Renal Transplant

Janelle Morris and Justin Roberts
Renal Transplant

- Kidney Transplant is the most effective treatment for end stage renal disease.
- The transplanted kidney can come from either a living or deceased donor.
### Stages of Renal Failure

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>GFR (mL/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage (protein in the urine) with normal or elevated GFR</td>
<td>90 or more</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage with mildly decreased GFR</td>
<td>60–89</td>
</tr>
<tr>
<td>3</td>
<td>Kidney damage with moderately decreased GFR</td>
<td>30–59</td>
</tr>
<tr>
<td>4</td>
<td>Kidney damage with severely decreased GFR</td>
<td>15–29</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure: end-stage renal disease (ESRD). Patients who have Stage 5 disease require dialysis or transplantation to survive.</td>
<td>Less than 15</td>
</tr>
</tbody>
</table>

End Stage Renal Disease

- Irreversible kidney failure.
- Common causes
  - Diabetes
  - Hypertension
  - Glomerulonephritis
End Stage Renal Disease

- Signs and Symptoms
  - Hypertension
  - Azotemia
  - Hyperkalemia
  - Anemia
  - Edema
  - Hyperphosphatemia
  - Metabolic Acidosis
Medication post operation:

- Neora 450mg Q 12hrs
- Imuran 150mg Q d
- Prednisone 90g Q d
- Magnesium oxide 400mg TID
- Bactrim, Neutra-phos, Persantine, omeprazole, Glucophage

**Side effects expected**
- Protein catabolism
- Hyperlipidemia
- Sodium retention
- Weight gain
- Glucose intolerance
- Inhibition Ca/VitD/Phos metabolism
- Hyperkalemia
- Hypertension
MNT for Renal Transplantation

- Adequate protein and calories
- Heart Healthy Diet
- Sodium restriction
- Long term nutrition and weight control

Renal Transplant

- http://www.youtube.com/watch?v=OKDA7BYzDRU&feature=related
Case Study

- Enez Joaquin
- Age 26
- Sex: female
- Education: High school
- Occupation: Secretary
- Household members:
  - Husband age 28, Type 2 Diabetes under control (diagnosis age 18)
  - Daughter age 9, in good health
- Family history: mother and father DM diagnosis
- Ethnic background: Pima Indian
Reason for Admit

- Patient admitted for deceased donor kidney transplant.
Patient History

- *Type 2 Diabetes Mellitus* diagnosis at age 13
- *Renal function* progressively declined over 7 years
- *Onset of disease*: Stage 5 chronic kidney disease 2 years ago
  - hemodialysis
  - transplant evaluation
  - placed on kidney transplant list
- *Tx*: Control BP; prep for transplant; nutrition consult
- *Patient compliant* with medication and kidney replacement regimes
- *Patient admits to drinking alcohol 12oz beer 1x/week*
Assessment: Anthropometric Measurements

- Height: 60”
- Weight: 165 lb
- BMI: 32
  - Stage II obese
- IBW: 100 lb
Dry/Edema-free weight

- Weight without excess fluids which build up between dialysis sessions

- \( aBWef = BWef + (SBW - BW) \times 0.25 \)
  
  \[ aBWef = 165 + (65 - 165) \times 0.25 \]
  
  \[ = 165 + (-100) \times 0.25 \]
  
  \[ = 140 \text{ lbs} \]

- \%IBW = \( \frac{140}{100} \text{ lbs} = 140\% \)

- Use if:
  - \(<95\% \text{ or }>115\% \)

  Based on NHANES II data (Nelms, 2007 p630)
Assessment

• Energy Requirements
  ▫ EER: 665 + (9.6x63.3kg) + (1.8x152.4) – (4.7x26)
    • = 1425 x 1.3 x 1.2 = 2,223 +/- 10%
    • = 2,000-2,450 kcal s/day

  ▫ Energy: 35 kcal/kg SBW
    • 140lbs/2.2 = 63.3kg
    • 63.3kg x 35 kcal/kg = 2,226 kcal

