

Updates and Outcomes in the New Kidney Transplant Allocation System

The Renal and Pancreas Transplant Division
at Saint Barnabas Medical Center

September 21, 2021



Quality
Insights
Renal Network 3

Updates & Outcomes in the New Kidney Allocation System

September 21, 2021

Francis L. Weng, MD, MSCE

Chief

Renal & Pancreas Transplant Division

Saint Barnabas Medical Center

Livingston, NJ



Saint Barnabas
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HEALTH

Outline



The prior, old kidney allocation system

The new kidney allocation system

Impact of the new system

The old kidney allocation system (prior to Mar 15, 2021)

The “old” system for allocating deceased donor kidneys had been in place since Dec 2014



Allocating kidneys is mainly based upon 2 factors:
classifications/categories and points/waiting time

1st classification/category

Sorted by points



2nd classification/category

Sorted by points



3rd classification/category

Sorted by point

This 2-step system of sorting is similar to other systems, such as boarding passengers onto a plane



In the old and new system, kidneys are allocated within certain categories or “classifications”

1

- 0-mismatch, cPRA = 100%

2

- cPRA = 100%

3

- 0-mismatch, cPRA = 99%

4

- cPRA = 99%

There are dozens of these classifications

Table 8-8: Allocation of Kidneys from Deceased Donors with KDPI Scores Greater Than 85%

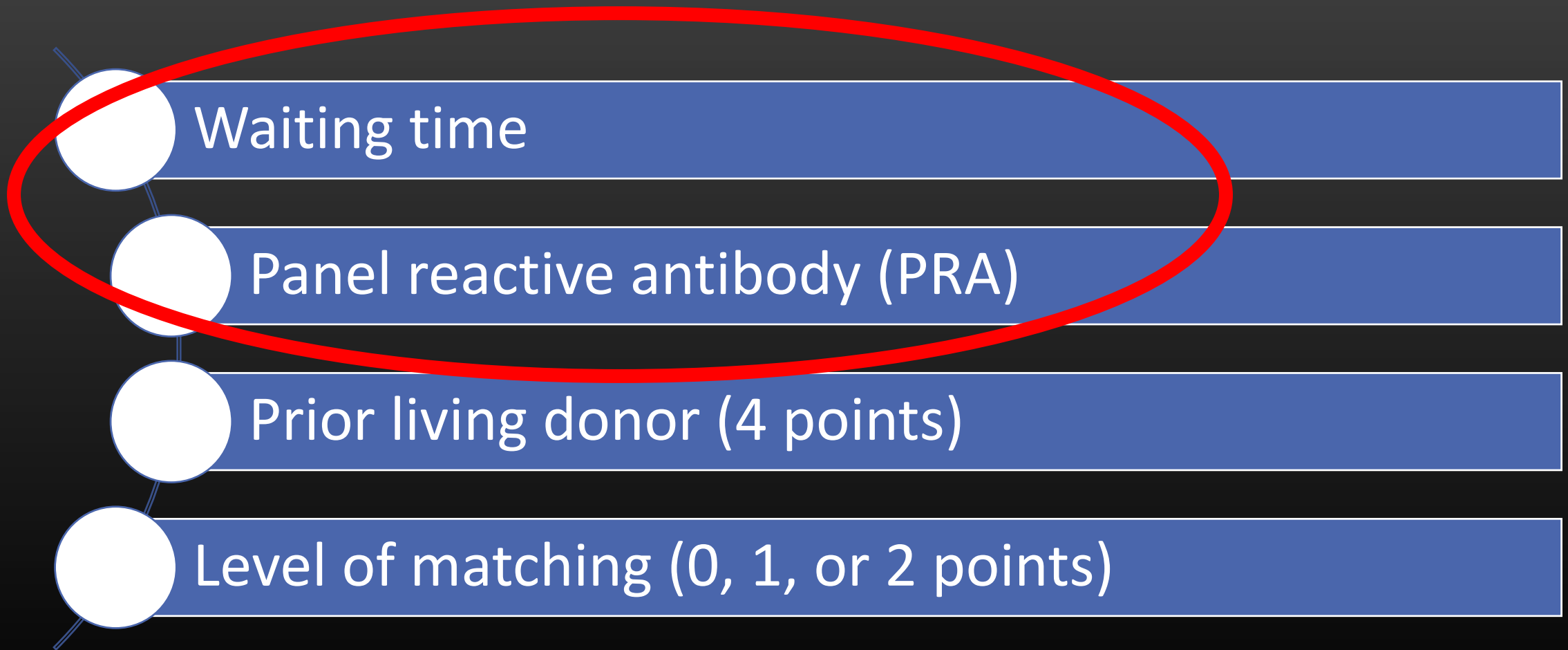
Classification	Candidates that are within the:	And are:	And the donor is this blood type:
1	OPO's DSA	0-ABDR mismatch, CPRA equal to 100%, blood type permissible or identical	Any
2	OPO's DSA	CPRA equal to 100%, blood type permissible or identical	Any
3	OPO's region	0-ABDR mismatch, CPRA equal to 100%, blood type permissible or identical	Any
4	OPO's region	CPRA equal to 100%, blood type permissible or identical	Any
5	Nation	0-ABDR mismatch, CPRA equal to 100%, blood type permissible or identical	Any
6	Nation	CPRA equal to 100%, blood type permissible or identical	Any
7	OPO's DSA	0-ABDR mismatch, CPRA equal to 99%, blood type permissible or identical	Any
8	OPO's DSA	CPRA equal to 99%, blood type permissible or identical	Any
9	OPO's region	0-ABDR mismatch, CPRA equal to 99%, blood type permissible or identical	Any
10	OPO's region	CPRA equal to 99%, blood type permissible or identical	Any
11	OPO's DSA	0-ABDR mismatch, CPRA equal to 98%, blood type permissible or identical	Any
12	OPO's DSA	CPRA equal to 98%, blood type permissible or identical	Any
13	OPO's DSA	0-ABDR mismatch, blood type permissible or identical	Any
14	OPO's region	0-ABDR mismatch, CPRA greater than or equal to 80%, and blood type identical	Any

The OLD kidney allocation system

The NEW kidney allocation system

IMPACT of the new allocation system

In the old system, points for adult candidates on the waiting list are based on 4 factors



“Waiting time” is calculated as 1/365 points for each day, starting with the earliest of 2 dates

Date of
initiation
of chronic
dialysis

OR

Date that eGFR
or CrCl became
 ≤ 20 ml/min, if
listed before
starting dialysis

If their PRA is extremely high, then candidates can get a very large number of points

If the cPRA is:	Then the candidate receives this many points:		If the cPRA is:	Then the candidate receives this many points:
0-19	0.00		85-89	4.05
20-29	0.08		90-94	6.71
30-39	0.21		95	10.82
40-49	0.34		96	12.17
50-59	0.48		97	17.30
60-69	0.81		98	24.40
70-74	1.09		99	50.09
75-79	1.58		100	202.10
80-84	2.46			

The OLD kidney allocation system

The NEW kidney allocation system

IMPACT of the new allocation system

Here are 2 examples of how points are calculated for candidates on the kidney waiting list

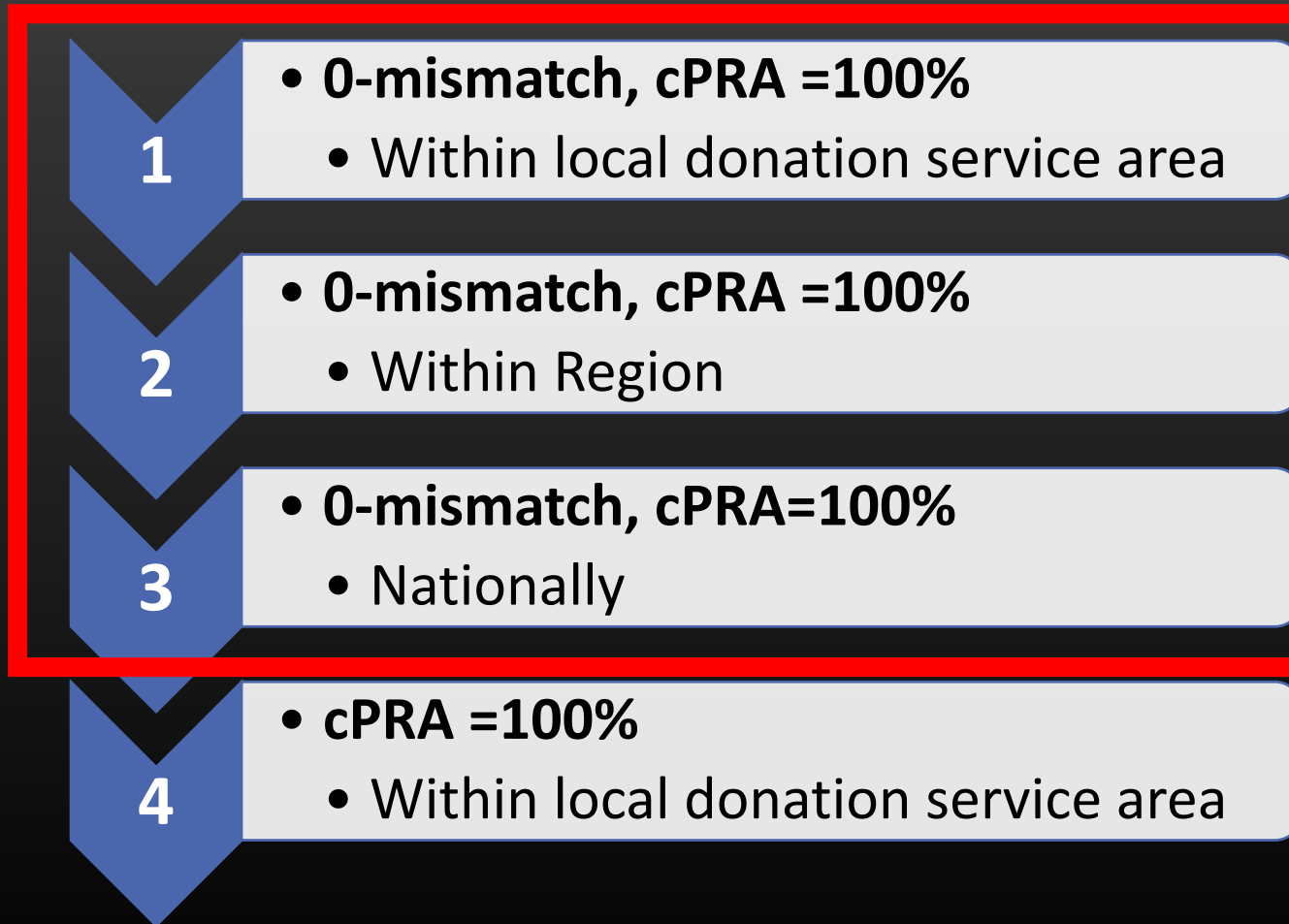
Patient A

- On hemodialysis for 2 years before he starts transplant evaluation
 - Listed after being on dialysis 3.2 years
- PRA = 0% (0 points)
- He would have 3.2 points
 - Could have 4.2 or 5.2 points, depending on the particular donor

Patient B

- Placed on waiting list 0.8 years before starting peritoneal dialysis
- Been on PD for 1.3 years
- PRA = 99% (50.09 points)
- She would have 52.19 points
 - Could have 53.19 or 54.19 points, depending on the particular donor

Within each classification, kidneys were first allocated locally, within a donation service area (DSA)



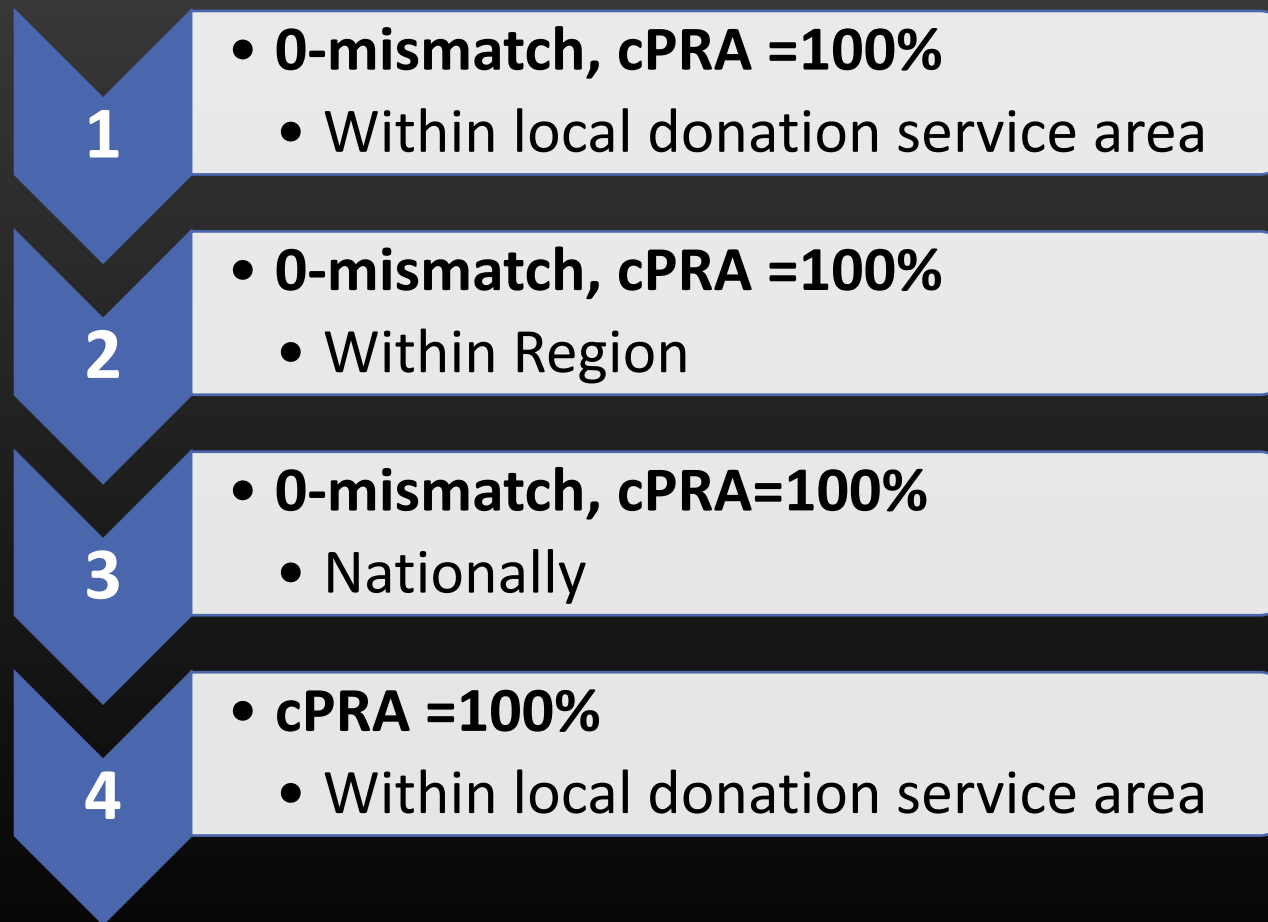
Each donation service area (DSA) is served by an organ procurement organization (OPO),

so the 2 terms are often used interchangeably

Our DSA or OPO serves north NJ and part of south NJ:

