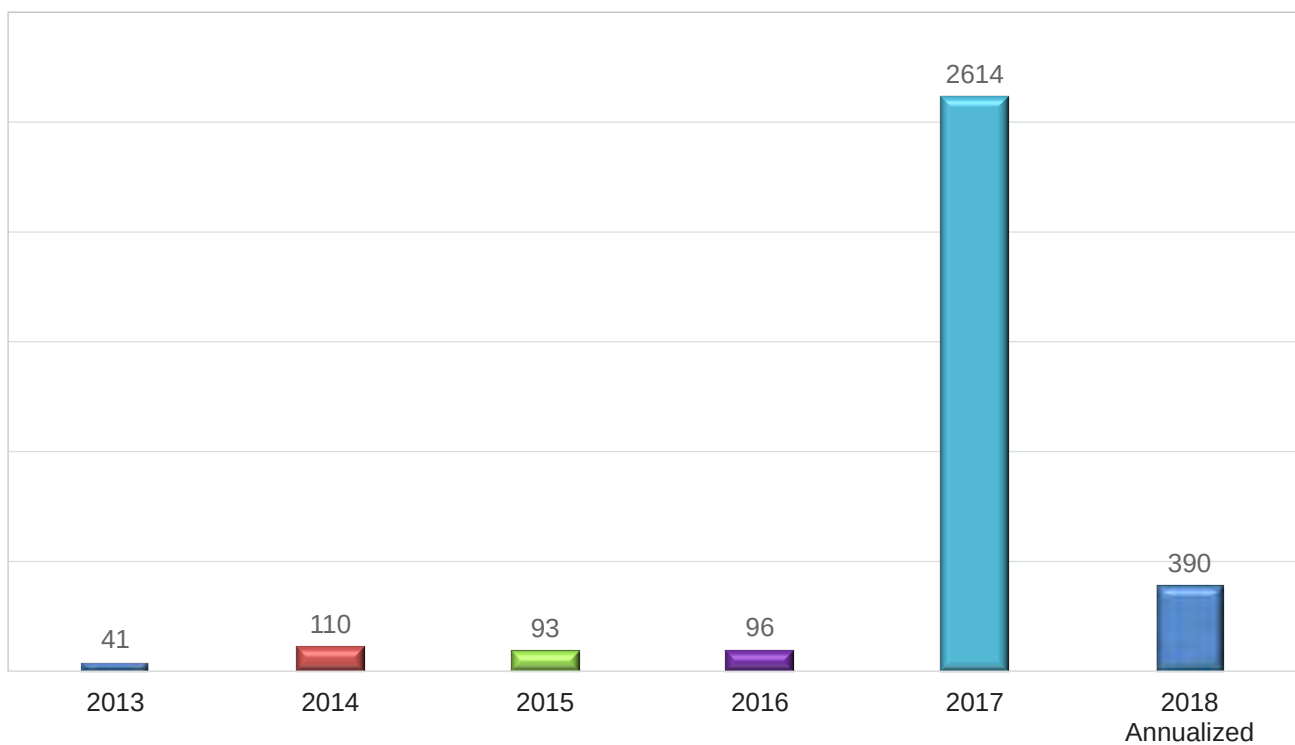
Non-Directed Donor Contacts

Via NKR Donor Intake Platform



Non-Directed Donor Referrals

Referred to NKR Member Centers

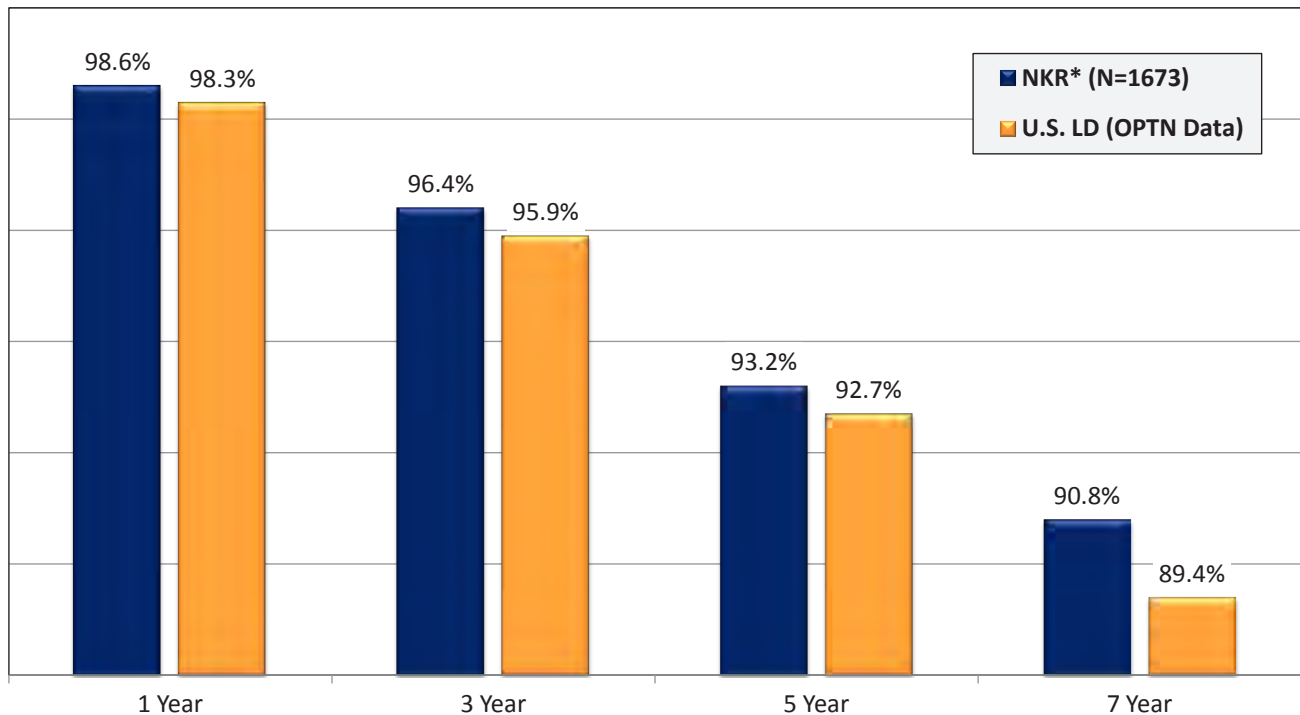


*2017: Donor intake system was re-engineered and the donor certification form was removed

*2018: Pre-workup labs were implemented which screened out candidates not willing to complete 24 hour urine test

NKR Graft Survival Advantage

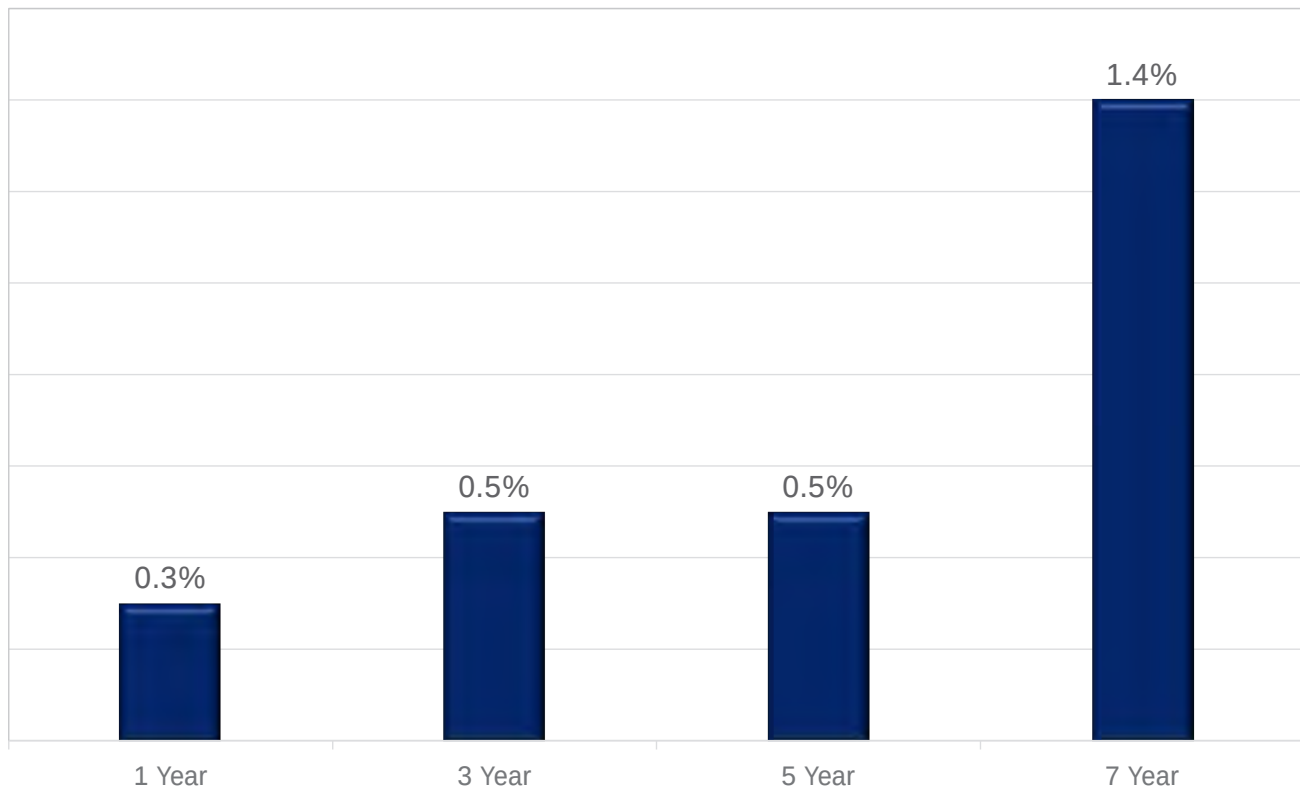
NKR Transplants vs. U.S. Living Donor Transplants (All Cause)
As of 9/30/2017



Provided courtesy of Johns Hopkins University School of Medicine, Department of Surgery
*Not including CHIP patients; Kaplan-Meier GS Rates for Transplants Performed: 02/2008-06/2017 with follow-up through 09/30/2017
<https://www.srtr.org/> SRTR data as of December, 2017

