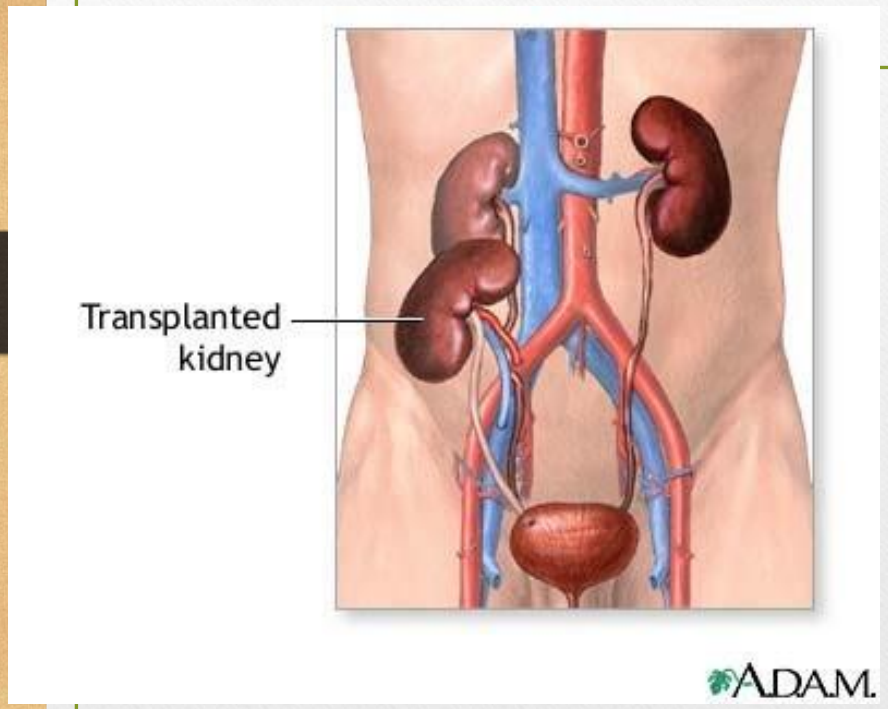
Renal transplantation

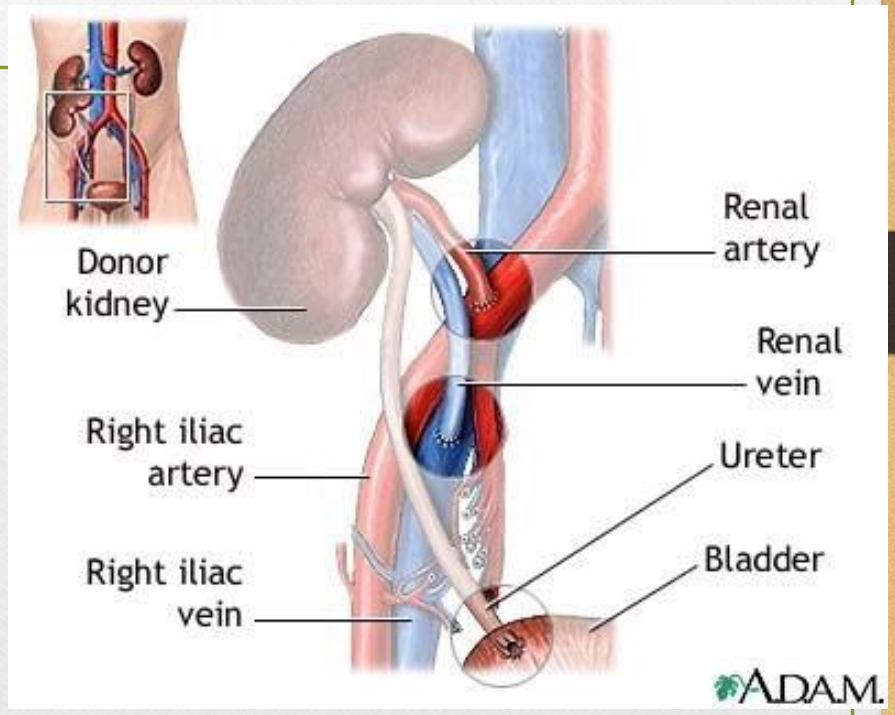
Dr. Saddam Al Demour
MD, MRCS, FACS, FEBU
School of Medicine
The university of Jordan

Basics of Transplantation

- Kidney transplantations the most effective therapy for end-stage renal disease.
- The transplanted organ can come from either alive donor or deceased donor.
- Most deceased donor organs come from brain dead donors.
- Non-standard criteria donors:
  - Expanded criteria donors(ECD).
  - Donation after cardiac death(DCD).