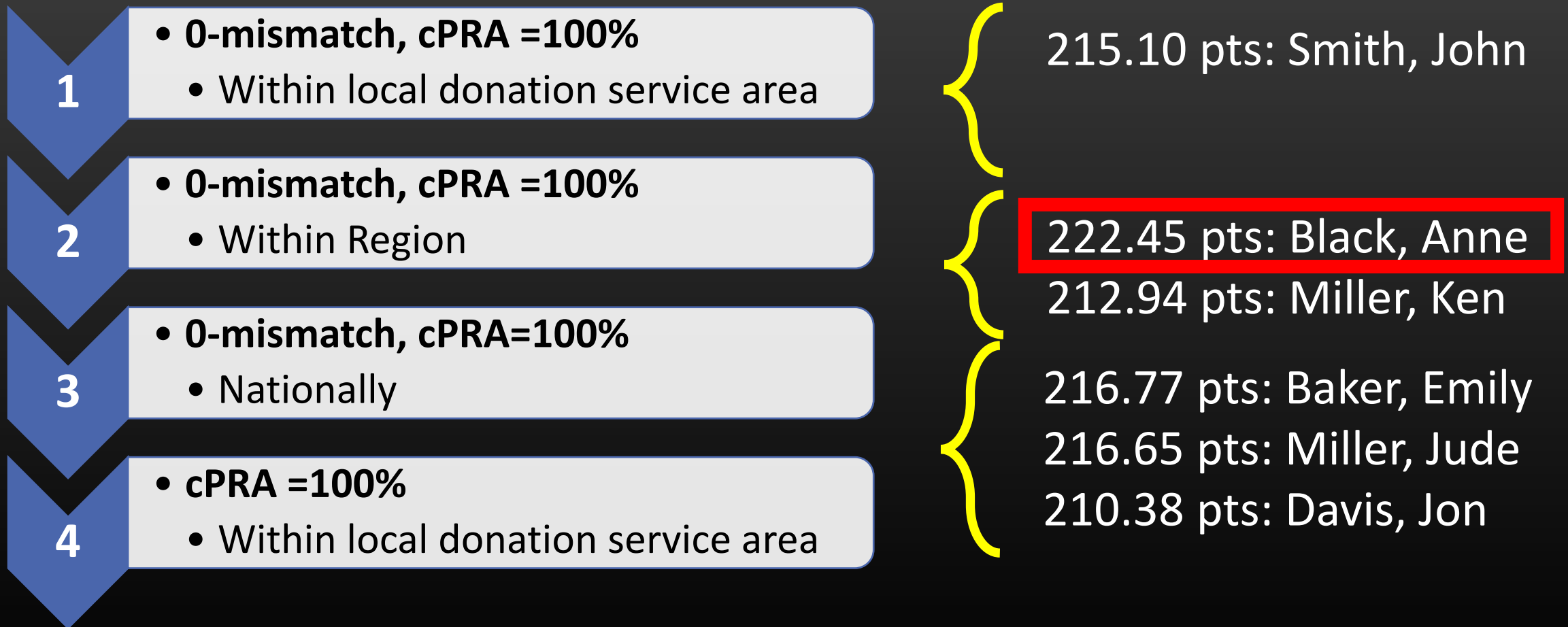
NJ Sharing Network

Within each classification, patients are “sorted”, mainly based upon points



215.10 pts: Smith, John

After local allocation, kidneys were allocated regionally and then nationally



The old system favored use of the kidneys locally, in the same DSA where they were procured

Allocate locally



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graph TD; A[Allocate locally] --> B[Allocate regionally]; B --> C[Allocate nationally];
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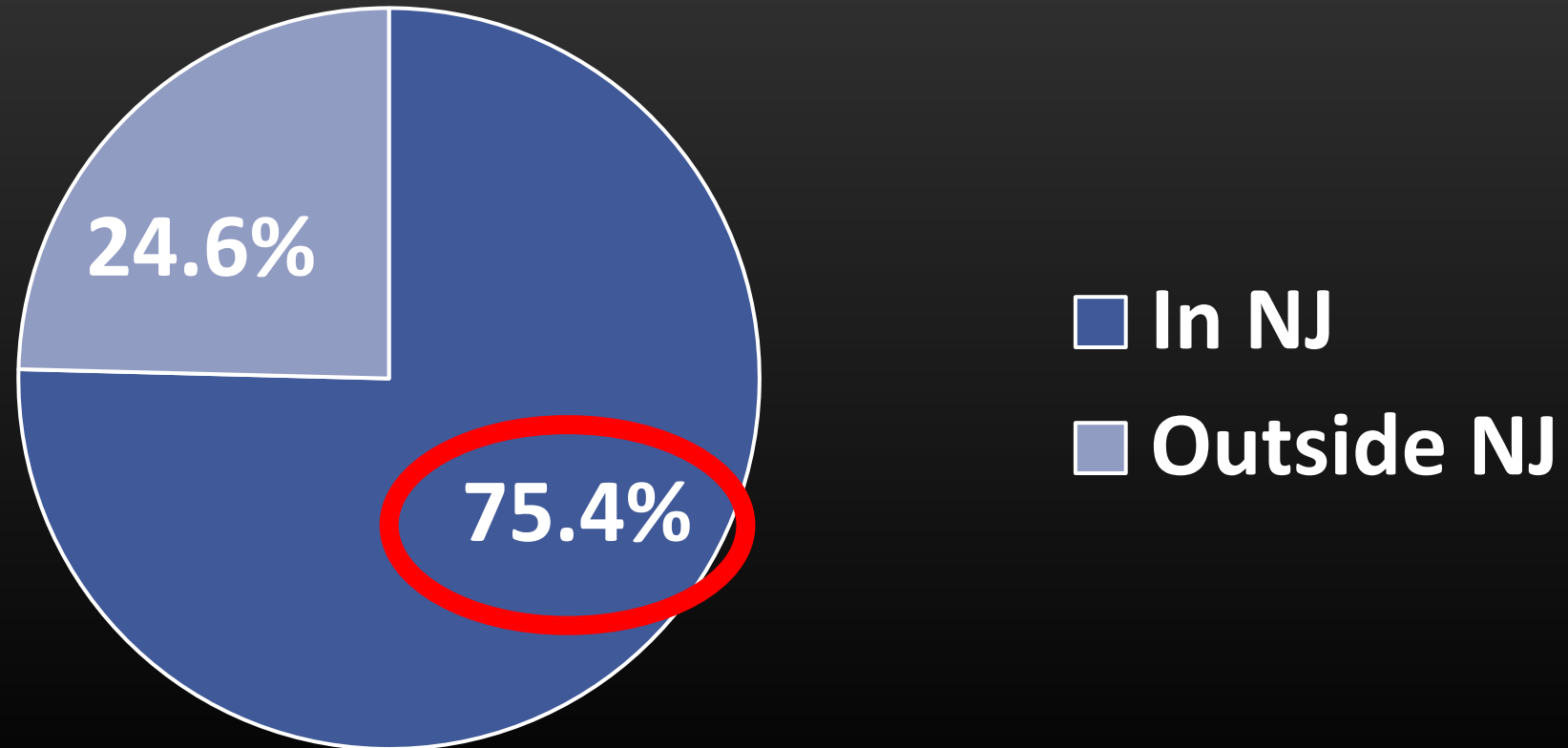
A flowchart with three rectangular boxes arranged vertically. The top box is blue and contains the text 'Allocate locally'. A light blue arrow points down from the bottom right of this box to the top right of the middle box. The middle box is a lighter shade of blue and contains the text 'Allocate regionally'. Another light blue arrow points down from the bottom right of the middle box to the top right of the bottom box. The bottom box is the lightest shade of blue and contains the text 'Allocate nationally'.

Allocate regionally

Allocate nationally

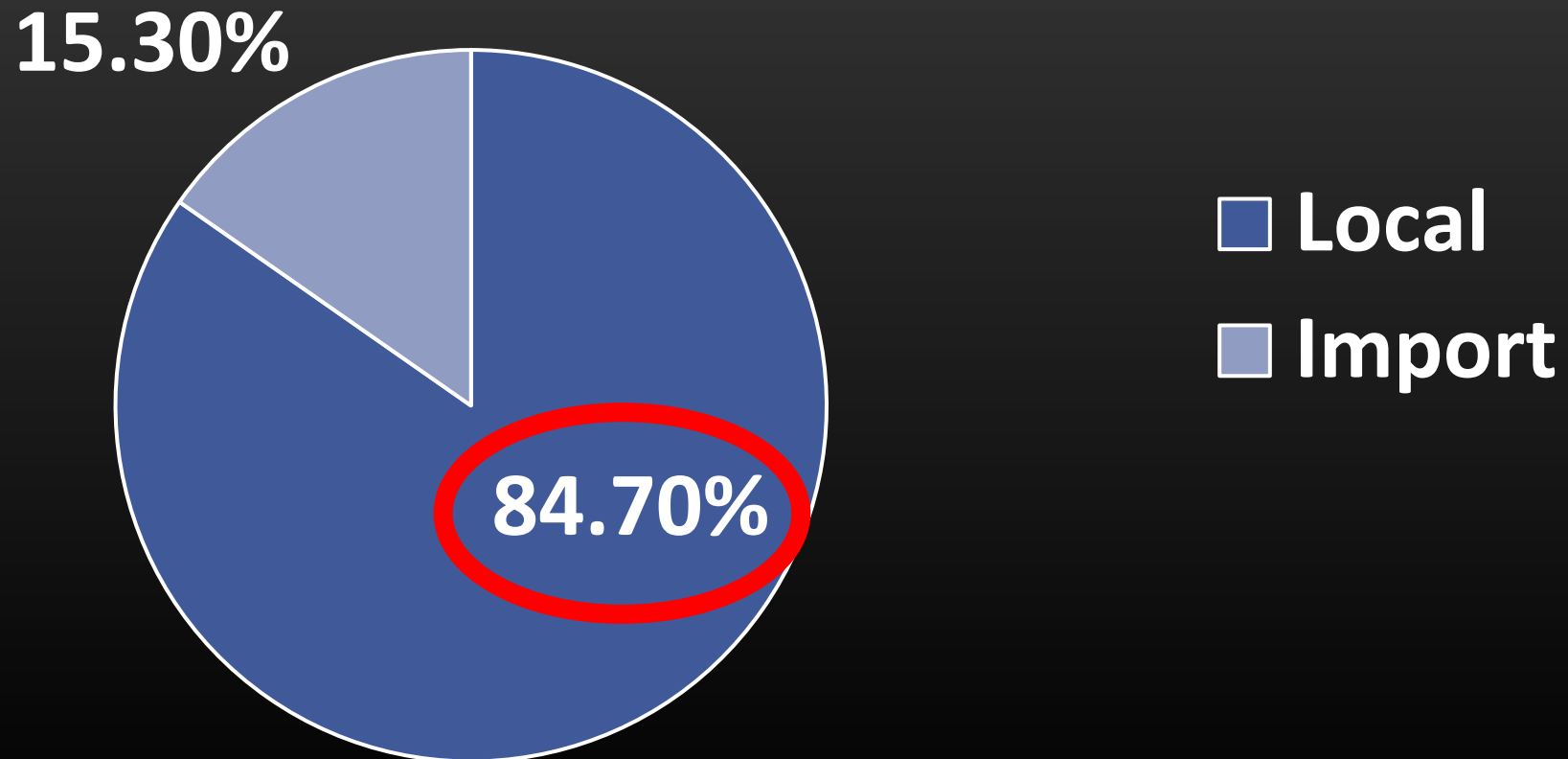
Most of the kidneys procured in New Jersey were transplanted at NJ transplant centers

Location of transplants of kidneys procured by NJ Sharing Network



Most of Saint Barnabas' deceased donor kidneys came from NJ Sharing Network, the local OPO

Source of Deceased Donor Kidneys at SBMC



When a kidney donor was available in NJ, the logistics of transplant were well-established

Rank	Center	Patient	PRA	Points
1	National Center X	AAA	100%	212.1
2	Regional Center Y	BBB	20%	6.31
3	Saint Barnabas	CCC	0%	6.29
4	Saint Barnabas	DDD	0%	6.28
5	Local Center A	EEE	25%	6.17
6	Saint Barnabas	FFF	32%	6.11
7	Local Center A	GGG	0%	6.01
8	Saint Barnabas	HHH	0%	6.00
9	Saint Barnabas	III	0%	5.97
10	Local Center B	JJJ	12%	5.93
11	Saint Barnabas	LLL	0%	5.80
12	Saint Barnabas	MMM	0%	5.77
13	Saint Barnabas	NNN	0%	5.75

- Most of the patients on the match run list for the patient were patients listed at Saint Barnabas
- Many patients on the list actually can't receive a transplant at that time from that donor
 - Positive crossmatch
 - Patient is ill or not truly ready
 - Transplant center declines that donor

When a kidney donor was available in NJ, the logistics of transplant were well-established

Rank	Center	Patient	PRA	Points
3	Saint Barnabas	CCC	0%	6.29
4	Saint Barnabas	DDD	0%	6.28
7	Local Center A	GGG	0%	6.01
8	Saint Barnabas	HHH	0%	6.00
9	Saint Barnabas	III	0%	5.97
10	Local Center B	JJJ	12%	5.93
11	Saint Barnabas	LLL	0%	5.80
12	Saint Barnabas	MMM	0%	5.77
13	Saint Barnabas	NNN	0%	5.75

- 100% PRA patient nationally is actually medically not ready
- Regional Center Y declines the kidney
- One of the patients from Local Center A has positive crossmatch
- One of the Saint Barnabas patients not truly available

