Surgical Assessment of the Potential Kidney Transplant Recipient

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Outline

- Why transplant?
- Contraindications
  - Absolute
  - Relative
- Surgical Evaluation of the Potential Transplant Recipient
  - Major Concerns
    - Vascular
    - Urologic
    - Body Habitus
  - Clinical Evaluation
  - Clinical Examples
- KAS Tidbits

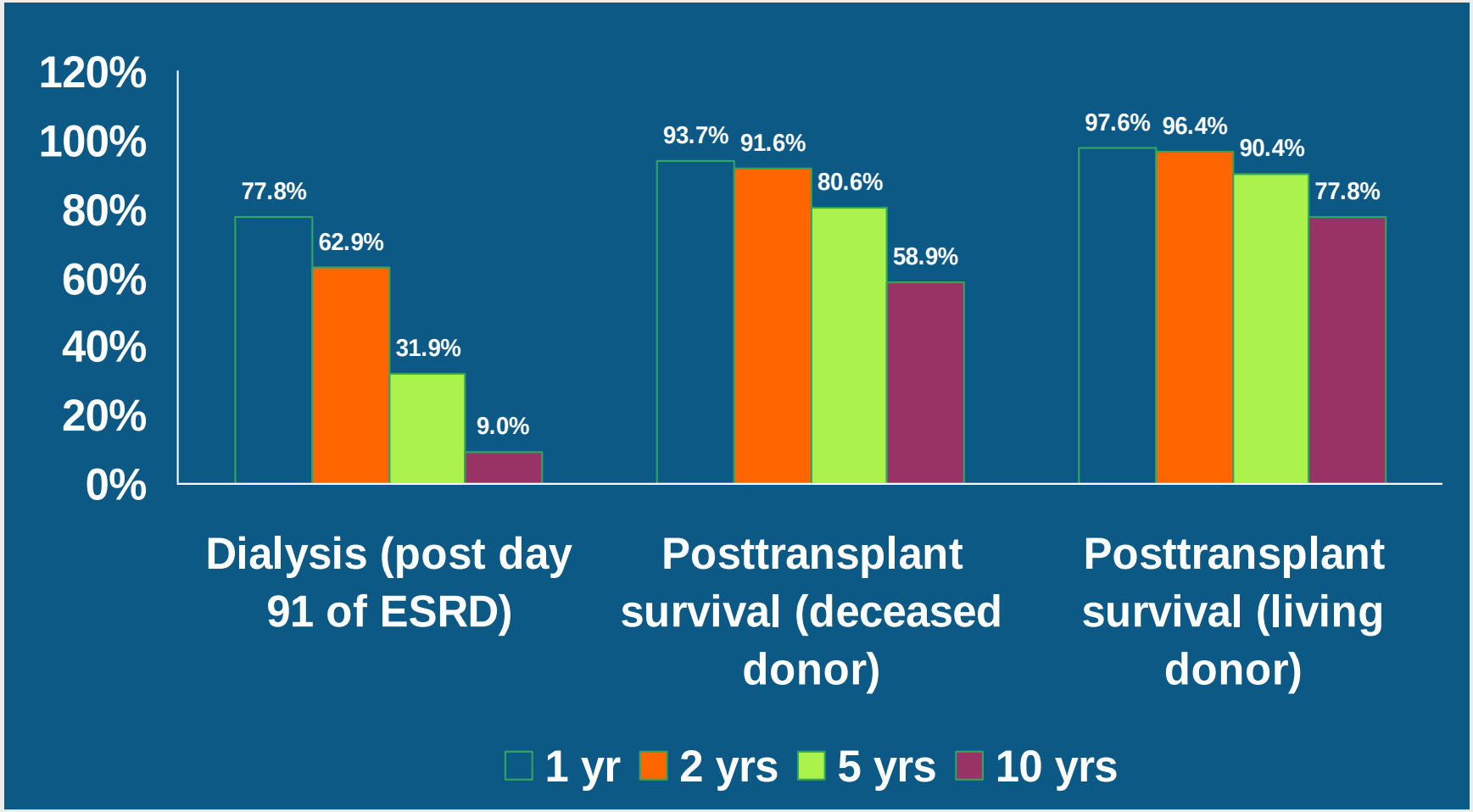
Myth: Transplant is for everyone!

Fact: Kidney tx is NOT considered a cure for kidney disease and may not be the best option for everyone.

Fact: Hemodialysis, peritoneal dialysis and transplantation are all valid methods of renal replacement therapy.

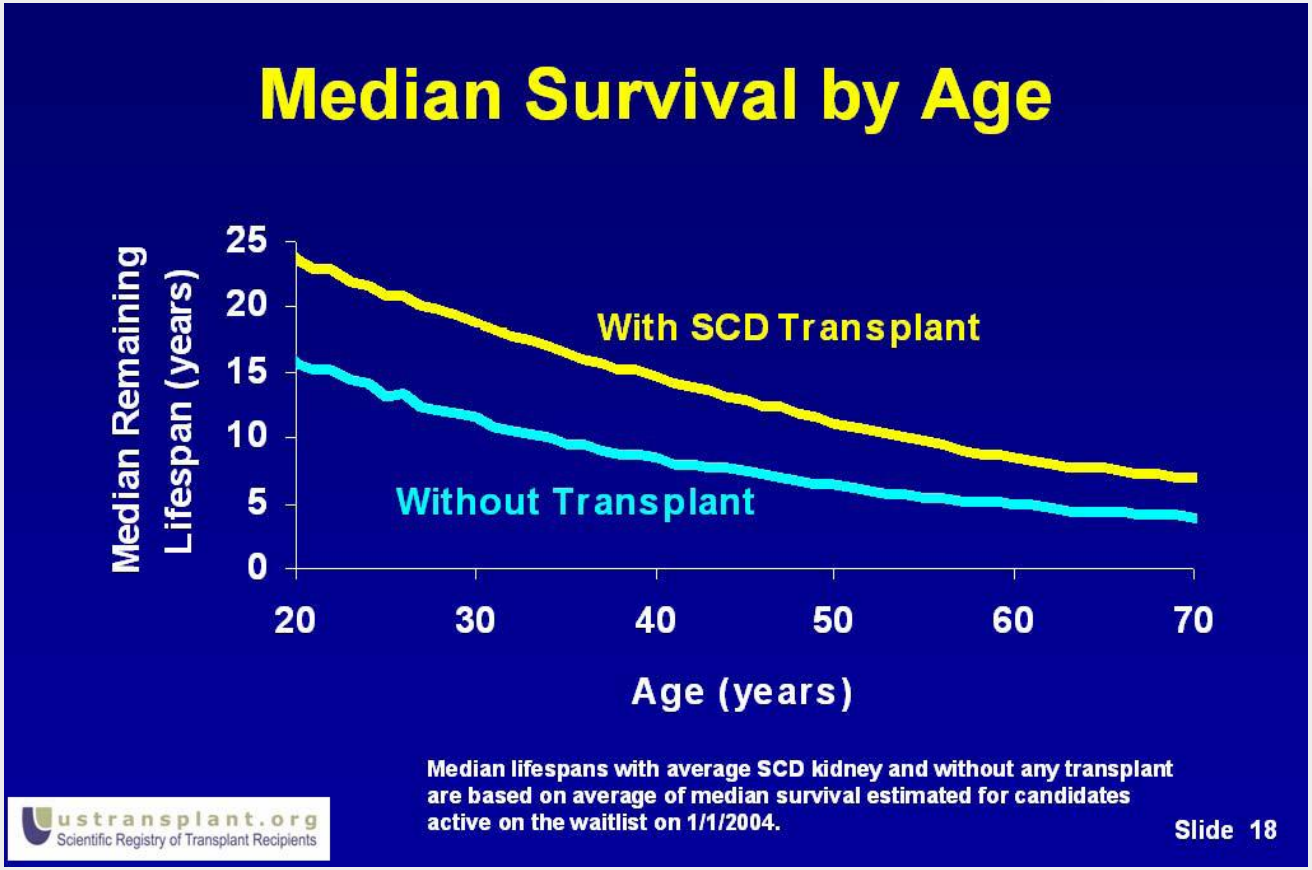
Personal or medical factors determine the best option for each patient.

ESRD Survival by Treatment Modality

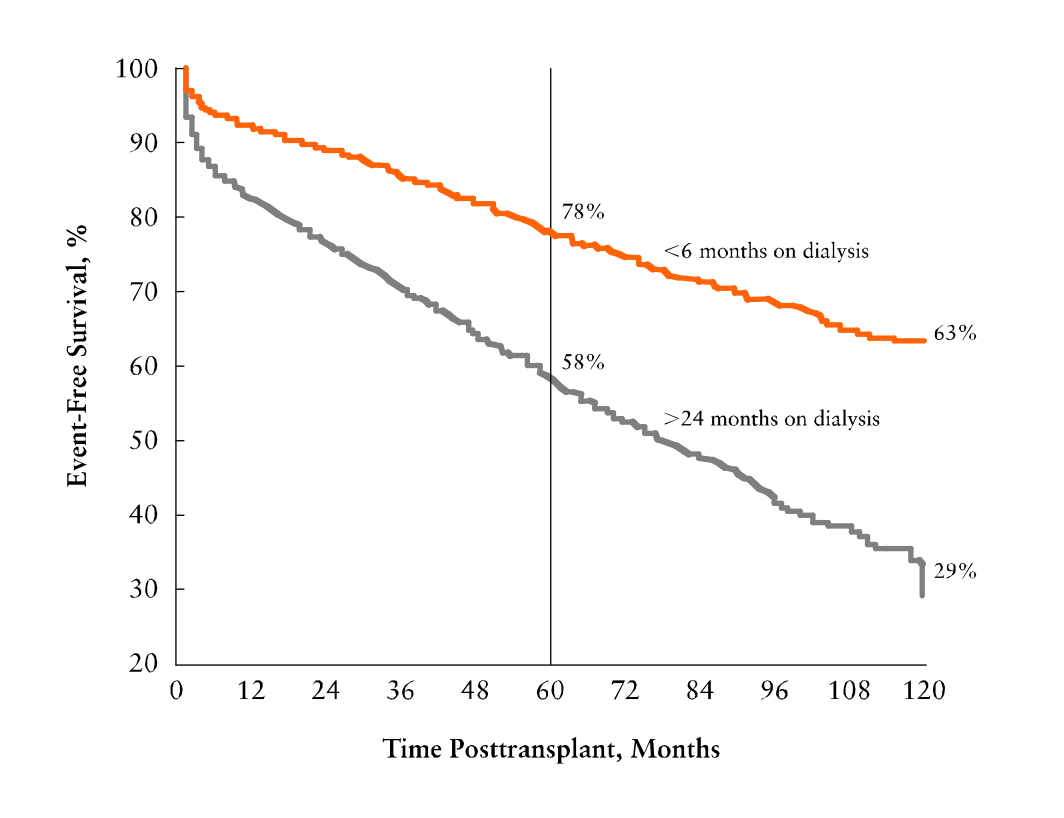


National Kidney Foundation. Available at: http://www.kidney.org.