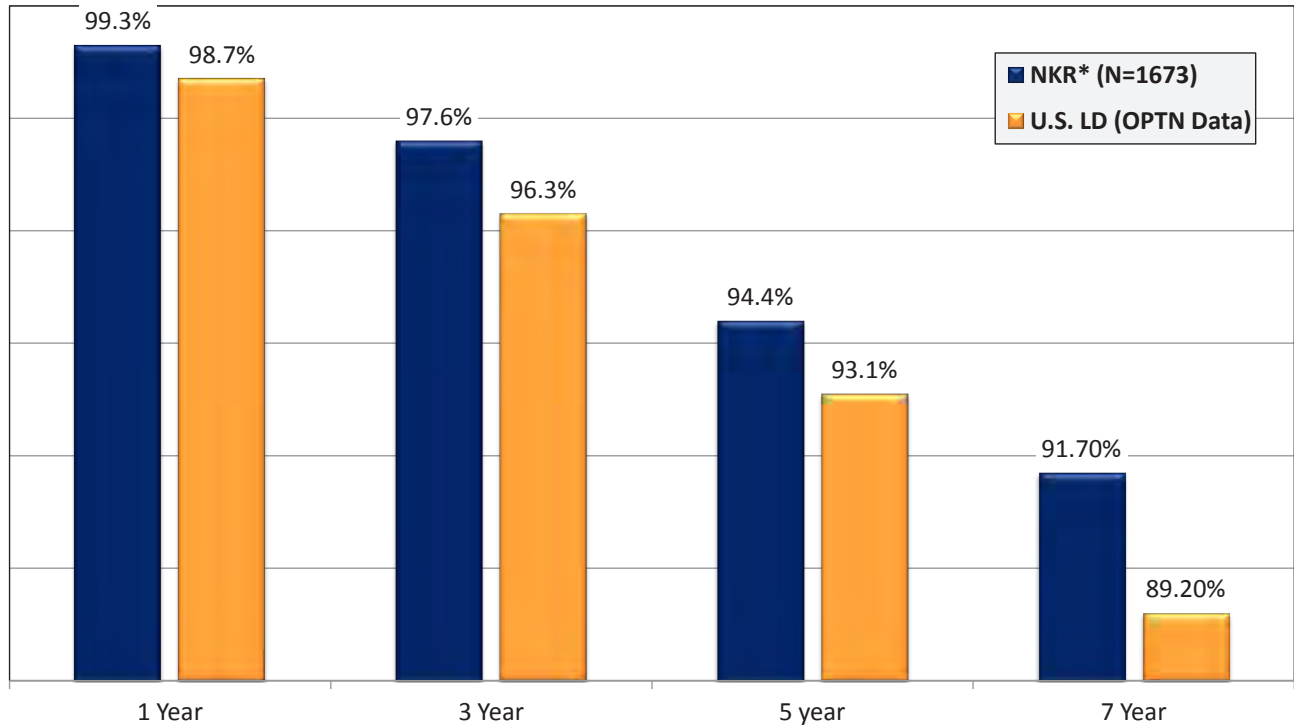
NKR Graft Survival Advantage

NKR Transplants vs. U.S. Living Donor Transplants (All Cause)
As of 9/30/2017



NKR Patient Survival Advantage

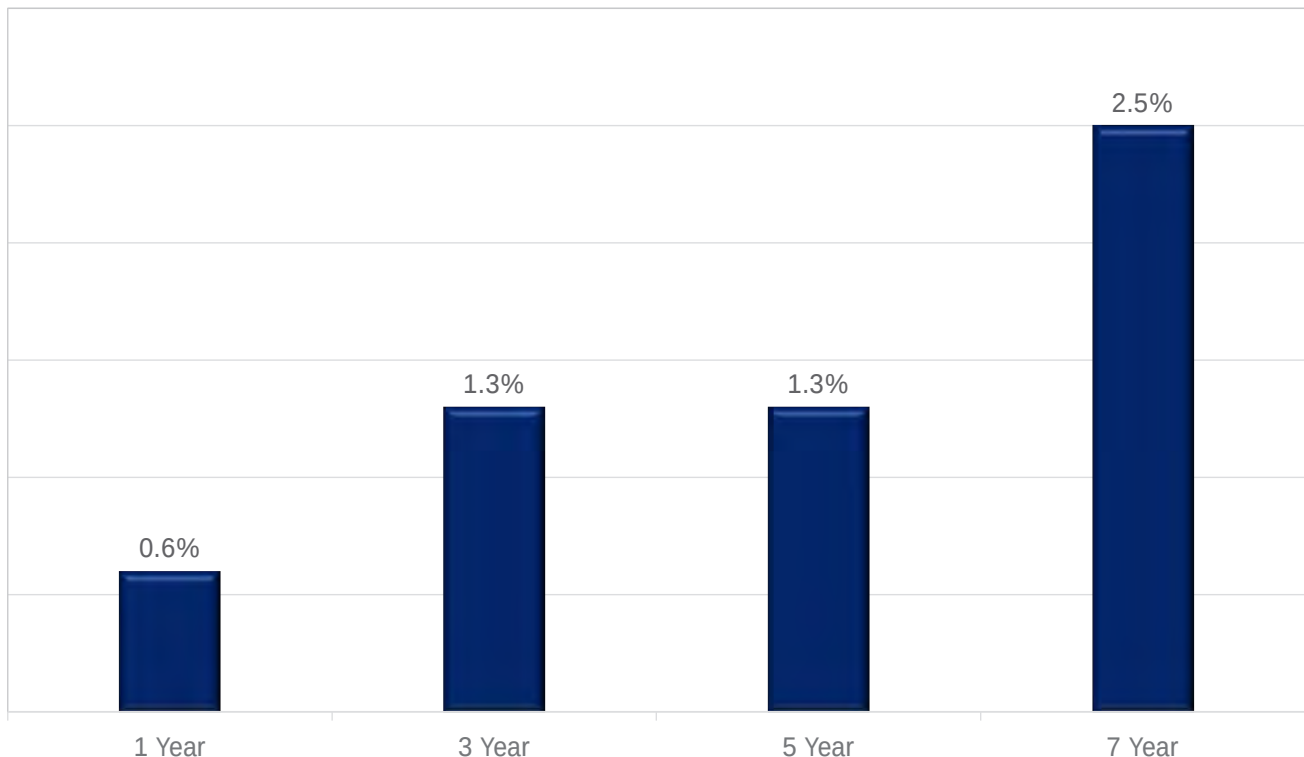
NKR Transplants vs. U.S. Living Donor Transplants (All Cause)
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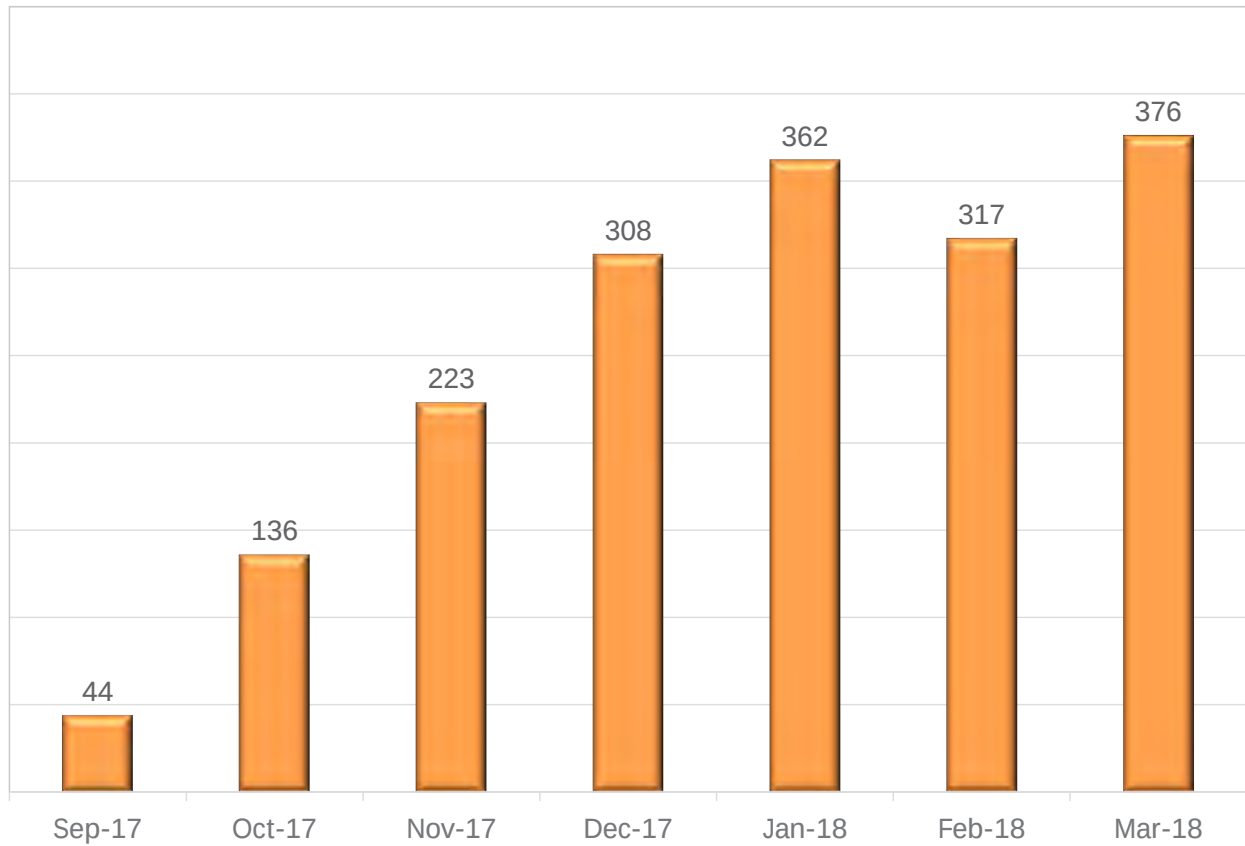
NKR Patient Survival Advantage