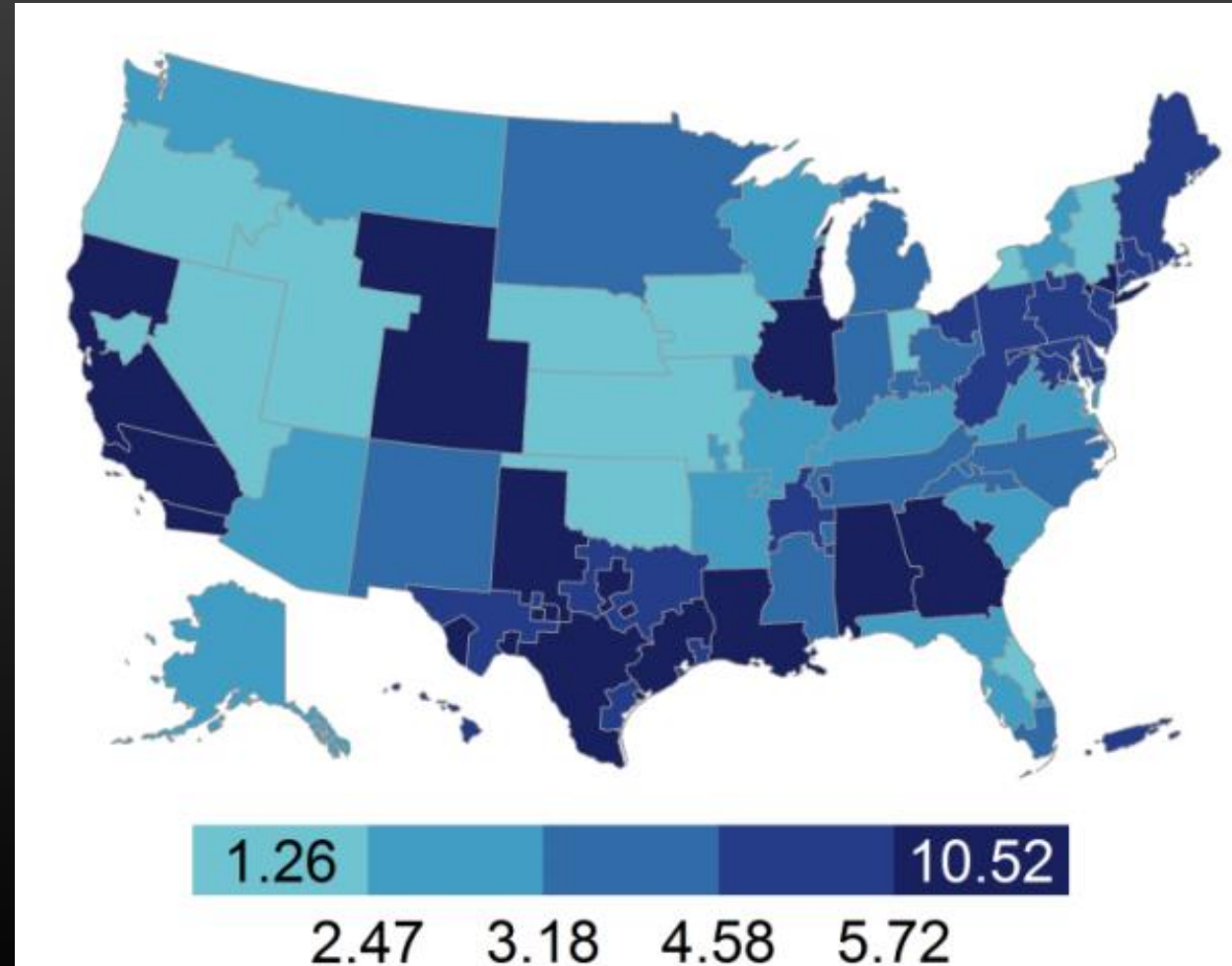
The old system had some predictability for transplant centers and OPO's

Rank	Center	Patient	PRA	Points
3	Saint Barnabas	CCC	0%	6.29
4	Saint Barnabas	DDD	0%	6.28
7	Local Center A	GGG	0%	6.01
8	Saint Barnabas	HHH	0%	6.00
9	Saint Barnabas	III	0%	5.97
10	Local Center B	JJJ	12%	5.93
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12	Saint Barnabas	MMM	0%	5.77
13	Saint Barnabas	NNN	0%	5.75

Both Saint Barnabas and NJ Sharing Network had a good idea, early in the donation process, regarding which patient might get a transplant from that donor

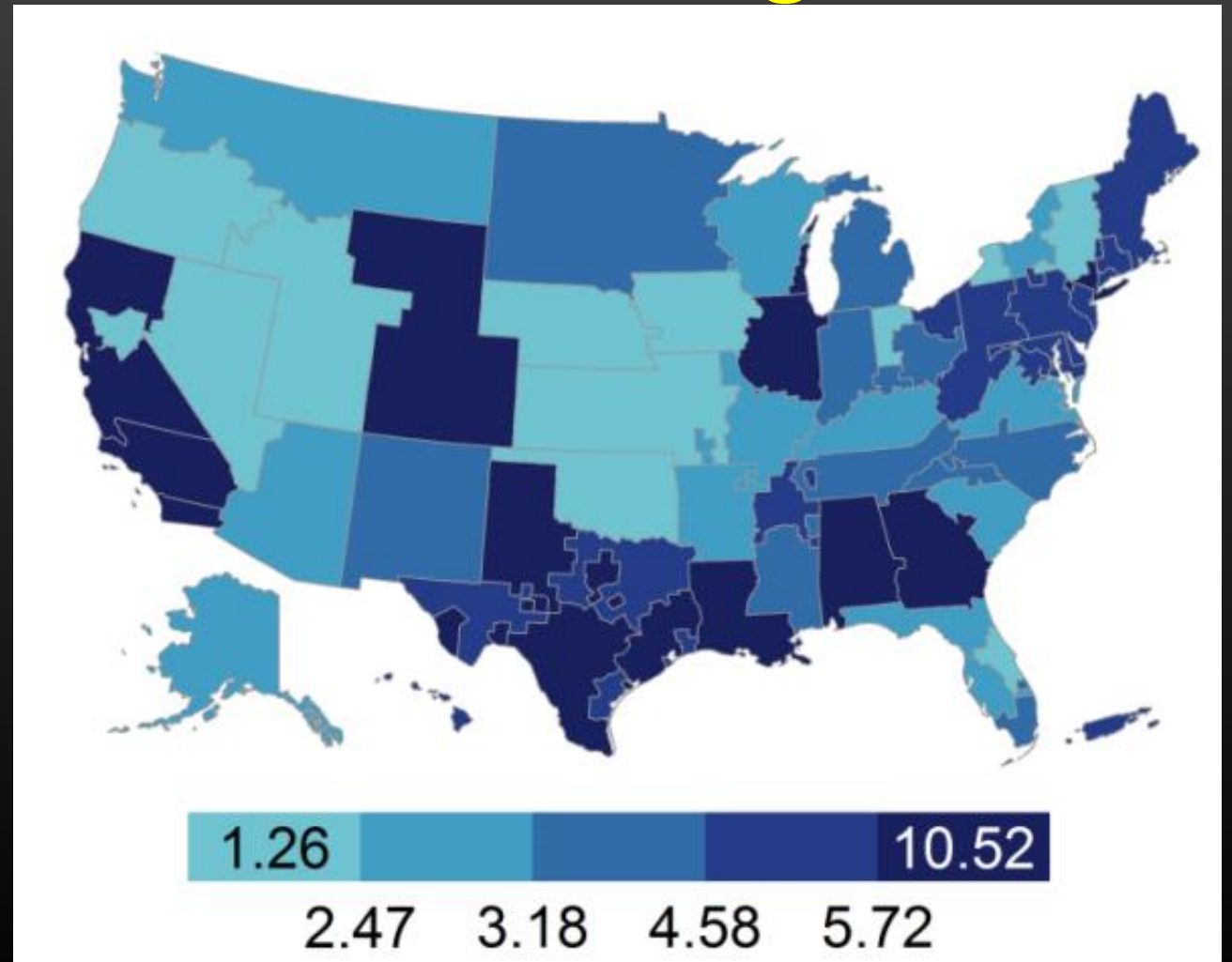
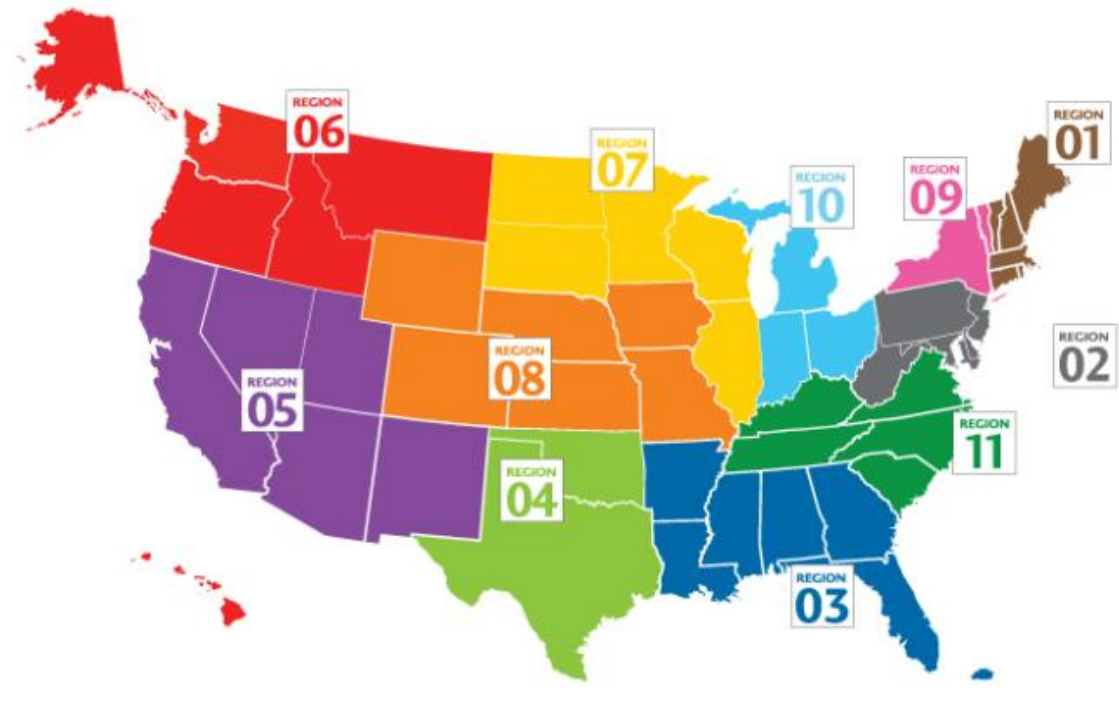
The old system, however, led to large geographic differences and disparities in waiting times for DDKT

- Median waiting times varied from 1.28 - 10.52 years
- These differences are not due to regional differences in age, race, sex, blood type, or PRA



Waiting times could differ greatly between adjacent donation service areas and regions

Figure 2: Map of OPTN Regions across the United States



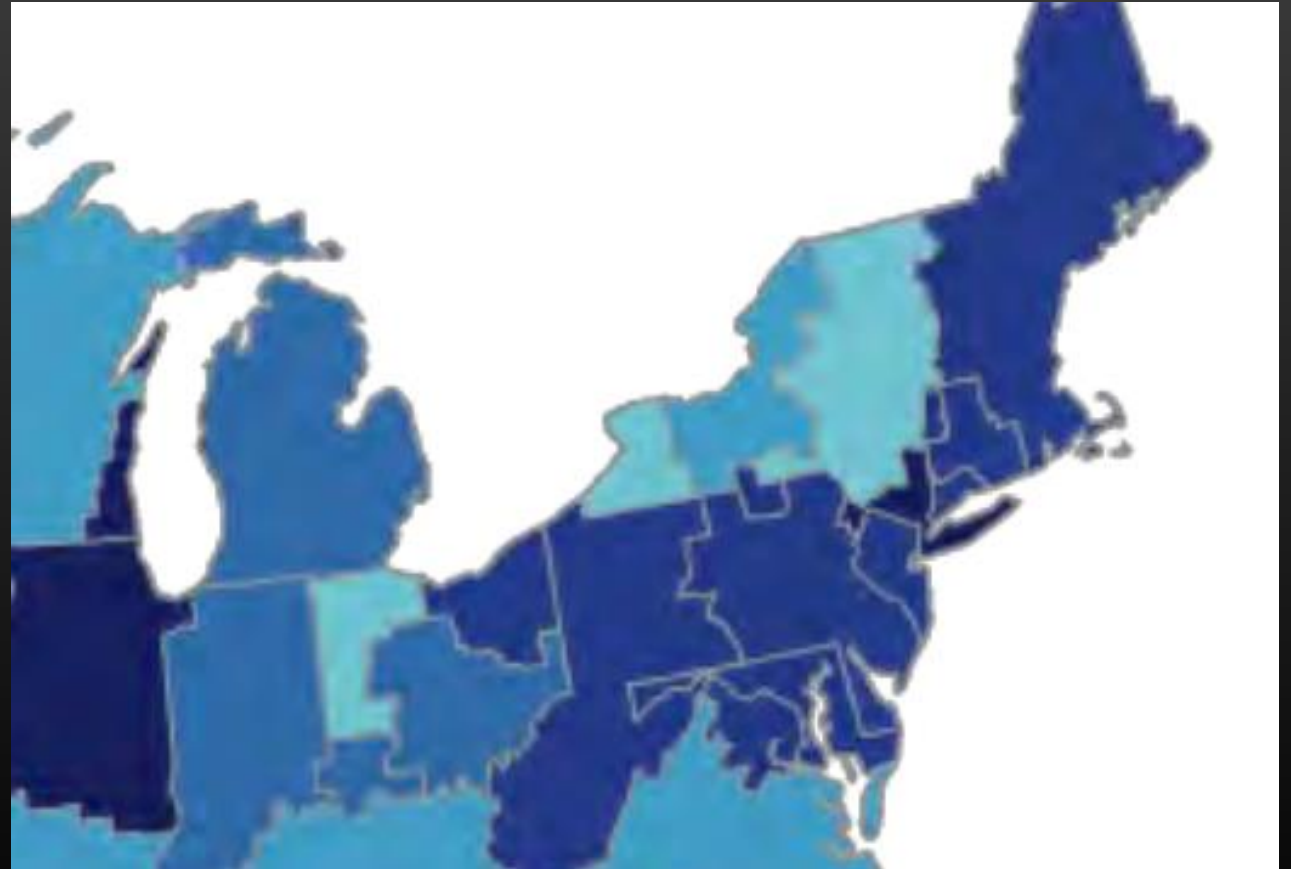
The OLD kidney allocation system

The NEW kidney allocation system

IMPACT of the new allocation system

These large differences led to patients listing at multiple centers, to decrease waiting time

Patients who originally listed at transplant centers in New York City would often try to list elsewhere



These large geographic differences violated federal rules, so the system had to change

- Federal “Final Rule” governs organ transplant in U.S. and states that
 - Allocation policies “shall not be based on a candidate’s place of residence or place of listing”, except to extent required by other regulations
- BUT, place of listing (DSA) is the #1 largest factor affecting kidney allocation
 - Place of listing is more important than PRA, blood type, diagnosis, age, education level, insurance type, race/ethnicity, gender, or any other factor, in determining likelihood of receiving a DDKT

Changes to the old system were debated throughout 2019 and approved in Dec 2019

Organ Procurement and Transplantation Network

Eliminate the use of DSA and Region in kidney allocation policy

[Home](#) » [Governance](#) » [Public Comment](#) » Eliminate the use of DSA and Region in kidney allocation policy