• Post-Kidney Transplant Patients. before-and-after trial obese hyperhomocysteinuric patients with a new kidney transplant (one year post-transplant) suggests that a diet of less than 30 kcal per kg per day can significantly reduce BMI, LDL-cholesterol and TG) after one year. (Grade II) (EAL)
Assessment

• Protein Requirements
  ▫ Protein: 1.2g/kg SBW
    • 1.2g/kg x 63.6kg = 76.32g prot/d

• Results from one study of kidney transplant patients with declined function suggest that a low-protein diet (0.55g per kg per day) can reduce proteinuria, compared to high-protein diet (2.0g per kg per day) (Salahudenn AK, 1992)(Grade A).

• Until there is stronger evidence to suggest otherwise, low protein intake (i.e. 0.55 g/kg) in kidney transplant recipients with chronic graft rejection should be avoided, as this may be associated with negative nitrogen balance. (Chadban, S et al., 2010)(Level III)
<table>
<thead>
<tr>
<th>Lab</th>
<th>Normal</th>
<th>Admit</th>
<th>D/C</th>
<th>Interpret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin</td>
<td>3.5-5</td>
<td>3.8</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>Na2+</td>
<td>136-145</td>
<td>136</td>
<td>138</td>
<td></td>
</tr>
<tr>
<td>PO4</td>
<td>2.3-4.7</td>
<td>6.3</td>
<td>4.5</td>
<td>Decreased kidney function</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1.8-3.0</td>
<td>2.9</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>Glucose</td>
<td>70-110</td>
<td>282</td>
<td>200</td>
<td>Uncontrolled DM</td>
</tr>
<tr>
<td>BUN</td>
<td>8-18</td>
<td>69</td>
<td>55</td>
<td>Decreased kidney function</td>
</tr>
<tr>
<td>Creatinine</td>
<td>0.6-1.2</td>
<td>12.0</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>Alk phos</td>
<td>30-120</td>
<td>131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chol</td>
<td>120-199</td>
<td>200</td>
<td></td>
<td>Inflamed glomerulus → change in lipid metabolism</td>
</tr>
<tr>
<td>TG</td>
<td>35-135</td>
<td>195</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HbA1c</td>
<td>3.9-5.2</td>
<td>7.1</td>
<td></td>
<td>Uncontrolled DM</td>
</tr>
<tr>
<td>RBC</td>
<td>4.2-5.4</td>
<td>4.0</td>
<td></td>
<td>Erythropoiesis</td>
</tr>
<tr>
<td>HGB</td>
<td>12—15</td>
<td>10.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCT</td>
<td>37-47</td>
<td>35</td>
<td></td>
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</tr>
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</table>
# Dietary History

**Previous nutrition therapy:** yes, 2 years ago+ Renal RD q 2-3 months  
**Food purchase/prep:** Self

## Usual Dietary Intake

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td>1 soft-cooked egg, 2 slices wheat toast with 1 tsp. low-fat margarine, 1 c art. Sweetened cranberry juice</td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td>2 beef tamales with ¼ c chili con carne, 1 can diet coke</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td>2 soft-shell tacos made with ½ c black beans, 2 flour tortillas, ½ c shredded lettuce, ¼ c tomatoes ¼ c chopped onions, 1 can diet coke</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td>6 vanilla wafers</td>
</tr>
</tbody>
</table>

**24-hour recall:** N/A
Sodium → 2,460.8 mg
Potassium → 1,658.0 mg
• Estimated Energy needs: 2,226kcal
• Estimated Protein needs: 76.32g prot/d
• Fluid Restrict: 1,000mL + urine output
  • Fluids Estimation: 32 oz → 946mL
Diagnosis

- PES
  - Food and nutrient-related knowledge deficit (NB-1.1), related to new dietary recommendations for post kidney transplant, as evidenced by recent kidney transplant.
Intervention

