Nutrition Before and After Transplant

NKF Illinois - Living with Kidney Disease & Transplantation
April 6, 2019
Megan Gutierrez, MS, RD, CSR, LDN
## Stages of Chronic Kidney Disease

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>GFR (mL/min/1.73m²)</th>
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Medical Nutrition Therapy
Stages of Chronic Kidney Disease

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DASH Diet

Overall Health
- Dietary Guidelines for Americans

Transplant
- Food Safety

Kidneys
- Renal Diet
DASH Diet

- Dietary Approaches to Stop Hypertension
- Helps treat and prevent high blood pressure
- Helps prevent osteoporosis, heart disease, stroke, and diabetes
- Reduce sodium < 1,500 or 2,300 mg/day
- Increase potassium, calcium, magnesium

Medical Nutrition Therapy

- Provided by a Registered Dietitian
- Education and counseling on behavioral and lifestyle changes
- Essential to promote lifelong eating habits and health measures
- Effective for improving body composition and nutrition-related lab values for at least one year
- Referral at least 12 months prior to dialysis or transplant
- Monitoring nutritional status every 1-3 months, depending on care setting
Nutrition and Transplant

Before
- DASH
- Diabetic
- Heart healthy
- Renal diet

During
- Up to 8 weeks after transplant
- Food safety

After
- Same as before
- Immuno-suppression

Overall Health
- Dietary Guidelines for Americans

Transplant
- Food Safety

Kidneys
- Renal Diet
Energy
Measured in calories per kilogram body weight

<table>
<thead>
<tr>
<th>30-35</th>
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<th>23-35</th>
</tr>
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<tbody>
<tr>
<td>• CKD 4-5</td>
<td>• Higher if complications present</td>
<td>• Adjusted to maintain desired body weight</td>
</tr>
<tr>
<td>• Nutritional status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PD vs HD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Kidneys
- Energy
- Vitamins/Minerals
- Protein
- Fluid
- Sodium
- Calcium
- Potassium
- Phosphorus

Nutritional status
• PD vs HD

Higher if complications present

Adjusted to maintain desired body weight
### Protein

**Measured in grams per kilogram body weight**

<table>
<thead>
<tr>
<th>0.6-0.8</th>
<th>1.3-2.0</th>
<th>0.8-1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 1.2-1.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Less protein before dialysis**
- **More during dialysis**
- **Animal vs Vegetable**

- **Promote healing**
- **Fight infection**
- **Boost muscle mass**
- **Provide energy**

- **Adequate (not excessive) intake to support allograft survival**

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### Sodium

**Recommendations in grams per day**

<table>
<thead>
<tr>
<th>1.0-2.0</th>
<th>&lt; 2.3</th>
</tr>
</thead>
</table>

- **Varies based on fluid balance, blood pressure**
- **Restrict if high blood pressure & swelling present**
- **Heart healthy diet guidelines**
### Potassium
Recommendations in grams per day

<table>
<thead>
<tr>
<th>2.0-3.0 or 3.0-4.0</th>
<th>Unrestricted or 2.0-4.0</th>
<th>Unrestricted or &lt; 2.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Unrestricted</td>
<td>• Unrestricted</td>
<td>• Restrict if high</td>
</tr>
<tr>
<td>• Restrict if high</td>
<td>• Supplement as needed</td>
<td>potassium present</td>
</tr>
<tr>
<td>potassium present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Restrict while</td>
<td>• Restrict if high</td>
<td></td>
</tr>
<tr>
<td>on dialysis</td>
<td>potassium present</td>
<td></td>
</tr>
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</table>

### Phosphorus
Recommendations in milligrams per day

<table>
<thead>
<tr>
<th>800-1000</th>
<th>DRI</th>
<th>DRI</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Maintain normal phosphorus level</td>
<td>• Supplement as needed</td>
<td>• Replete with diet</td>
</tr>
<tr>
<td>• Adjust to meet protein needs</td>
<td></td>
<td>• Supplement as needed</td>
</tr>
</tbody>
</table>
## Calcium
Recommendations in milligrams per day