NKR Transplants vs. U.S. Living Donor Transplants (All Cause)
As of 9/30/2017



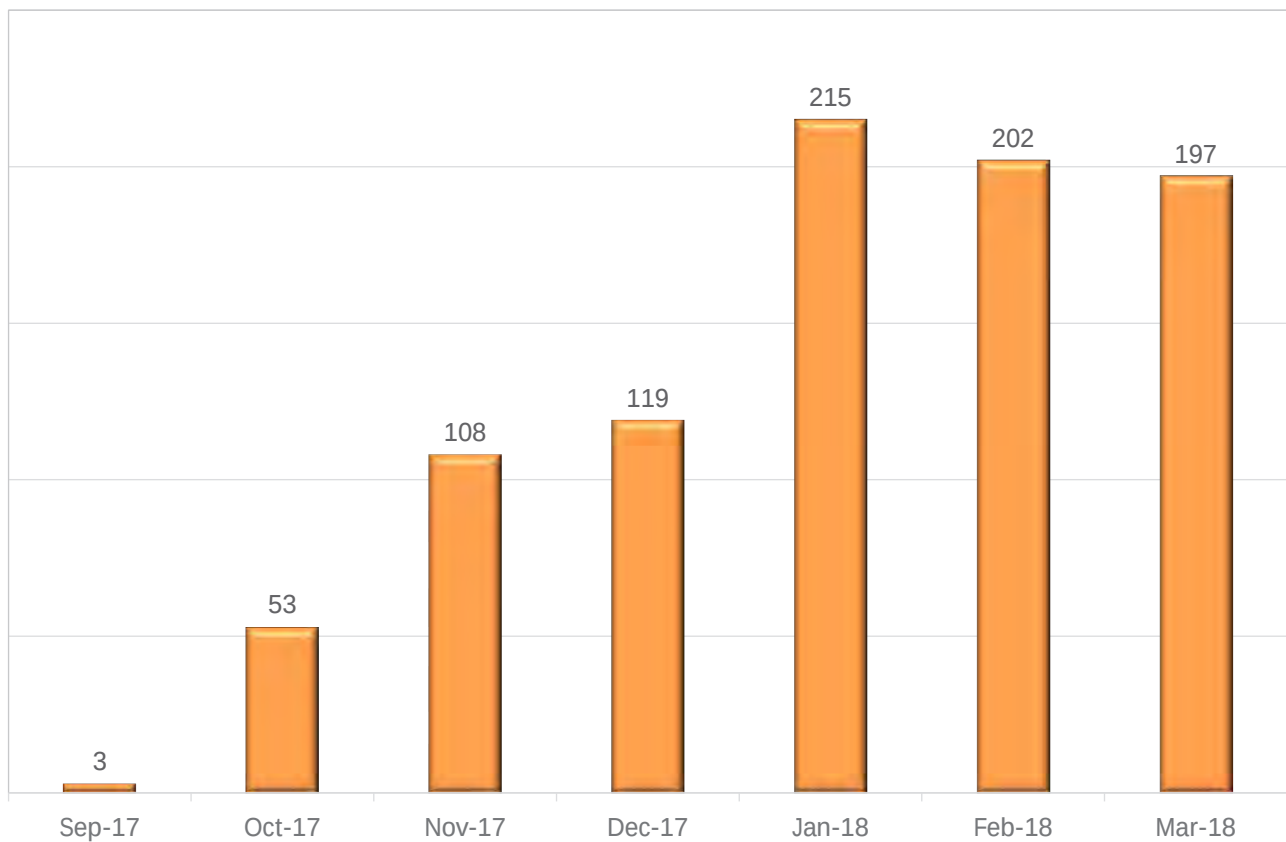
Pre-Workup Labs

24-Hour Urine Jugs Shipped



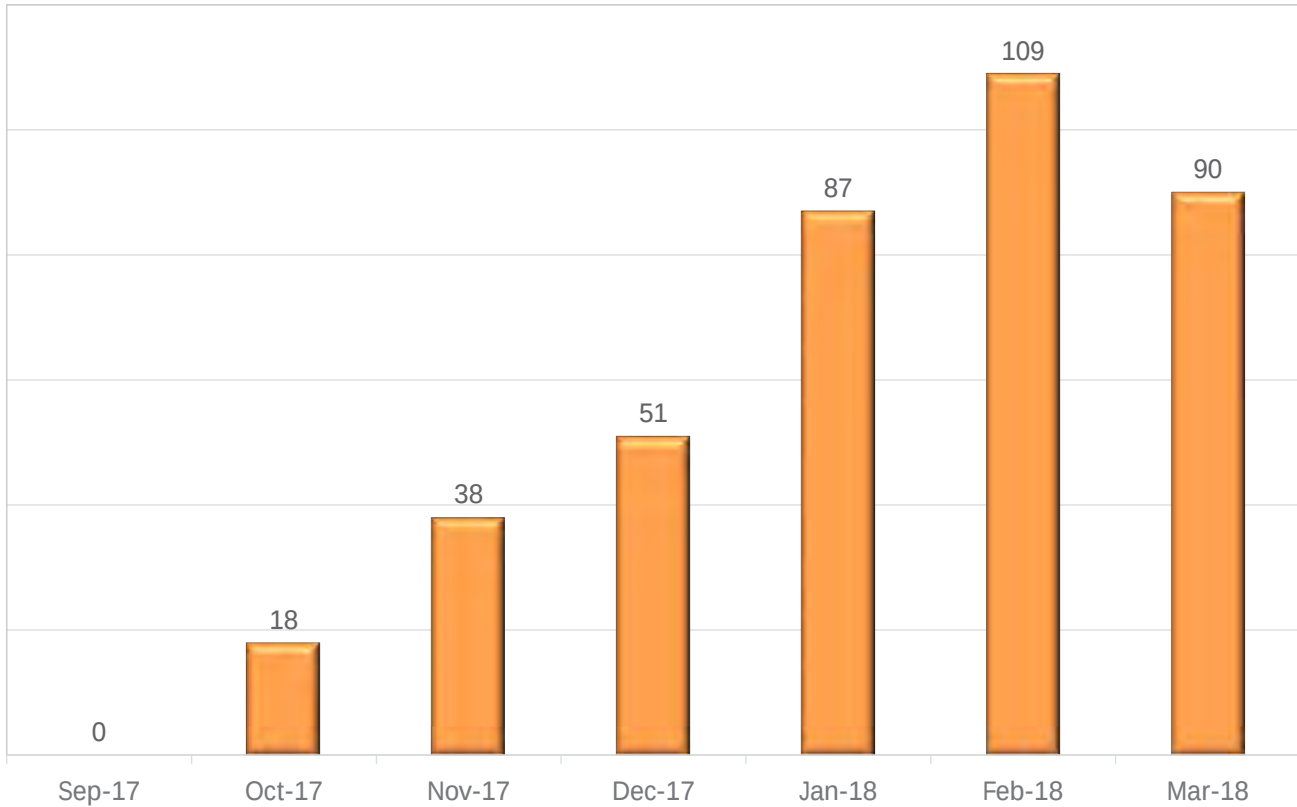
Pre-Workup Labs

Scripts Uploaded



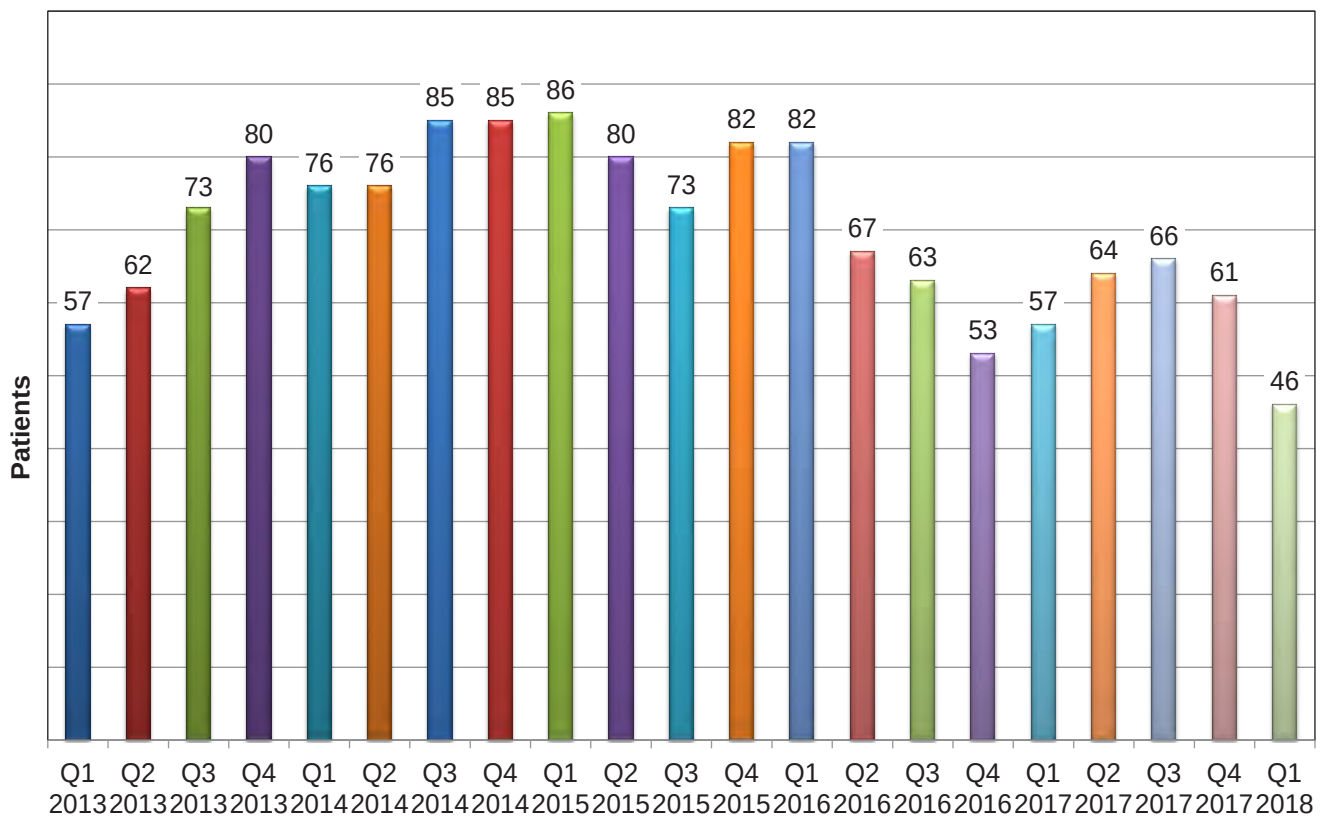
Pre-Workup Labs

Results Uploaded



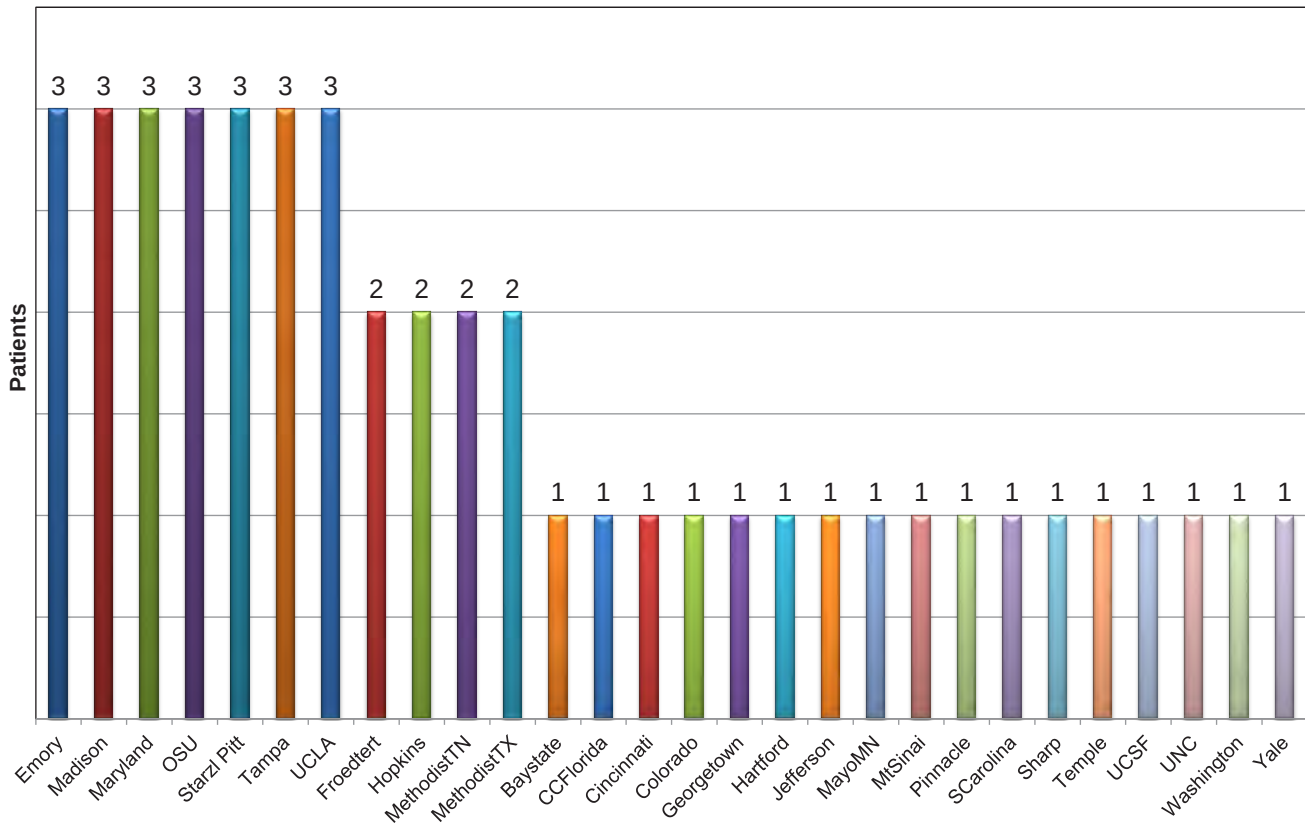
Patients Waiting > 1 Year by Quarter

As of 3/31/2018



Patients Waiting > 1 Year by Center

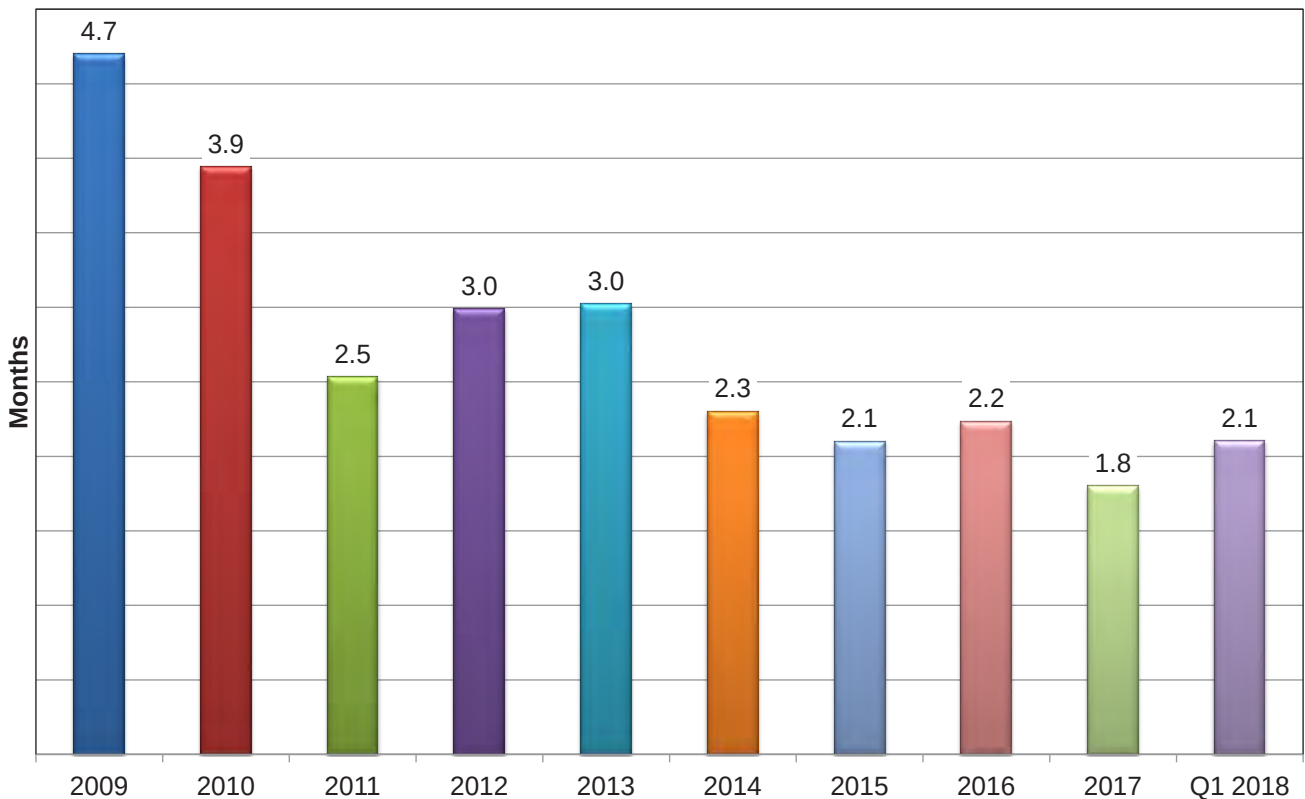
As of 3/31/2018



Transplanted Patient Median Wait Time

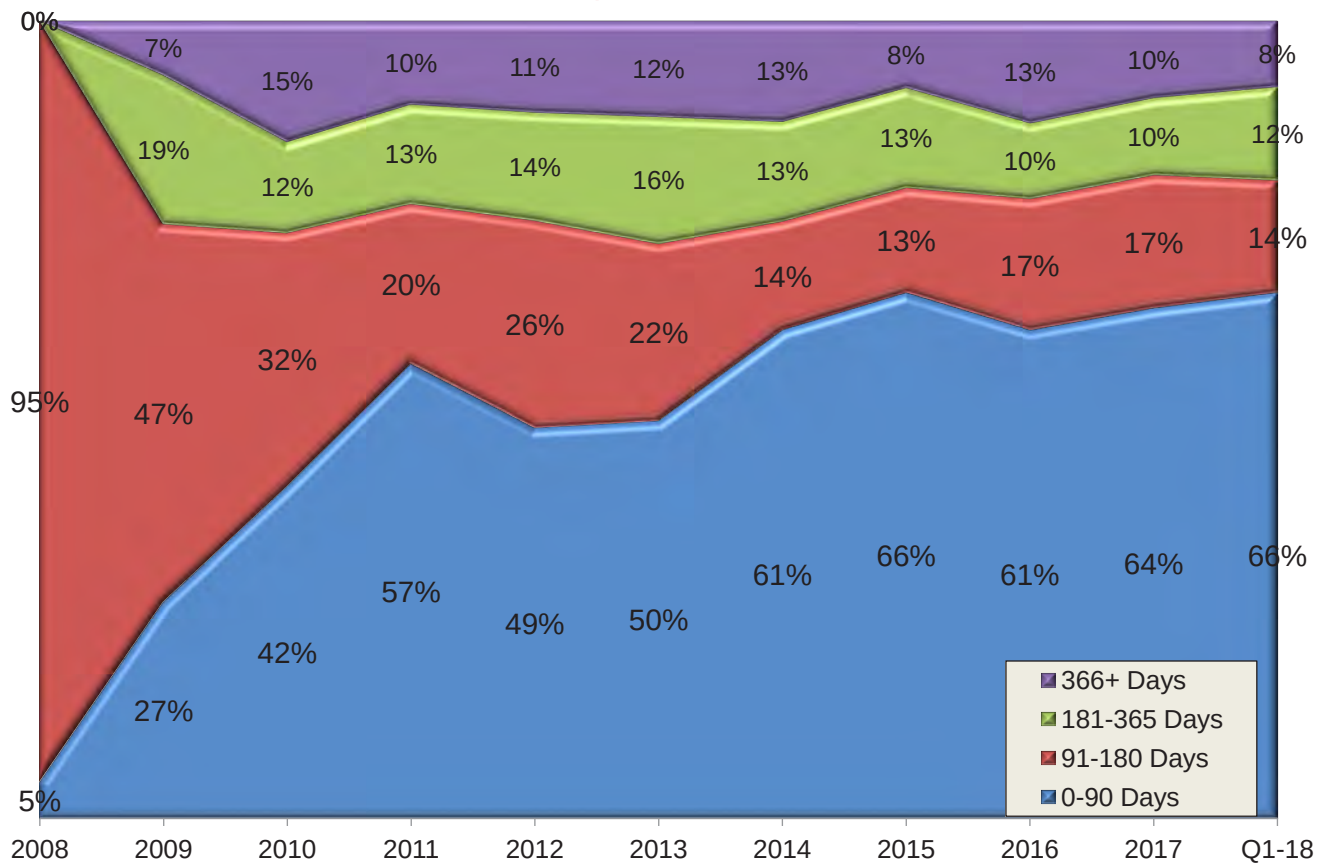
Wait times of patients transplanted during prior 12 months

As of 3/31/2018



Wait Time Distribution

Transplanted Pairs



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	PW64154	O	A	0	49.7	53	48	7	22	-5140
2	R118DE	O	A	0	0.08	38	62	78	17	-18400
3	HIPR	O	A	0	0	70	69	109	16	-41300
4	JZ0126	O	B	0	0	49	52	4	15	-790
5	TB9421	O	A	0	81.63	49	48	4	14	-5140
6	BSMCWA	O	A	0	0	67	66	113	14	-2630
7	2002087531	O	AB	0	13.83	75	43	66	13	-2060
8	RFLCC07	O	AB	0	0	52	44	109	13	-14040