Anatomy of Renal Transplantation





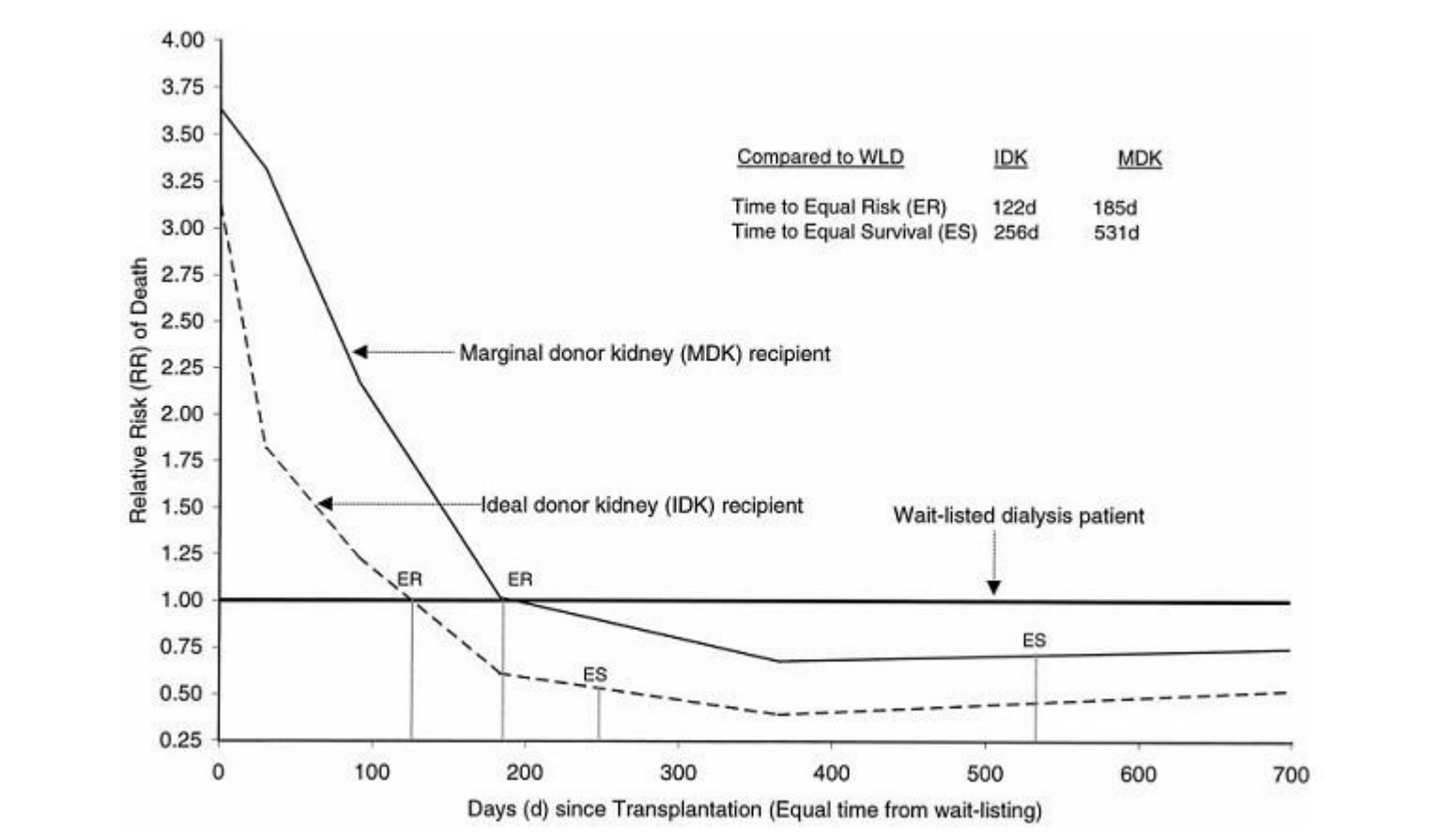
Recipient Selection

- Very few contraindications.
- General medical condition.
- Cardio vascular screening.
- Age-appropriate routine cancer screening (papsmear, mammography, colonoscopy, PSA).
- Infection (HIV, Hepatitis, TB).
- Presence of preformed antibody (PRA).
  - Pregnancy, prior transplant, blood transfusion
- Psychosocial evaluation, including compliance.