Transplant vs Hemodialysis



Graft Survival in 2405 Paired-Kidney Transplants: Short vs Long ESRD Time



Adapted with permission from Meier-Kriesche HU, et al. *Transplantation*. 2002;74:1377-1381.

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Contraindications

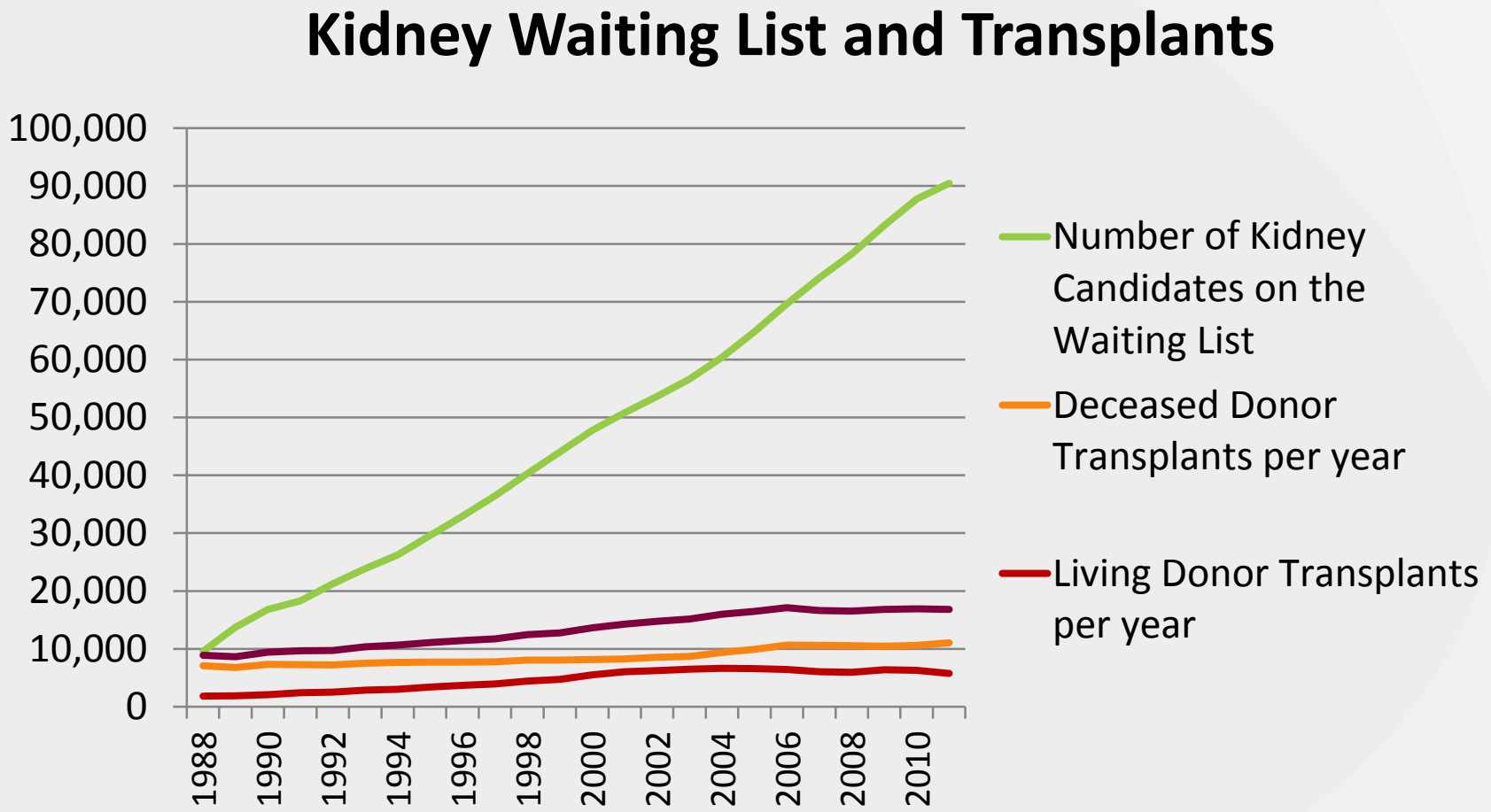
Absolute

- Active Cancer
- Irreversible Failure
  - Heart
  - Pulmonary
  - Hepatic
- Active Systemic Dz
  - Lupus, Sickle Cell
- Active Infection

Relative

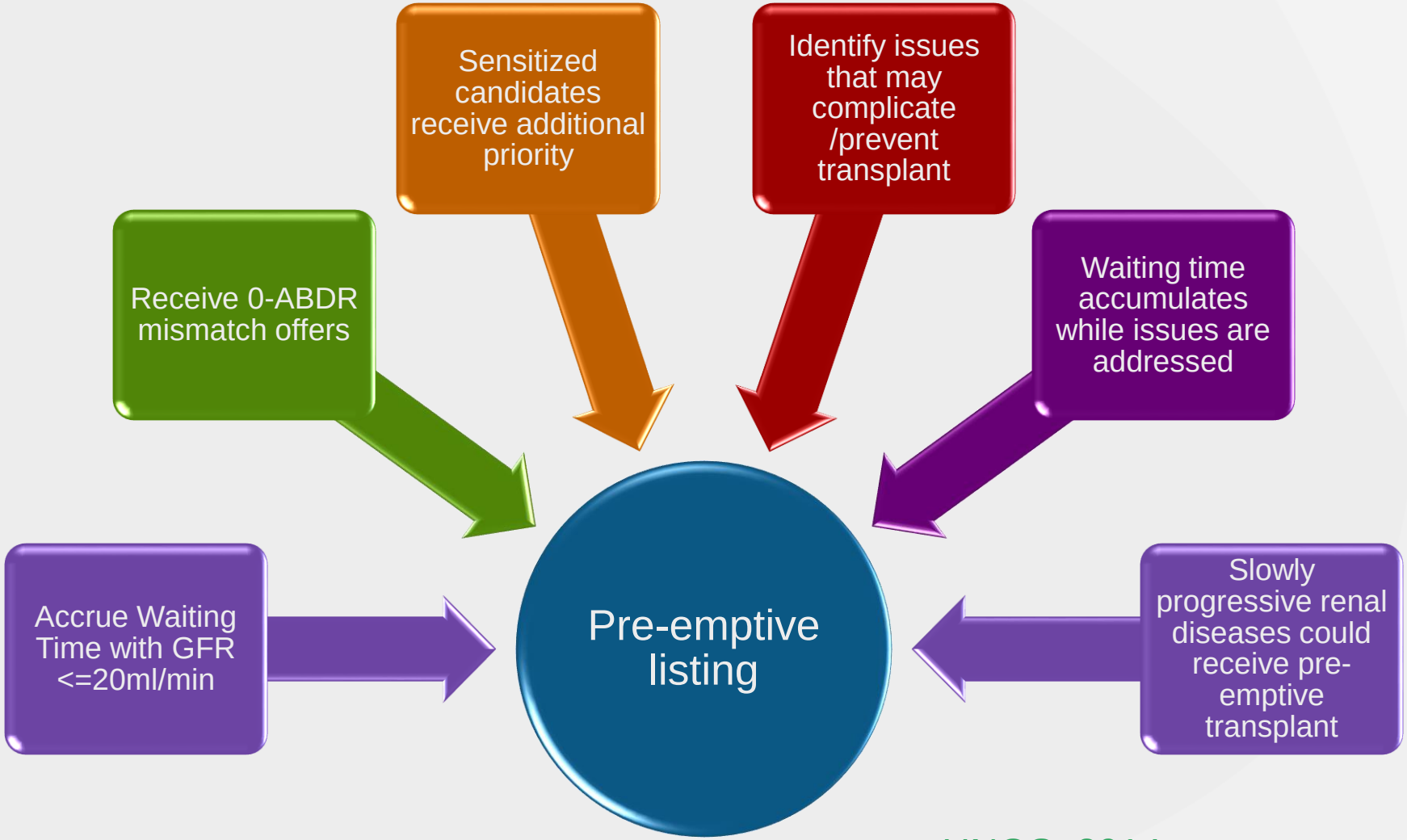
- Treated Cancer
  - Grade, Stage, Site
- HCV, HIV, HBV
  - HOPE Act
- Morbid Obesity
- PVD
- Treatable CVD
- Unresolved Psychosocial Issues
  - Noncompliance
- Smoking

The Growing Waiting List



OPTN data as of September 1, 2012

Importance of early referral



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Living Kidney Donation

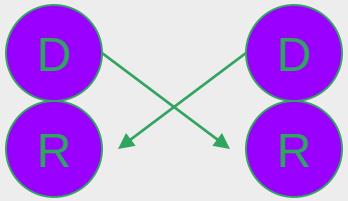
- Best option for recipient
  - Enhanced survival relative to deceased donors
  - Eliminates issues of brain death, shock, trauma that activate innate immune response
  - Timed transplant when recipient health maximized
  - Immediate function routine

Direct vs Paired donation!