*As of 4/20/18

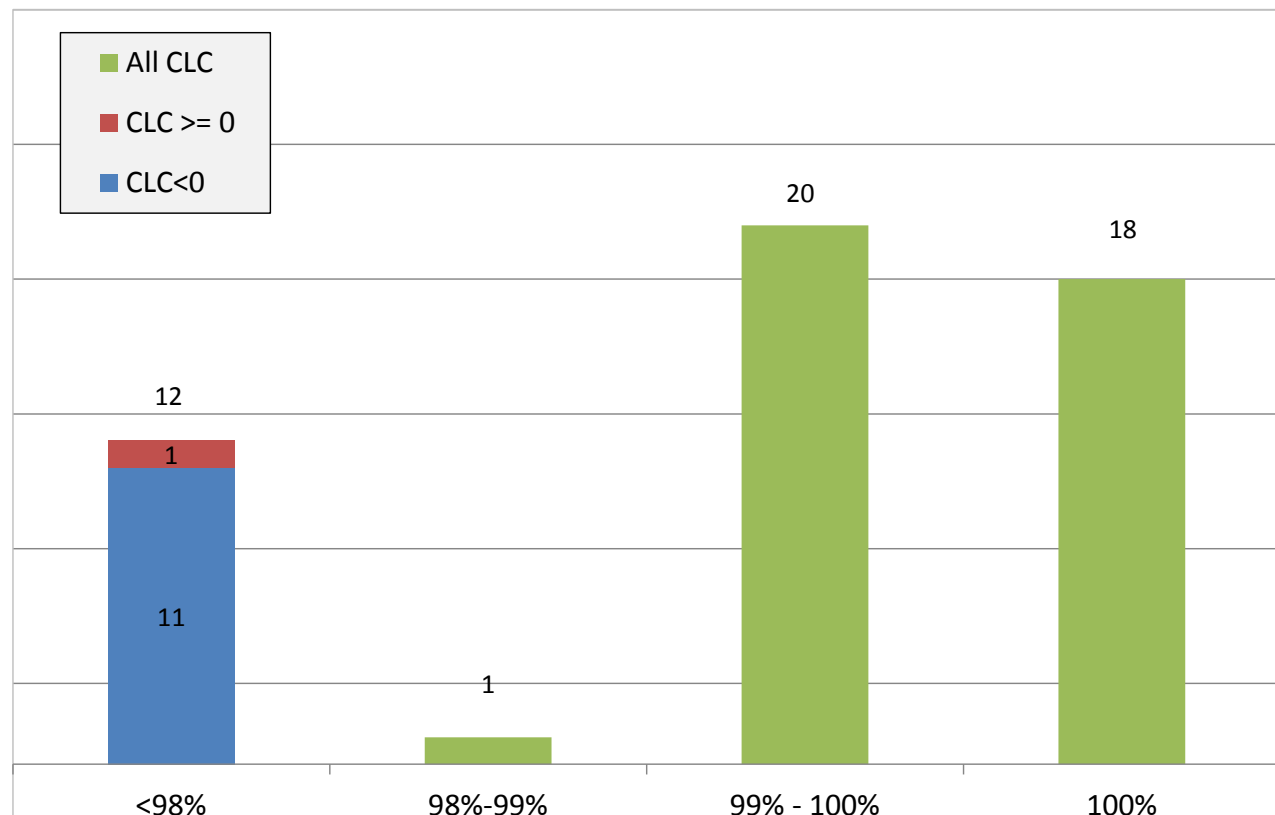
Pairs waiting >1 year Due to High cPRA

#	R Alias	R ABO	D ABO	MHP	cPRA4	R Age	D Age	PMPc	Wait (Months)
1	SMIT93	A	A	0	100	24	50	0	66
2	STORB	O	A	0	100	61	66	0	64
3	MAB1402991	AB	B B O	0	100	14	50 37 50	0	58
4	NL2157	O	A	0	100	68	35	0	56
5	JFOR468	O	B	0	100	63	64	0	39
6	FD809142R	O	A	0	100	16	48	0	29
7	CISJEN	A	A	25	100	33	35	0	26
8	JF61593	A	O	0	100	50	35	0	25
9	R3148	A	AB	0	100	39	34	0	24
10	SS11376266	A	A	10	100	63	39	0	24
11	DM8150868	A	A	0	100	30	28	0	23
12	RUMOR	A	A	25	100	54	27	0	22
13	EBKPR	A	O	0	100	36	26	0	20
14	RG624929	O	AB	0	100	33	51	0	18
15	EGUE357	O	O	0	100	62	36	0	17
16	STESCA	B	B	6	100	44	41	0	16
17	SCHNALRE	O	O	0	100	54	54	0	15
18	DEKEDRE	O	O	0	100	47	35	0	14
19	KM7491184	B	O	0	100	43	48	0	13
20	JJ1978	B	O O	0	99.97	39	47 36	0	56
21	GM8784	B	O	0	99.97	23	31	0	31
22	J36760809G	O	O	50	99.97	37	27	0	25
23	J24548992N	B	O	50	99.95	39	37	0	33
24	R303348	B	AB	0	99.95	58	41	0	31
25	BURCHD77	B	B B	0	99.95	40	44 38	0	30
26	UC06142609	O	O	0	99.95	66	49	0	19
27	R5438	O	O	0	99.95	63	36	0	19
28	JS966563	O	O	0	99.92	38	52	0	15
29	MP14561160	O	O	0	99.89	48	43	0	21
30	BC1946	O	A	0	99.87	71	44	0	71
31	RS537425	B	A	0	99.81	55	52	0	15
32	LCL2183933	O	O O	0	99.79	23	57 34	0	24
33	AD0043	O	O	0	99.74	50	53	0	41
34	KHBHR	A	O	0	99.68	66	39	0	23
35	HAERROS76	O	A	0	99.63	41	67	4	18
36	WDUR980	A	AB	0	99.39	48	55	0	15
37	SMHCOL	O	A	0	98.52	22	55	0	29
38	BD02081975	B	AB	0	97.17	42	50	0	13