Benefits of Transplantation

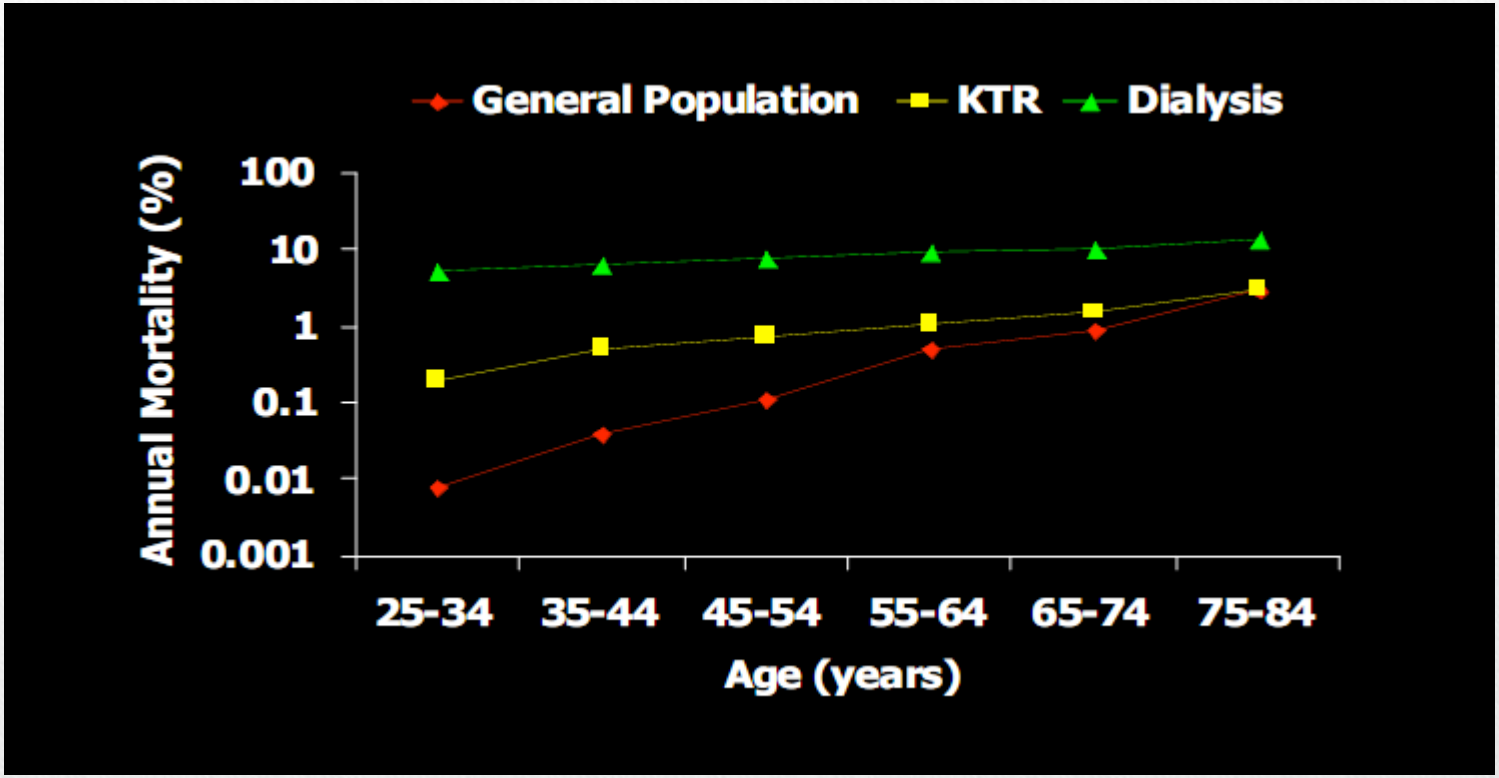
- Life expectancy
- Cardio-vascular benefits
- Quality of life
- Socioeconomic benefits