Proposal Overview

Status: Implemented

Sponsoring Committee: *Kidney Transplantation*

Strategic Goal: Provide equity in access to transplants

[Policy Notice 12/2019](#) (PDF - 1,449 K)

Summary of the old kidney allocation system, prior to March 15, 2021



Based upon classifications (categories) and points

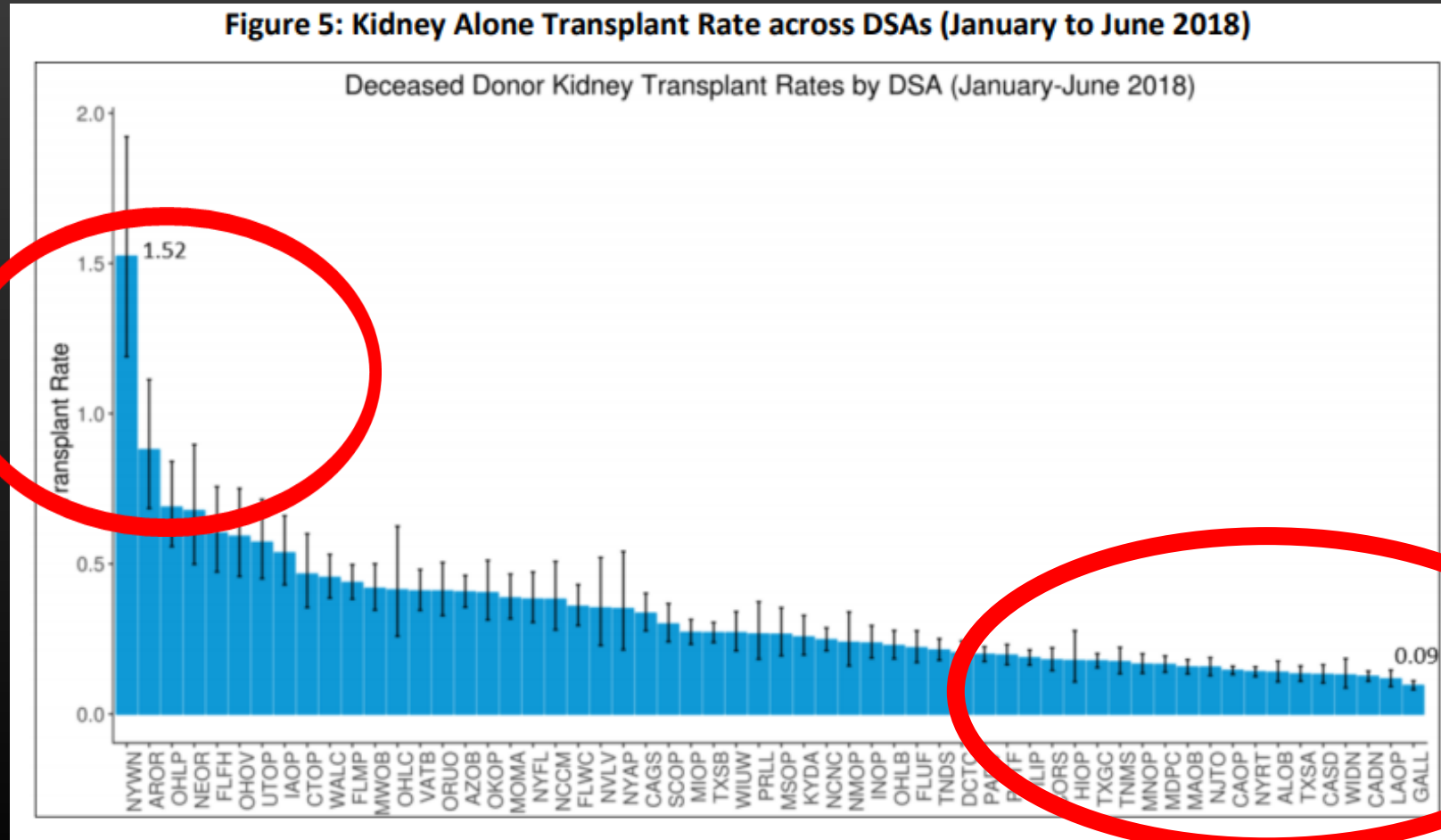
The diagram illustrates the old kidney allocation system as a vertical list of three points. Each point is preceded by a white circle, and the text is contained within a horizontal bar of varying shades of blue. The first bar is a vibrant blue, the second is a medium blue, and the third is a light blue-grey. The circles are connected by a thin, light blue line that starts from the top left and extends downwards.

Favored local use of kidneys

Caused large geographic inequities in transplant rate

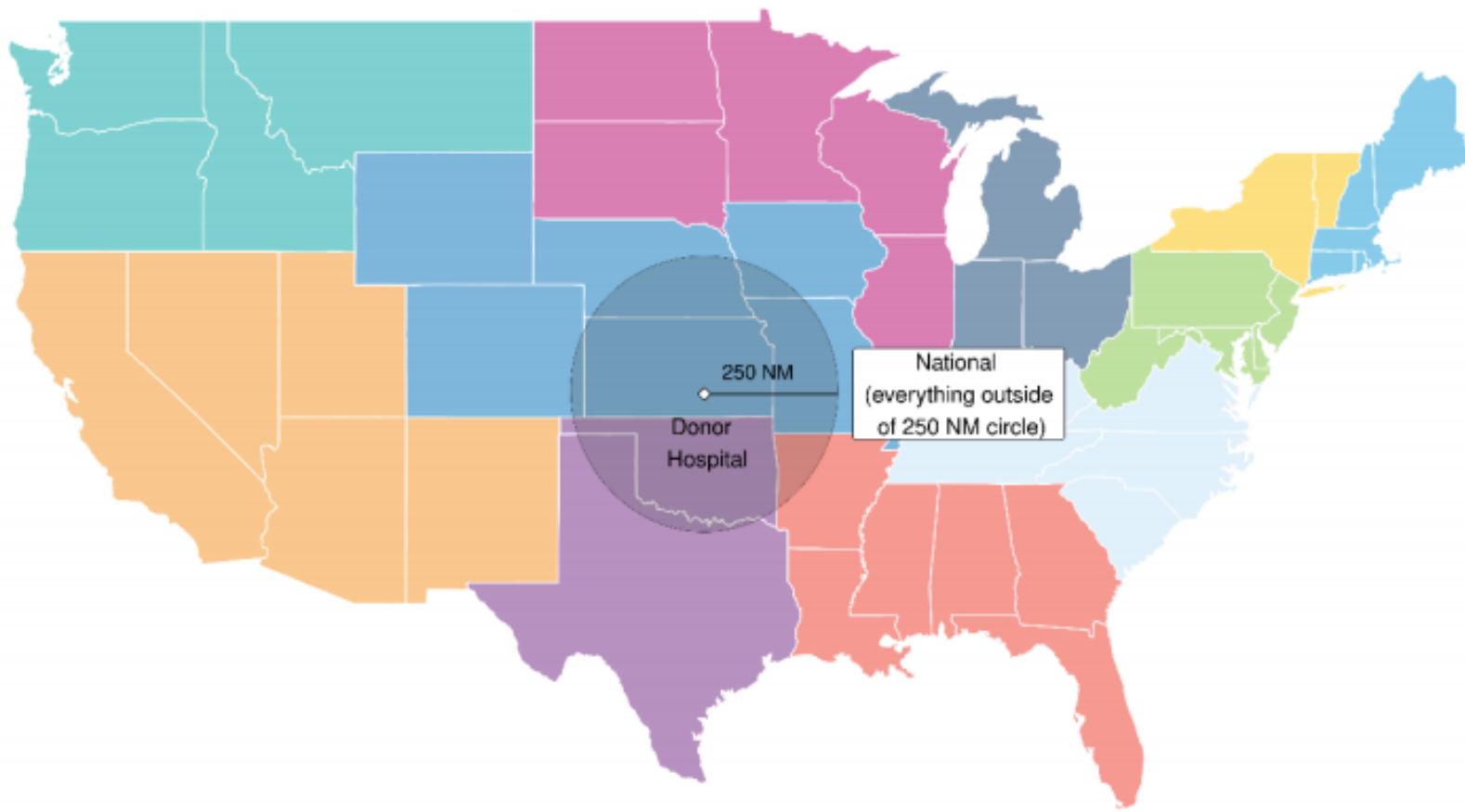
The new kidney transplant allocation system (starting Mar 15)

The new system is designed to decrease the 15-fold geographic variation in transplant rates



In the new system, kidneys are first allocated in a 250NM circle around the donor hospital

Figure 6: Visualization of Single Fixed-Distance 250NM Circle for DSA



Now, instead of 3 geographic categories, there are only 2 geographic categories

- 1) Within 250NM
- 2) National

Based upon the distance from donor hospital to transplant center, patient may get extra points

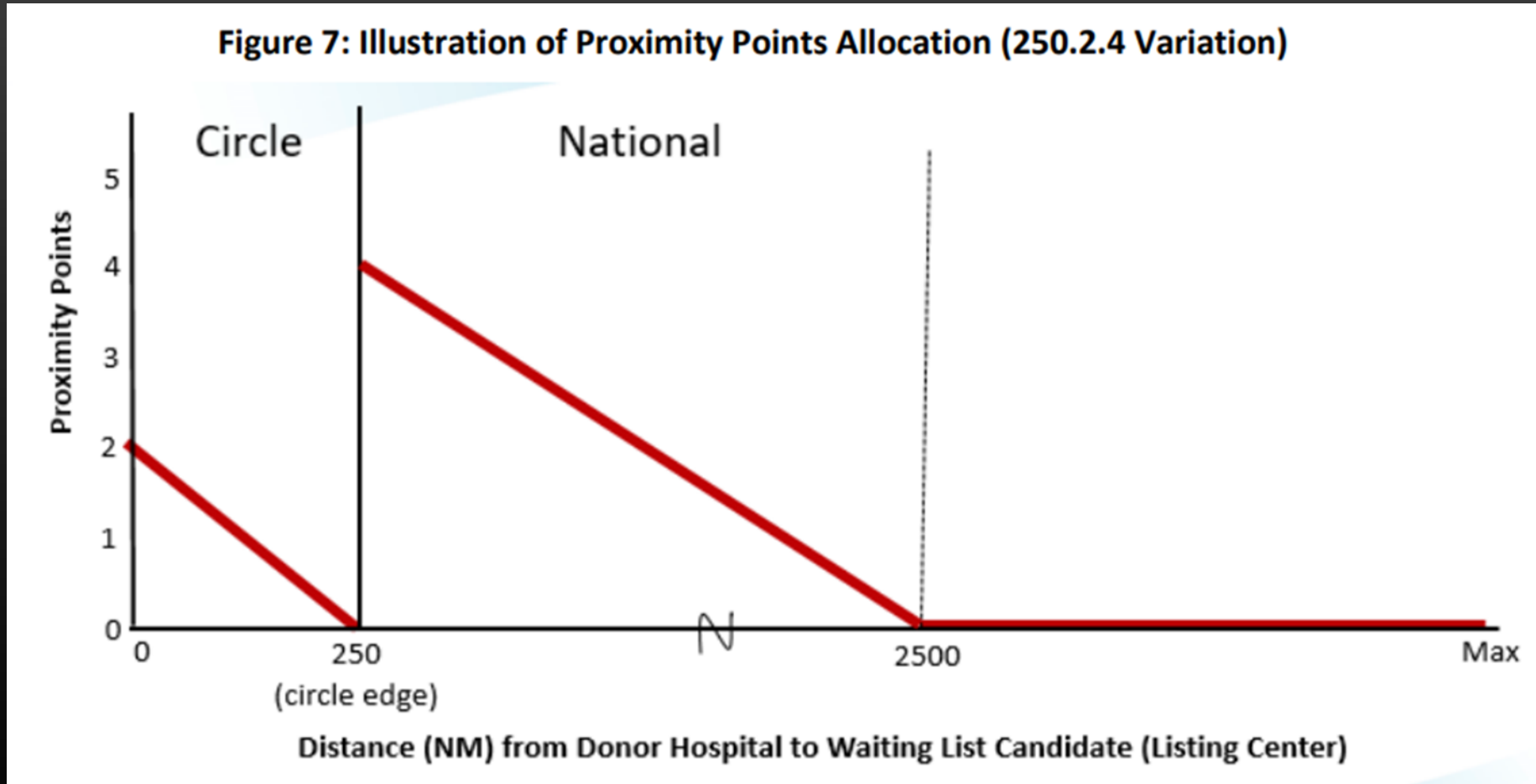
Within the 250NM circle

- Candidates get up to 2 proximity points
- 2 proximity points if donor hospital is 0 NM from the transplant center
- Zero proximity points if candidate's transplant center is 250 NM distance from the donor hospital

Nationally

- Candidates get up to 4 proximity points, going out to 2500NM
- 4 proximity points if donor hospital is 250 NM from the transplant center
- Zero proximity points if candidate's transplant center is 2500 NM distance from the donor hospital