*As of 4/20/18

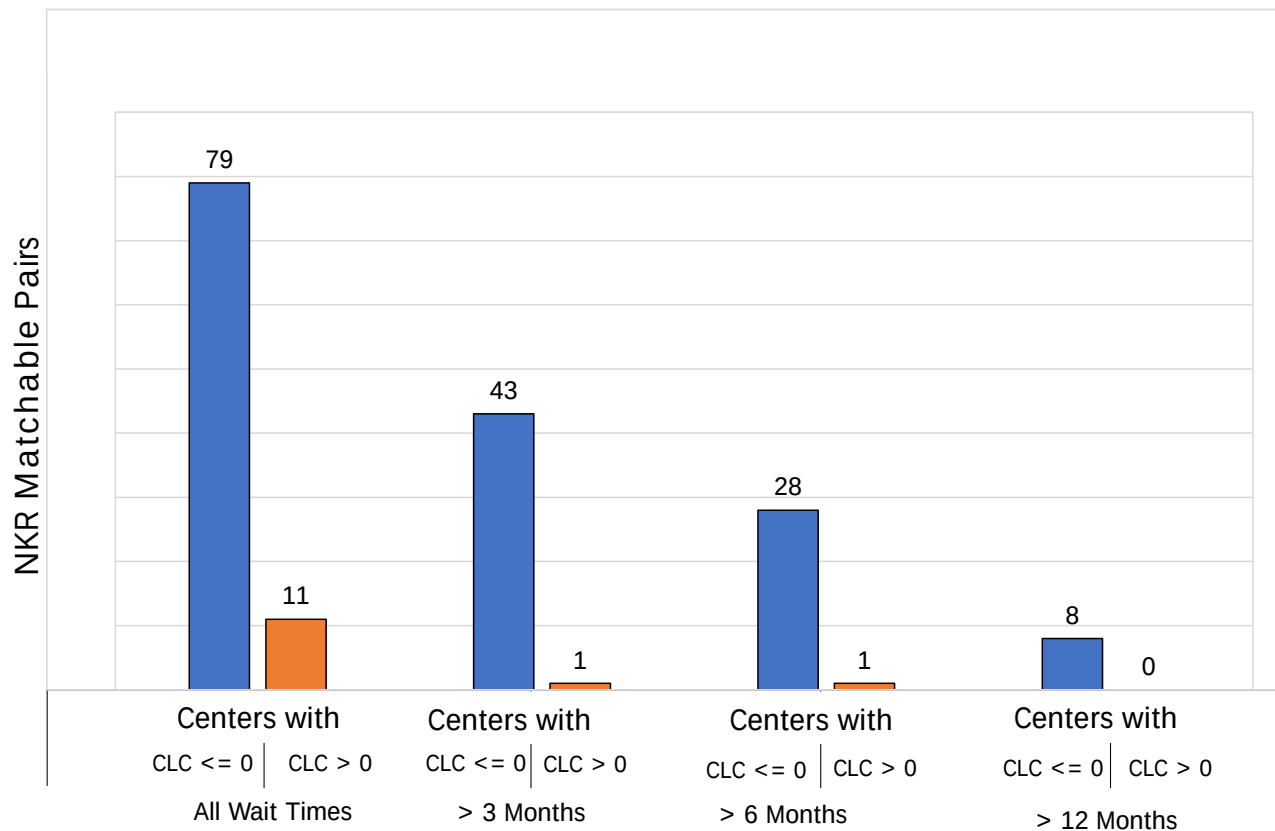
Unmatched Target Pairs

Waiting more than 12 Months



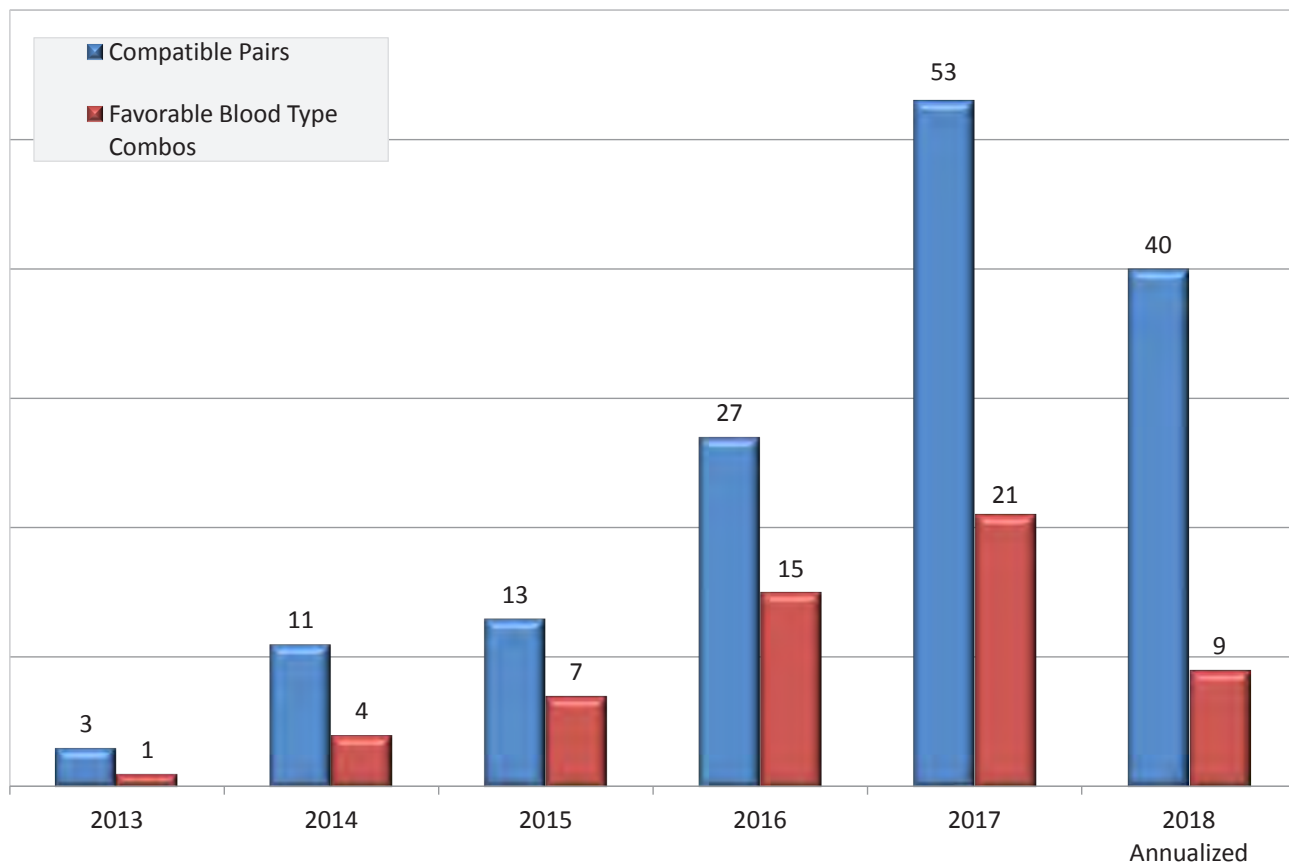
*As of 4/5, 3:40pm

Pair Wait Time Analysis



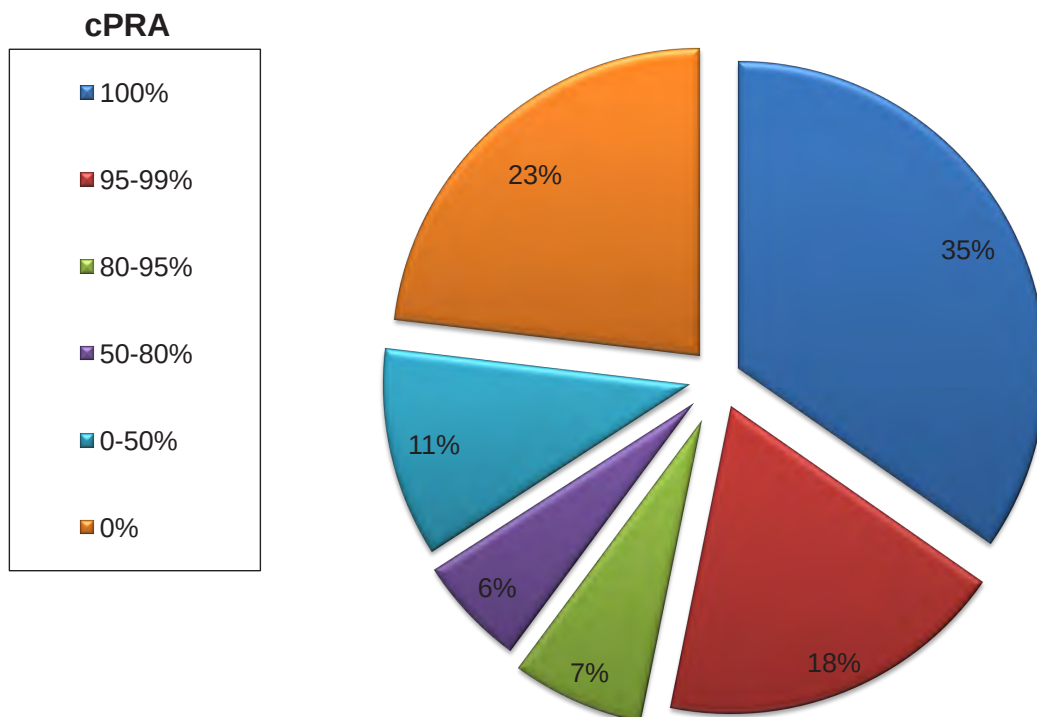
*As of 4/5, 3:55p m

Compatible Pairs Transplanted

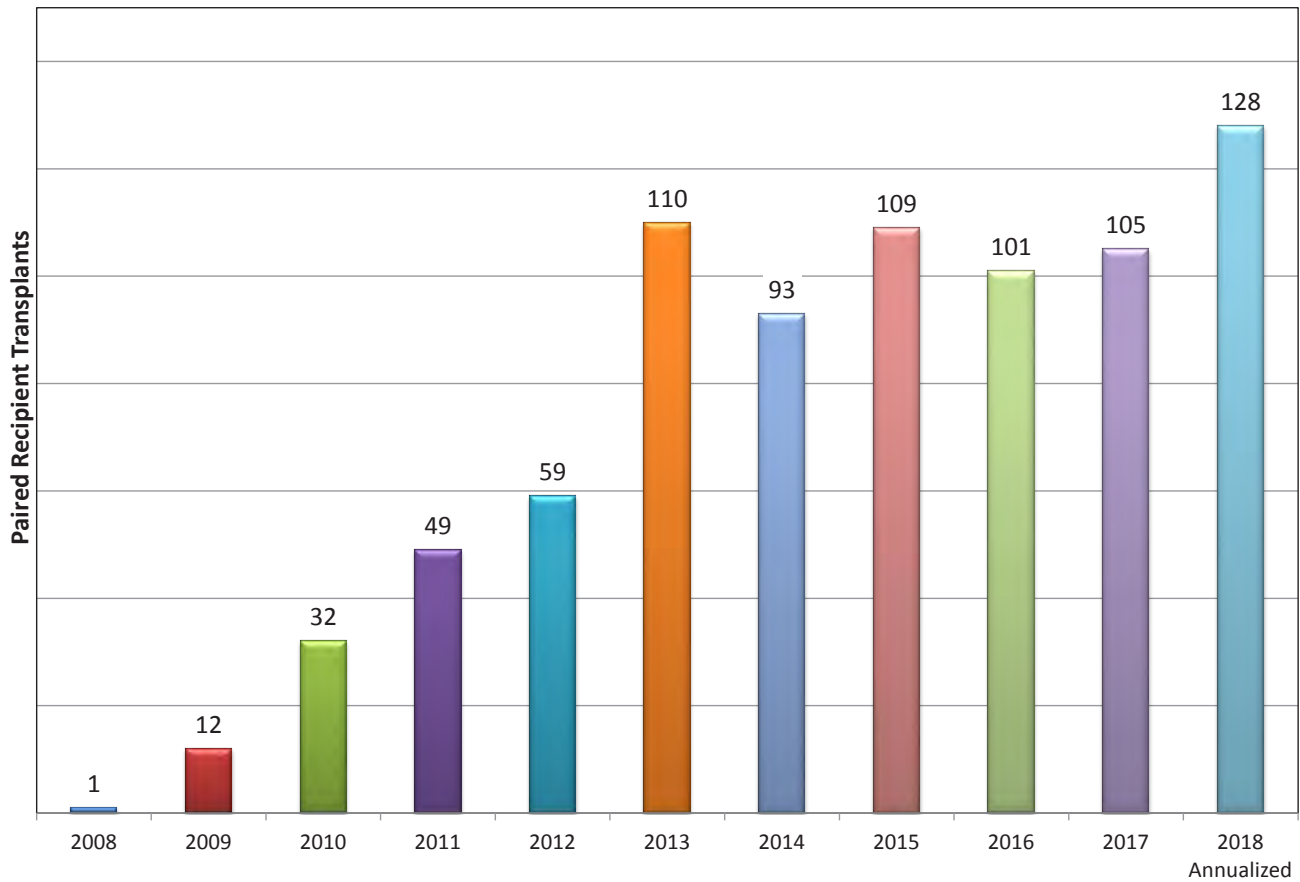


Pool Composition by cPRA

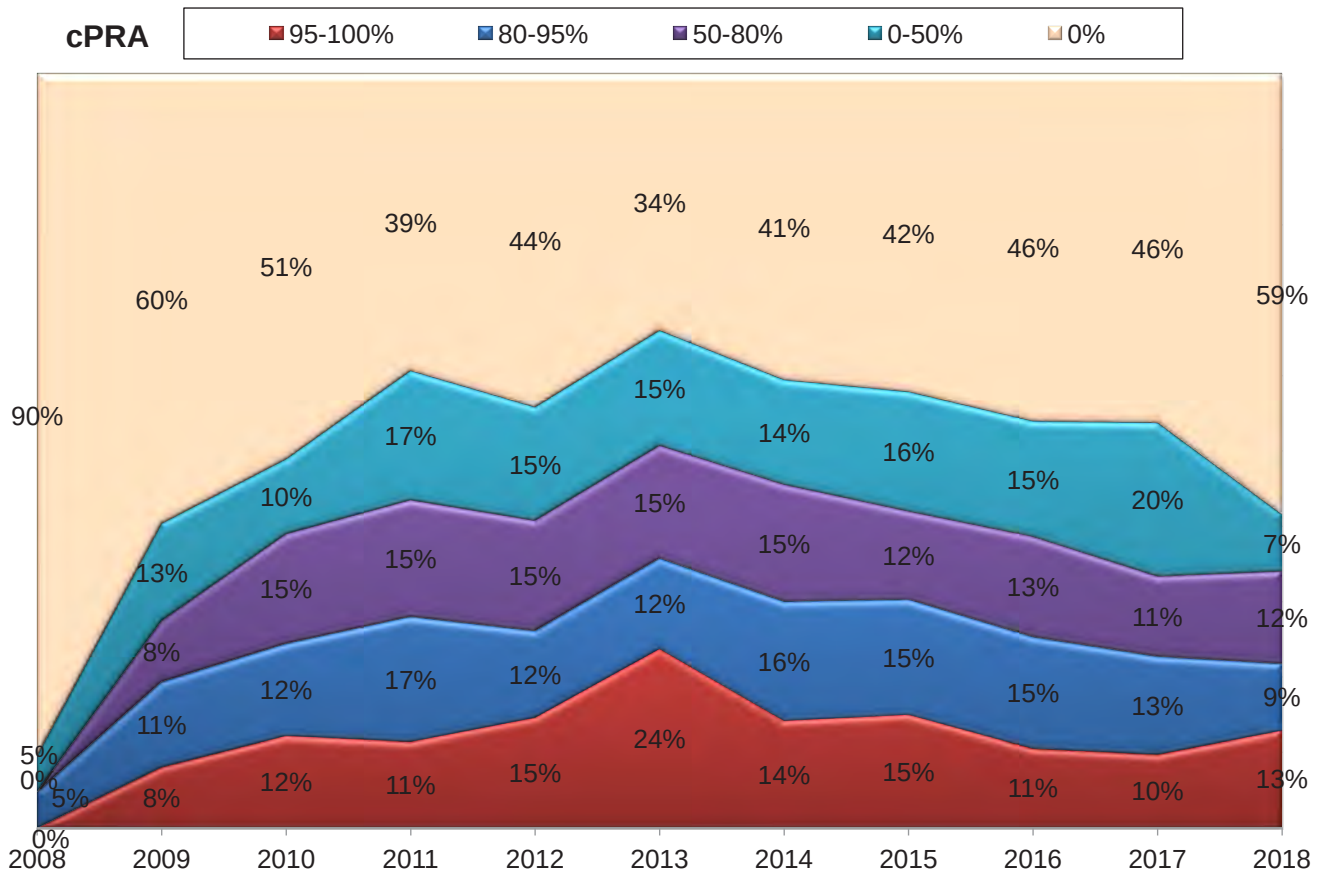
As of 3/31/2018



Transplanted Patients with cPRA > 80%



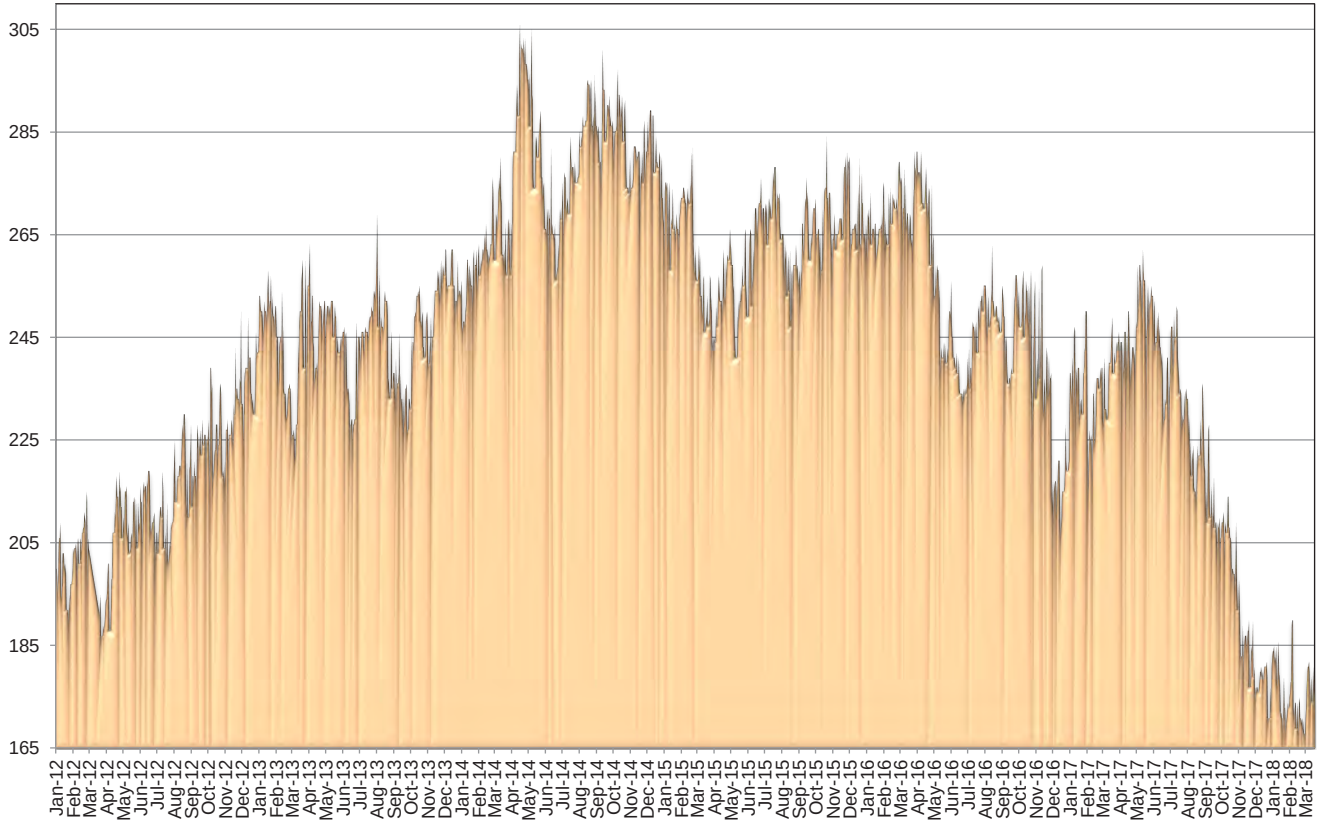
Transplanted Patients by cPRA



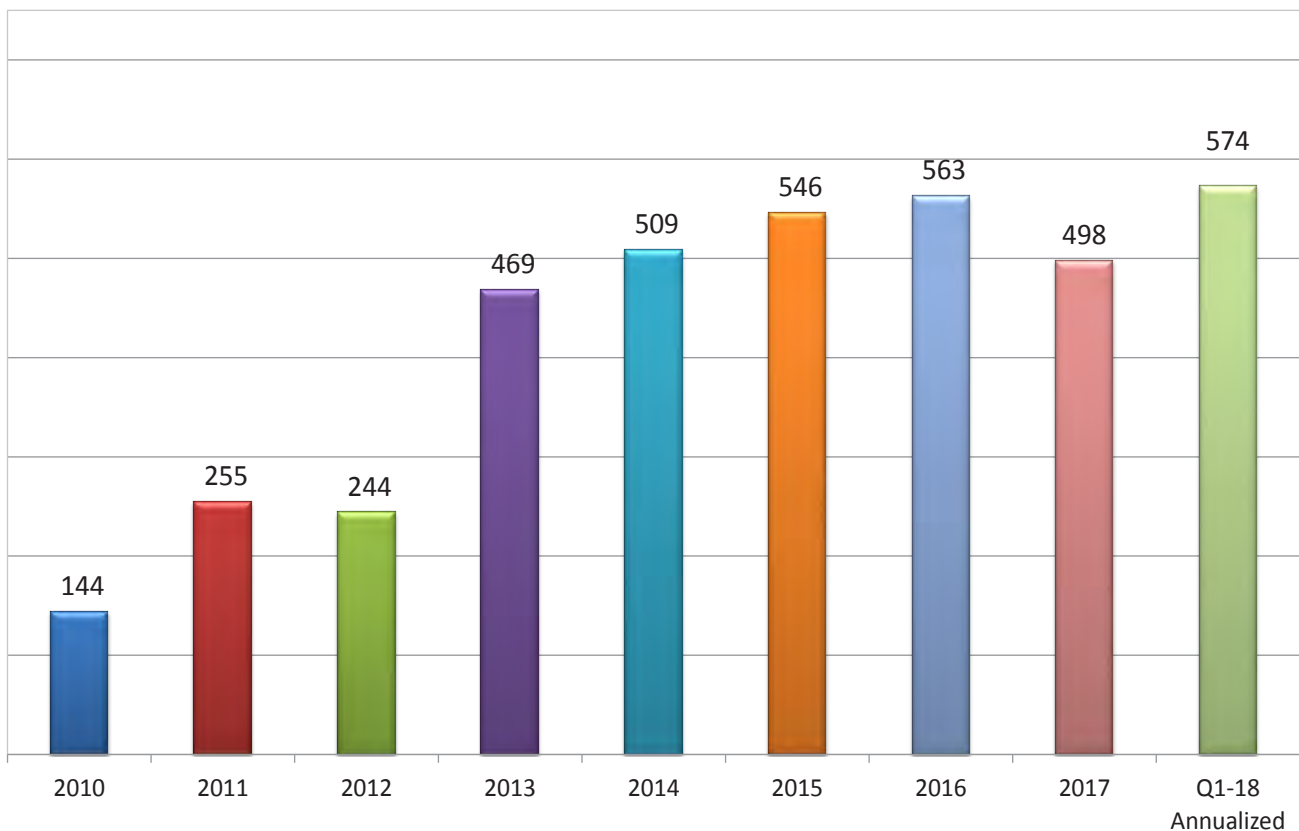
Pool Size

Unmatched Patients by Day

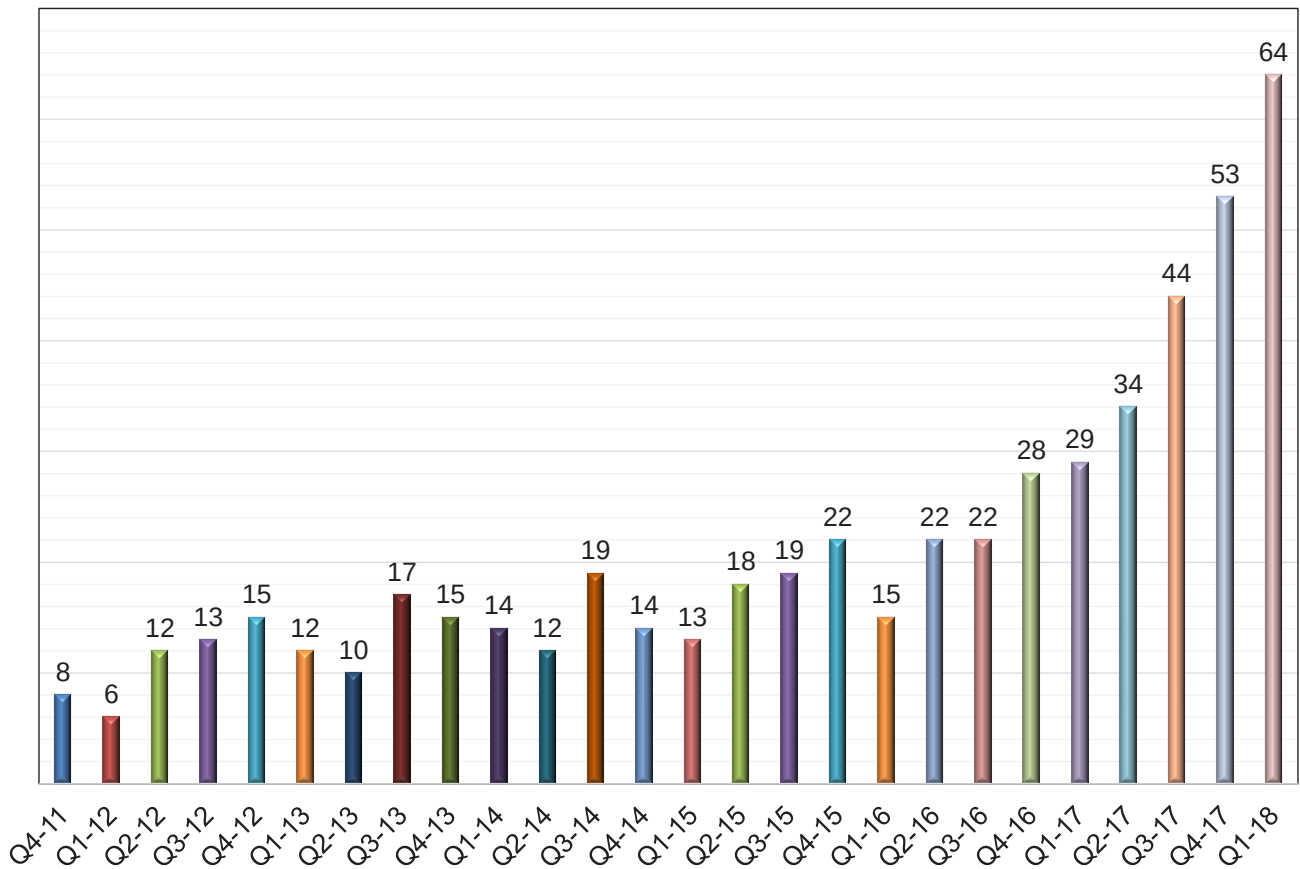
1/14/2012 – 3/31/2018



New Exportable Pairs



Chains Started



Chain and Loop Statistics

Category	Count	Mean Length	Transplants
Ended	591	3.87	2287
Broken	24	4.12	99
Active	2	2.50	5
Chain Total	617	3.88	2394
Loops	105	2.33	245
Total	722	3.65	2636

**Updates as of 4/19/18

Great HLA Matches

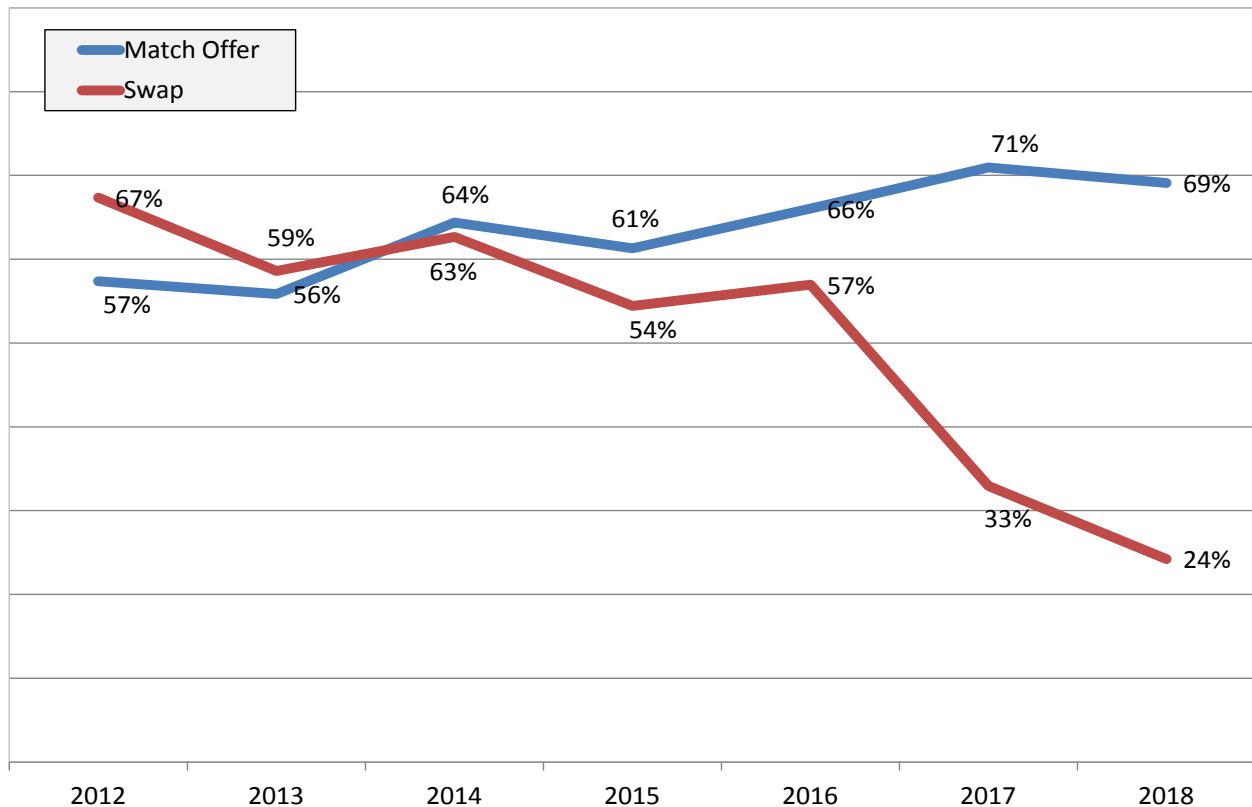