Life Expectancy



Ojo, *J Am Soc Neph*, 2001;12:589

Cardiovascular Benefits



Foley, *Am J Kidney Dis*, 1998;32(S1):8
Slide courtesy of Dr. Robert Gaston

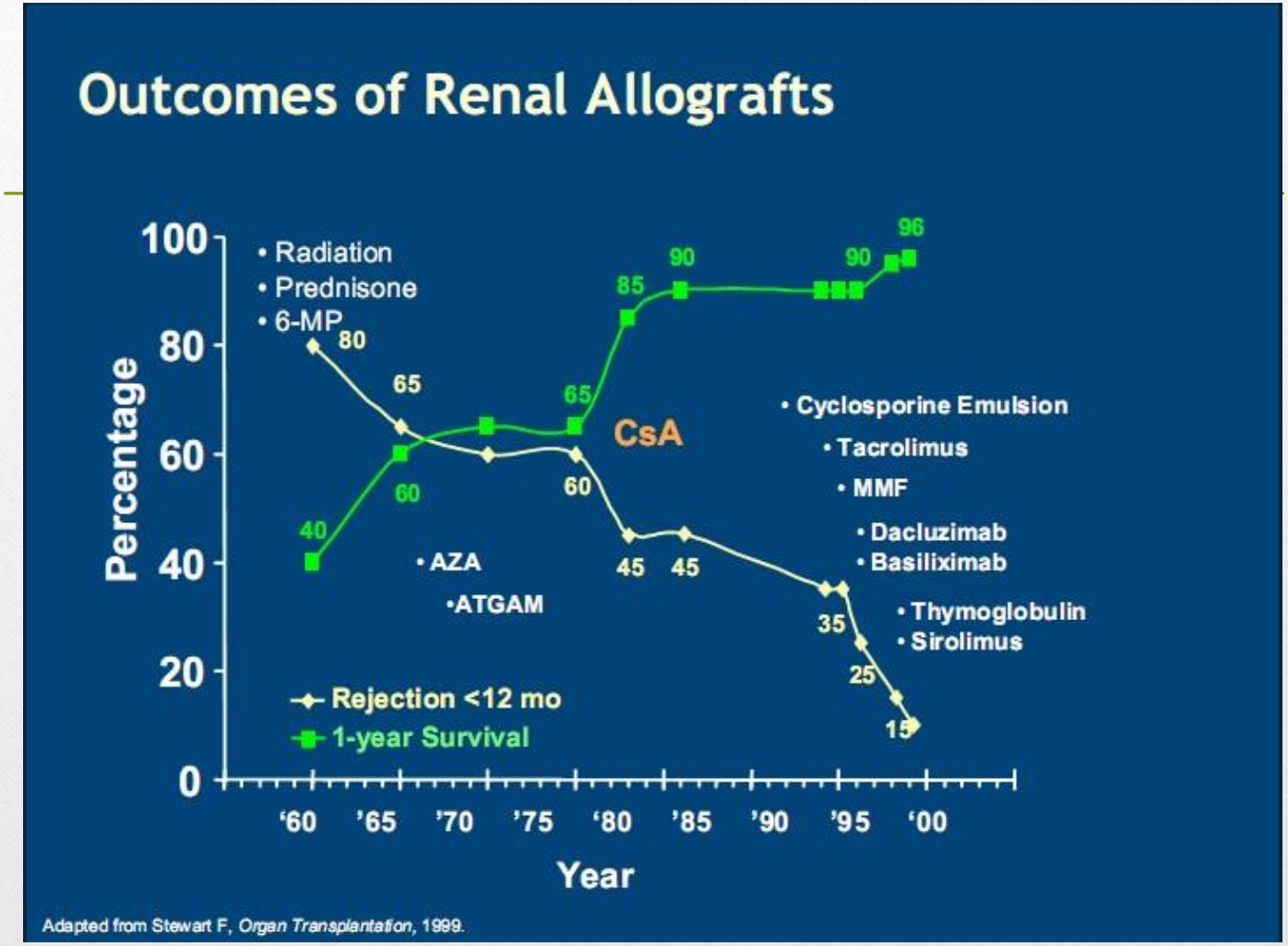
Quality of Life

- Numerous studies have detailed improved quality of life.
- Life satisfaction, physical and emotional well-beingand ability to return to work higher in transplant recipients.
- Uremic complications more fully reversed.
- Fertility returns.