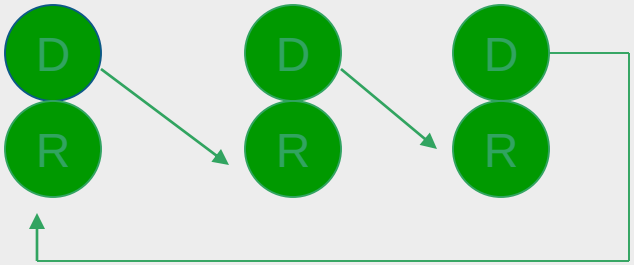
Paired Donation

Traditional Paired Exchange

Two Pair Exchange



Three Pair Exchange



Chains

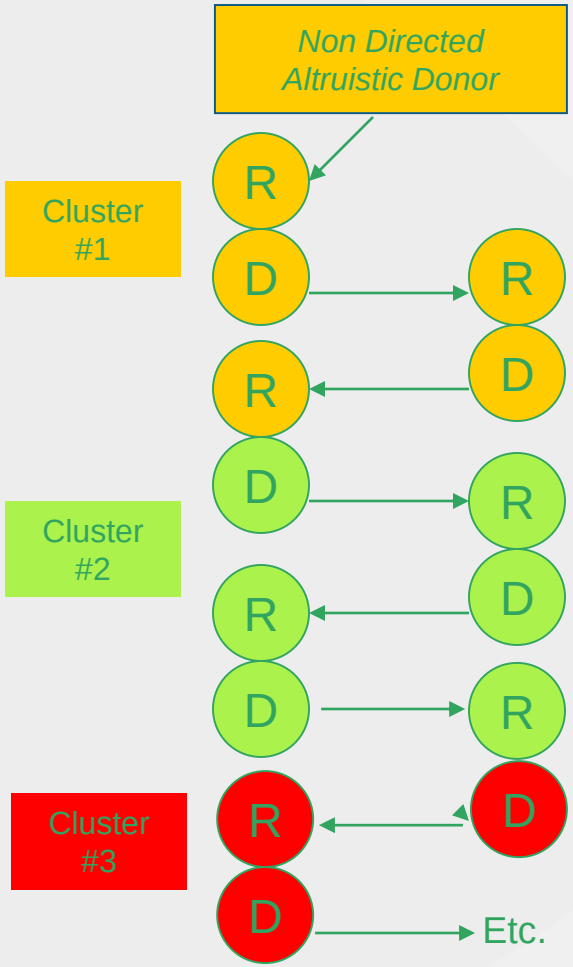
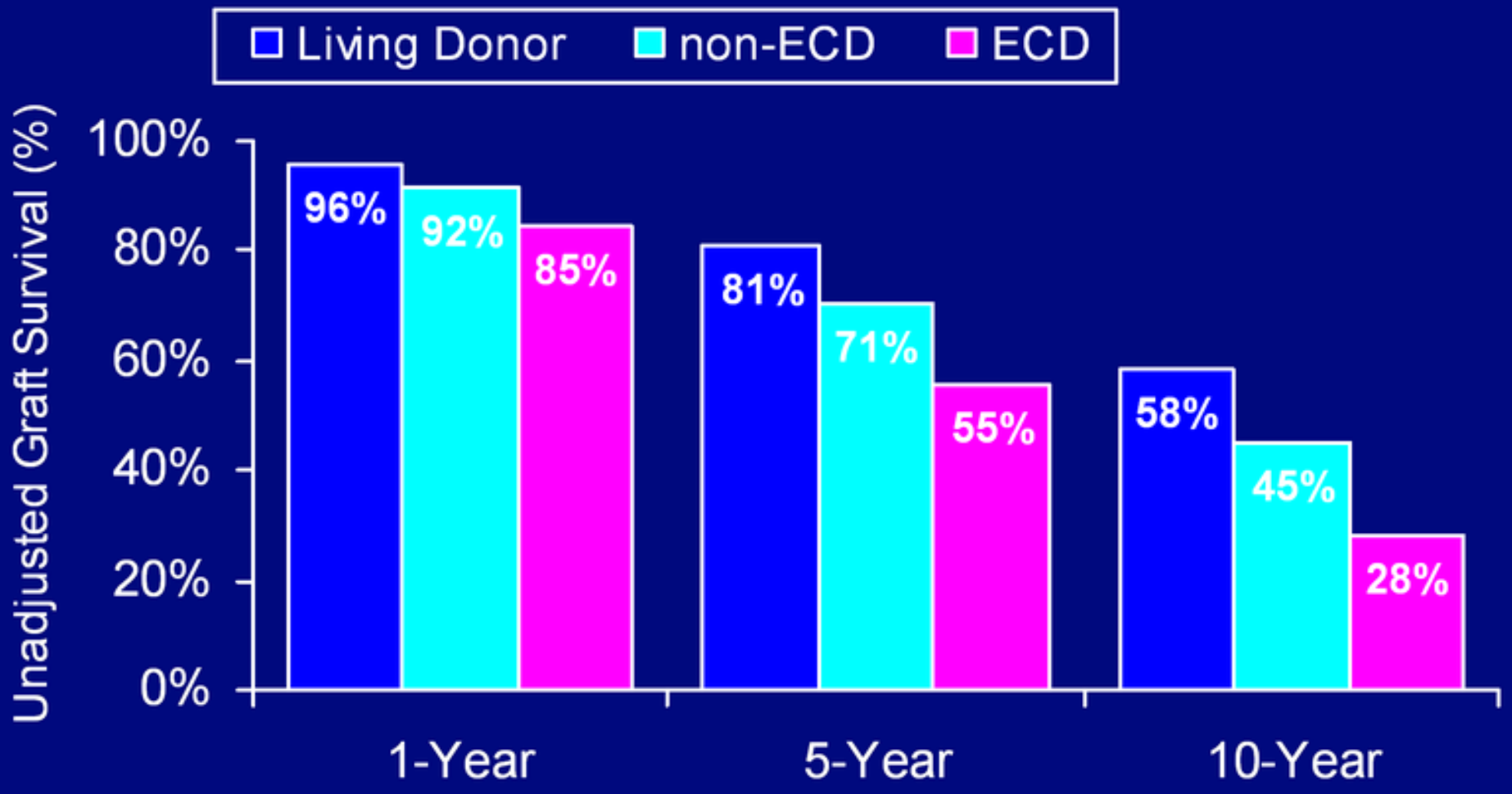


Figure III-7. Unadjusted 1-Year (2005-2006), 5-Year (2001-2006), and 10-Year (1996-2006) Kidney Graft Survival*, by Donor Type

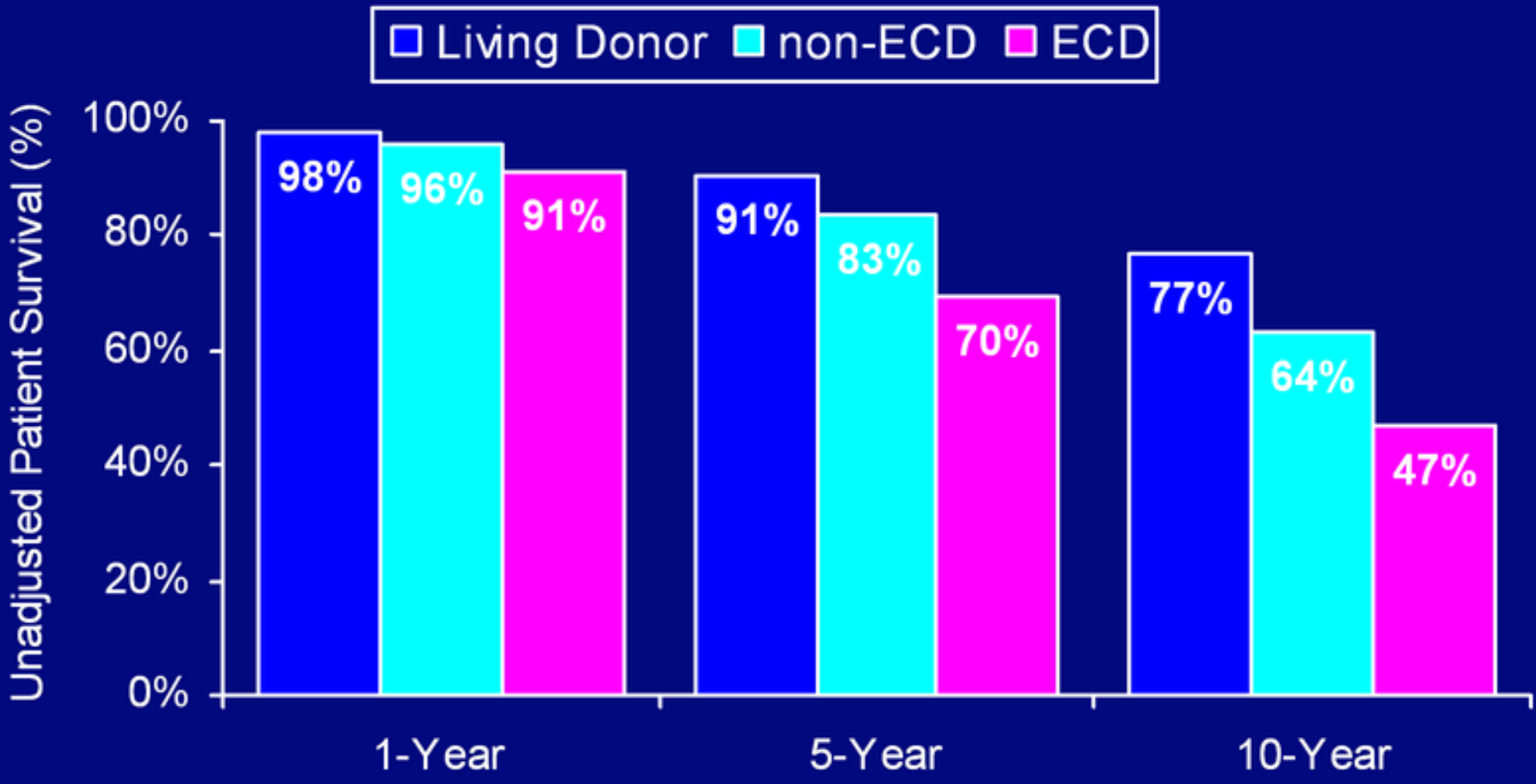


*Death is included as an event.

SRTR

Source: *2008 OPTN/SRTR Annual Report,* Tables 5.10a, b, d.