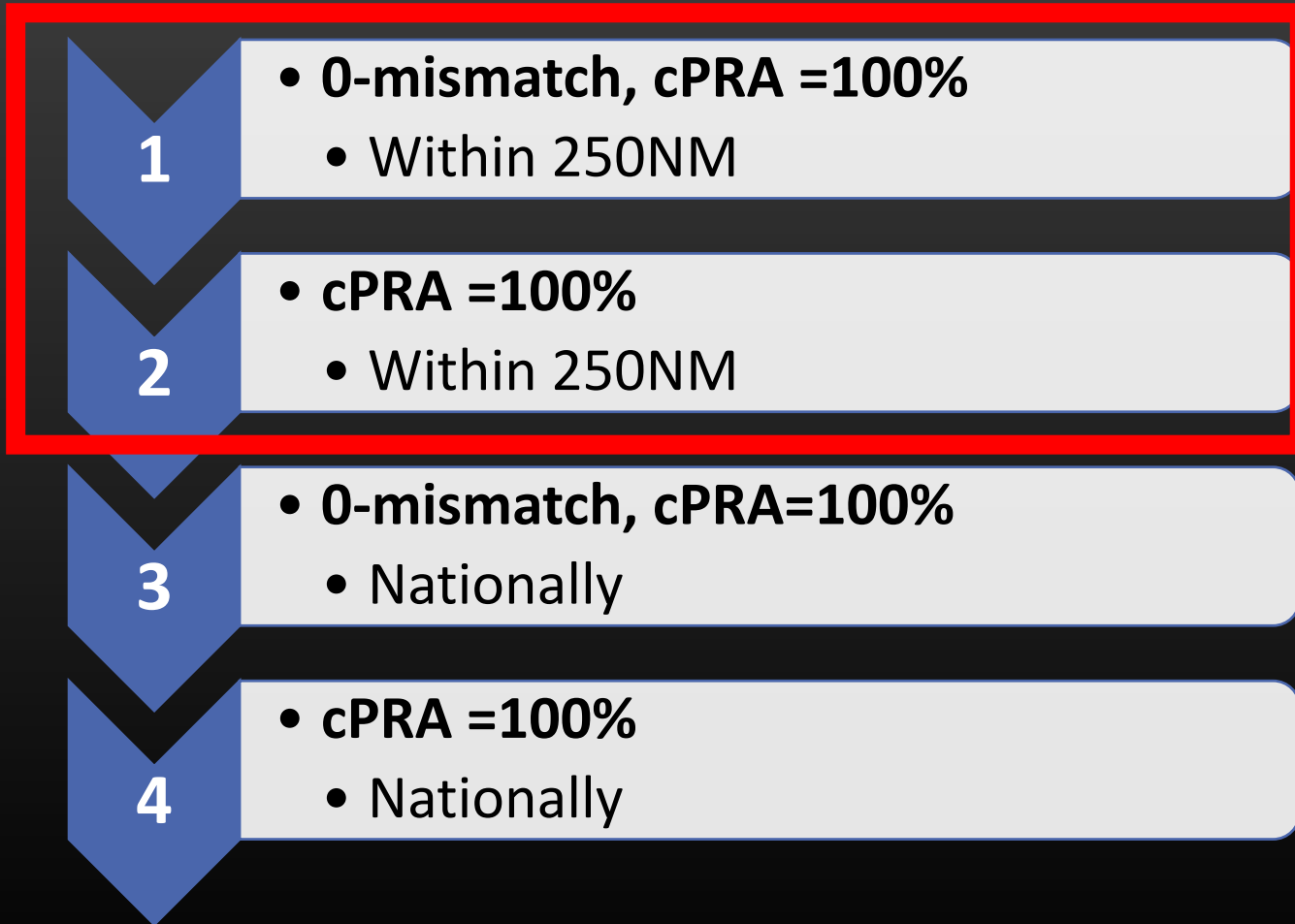
Based upon the distance from donor hospital to transplant center, patient may get extra points



In the new system, adult candidates on the waiting list get points based on 5 factors

- Waiting time
- Panel reactive antibody (PRA)
- Prior living donor (4 points)
- Level of matching (0, 1, or 2 points)
- Proximity points (up to 2 points if within 250NM and 4 points if national)

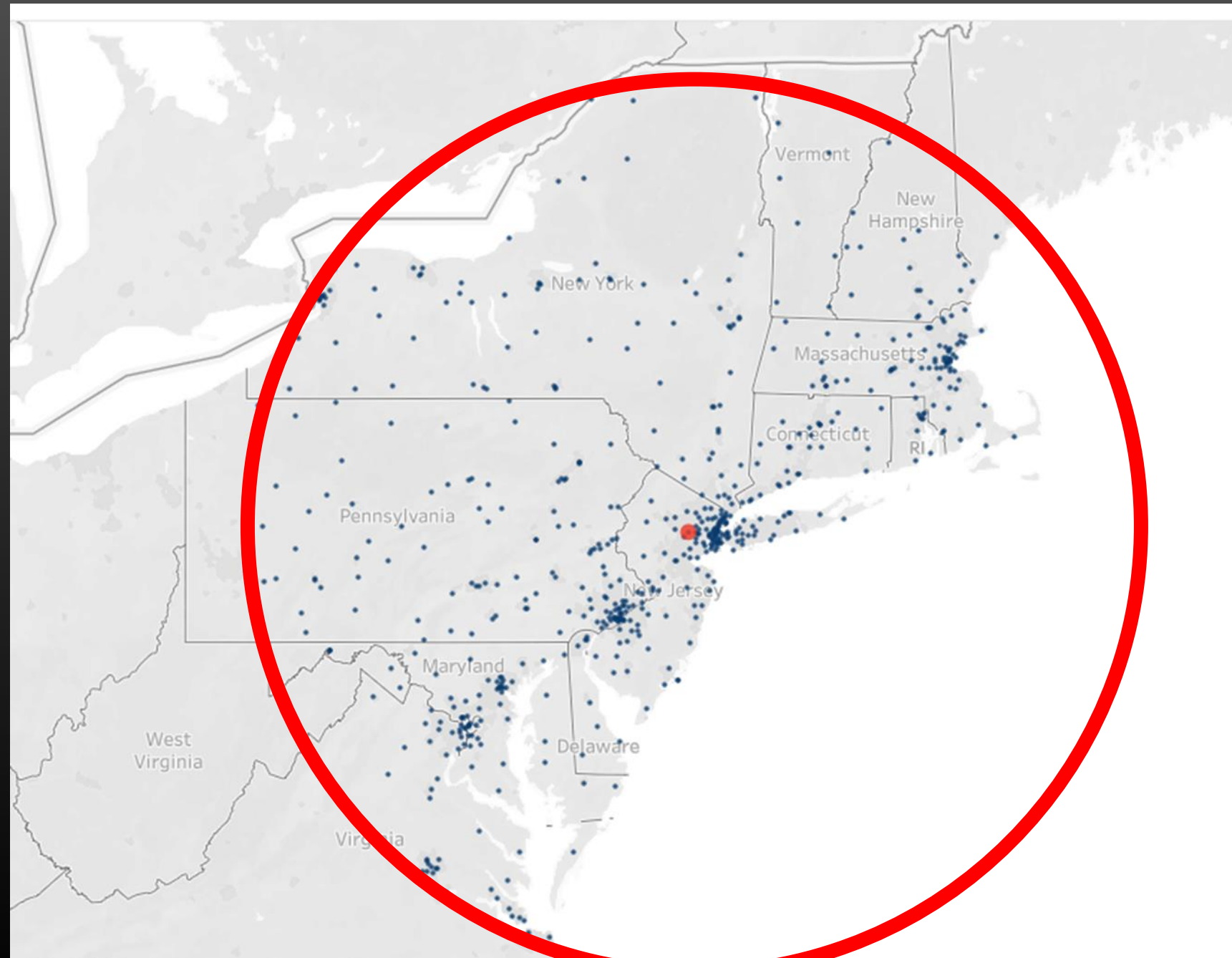
Kidneys are still allocated by classification, but local DSA and regions are not used to allocate



Within each classification, the only 2 geographic categories are now **250NM vs national**

How large is a
250NM radius?

This circle is
drawn around
Saint Barnabas,
and stretches
from Maine to
Virginia



How are points NOW calculated for candidates on the kidney waiting list?

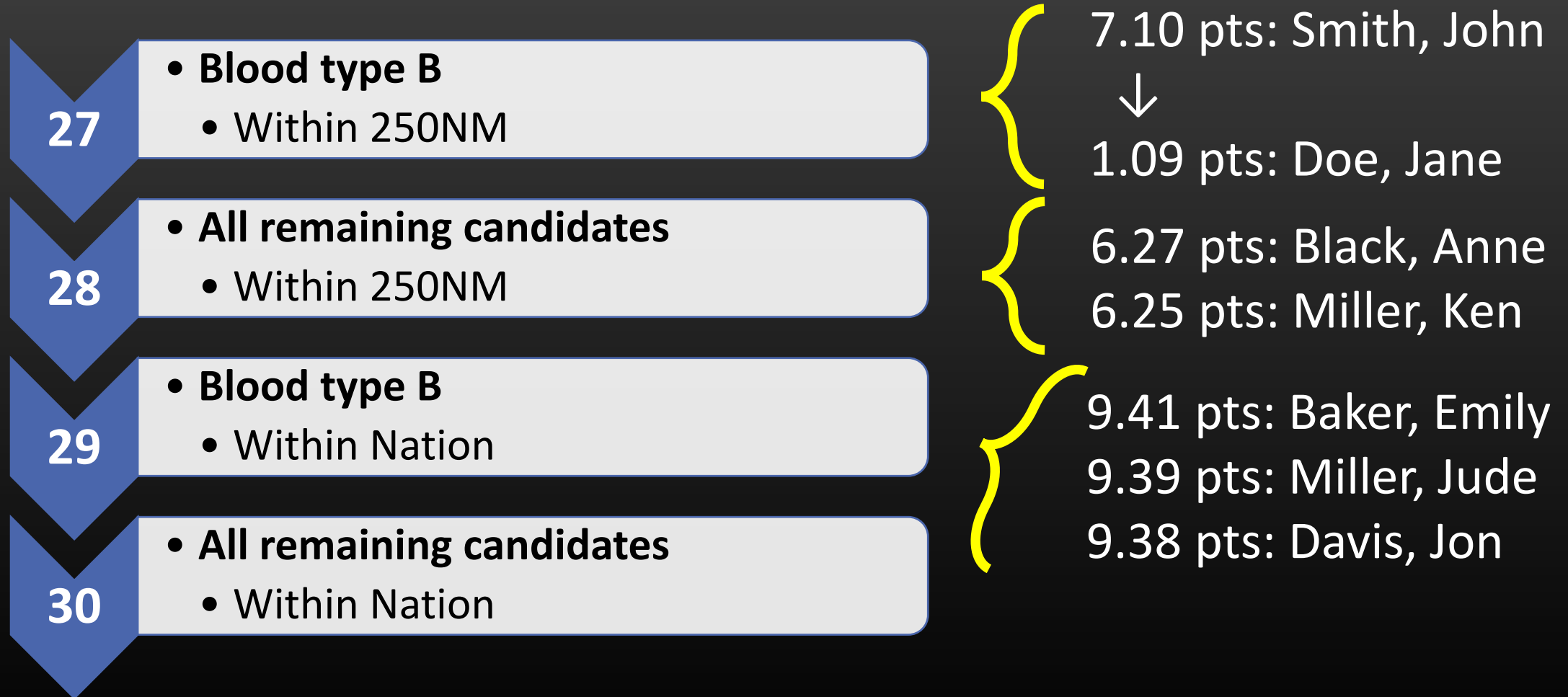
Patient A

- On hemodialysis for 2 years before he starts transplant evaluation
 - Listed after being on dialysis 3.2 years
- PRA = 0% (0 points)
- Distance from transplant center to donor hospital is 100 NM = 1.2 proximity points
- He would have 3.2 points + 1.2 proximity points, or 4.4 points
 - Could have 5.4 or 6.4 points, depending on the particular donor

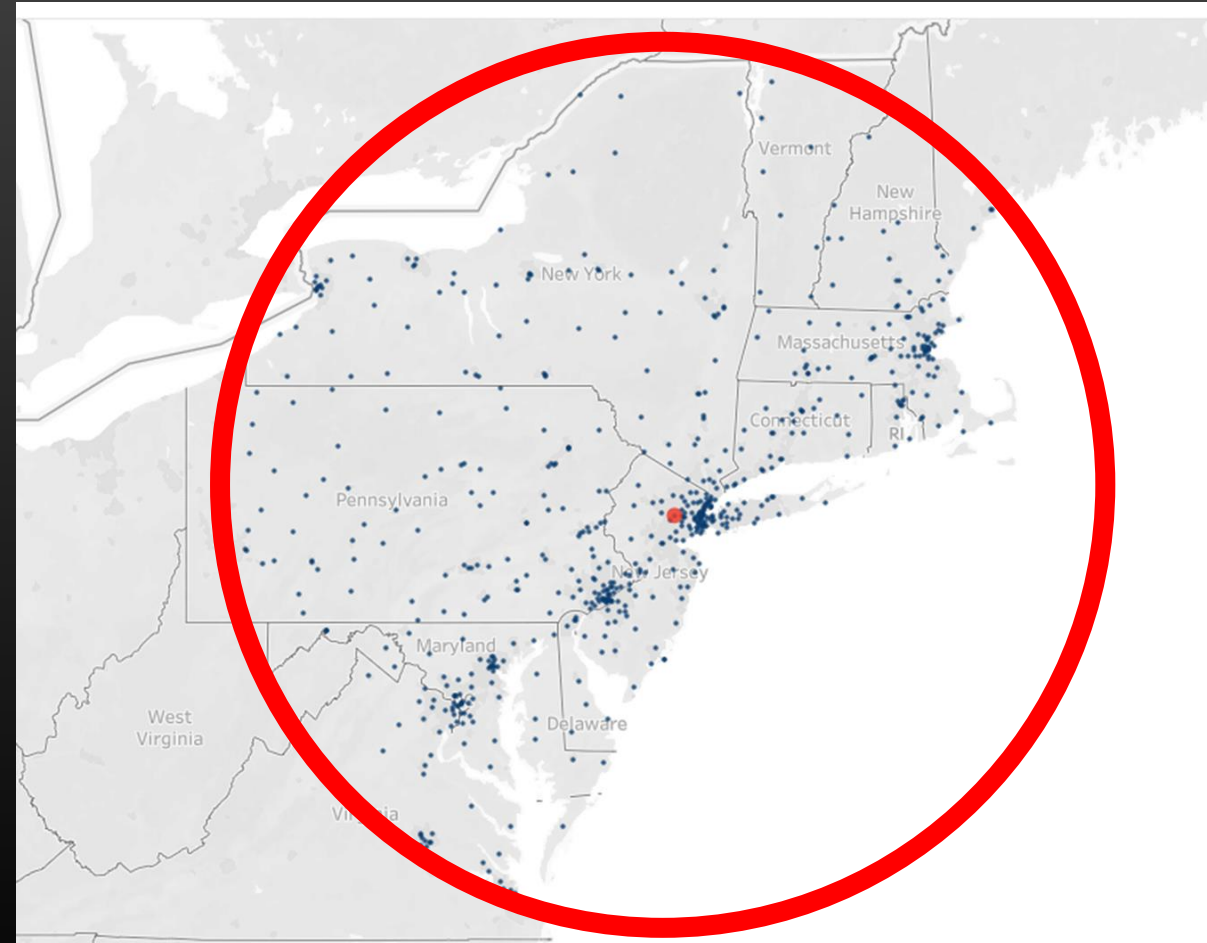
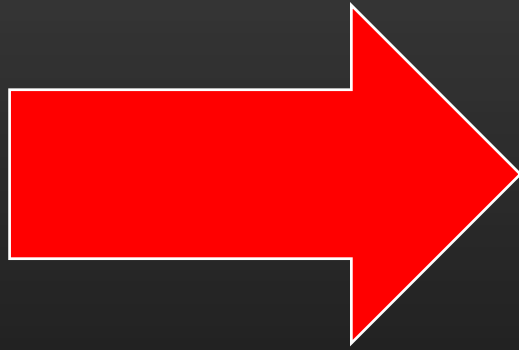
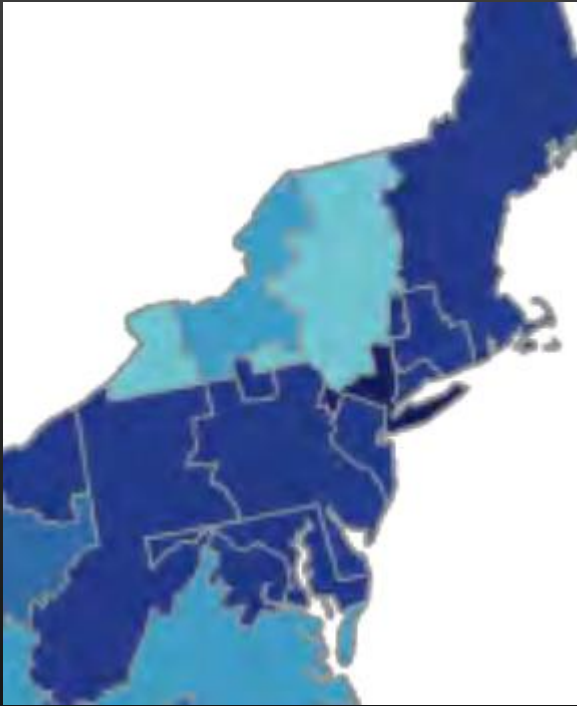
Patient B