Zero Mismatch

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	Penn	1227	2/14/2018	O	O	7	3	58	26	100
2	Walter Reed	1203	2/8/2018	A	AB	100	5	61	40	100
3	Maine	1157	1/3/2018	A	A	100	9	54	52	100
4	Hartford	1191	1/3/2018	O	O	0	9	46	59	100
5	Hopkins	1019	6/1/2017	A	AB	0	2	40	55	100
6	Brigham	1026	5/24/2017	A	A	95	2	58	33	100
7	ChristHosp	952	1/18/2017	A	A	99	1	57	34	100
8	UMinn	928	11/8/2016	A	A	100	4	66	12	100
9	Cincinnati	884	8/31/2016	A	A	73	1	28	40	100
10	OSU	509	8/30/2016	A	A	91	1	38	67	100
11	SCarolina	459	2/11/2016	A	A	100	3	64	53	100
12	Madison	442	12/22/2015	A	A	97	6	22	63	100
13	UMinn	440	11/19/2015	O	O	100	5	23	20	100
14	UCLA	357	2/17/2015	A	A	100	34	39	52	100
15	Emory	351	12/11/2014	A	A	100	5	25	33	100
16	Hopkins	330	11/13/2014	A	O	96	1	41	38	100
17	Loyola	324	8/5/2014	A	A	100	1	37	55	100
18	Madison	674	1/9/2014	O	A	99	5	29	33	100
19	Barnabas	182	10/3/2012	A	A	92	4	51	50	100
20	Barnes	105	3/31/2011	A	A	100	7	60	32	100
21	UCSF	58	6/15/2010	A	A	100	6	47	58	100