Figure III-6. Unadjusted 1-Year (2005-2006), 5-Year (2001-2006), and 10-Year (1996-2006) Kidney Recipient Survival, by Donor Type

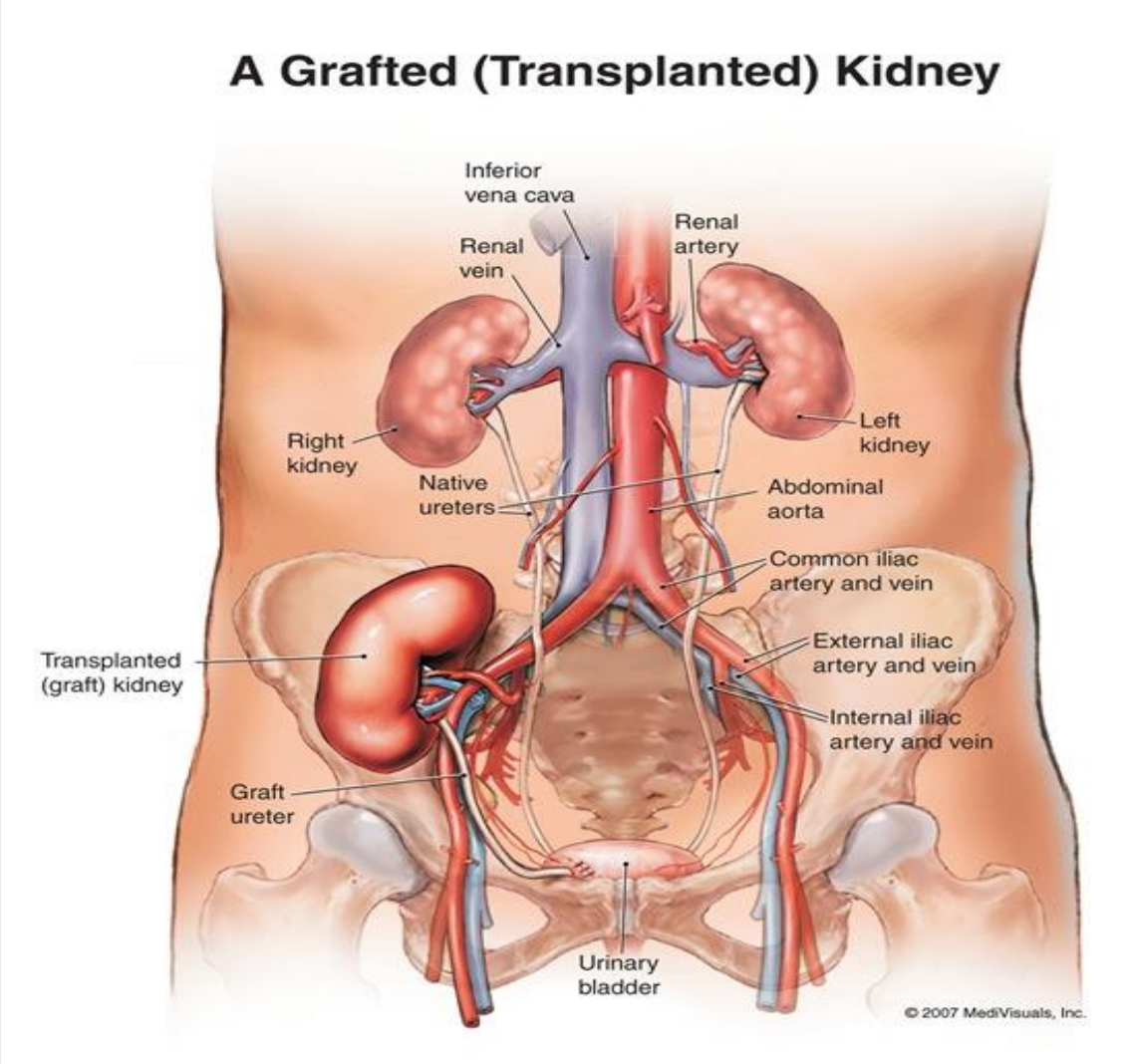


SRTR

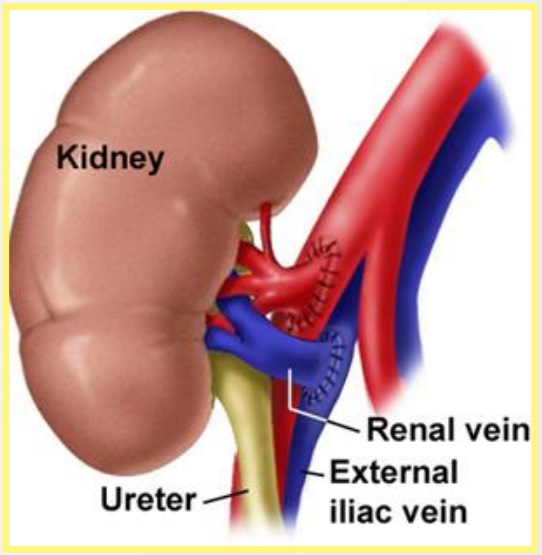
Source: *2008 OPTN/SRTR Annual Report,* Tables 5.14a, b, d.

Surgical Assessment of Potential Kidney Transplant Recipient

Kidney Transplant Standard Surgical Approach

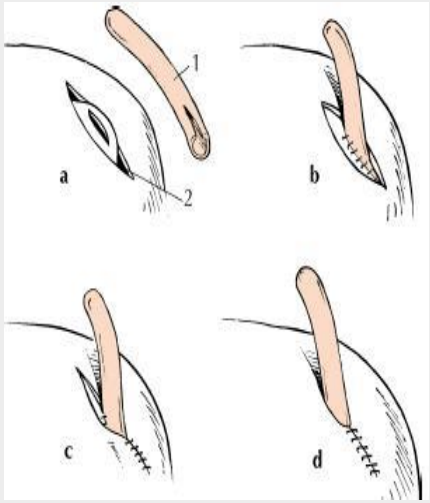


Kidney Transplant Standard Surgical Approach



Vascular anastomoses

1. Anterior abdominal approach, yet extraperitoneal.
2. External iliac vessels
3. Vein first, then artery.



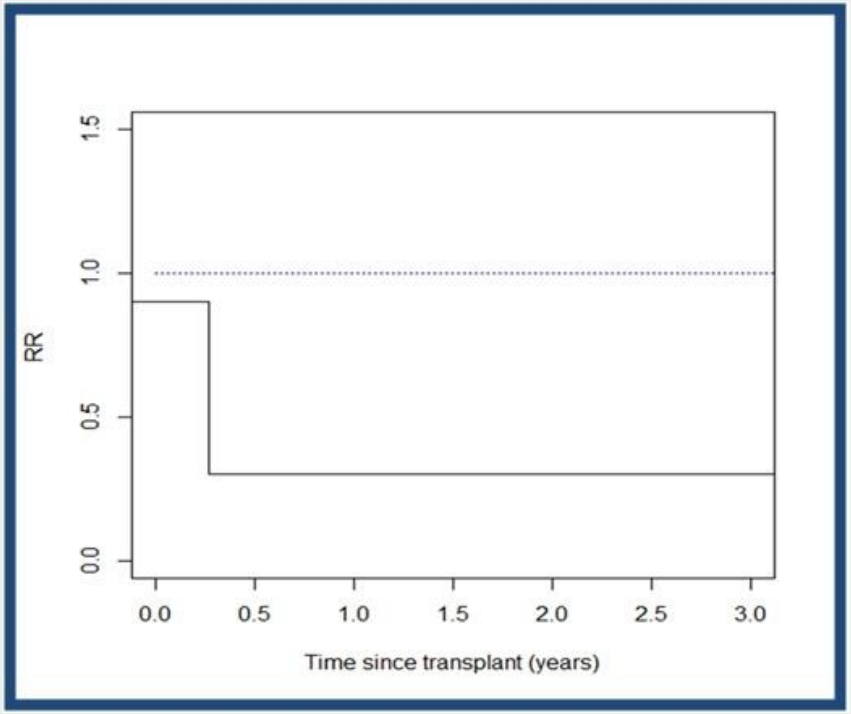
1. GU irrigant instilled per Foley catheter to 150-200 mls and Foley tubing clamped leaving bladder distended
2. Vessels done first, then ureter.
3. Spatulated ureter sewn to dome of bladder +/- ureteral double-J stent.
4. Tunnel closure approximates antireflux mechanism.

Vascular

- Risk factors in our patients
  - ESRD, HTN, DM, lipids, +/- smoking
- Silent disease – “asymptomatic” but relative to level of activity
- Anastomotic site vs proximal disease (or both)
  - Risk for future intervention
    - Abdominal aortic aneurysm

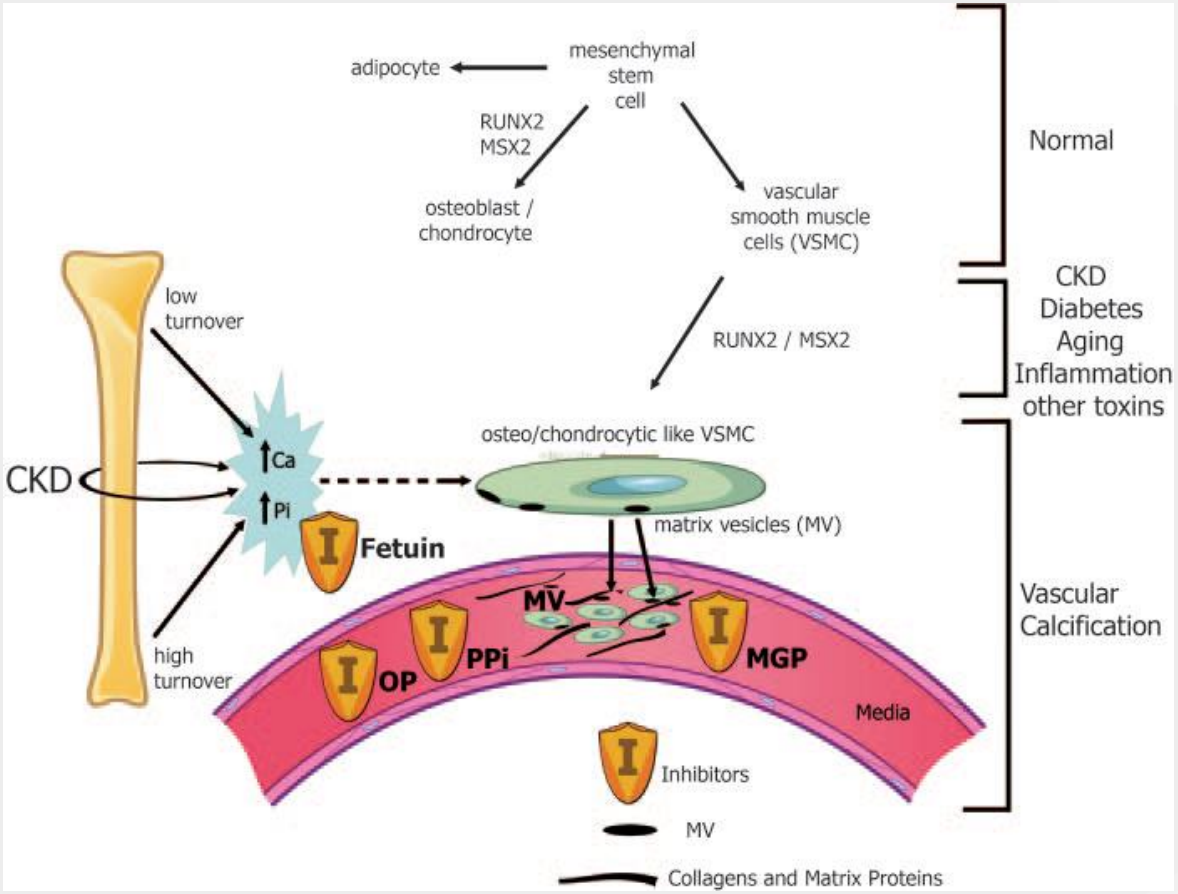
Transplant and Vascular Disease

- USRDS database
  - 23,699 met criteria
    - 22.86 on dialysis
    - 4.98 wait-listed
    - 4.86 for KTX
- Survival advantage with living donor transplant
- No survival advantage at any point with deceased donor