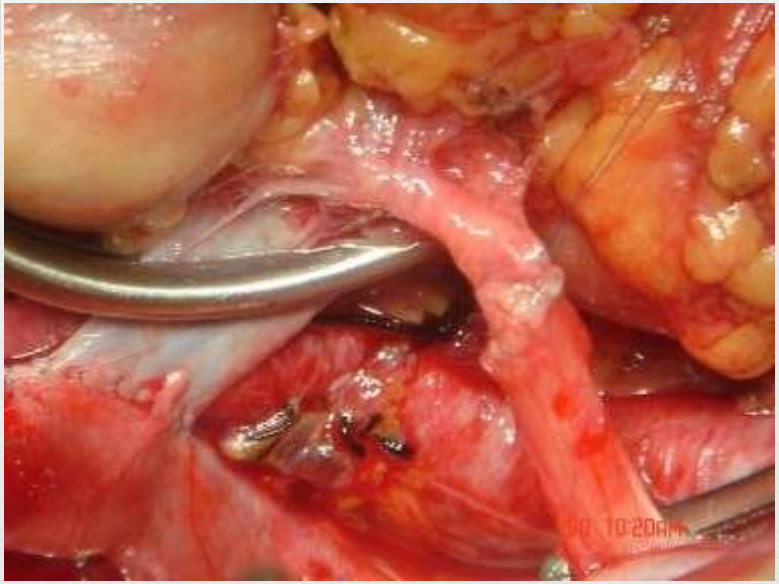
Socio-economic Benefits

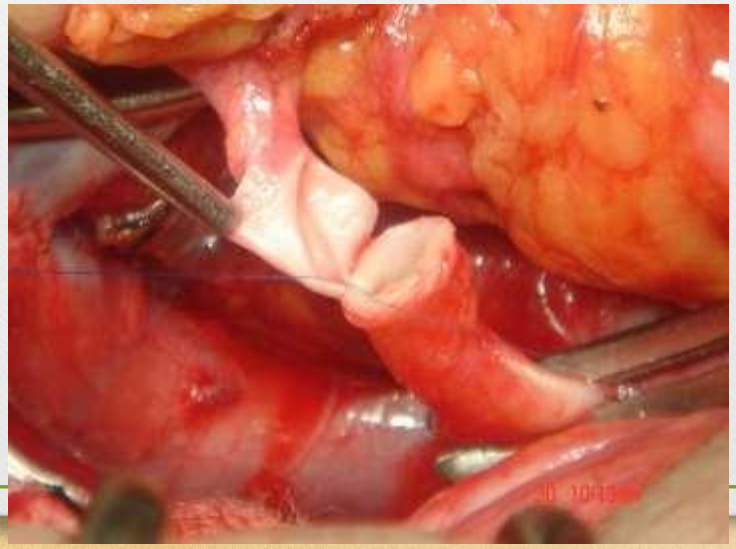
- Increased rates of return to work.
- Cost to society:
  - Annual cost of hemodialysis: $60,000-$80,000
  - First year after transplantation: >$100,000
  - There after: $10,000 per year.
- Mean cumulative costs of dialysis and transplantation are equal for first 3-4 years, then lower for transplantation.