<table>
<thead>
<tr>
<th>Category</th>
<th>Calcium Level</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| DRI or < 2,000    |               | - Maintain normal calcium levels  
                             - Restrict to include binder load |
| 1,200-1,500       |               | - Supplement as needed |
| 1,200-1,500       |               | - Replete with diet  
                             - Supplement as needed |

## Fluids

<table>
<thead>
<tr>
<th>Urine Output + 1L</th>
<th>Varies</th>
<th>Unrestricted</th>
</tr>
</thead>
</table>
| - Maintain balance  
                             - Restricted in dialysis – PD vs HD |
| - Limited only by graft function  
                             - Depends on volume status |
| - Achieve adequate hydration |
Vitamins/Minerals
Recommendations based on Dietary Reference Intakes

- B-complex
- Vitamin C
- Vitamin D
- Iron
- Zinc
- Depending on renal function

DRI
• ≥ 0.25 mcg vitamin D per day

DRI
• ≥ 0.25 mcg vitamin D per day
- Zinc
- Magnesium

Overall Health
- Dietary Guidelines for Americans

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Kidneys
- Renal Diet
Herbals & Botanicals
After Transplant

Do not use these immune-enhancing products

- Ginseng (bleeding risk)
- Echinacea (immune system)
- Astragalus (drug interactions)
- Noni juice (high potassium; drug interactions)
- St John’s Wort (organ rejection)

Use these herbs with caution

- Green tea extract
- Dong quai (bleeding risk)
- Milk thistle (drug interactions)

Drug-Nutrient Interactions
After Transplant

- No grapefruit
- No pomegranate
- No starfruit
- No Seville (sour) oranges

- Can cause changes in absorption of certain medications
- Duration of the effect can last up to 24 hours and can have cumulative effects
Nutritional Side Effects of Transplant Medications

Prednisone
- Impaired wound healing
- Increased blood glucose with diabetes
- Increased fluid retention causing high blood pressure
- Increased cholesterol and triglyceride levels
- Increased appetite leading to weight gain
- Osteoporosis

Myfortic or Cellcept
- Nausea, vomiting, diarrhea

Nutritional Side Effects of Transplant Medications

Prograf
- Increased blood pressure
- Increased potassium levels
- Decreased magnesium levels
- Possible nausea, vomiting, diarrhea
- Increased blood glucose levels
- Decreased appetite

Rapamune
- Increased blood glucose levels
- Possible nausea, vomiting, diarrhea
- Increased blood lipids
- Impaired wound healing
Nutritional Side Effects of Transplant Medications

Cyclosporine

- Possible nausea, vomiting, diarrhea
- Increased potassium levels
- Increased blood glucose and lipid levels
- Decreased magnesium levels
- Increased blood pressure

Food Safety

After Transplant

- Anti-rejection medicines weaken your body’s ability to fight infection
- Bacterial infections can be picked up from food – safe handling at home, dining out, and “high-risk” foods
- 250 known food-borne diseases
- Symptoms range from mild GI distress to severe dehydration which could interfere with immunosuppression and kidney filtration
High Risk Foods

• Raw or undercooked meat or poultry
• Raw or undercooked fish or shellfish
  – Sushi, sashimi, ceviche
  – Refrigerated smoked fish
  – Partially cooked shrimp or crab
• Raw or undercooked eggs
  – Homemade Caesar dressing, cookie dough, or eggnog
• Cheese made from raw or unpasteurized milk
  – Feta, brie, camembert, blue-veined, or queso fresco
• Deli meats, luncheon meats, hot dogs that haven’t been reheated
• Fruits and vegetables
  – Unwashed raw or damaged fruits
  – Unwashed raw vegetables or salads
  – Unpasteurized ciders
  – Salads from deli or salad bars
  – Sprouts (alfalfa or bean)

Nutrition Education

After Transplant

• Diet and therapeutic lifestyle modifications are recommended to reduce cardiovascular disease risks in adults with CKD
• Monitor for signs and symptoms of obesity, high cholesterol, high blood sugars, and bone health
• DASH/Heart-healthy – low sugar, high fiber, low saturated fat, moderate sodium
  – Good for glucose control and cholesterol management
  – Add fiber and nuts
  – Limit carb intake to 130-180g per day; focus on whole grains
• Lifestyle modifications
  – Walk for 30 min per day
  – Calorie restriction
Questions?

Thank You