Brar A, et al. AJT (abstract) 2015;15(supple 3)

Not Just a Bone Problem



Genitourinary

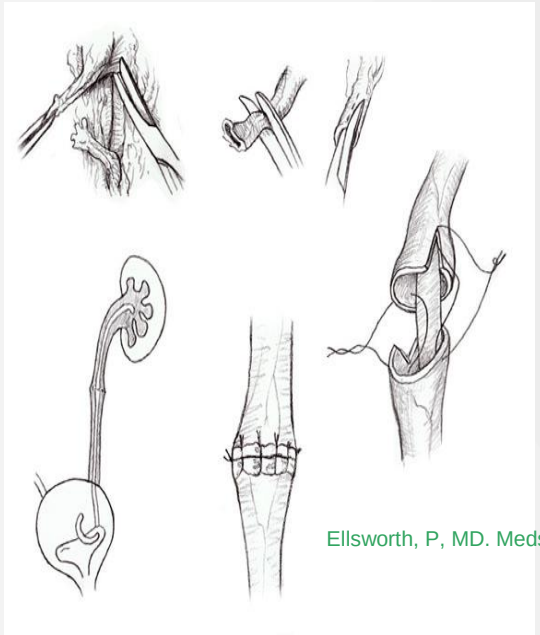
- Longevity of oliguria/anuria
- Cytoxan use and risk of cancer
- Bladder assessment
  - Unrecognized Bladder Outlet Obstruction
  - TUR cannot be done in setting of anuria
  - Possible protocol – start with assessment while still voiding – Stage IV-V
- Pretransplant nephrectomy
  - Limited indication at this time

Alternative Plumbing

Reasons for alternate drainage

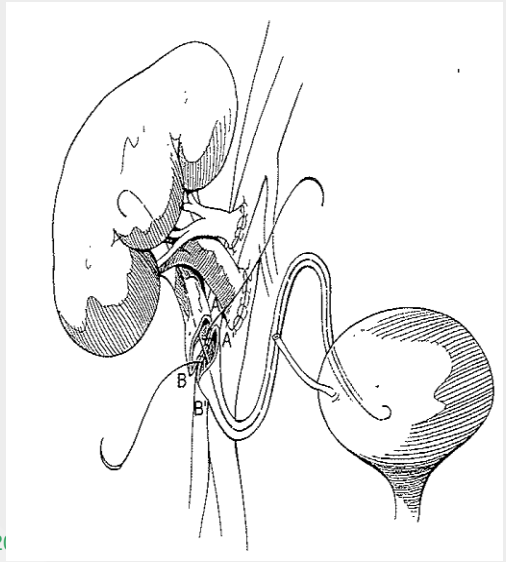
1. Some surgeons use as primary method
2. Short transplant ureter
3. Small bladder following years of anuria – unable to distend
4. Repair of urine leak with ureteral necrosis

Uretero-ureterostomy

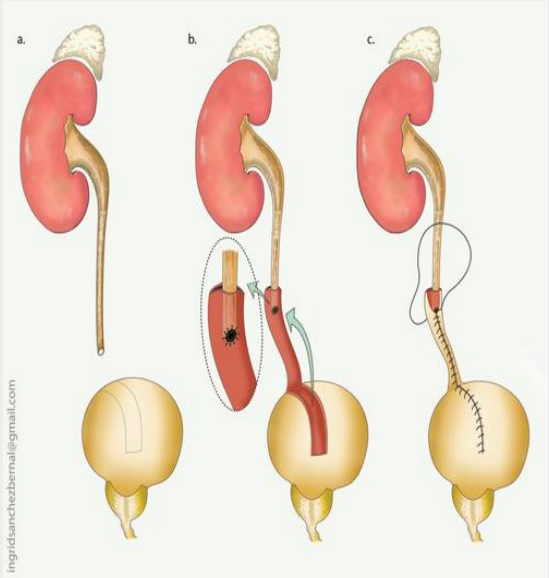


Ellsworth, P, MD. Medscape, 2

Uretero-pyelostomy



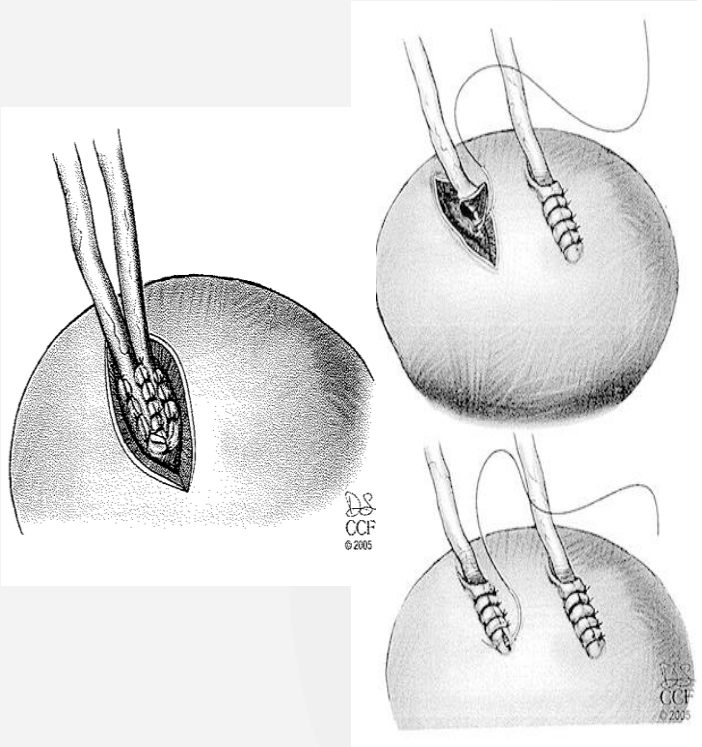
Boari Flap/Psoas Hitch



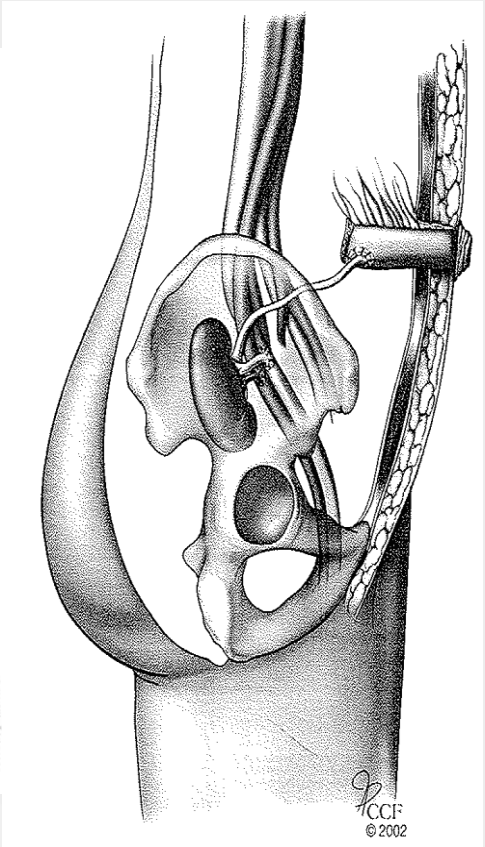
Pereria B etal, SJTREM, 2010

Alternative Plumbing

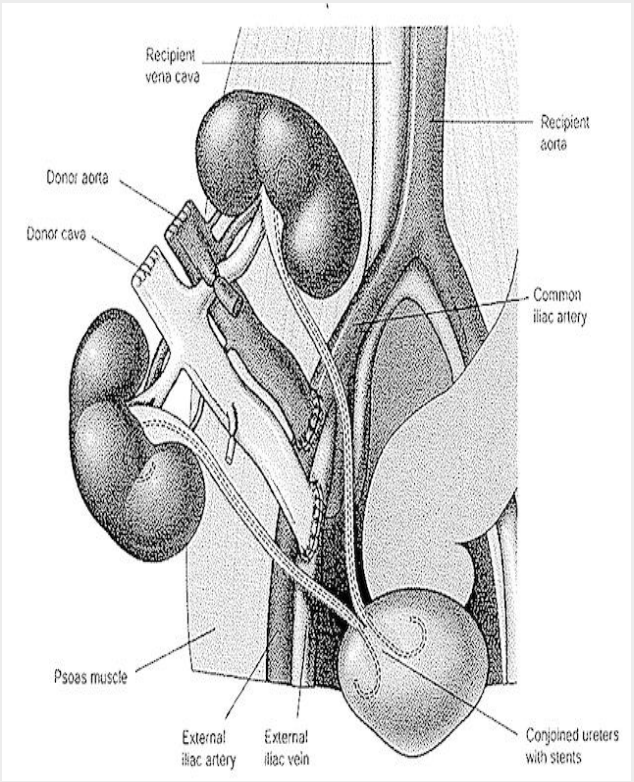
Double ureter approaches



Ileal loop (aka ileal conduit)



Pediatric en bloc transplantation



“Blue Plate Special”

- Pre transplant operative package in the days of limited immunosuppression
  - Bilateral Nephrectomy
  - Splenectomy
  - Appendectomy

Pre-transplant Native Nephrectomy

- Symptomatic Polycystic Kidney Disease
  - Hemorrhage, pain, infected cysts
  - Anephric state – hypotension due to reduced renin
- Infectious etiology
  - Usually pediatrics – reflux, obstruction
- Prior obstruction and instrumentation
  - Colonized obstructed system
- Renal Masses – ACDD
  - Leave long ureter for potential use with transplant, unless limited by diagnosis

Body Habitus

- BMI standard is relatively high for area programs
  - Evaluation 41
  - Active listing 38
- Pannus transplantable or not
- Increases risk of surgical complication
  - Wound
  - Anastomosis time
- Obesity related metabolic, renal and liver disease
- Pre-transplant bariatric surgery

Prior Transplant Patients

- Transplant in place or explanted
- “Just move to the other side”
  - ?third transplant
    - Intraperitoneal or remove one kidney
  - Vascular disease worse on non-transplant side

Evaluation

- Clinical history
  - Smoking changes everything
  - Prior vascular surgery, amputation
- Clinical exam
  - Bruits, absent distal pulses, skin changes
- Abdominopelvic CT scan – noncontrast
  - Assess vascular disease
  - Assess native kidneys
  - Incidental findings
- Abdominal Ultrasound for younger patients

