CKDinform:
Renal Replacement Therapy: What the PCP Needs to Know
Learning Objectives

• Describe treatment options for renal replacement therapy to improve awareness and understanding.
• Explain evidence-based strategies to manage patients with kidney failure in need of renal replacement therapy to improve outcomes.
• Discuss management of patients receiving dialysis or living with a kidney transplant, from a primary care perspective.
Indications for Renal Replacement Therapy

- Hyperkalemia*
- Metabolic acidosis*
- Fluid overload (recurrent CHF admissions)*
- Uremic pericarditis (rub)
- Other non specific uremic symptoms: anorexia and nausea, impaired nutritional status, increased sleepiness, and decreased energy level, attentiveness, and cognitive tasking, etc.

*Refractory to medical management
Referral and Education for Patients with Progressive CKD

• Refer patients early, when eGFR <30 mL/min/1.73m².
• Education about types of renal replacement therapy:
  o Hemodialysis (vascular access +++)
  o Peritoneal Dialysis (QOL advantage +++)
  o Kidney Transplantation
    • Refer when eGFR <20 mL/min/1.73m²
    • Living kidney transplant (family, friends)
    • Build time on list before dialysis initiation
    • Even transplant before dialysis initiation (pre-emptive)
• No PICC lines for patients with eGFR <45 mL/min/1.73m².

PICC, peripherally inserted central catheter
Advantages of Timely Referral in Patients with Progressive CKD

• Improves patient preparation for RRT.
• Greater use of permanent vascular access.
• Avoidance of emergent hemodialysis initiation.
• Greater utilization of transplantation and self-care dialysis (i.e., peritoneal dialysis or home hemodialysis).
• Management of medications which may help to delay the need for RRT.
• Gives the nephrologist adequate time to counsel patients through this challenging transition in their lives.
Medical Health and Wellness: Components of Multidisciplinary Care in Progressive CKD

- Education and counseling about different RRT modalities, transplant options, and vascular access surgery.
- Protocols for laboratory and clinic visits; with attention to CKD and CVD-associated comorbidities (e.g., high blood pressure).
- Ethical, psychological, and social care (e.g., social bereavement, depression, anxiety).
- Dietary counseling and education on other lifestyle modifications (e.g., exercise, smoking cessation).
- Vaccination program.
High Blood Pressure

- Common in both dialysis and transplant populations.
- Target blood pressure:
  - Dialysis:
    - Predialysis: <140/90 mm Hg
    - Postdialysis: <130/80 mm Hg
  - Transplantation: <130/80 mm Hg
- Managing high blood pressure in dialysis requires attention to fluid status and antihypertensive medications, while minimizing intradialytic fluid accumulation.
- Can be impacted by certain immunosuppressants in kidney transplantation recipients. Monitor for adverse effects and drug–drug interactions.

Principle of Hemodialysis

- Hemodialysis machine
- Unfiltered blood flows to dialyzer
- Filtered blood flows back to body

Vein
Artery
Dialysis Access

• **AV Fistula**
  - Vein cross-cut, attached end-to-side to artery.
  - High-pressure flow dilates and thickens vein.
  - Best alternative:
    - Lowest infectious risk.
    - Longest lasting with least thromboses.
  - Drawbacks:
    - Takes 2-4 months to mature.
    - Only about 50% ever mature.
  - Goal for all dialysis patients.
SAVE the Non-Dominant ARM for Vascular Access

• When GFR <30 mL/min/1.73m²
  o No BP measurement
  o No IV
  o No Blood Draws

• Place vascular access within a year of hemodialysis anticipation...
Principle of PD Treatment

1. IN
2. DWELL
3. OUT

Dialysate

Dialysate out bag

Peritoneal cavity
Peritoneal membrane
Catheter
Principle of Kidney Transplantation

Iliac Fossa
Key Concepts

- Kidney transplantation is the most cost-effective modality of renal replacement.
- Transplanted patients have a longer life and better quality of life.
- Early transplantation (before [pre-emptive] or within 1 year of dialysis initiation) yields the best results.
- Living donor kidney outcomes are superior to deceased donor kidney outcomes.
- Early transplantation is more likely to occur in patients that are referred early to nephrologists.
- Refer for transplant evaluation when eGFR ≤20 mL/min/1.73m².
Key Concepts

• The most common cause of transplant loss is death with a functional transplant due to:
  - Heart disease +++
  - Infections
  - Malignancies

• Immunosuppressants are essential to prevent immunological loss of the transplant, but side effects can also lead to potential loss of transplant.