- Placed on waiting list 0.8 years before starting peritoneal dialysis
- Been on PD for 1.3 years
- PRA = 99% (50.09 points)
- Distance from transplant center to donor hospital is 7 NM = 1.9 proximity points
- She would have 52.19 points + 1.9 proximity points, or 54.09 points
 - Could have 55.09 or 56.09 points, depending on the particular donor

Here's an example of how kidneys are still allocated by classification, within 250NM vs nationally

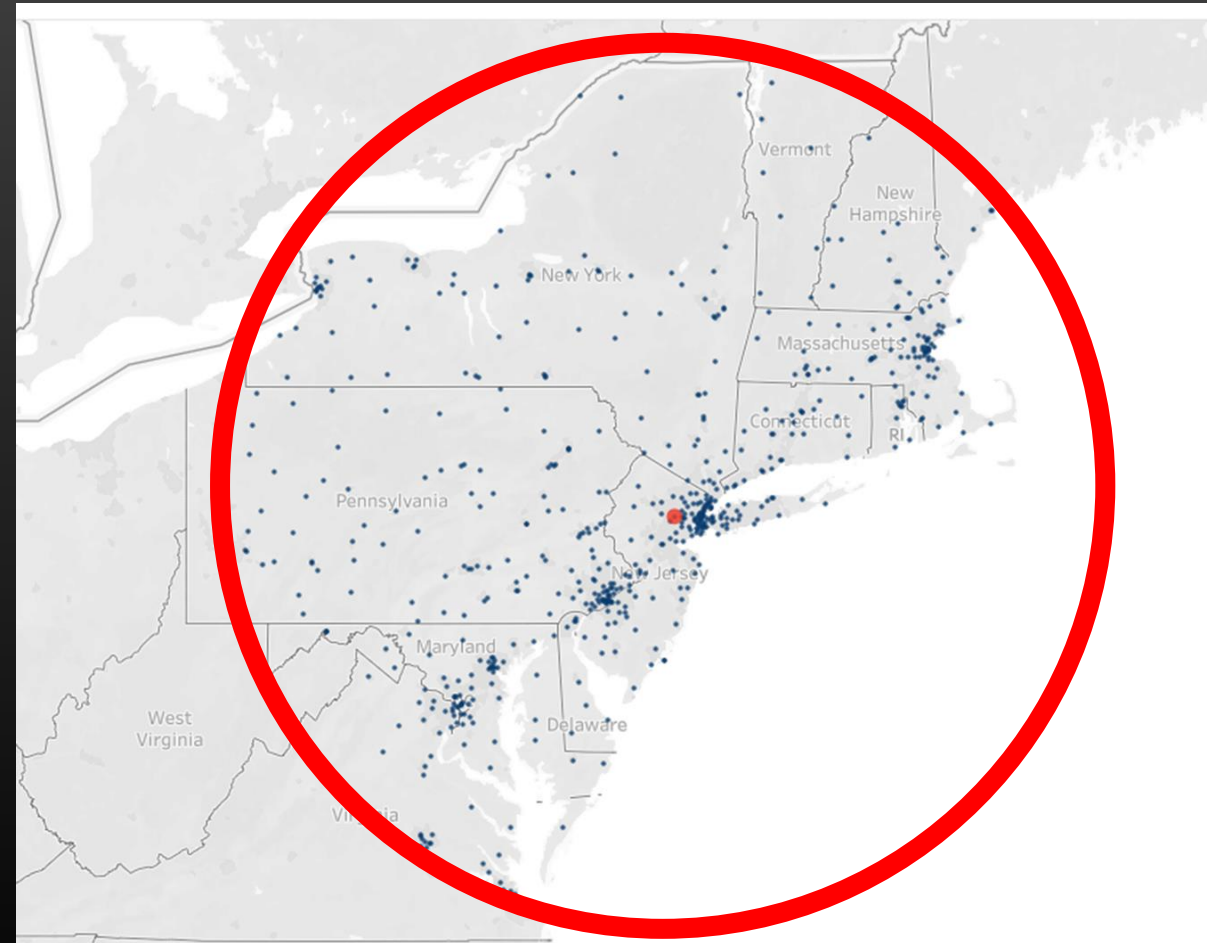
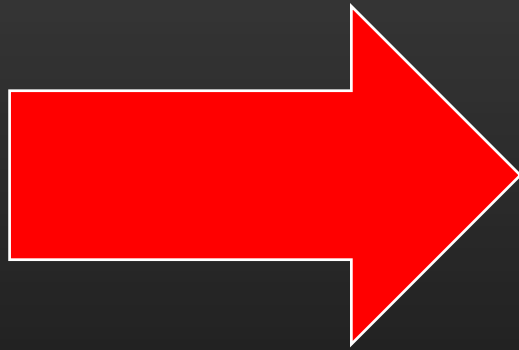
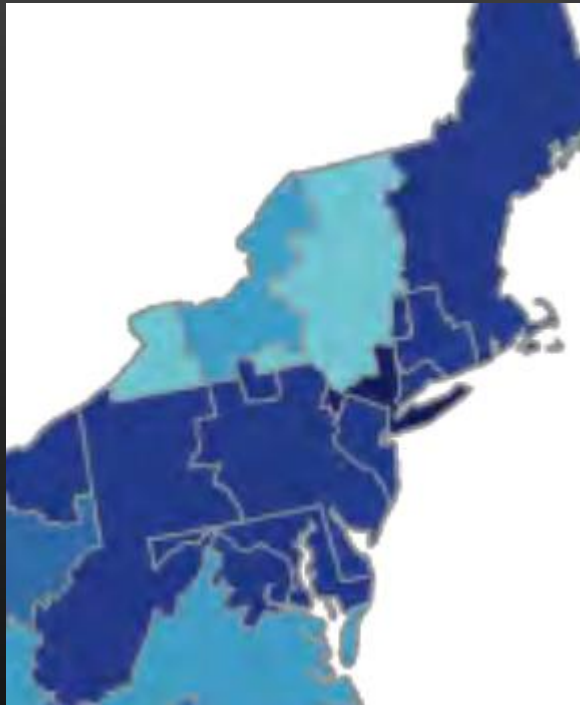


Going from the DSA/region system to 250 NM circles will eliminate the sharp boundaries



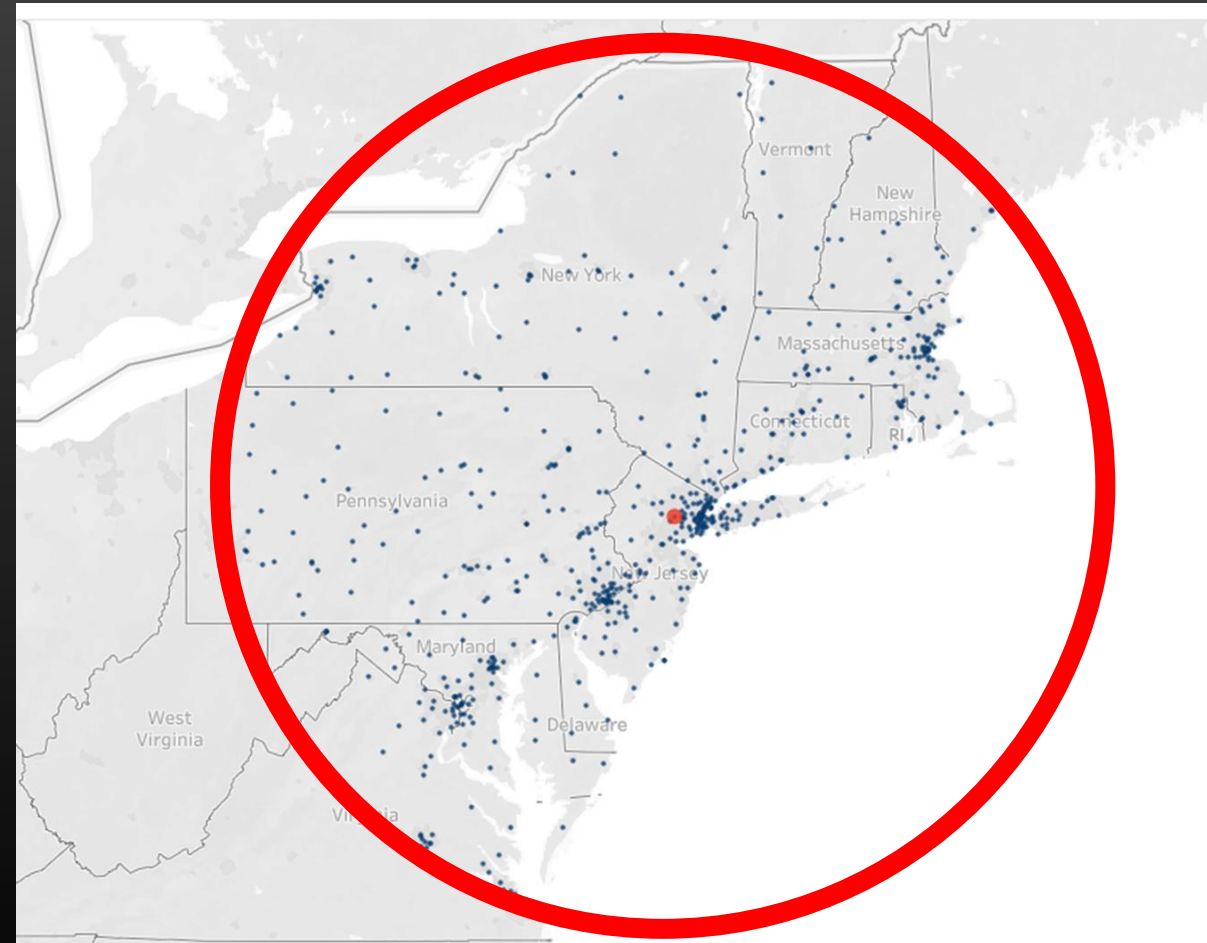
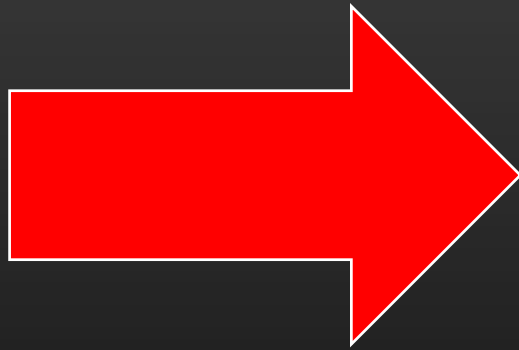
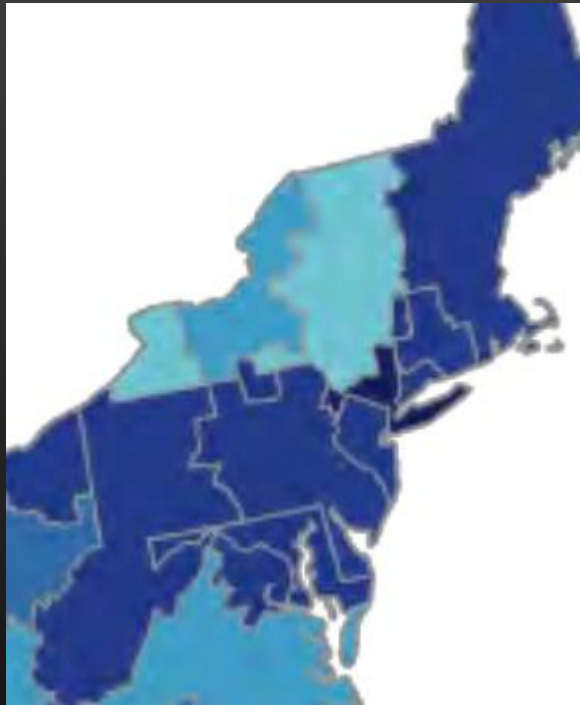
- Changes should therefore decrease the large differences in waiting times between DSA's and regions

Going from the DSA/region system to 250 NM circles will lead to more shipped kidneys