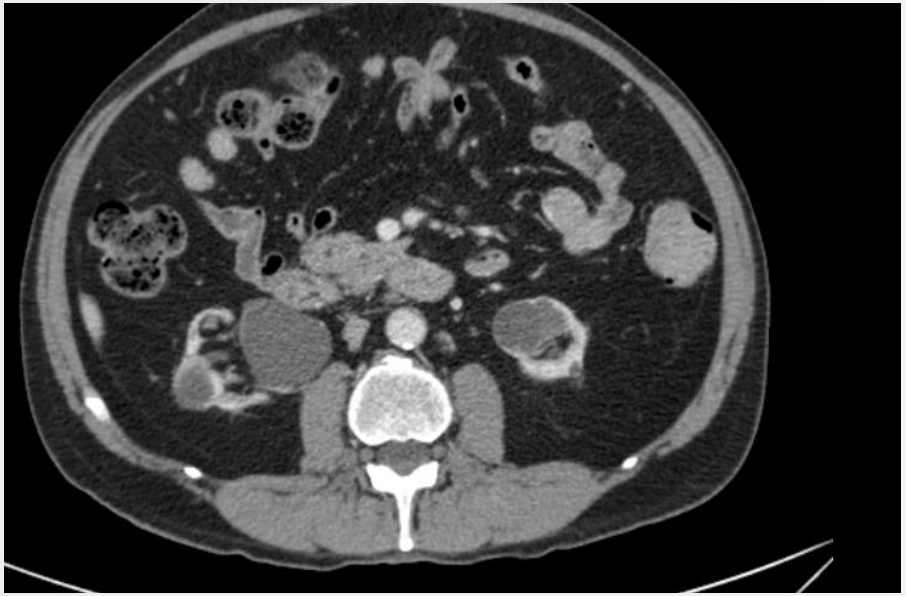
Abdominopelvic CT
Peripheral Vascular Disease

Aortoiliac disease s/p aortobifemoral graft
Kidney transplant

Native Kidneys
Acquired Cystic Disease of Dialysis

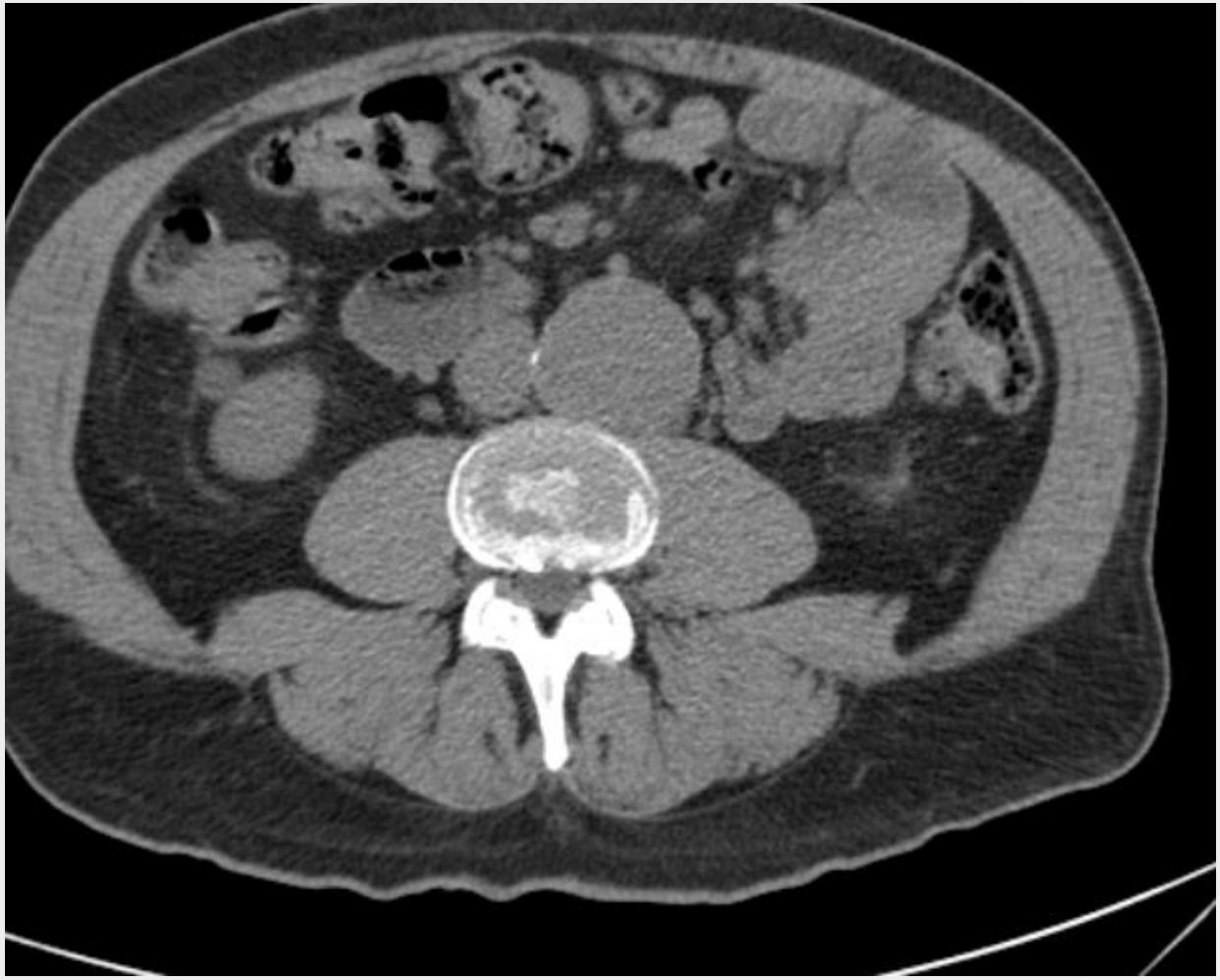
Without Contrast

With Contrast



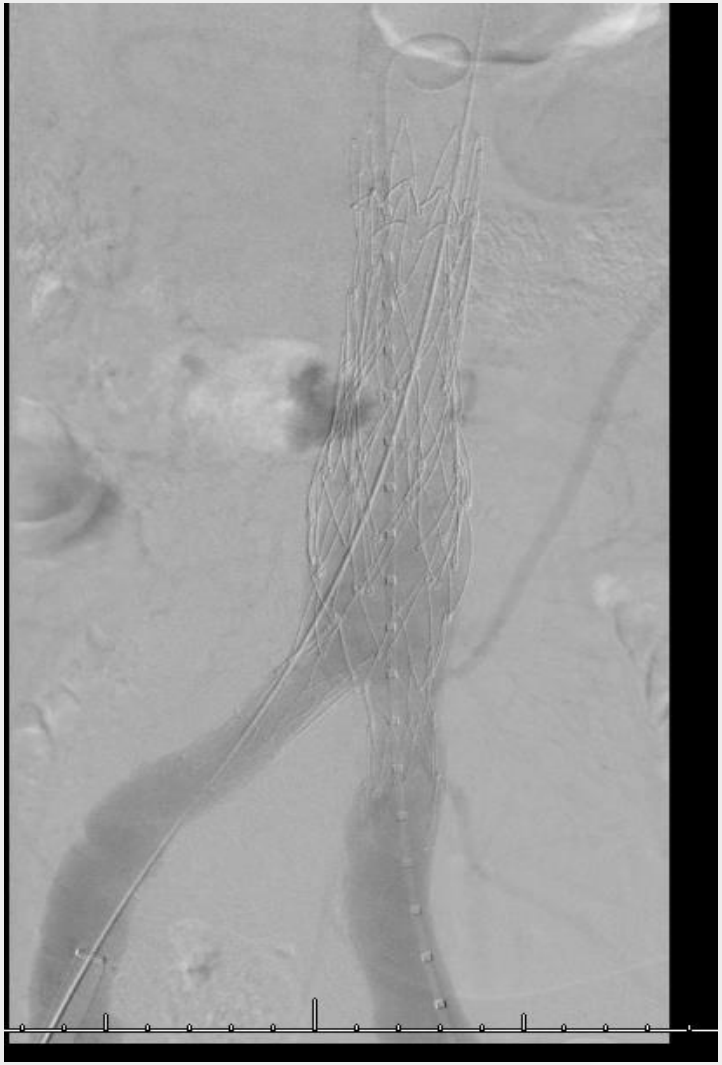
Renal Mass

Aortic Abdominal Aneurysm

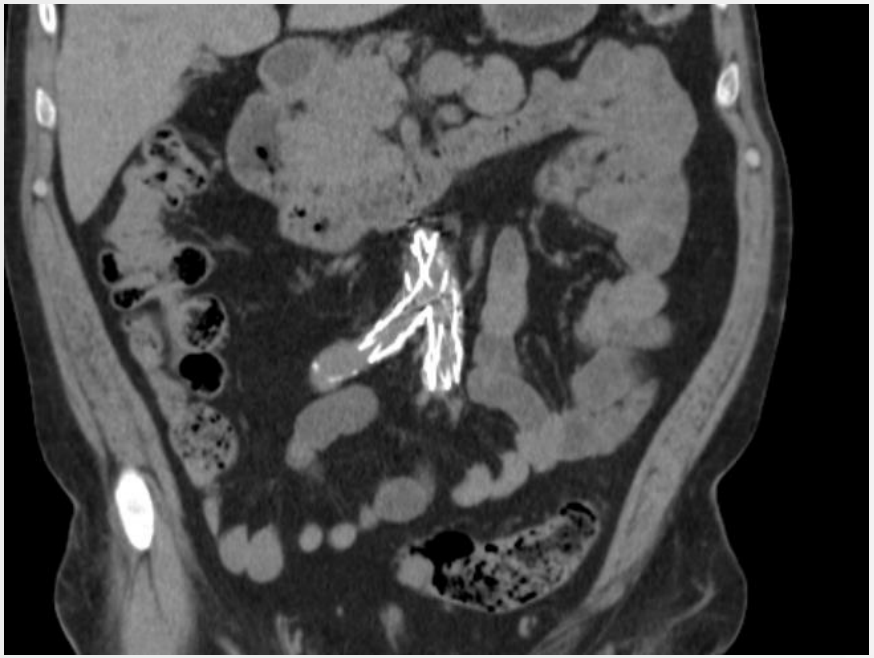


Abdominal Aortic Aneurysm
Normal External Iliac Vessels

Pre-transplant Repair
Endograft



Post-repair CT



Prior Transplant

Post-cancer therapy waiting times

- Untreated or metastatic – no transplant
- Risk relative to dialysis death rate
- Israel Penn International Transplant Tumor Registry (IPPITR) – consultation service
- Renal Cell Carcinoma
  - Stage 1 (usually includes ACDD) – no wait
  - Stage 2 or > - 2-5 years
- Breast, Melanoma, Lung, Colon
  - Usually five year wait but again relative to stage
- Prostate Cancer
  - Low stage, local surgical control and PSA remains low – 2 years