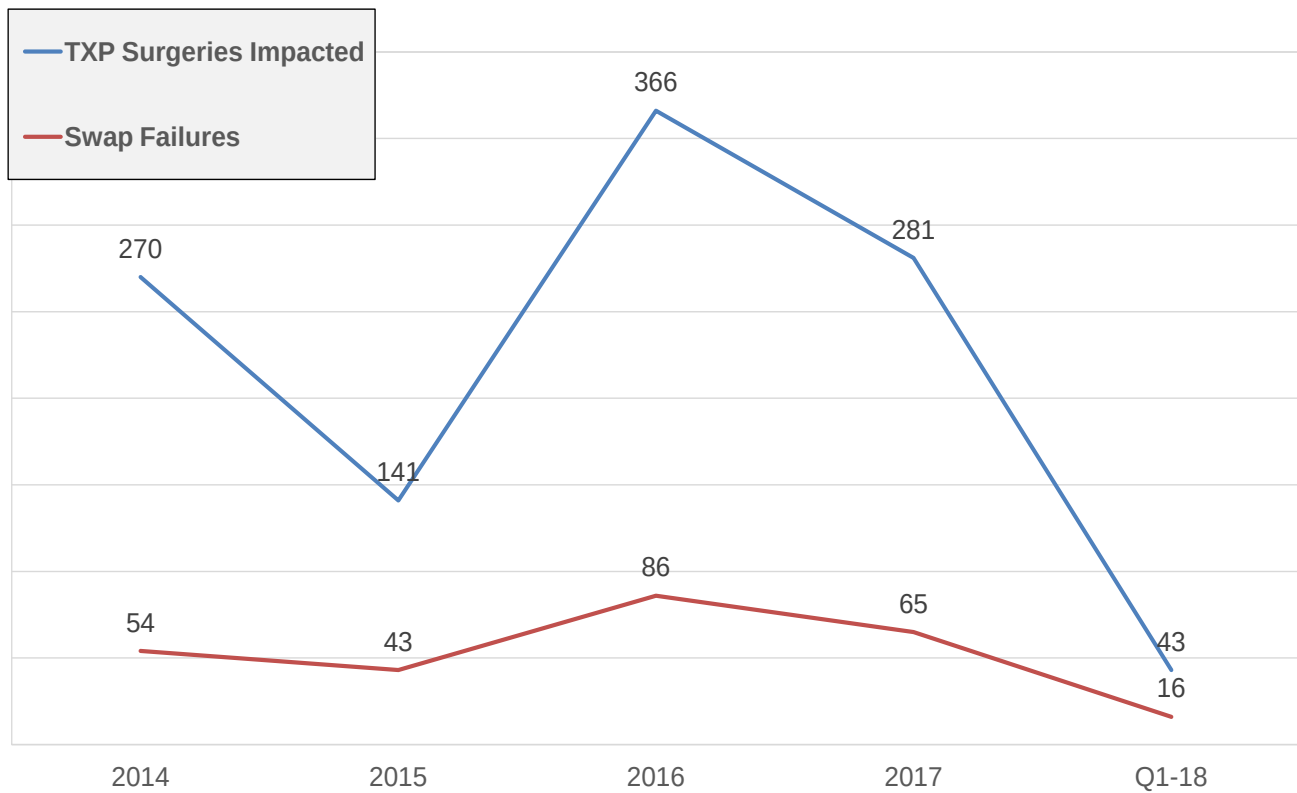
Failure Rates

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

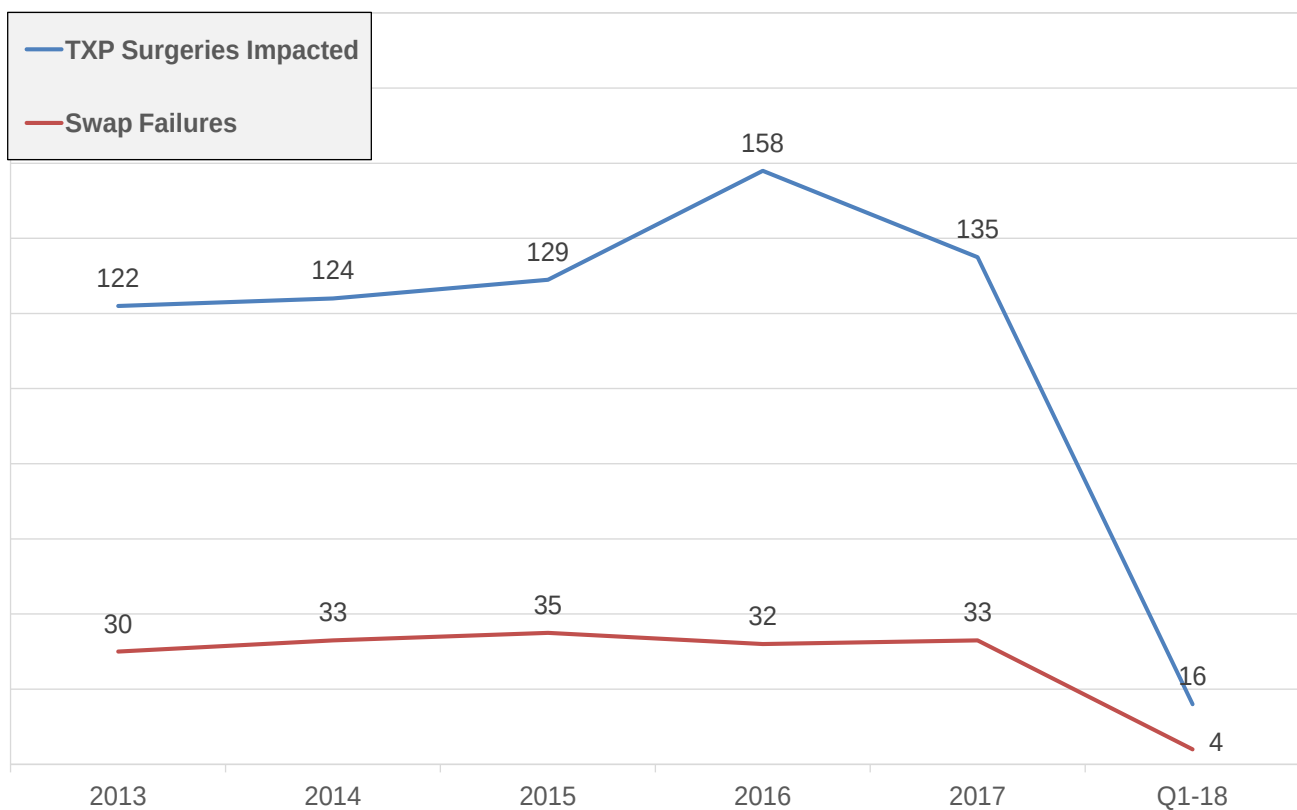
Swap Rate = $1 - (TXP/XM)$



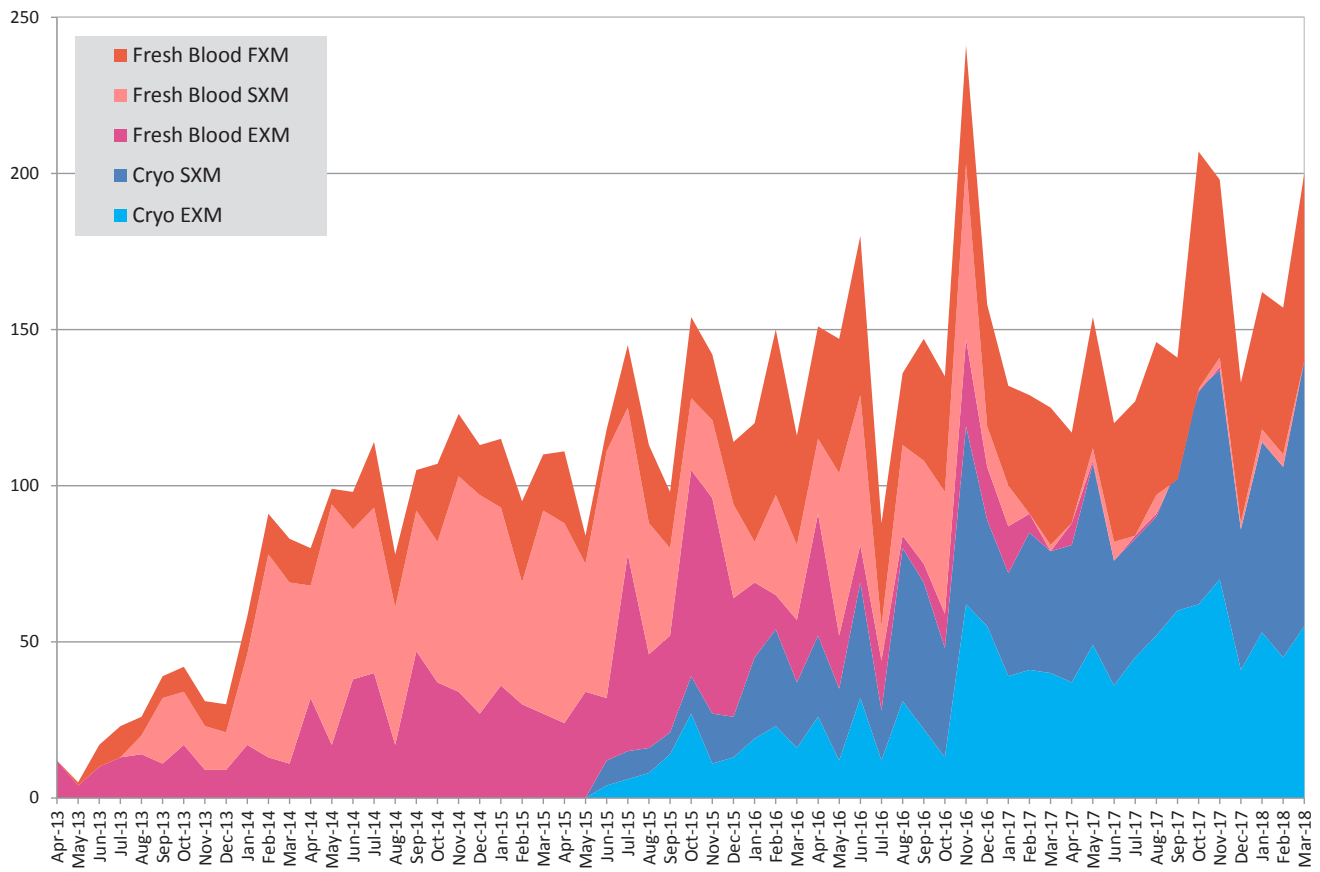
Non-XM Swap Failures & TXP Surgeries Impacted



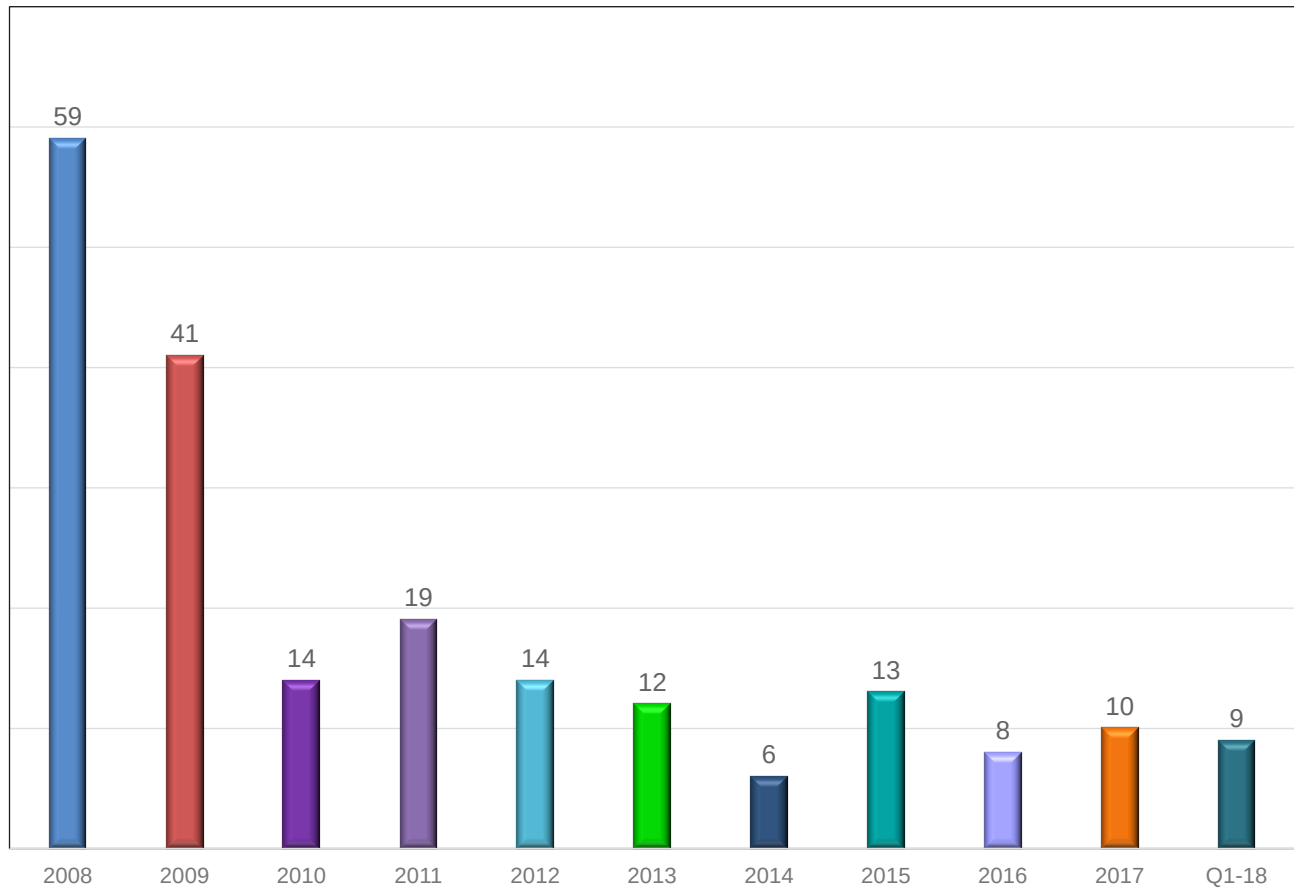
XM Swap Failures & TXP Surgeries Impacted



Streamlined XMs Requested



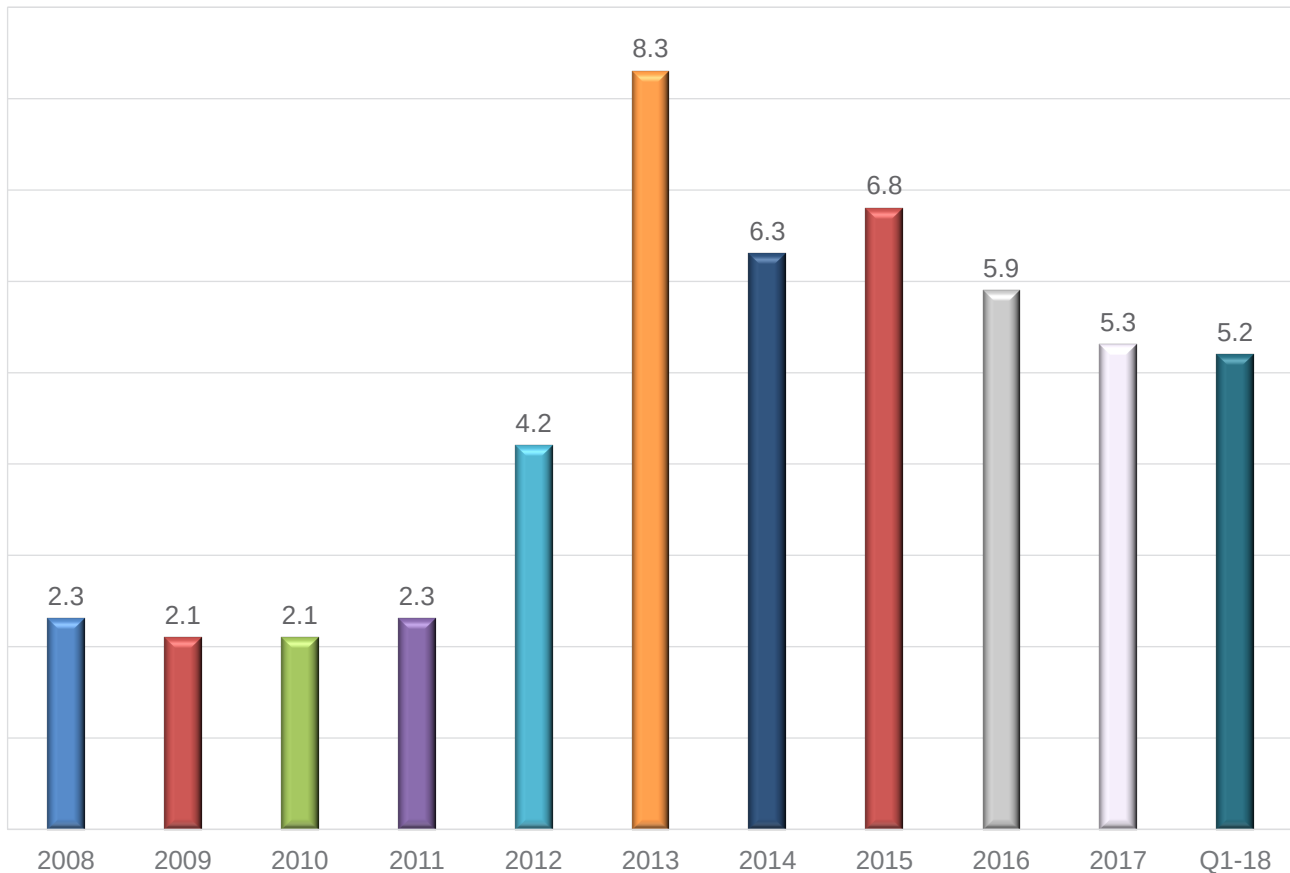
Bridge Donor Median Wait Times in Days



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
2017	10	16	114	2
Q1-18	9	12	44	2

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	1	3%
2017	62	1	3	5%
2018	20	0	0	0%
Total	507	9	23	

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
25	Donor Ruled Out- Medical Issue		✓	UMinn	8/23/2017
	Total	9	23		

Advanced Donation Program (ADP)