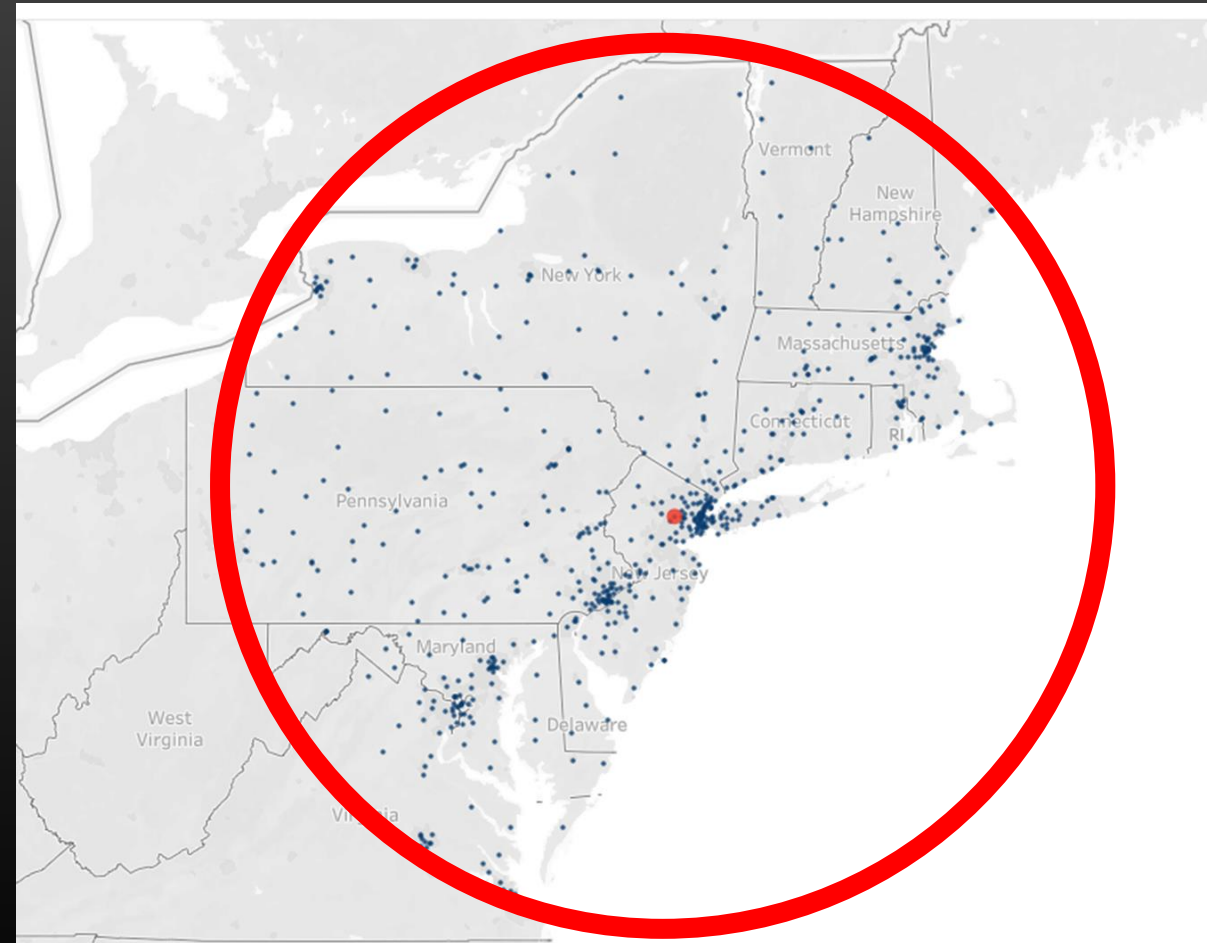
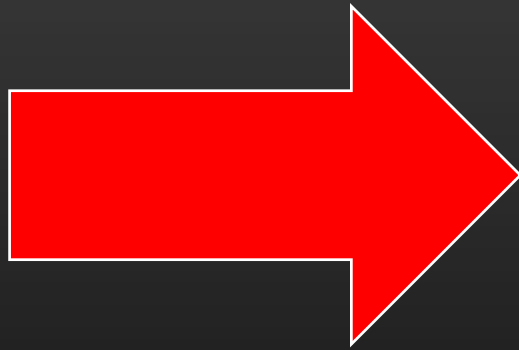
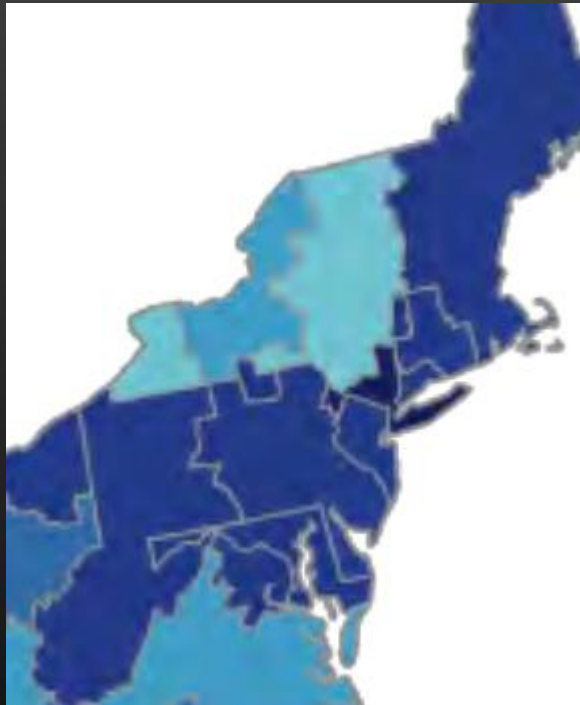


- 250 NM radius is large, and most centers in the circle are in a different OPO

Use of proximity points is a way to slightly favor “local” allocation of kidneys



For any classification, candidates inside the 250NM circle are prioritized over those outside the circle



Summary of the new kidney allocation system, starting March 15, 2021



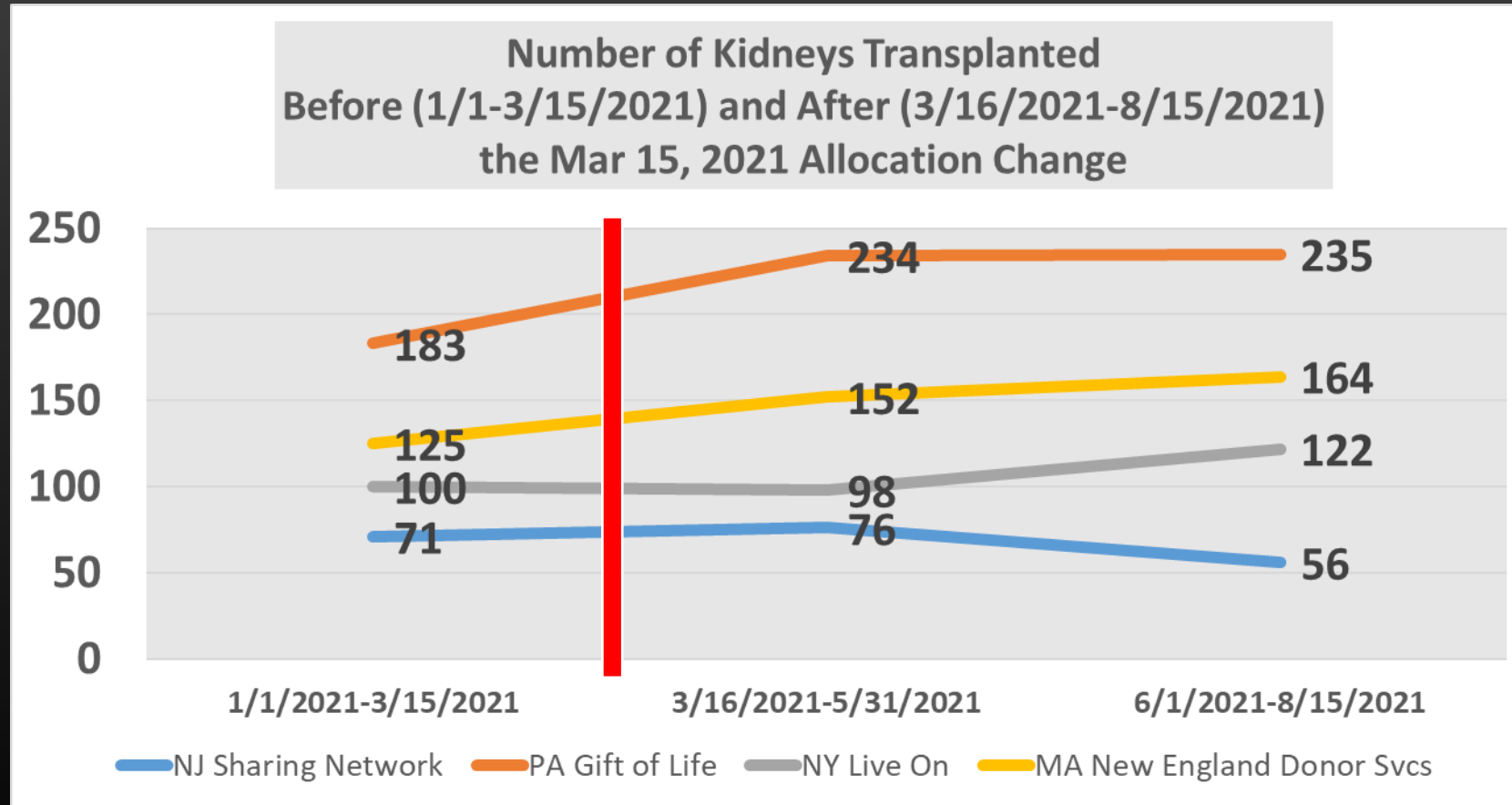
- Based upon classifications (categories) and points

- Favors sharing of kidneys in a 250 NM circle

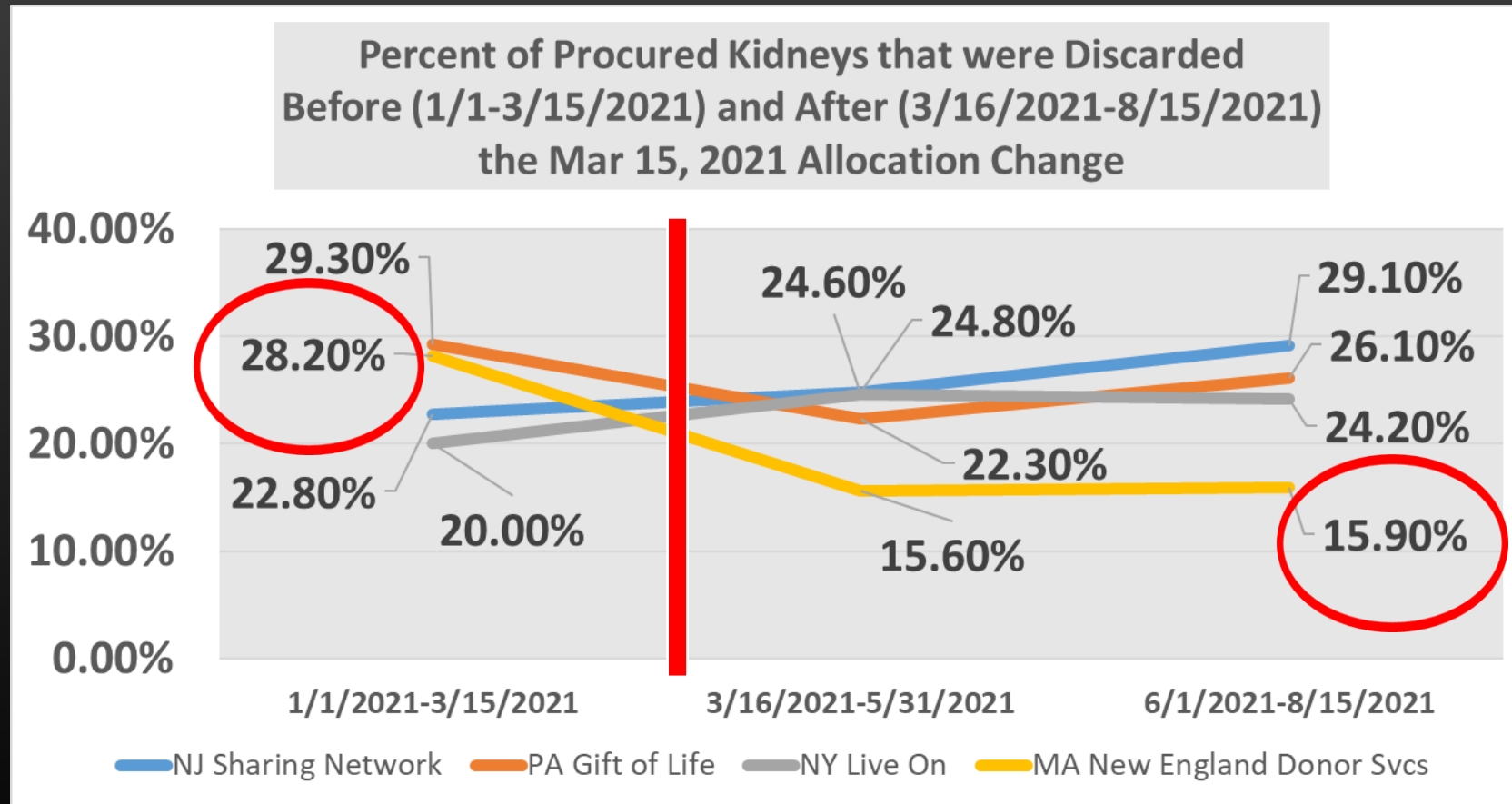
- Should decrease geographic inequities in transplant rate

Impact of the new kidney transplant allocation system

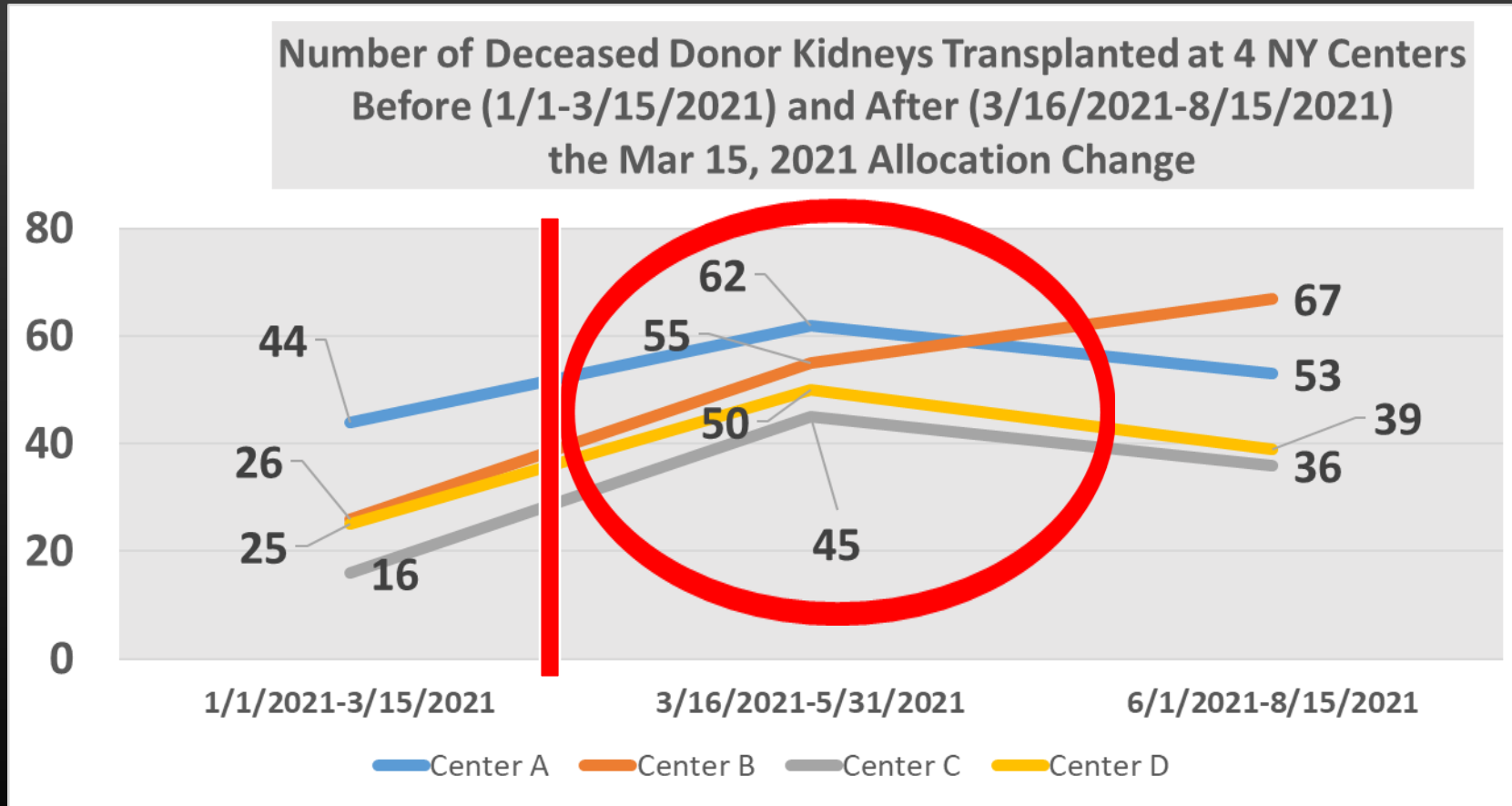
Since Mar 15, kidney transplants from nearby DSA/OPO's have actually increased