ESRD following Kidney Transplant

- Difficult transition from tx to ESRD
  - No need for ongoing immunosuppression
    - Usually antiproliferative then calcineurin then steroids
  - Steroids are long term taper
  - Most kidneys burn-out with chronic changes
    - History of past rejection is risk factor
- “old-school” rejection
  - Early – Erythropoietin resistance from inflammation
  - Acute rejection
    - Abdominal pain, tenderness and enlargement of kidney graft
    - Fever, worsening hypertension
    - Gross hematuria from fractured kidney

Allograft Nephrectomy

- Pretreatment with short course immunosuppression
  - Solumedrol and tacrolimus
- Subcapsular nephrectomy
  - Donor blood vessels and capsule remain
- Bladder irrigation
  - Remove clot
  - Irrigate with Gentamycin
- Post-op need more frequent assessment of PRA – q2weeks time three

Kidney Allocation System (KAS)

Policy Objectives

- Make the most of every donated kidney without diminishing access
- Promote graft survival for those at highest risk of re-transplant
- Minimize loss of potential graft function through better longevity matching
- Improve efficiency and utilization by providing better information about kidney offers

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Major allocation components

Replace SCD/ECD with KDPI	Incorporate A_2/A_2B to B
Add longevity matching	Base pediatric priority on KDPI (presently based on donor < 35)
Increase priority for sensitized candidates/CPRA sliding scale	Remove payback system
Include pre-registration dialysis time	Remove variances

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Revised waiting time calculation

Old

Waiting time begins at/after registration with GFR <=20 ml/min **OR** On Dialysis

New

Waiting time points awarded for dialysis prior to registration (pediatric and adults)

- Recognizes time spent with ESRD as basis for priority

Reminder

Waiting time points based on GFR remains the same

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Sensitized candidates

Old

CPRA >=80% receive 4 additional points and zero points for moderately sensitized candidates

New

Points assigned based on a sliding scale starting at CPRA>=20%

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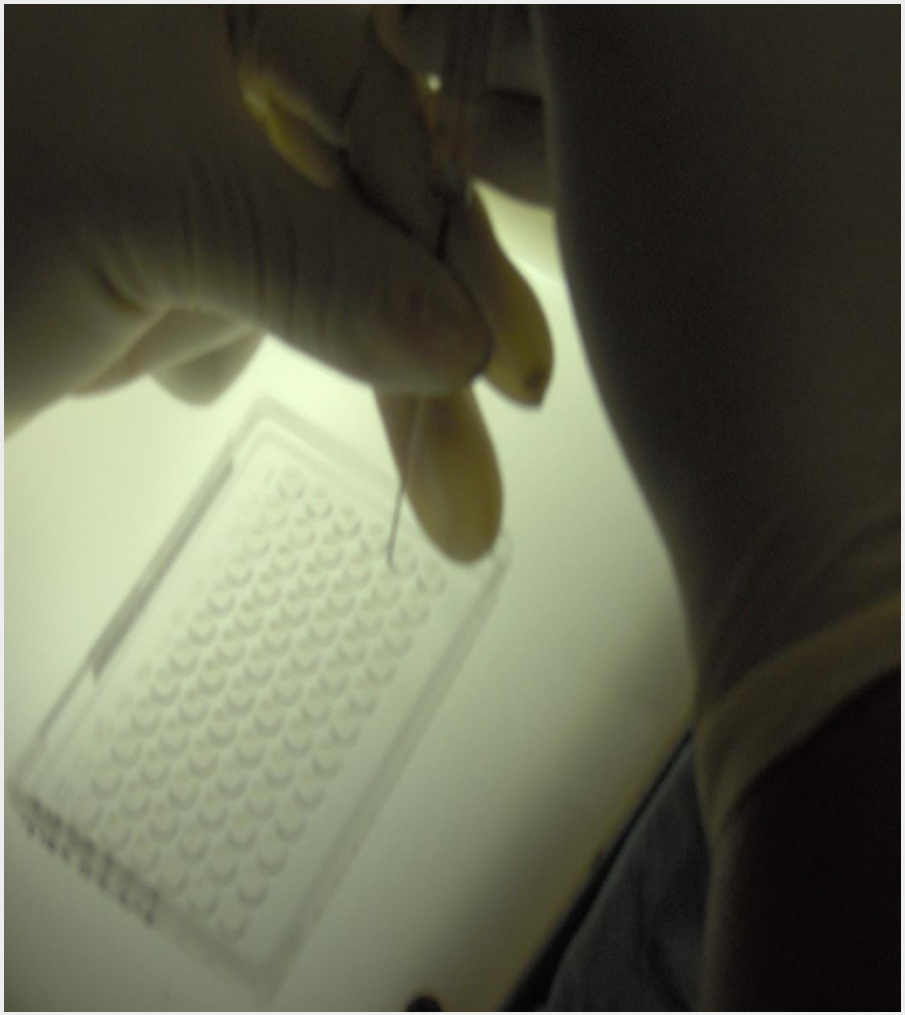
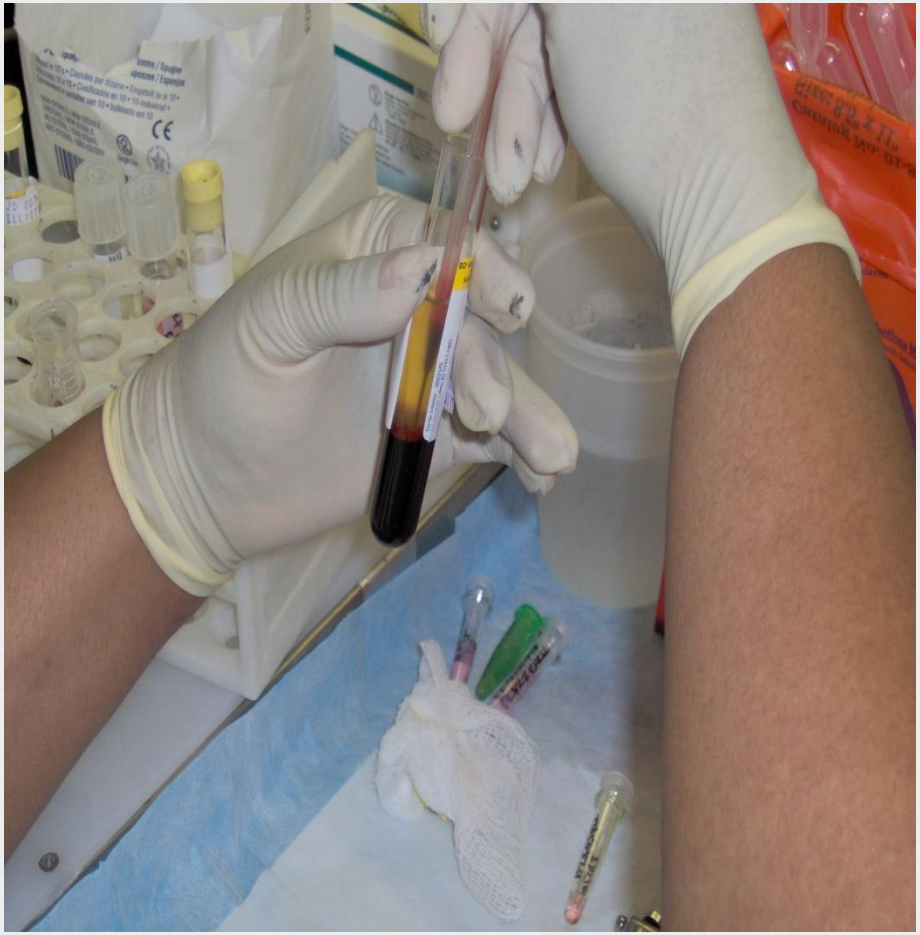
Tissue Typing: Who am I?

- Cytotoxic Assay
  - Known antibody mixed with unknown cells (recipient)
  - Identifies 6 HLA antigen sites
  - Class I: 2A, 2B
  - Class II: 2 DR

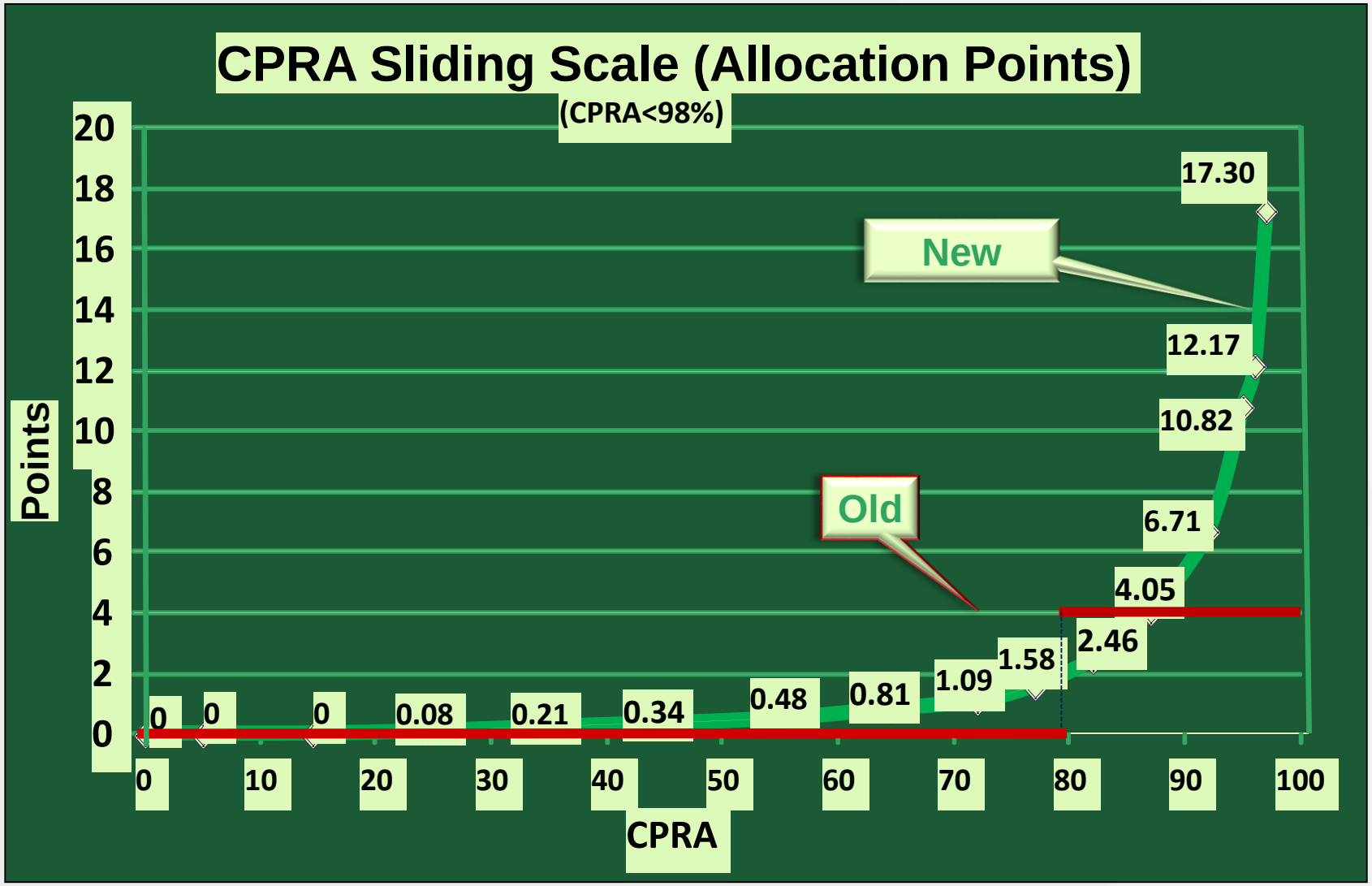


Panel Reactive Antibodies: What's my immune history?