Immunosuppressive Medications

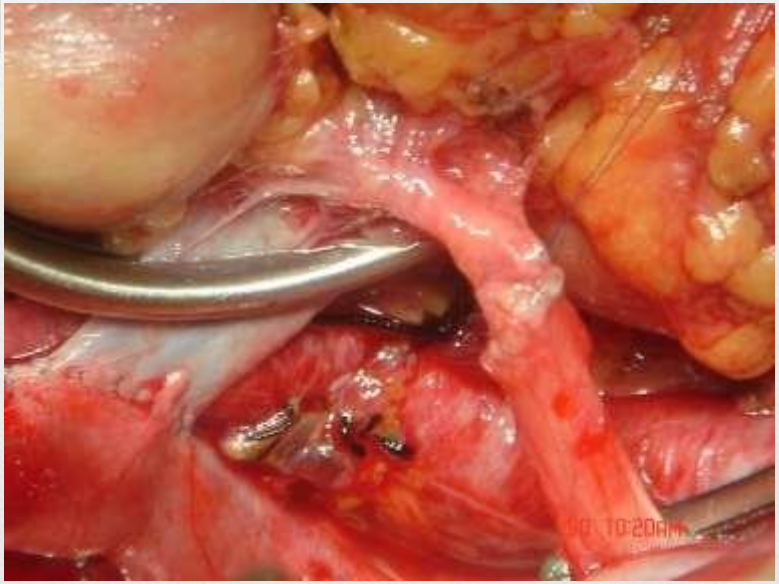


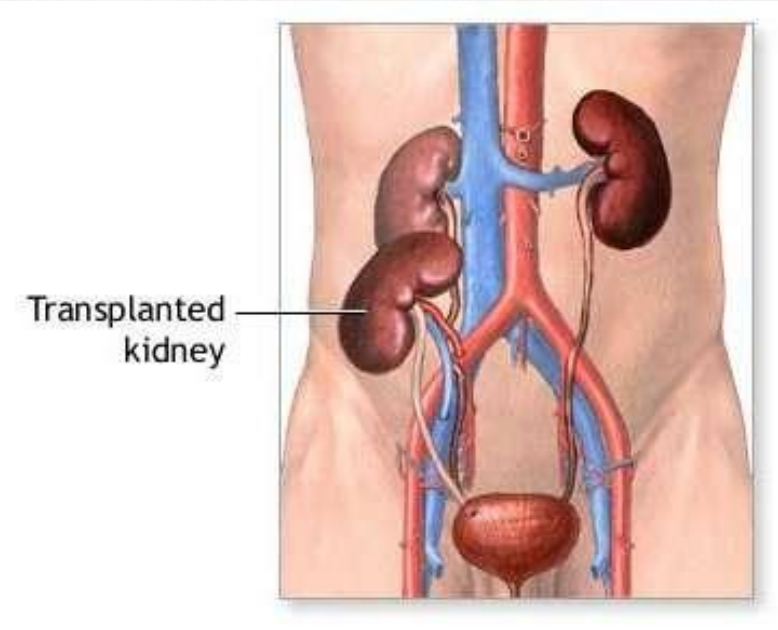
Slide courtesy of Dr. Meier-Kriesche

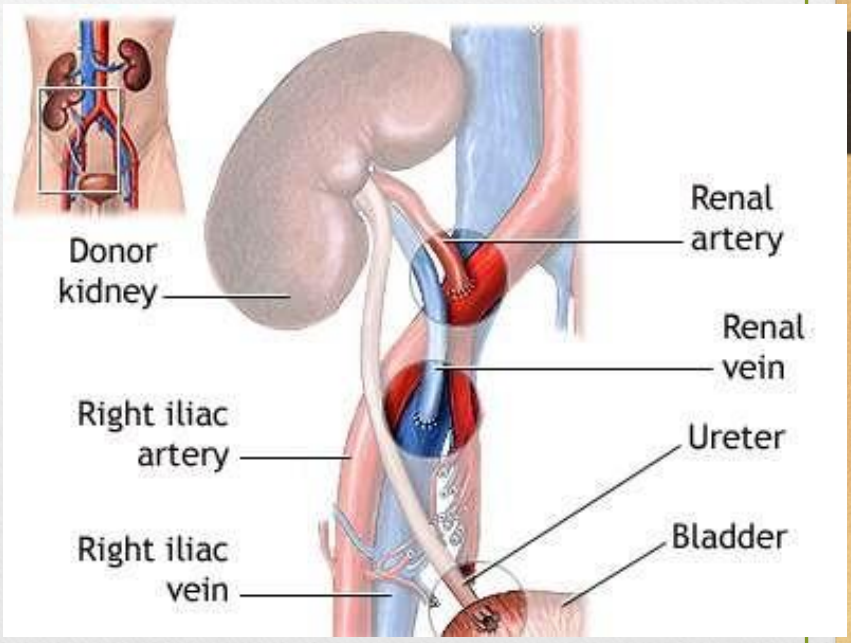




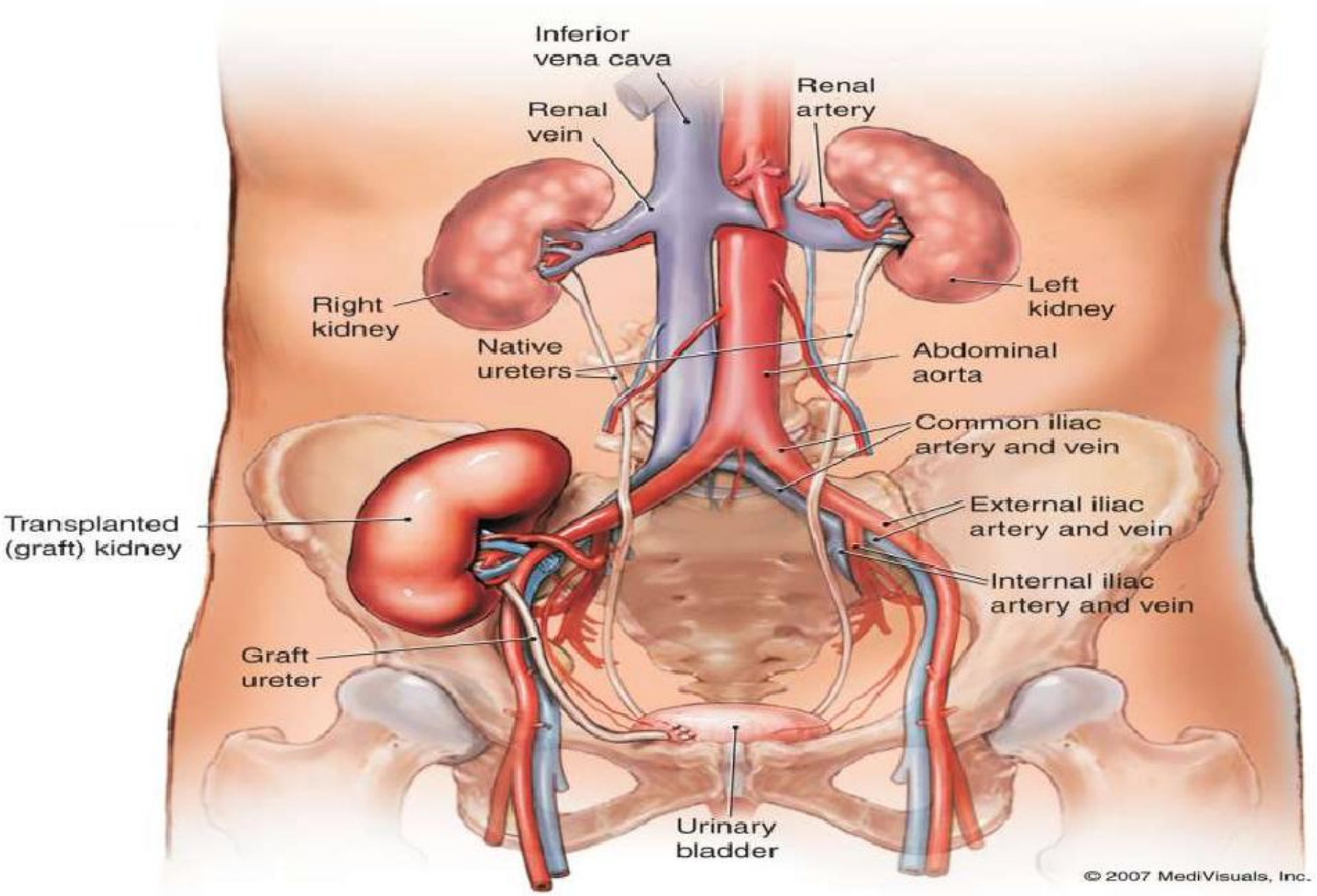

9:44AM




Transplanted kidney


Donor kidney
Renal artery
Renal vein
Right iliac artery
Ureter
Right iliac vein
Bladder

A Grafted (Transplanted) Kidney



Immuno-suppressive Medications

- Induction:
  - Corticosteroids
  - Anti-thymocyte globulin(ATG)
  - IL-2receptor antagonists
- Maintenance:
  - Corticosteroids
  - Calcineurin inhibitors(CNIs)
  - mTOR inhibitors
  - Antimetabolites