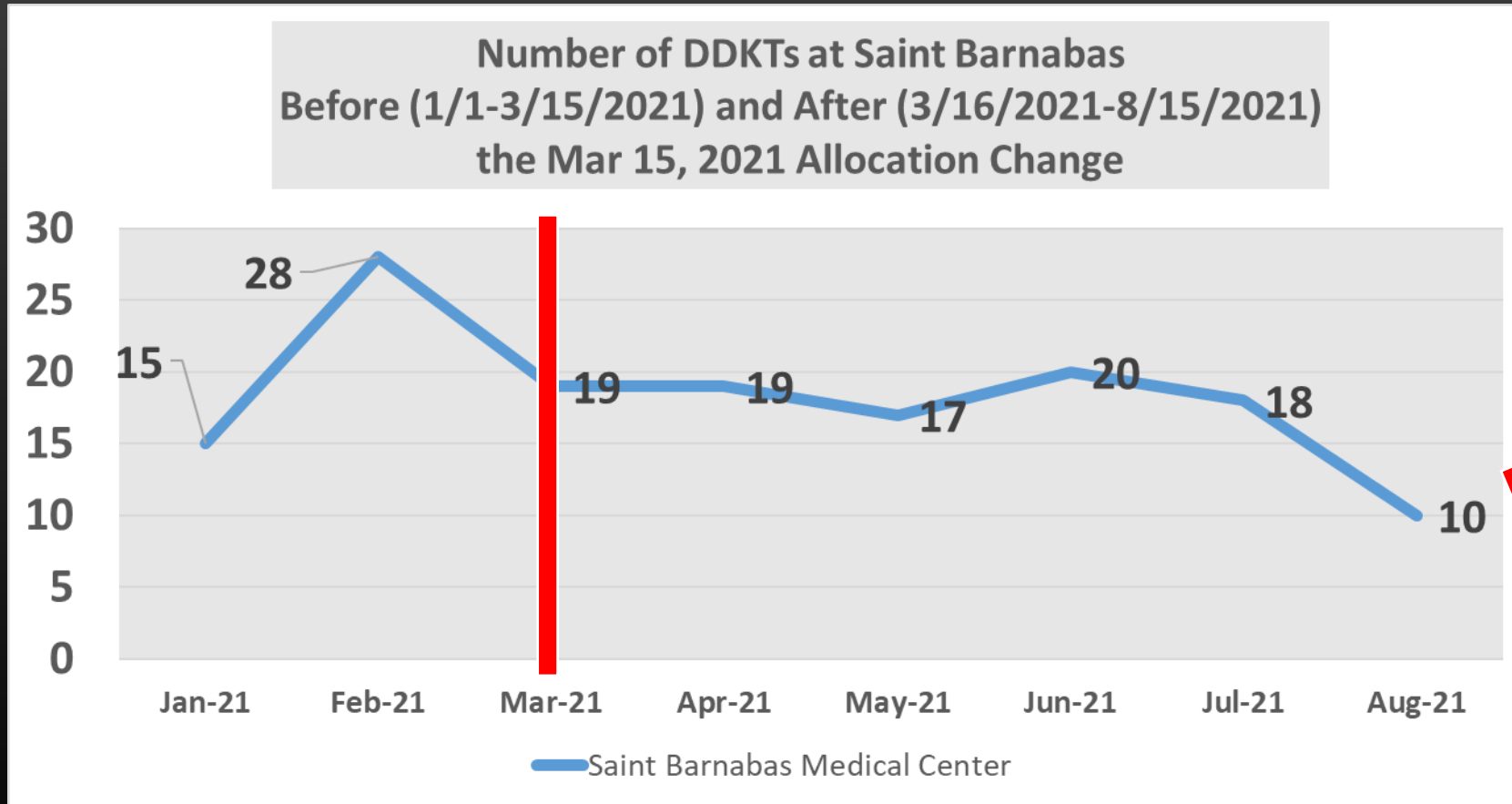
Fewer kidneys are being discarded, probably because of broader sharing in these 250NM circles



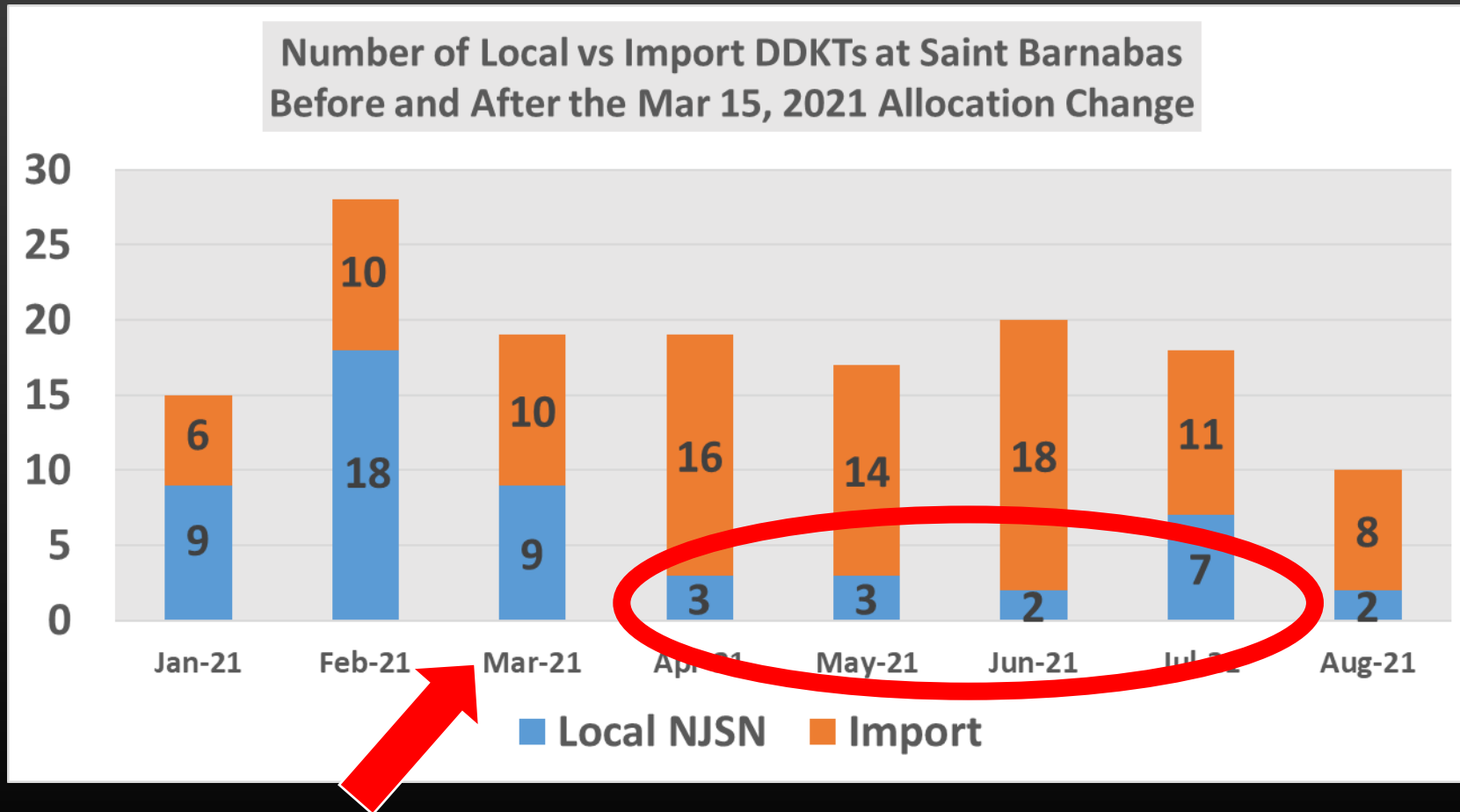
At some centers in DSA's with long waiting times, the number of transplants has greatly increased



At Saint Barnabas, the number of deceased donor kidney transplants has been mostly steady



At Saint Barnabas, most of our deceased donor kidneys are now import kidneys



Sharing kidneys within 250 NM circles has created many consequences

Many more kidney offers

Offers from many OPO's

~Same number of transplants



Sharing kidneys within 250 NM circles has created many consequences

More shipped kidneys

Longer cold ischemic times

More delayed graft function

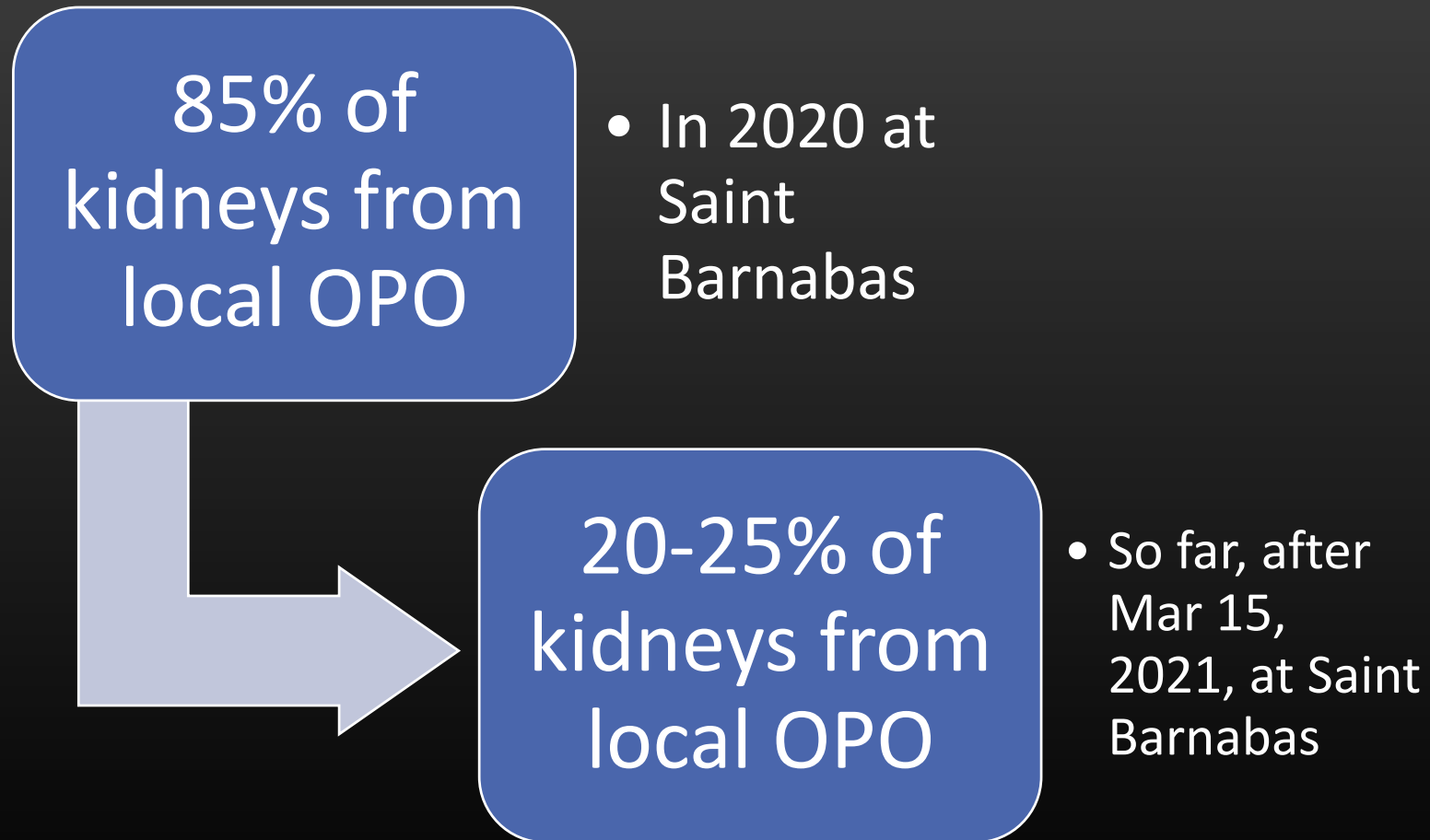


Patients may get a kidney transplant, even if they're #100 on the list for that kidney donor

Rank	Center	Patient	PRA	Points
1	National Center X	AAA	100%	212.1
2	Regional Center Y	BBB	20%	10.31
3	Regional Center Y	CCC	0%	10.29
4	Regional Center Y	DDD	0%	10.28
5	Regional Center Y	EEE	25%	10.17
6	Regional Center Y	FFF	32%	10.11
7-90	Other centers			
91	Saint Barnabas	HHH	0%	6.00
92	Saint Barnabas	III	0%	5.97
93	Local Center B	JJJ	12%	5.93
94	Regional Center	LLL	0%	5.80
95	Regional Center	MMM	0%	5.77
96	Regional Center	NNN	0%	5.75

- There are dozens of kidney transplant centers in the Northeast
- Centers may decline a kidney for their patient for many reasons

Transplant centers and OPO's have had to develop many new relationships with each other



What should our transplant candidates know about these changes?



You may get many calls for transplant offers BUT not receive an actual transplant

Even if the kidney offer is turned down by other transplant centers and patients, it should be a good kidney for you

The kidney transplant might be “sleepy” in the beginning, so you might need dialysis in the first few days and weeks

Conclusions

The old kidney allocation system favored usage of kidneys locally, with limited sharing

- Disadvantage of creating geographic disparities in transplant rate

The new system favors sharing of kidneys in large 250 NM circles

- Disadvantage of increased shipping and logistical problems

After Mar 15, 2021, the number of deceased donor kidney transplants at Saint Barnabas has remained steady

As the system settles down, we will see and hope that our patients can continue to receive transplant offers and transplants

Thank you for your attention.



- QIRN3 Transplant Designee Hub
<https://www.qirn3.org/Clinical/Transplantation.aspx>
- QIRN3 Transplant QIA Website
<https://www.qirn3.org/Ongoing-Projects/Improving-Transplant-Listing-QIA.aspx>