- Drawn monthly
- 0 % good!
- What factors have you been exposed to?
- How does this happen?
  - Prior transplants.
  - Pregnancies.
  - Blood product transfusions.



Point changes: Sensitization



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Classifications:
Very Highly Sensitized

- Candidates with CPRA >=98% face immense biological barriers
- Old policy only prioritized sensitized candidates at the <u>local level.</u>

CPRA=100%	National
CPRA=99%	Regional
CPRA=98%	Local

- To participate in Regional/National sharing, review & approval of unacceptable antigens will be required

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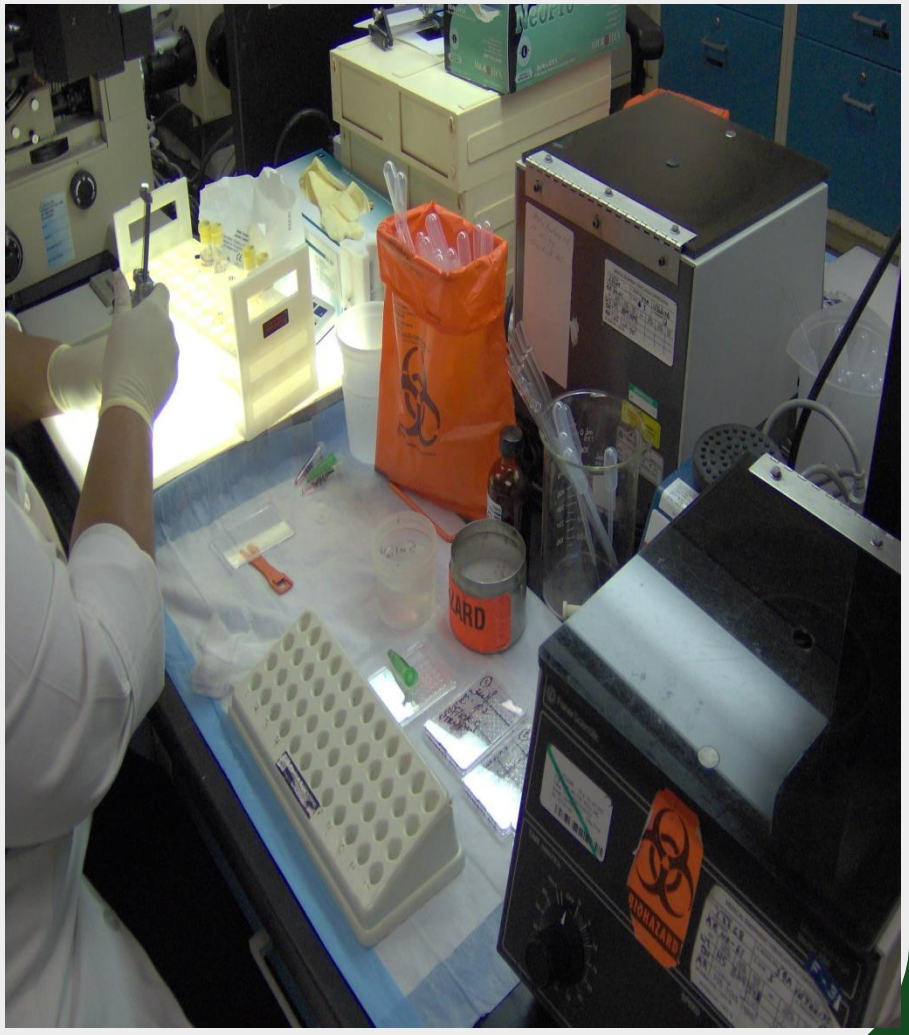
Crossmatching

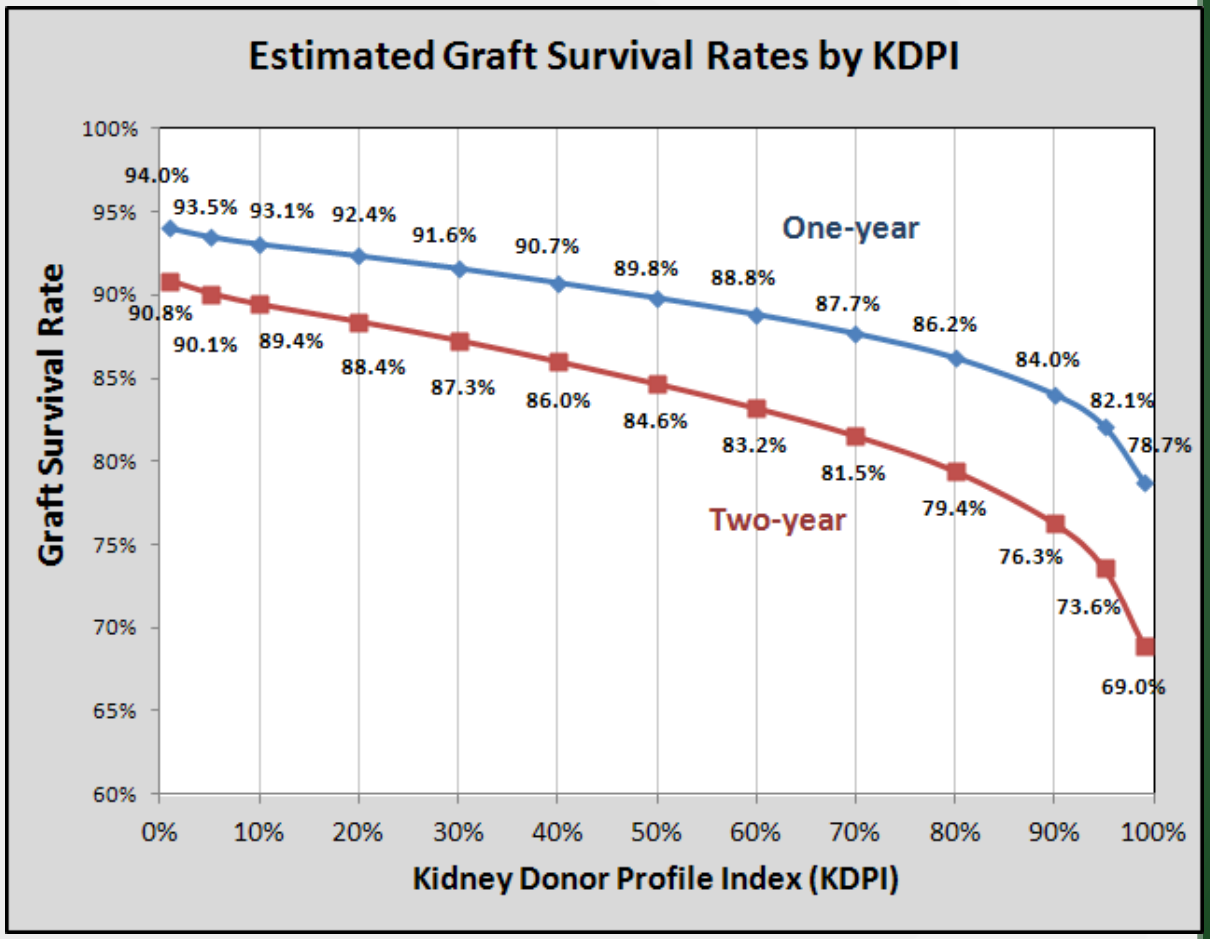
- “Is this donor safe for me?”
- Unknown serum (recipient) mixed with unknown cells (donor), for both T and B cells.
- Positive bad!



Kidney Donor Profile Index (KDPI)

KDPI Variables

- Donor age
- Height
- Weight
- Ethnicity
- History of Hypertension
- History of Diabetes
- Cause of Death
- Serum Creatinine
- HCV Status
- DCD Status



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Longevity Matching

- Estimated Post-Transplant Survival
  - Candidate age, time on dialysis, prior organ transplant, diabetes status
- Top 20% of candidates by EPTS to receive kidneys matched on longevity
- Applies only to kidneys with KDPI scores <=20% not allocated for multi-organ, very highly sensitized, or pediatric candidates

Local + Regional for High KDPI Kidneys

- KDPI >85% kidneys are allocated to a combined local and regional list
- Promotes broader sharing of kidneys at higher risk of discard
- DSAs with longer waiting times are more likely to utilize these kidneys than DSAs with shorter waiting times

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B Candidates receiving A_2/A_2B Kidneys

- Candidates with blood type B who meet defined clinical criteria are eligible to accept kidneys from donors with blood type A_2 or A_2B
- Reported anti-A titer values required on regular schedule
- No titer values of greater than or equal to 1:8 allowed for candidate participation

Let's not forget ABO!

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Background

- KAS implemented Dec 4, 2014
- Key goals:
  - Make better use of available kidneys
  - Increase transplant opportunities for difficult-to-match patients (increased equity)
  - Increase fairness by awarding waiting time points based on dialysis start date
  - Have minimal impact on most candidates

Summary: First Year of KAS

- Overall – KAS is meeting key goals
  - Decrease in longevity mismatches
  - Increase in the number of transplants among very highly sensitized patients
  - Increase in access to transplant for African Americans candidates
- “Bolus effects”: the percent of transplants to CPRA 99-100% and dialysis>10 years recipients are both tapering post-KAS
- Increase in A2/A2B□B transplants, but still room for growth
- Transplant volume up 4.6%

Summary: First Year of KAS (cont'd)

- No change in waiting list mortality rates
- Six-month graft and patient survival rates similar to pre-KAS
- Several trends deserve further attention:
  - Fewer 0MM transplants
  - Slight drop in pediatric transplants will continue to be tracked closely
  - Logistical challenges in allocation
  - Increased CIT and DGF
  - Increase in discard rates, particularly KDPI>85% kidneys.

Questions?