Immunosuppressive Medications

- Treatment of Rejection:
  - Corticosteroids
  - Anti-thymo-cyteglobulin
  - Intravenous Immunoglobulin(IVIG)
  - Rituximab

Common Complications of Transplantation

- Early complications
  - Surgical complications Delayed or slow graft function
  - Lymphocele
- Acute rejection
  - Acute cellular rejection
  - Antibody-mediated rejection
- Infectious complications
  - Cytomegalo virus BK virus
  - Others
- Malignancy Chronic allograft dysfunction

Surgical Complications

Graft thrombosis:

- Caused by thrombosis of donor renal artery or vein.
- Usually happens in first week.
- Diagnosed by ultrasound with doppler studies.
-

Urine leak:

- Elevated creatinine.
- May or may not have abdominal pain. Diagnose with
- nuclear medicine scans(DTPA or MAG3). Surgical
- repair and/or relief of obstruction.

Delayed Graft Function

- Need for dialysis in the first week after transplantation.
- Causes:
  - ATN from prolonged cold ischemia.
  - Acute rejection.
  - Recurrent disease.
- Usually require s biopsy for diagnosis and management.

Lymphocele

- Collection of lymphcaused byleakage fromiliac lymphatics.
- Presents several weeks post-operatively.
- Symptoms:
  - Compression of kidney, ureter, bladder: obstructive uropathy and ARF.
  - Compression of iliac vessels: unilateral lower extremity oedema and DVT.
  - Abdominal mass.
- Treatment is surgical.

Acute Rejection

- May present with ARF or proteinuria.
- Diagnosis made by biopsy.
- Pathology is reported according to Banf classification.
- Acute cellular rejection: treat with steroids or ATG based on severity
- Antibody-mediated rejection: may require steroids, ATG, rituximab, IVIG or plasma pheresis based on severity and setting.

Cytomegalovirus

- Most common viral infection after transplantation.
- Various degrees of severity:
  - Asymptomatic CMV viremia
  - CMV syndrome (viremia plus constitutional symptoms)
  - CMV end-organor invasive disease(hepatitis, gastritis, colitis, pneumonitis)
- Risk factors:
  - Useof antibody induction
  - Donor seropositive, recipient sero negative status

Cytomegalovirus

- Clinical presentation:
  - Asymptomatic (detected on screening)
  - Neutropenia
  - Malaise& constitutional symptoms
  - GI CMV: gastritis, colitis, esophagitis
  - Clinical hepatitis, pneumonitis
- Prophylaxis:
  - All patients at risk (D+/R+, D-/R+ or D+/R-) receive valgan ciclovir prophylaxis for 4.5-6 months.
  - "Pre mptive" strategy with CMV PCR monitoring.

Other Infections

- Transplant patients have in creased susceptibility to all other commoninfections.
- Opportunistic infection :
  - *Pneumocystis jirovicii* pneumonia
  - *Candida* infection
  - Toxoplasmosis
  - Nocardiosis
  - *Cryptococcus* infections

Malignancy

- Recipient of organ transplants are at higher risk of developing malignancy.
- May be related to impaired immune surveillance as a result of immunosuppression.
- Skin cancer most common: sunprotection ***mandatory***.
- Routine cancer screening.
- Specific malignancies:
  - Kaposi sarcoma
  - Post-transplant lymphoproliferative disorder (PTLD)

Chronic Allograft Dysfunction

- Persistent rise in serum creatinine and worsening GFR over weeks to months is termed chronic allograft dysfunction.
- Histological counterpart is chronic allograft nephropathy (CAN).
- Characterized by nonspecific interstitial fibrosis and tubular atrophy.
- Usually irreversible and will lead to allograft failure and need for dialysis or re-transplantation.

Chronic Allograft Dysfunction: Why Do Grafts Fail?

- Chronic low-grade immune injury
- Long-stand in ghypertension
- Recurent disease (diabetic nephropathy or glomerulo-nephritis)
- Repeated episodes of acute rejection
- Donor disease
- Calcineurin inhibitor nephrotoxicity

THANK YOU.

ANY QUESTIONS?