- Food and nutrient delivery (ND-1)
  - Modify patient diet to Dialysis ADA diet (1.2g/kg protein, 2g K+, 1g PO4, 2 g Na2+, Fluid Restriction 1,000mL+ urine output)
  - Why....?
Treatment

- Diet Order Recommendation: Dialysis ADA Therapeutic Diet for 6-8 weeks
  - 35 kcal/kg
    - 63.3kg x 35 kcal/kg = 2,226 kcal
  - 1.2g protein/kg
    - 1.2g protein/kg x 75 kg = 90g protein
  - CHO Controlled
  - 2g K+
  - 1g phosphorous
  - 2g Na²⁺
  - 1,000mL fluid + urine output
  - Adequate Ca²⁺ and Vit D
Sample day....

<p>| | |</p>
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<tr>
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<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td>1 soft-cooked egg, 2 slices wheat toast with 1 tbsp. low-fat margarine, 1 c grapes</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td>1 4oz lite strawberry yogurt, celery with peanut butter</td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td>2 chicken tamale with ¼ c chili con carne, ½ can diet coke</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td>½ c sugar free vanilla pudding, low fat mozzarella string cheese, 2 low sodium crackers</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td>2 soft-shell tacos made with ½ c black beans, 1 whole wheat tortilla(6”), ½ c shredded lettuce, ¼ c tomatoes ¼ c chopped onions, ½ can diet coke, dinner salad with Italian dressing</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td>6 vanilla wafers, ¼ c cottage cheese</td>
</tr>
</tbody>
</table>
Intervention

• Coordination of Other Care During Nutrition Care (RC-1)
  ▫ Refer patient to and collaborate with renal care team: Physician, Registered Nurse, Social worker

• Nutrition –Related Behavior Modification Therapy (C-1)
  ▫ Educate on heart healthy modifications to diet and lifestyle
    • Make 1-3 goals for patient to try
  ▫ Motivational Interviewing and goal setting approaches
    • → patient chooses from provided options
Weak observational data also support dietary protein and salt restriction to stabilize renal function in kidney transplant patients.

One RCT in patients with a recent kidney transplant showed that a one-year term of cardiovascular exercise may improve patients' health-related QOL by decreasing physical limitations.

(EAL summary) What are the effects of physical activity interventions on the factors of disease progression and quality of life in patients with a kidney transplant? (CKD 2008) (Grade III)
Is it within our scope of practice to treat Mrs. Enez?

Food and nutrient delivery (ND-1)
Modify patient’s Diet order to Renal → Not in California

Food and nutrient delivery (ND-1)
Provide patient with nutrition and lifestyle education → Yes

Coordination of Other Care During Nutrition Care (RC-1)
→ Yes

Nutrition –Related Behavior Modification Therapy (C-1)
MI and Goal Setting → Yes
Monitoring

- Weekly blood tests for 6-8 weeks post transplant: Renal panel, including Na⁺, K⁺, phosphorous, lipids, glucose and protein.
  - Continue monitoring once a month after initial 2 month period post transplant

- Monitor fluid intake and output once per week until normalized

(Nelms, 2007 p. 644)
Follow-Up Recommendations

• Increase follow-up visits with Renal RD to 1x per month for 6 months
  ▫ Ensure low Potassium and carbohydrate intake while on cyclosporine
  ▫ Ensure adequate Ca2+, PO4-, Vit D
  ▫ Help manage possible weight gain 2’ Medication

• After approx. 1 month post transplant
  ▫ Decrease protein intake \( \rightarrow 1g/kg/d \)
  ▫ Decrease energy \( \rightarrow <30g/kg/d \)

(Schooch, 2009), (Clifford, 2012)
Follow-Up Recommendations

- **Long term:**
  - Advise patient on heart friendly, carbohydrate controlled diet plan
References

7. Clifford, D. Renal Transplant lecture slides, NFSC 471. CSUC. 4/12/12