Summary

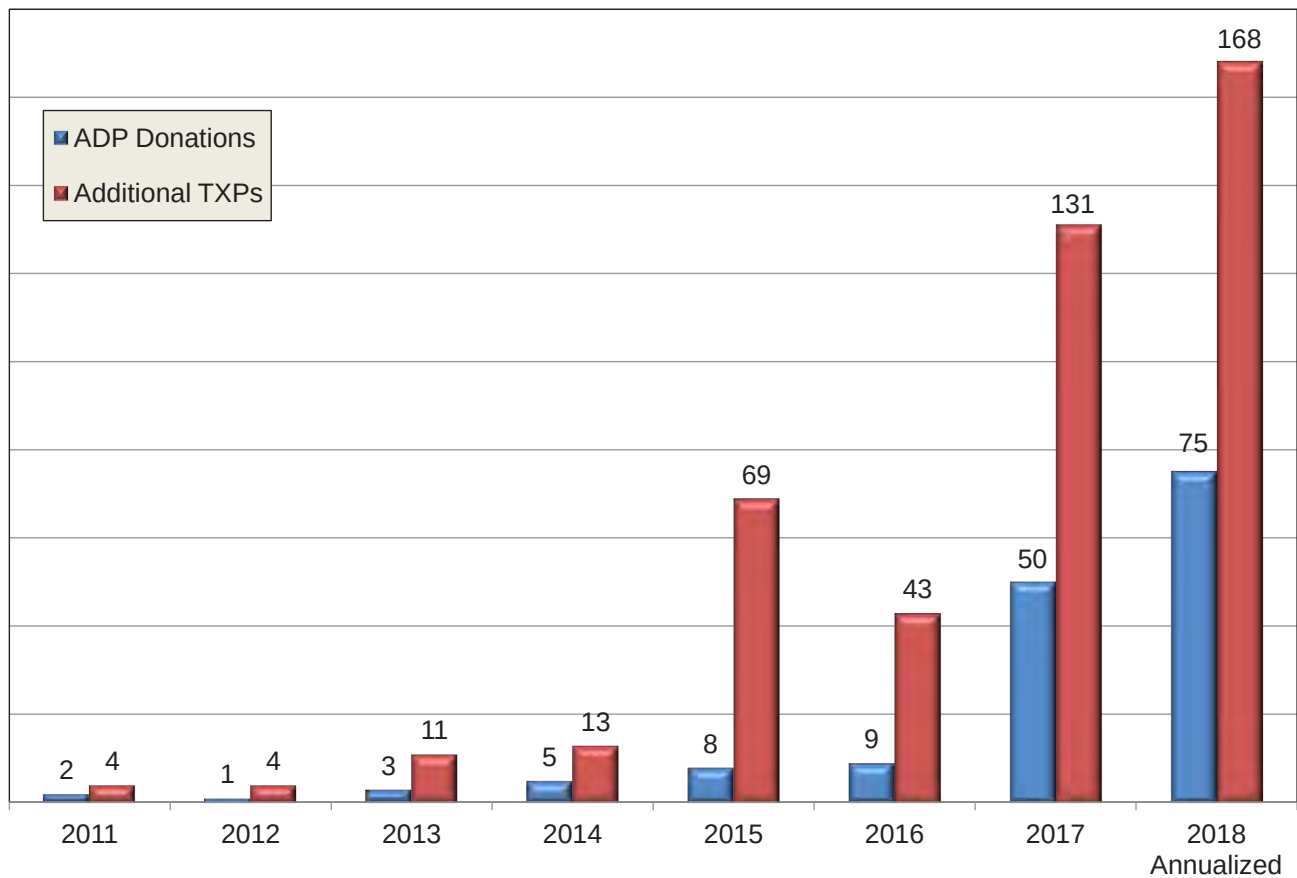
As of 3/31/2018

Type	Cases	Add'l TXPs Facilitated	80 % + cPRA TXPs Facilitated	95 % + cPRA TXPs Facilitated
Short-Term*	74	247	78	40
Voucher**	29	83	13	6
Total	103	331	91	46

*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.

ADP Donations & Additional TXPs Facilitated

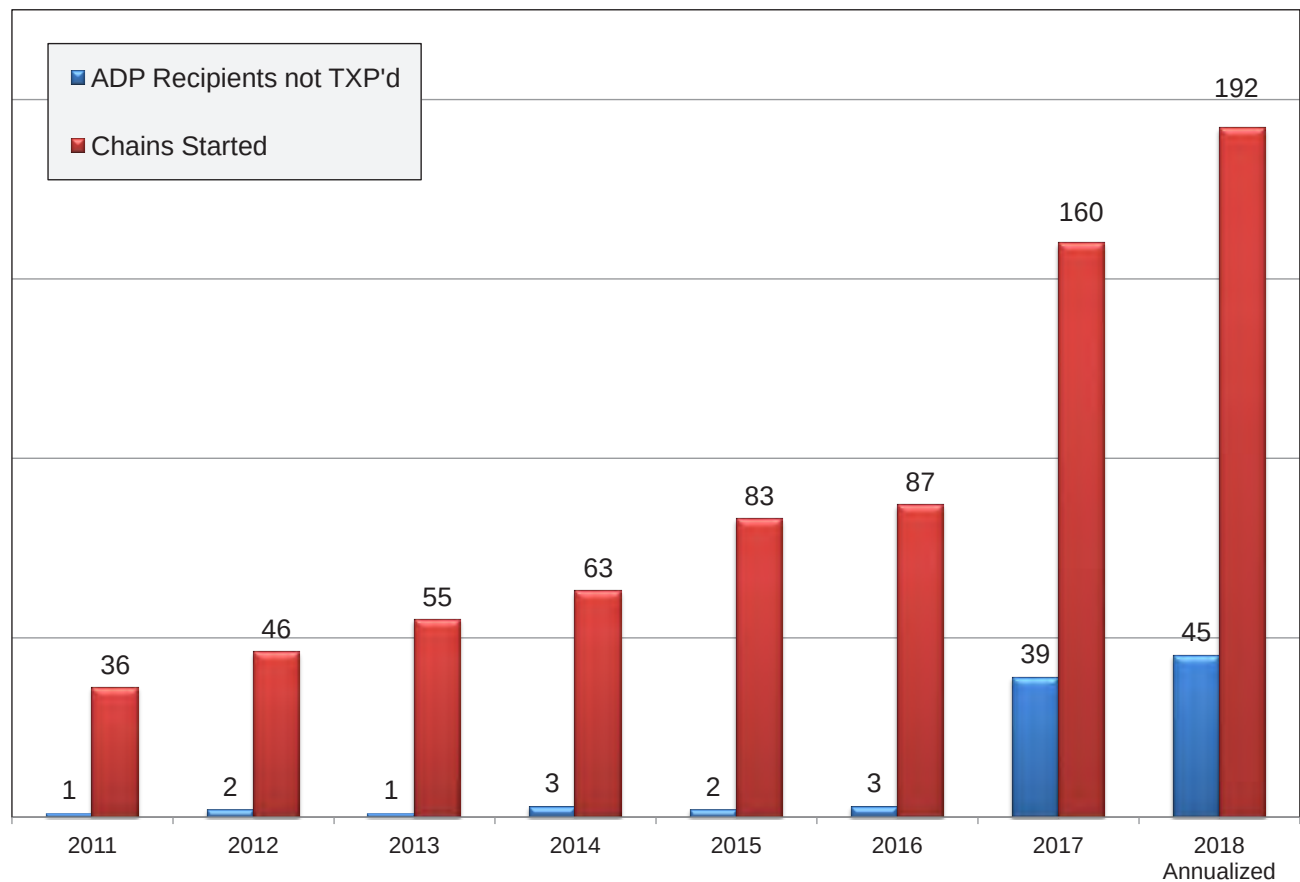


ADP Recipient Pool



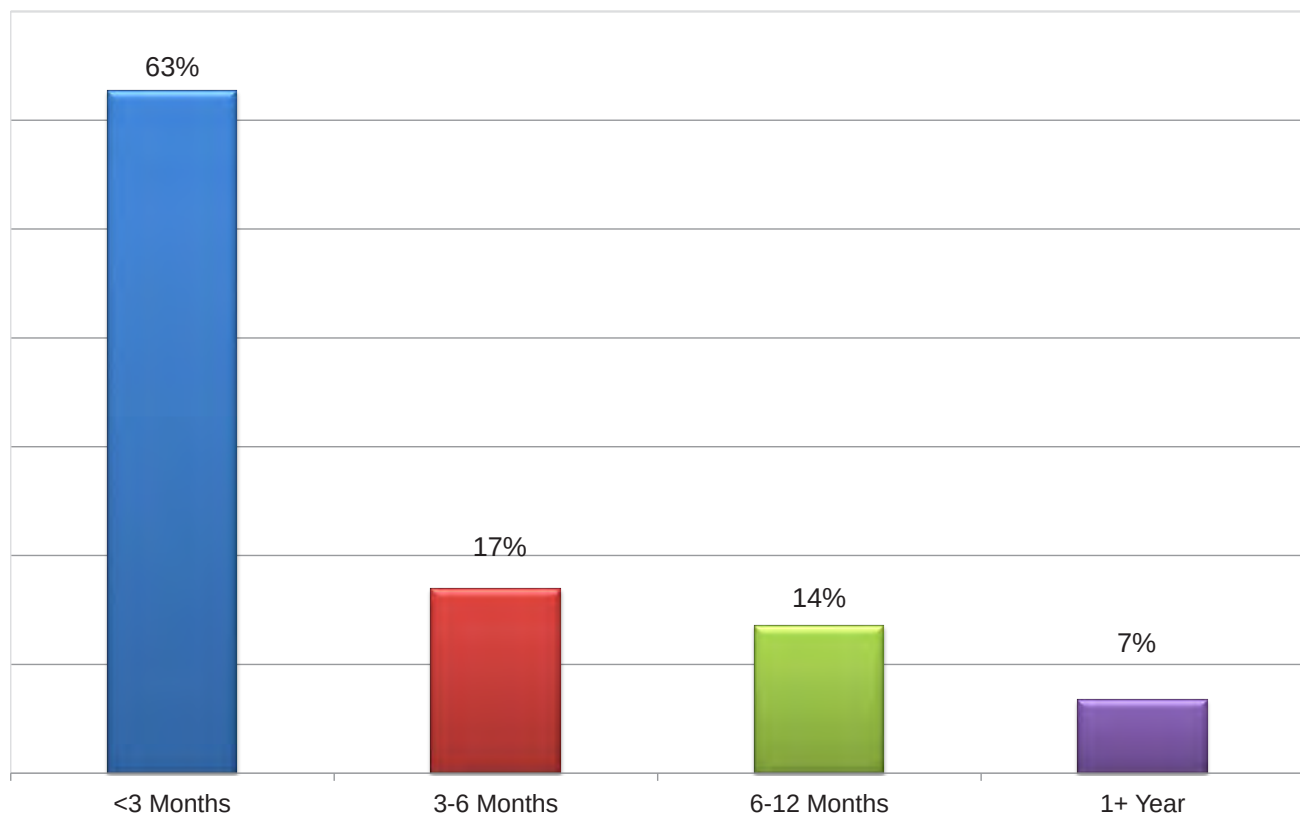
*As of 4/5, 4:40pm

ADP Recipients Outstanding vs. Overall Chains Started



ADP Wait Time Analysis

As of 3/31/18



Program Statistics

As of 3/31/2018

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Transplants Facilitated	21	62	131	175	226	308	310	360	399	462	147
2	Paired Transplants Facilitated	21	39	91	131	164	252	255	288	315	318	85
3	Chip Transplants Facilitated	0	23	40	44	62	56	55	72	84	144	62
4	Ending Unmatched Patient Pool	80	127	120	201	241	255	279	280	215	181	173
5	Cumulative Transplants	21	83	214	389	615	923	1233	1593	1992	2454	2601
6	Cumulative Paired Transplants	21	60	150	280	526	777	1030	1316	1630	1946	2031
7	Cumulative Chip Transplants	0	23	64	109	89	146	203	277	362	508	570
8	Cumulative Paired Patient Pool	101	210	334	590	805	1062	1351	1615	1877	2152	2243
9	Percent of Pool Transplanted (Paired Recipients)	21%	40%	64%	66%	71%	76%	79%	84%	89%	92%	92%
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	0.8
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	4.0	4.5
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	1.8	1.8
13	Mean cPRA of Transplanted Patients	4.1%	25.9%	34.5%	40.3%	44.1%	54.0%	48.3%	48.9%	42.8%	41.9%	46.7%
14	Number of Transplants Completed by cPRA											
15	100%	0	1	4	10	4	5	3	7	3	4	0
16	95-100%	0	4	12	10	29	68	41	47	39	41	19
17	80-95%	1	7	16	29	26	37	49	55	59	60	13
18	50-80%	0	5	19	27	33	46	48	42	53	49	18
19	0-50%	1	8	13	30	34	47	43	57	61	94	11
20	0%	19	37	67	69	100	105	126	152	184	214	86
21	Sub-total	21	62	131	175	226	308	310	360	399	462	147
22	Percent of Transplants Completed by cPRA											
23	100%	0%	2%	3%	6%	2%	2%	1%	2%	1%	1%	0%
24	95-100%	0%	6%	9%	6%	13%	22%	13%	13%	10%	9%	13%
25	80-95%	5%	11%	12%	17%	12%	12%	16%	15%	15%	13%	9%
26	50-80%	0%	8%	15%	15%	15%	15%	15%	12%	13%	11%	12%
27	0-50%	5%	13%	10%	17%	15%	15%	14%	16%	15%	20%	7%
28	0%	90%	60%	51%	39%	44%	34%	41%	42%	46%	46%	59%
29	Sub-total	100%	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	105	32
31	Percent of Transplanted Patients with cPRA >80%	5%	19%	24%	28%	26%	36%	30%	30%	26%	23%	22%

Program Statistics

As of 3/31/2018

		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
32	Number of Unmatched Patients by cPRA											
33	100%				79	73	83	81	80	80	63	60
34	95-99%				73	73	61	61	53	37	32	32
35	80-95%				15	15	24	19	22	12	14	12
36	50-80%				14	11	14	13	25	13	8	10
37	0-50%				14	10	22	37	35	28	16	19
38	0%				50	59	51	68	65	45	48	40
39	Sub-total				245	241	255	279	280	215	181	173
40	Percent of Unmatched Patients by cPRA											
41	100%				32%	30%	33%	29%	29%	37%	35%	35%
42	95-99%				30%	30%	24%	22%	19%	17%	18%	18%
43	80-95%				6%	6%	9%	7%	8%	6%	8%	7%
44	50-80%				6%	5%	5%	5%	9%	6%	4%	6%
45	0-50%				6%	4%	9%	13%	13%	13%	9%	11%
46	0%				20%	24%	20%	24%	23%	21%	27%	23%
47	Sub-total				100%	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	392	126
50	6-12 months	0	10	14	19	24	44	35	38	30	37	12
51	1-2 years	0	4	15	14	20	25	27	22	32	29	6
52	2+ years	0	0	2	2	2	7	5	2	10	4	3
53	Sub-total	21	56	105	141	226	308	310	360	399	462	147
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%	84.8%	85.7%
56	6-12 months	0.0%	17.9%	13.3%	13.5%	10.6%	14.3%	11.3%	10.6%	7.5%	8.0%	8.2%
57	1-2 years	0.0%	7.1%	14.3%	9.9%	8.8%	8.1%	8.7%	6.1%	8.0%	6.3%	4.1%
58	2+ years	0.0%	0.0%	1.9%	1.4%	0.9%	2.3%	1.6%	0.6%	2.5%	0.9%	2.0%
59	Sub-total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60	Total Chains Started	4	9	28	36	46	55	63	83	99	160	79
61	Total Loops Completed	0	3	2	3	12	24	17	15	7	15	0
62	Number of broken chains	3	2	2	0	4	3	4	1	2	2	0
63	Bridge Donors Held (2017 Annualized)	9	29	61	75	54	37	49	53	68	62	19
64	Percent of broken chains	33%	7%	3%	0%	7%	8%	8%	2%	3%	3%	0%



P.O. Box 460 • Babylon, NY 11702-0460

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