What is CKD?
- Definition: Chronic Kidney Disease is the slow loss of kidney function over time.
- The loss of kidney function takes place over months or even years.
- GFR <60 for > 3 months, with or without kidney damage.

What do our kidneys do?
- Our kidneys act as a filtration system, removing waste and toxins.
- Help regulate fluid and electrolyte balance.
- Form urine to excrete waste and excess fluid.

How common is CKD?
- Chronic kidney disease is a growing health problem in the United States.
- A report by the Centers for Disease Control (CDC) determined that 10% of all adults above the age of 20 years have chronic kidney disease.
- The prevalence of chronic kidney disease has increased by 16% from the previous decade.
- The increasing incidence of diabetes mellitus, hypertension and obesity.

Who is at risk for CKD?
- CKD is more common among women than men.
- Those with high blood pressure, HTN.
- Those with uncontrolled diabetes.
- More than 35% of people aged 20 years or older with diabetes have CKD.
- More than 20% of people aged 20 years or older with hypertension have CKD.

Symptoms of CKD
- Symptoms may include:
  - Appetite loss
  - Fatigue
  - Headaches
  - Itching and dry skin
  - Nausea
  - Unintentional weight loss

More symptoms
- As CKD becomes progressively worse these other symptoms may occur:
  - Abnormally dark or light skin
  - Drowsiness and/or confusion
  - Problems concentrating or thinking
  - Numbness in the hands or feet
  - Muscle twitching or cramps
  - Easy bruising, bleeding, or blood in the stool
  - Excessive thirst
  - Amenorrhea
  - SOB
  - Edema
  - N/V, typically in the morning
DIAGNOSIS OF CKD

• The diagnosis of CKD is determined by urine, blood, and imaging tests such as an ultrasound
  • Stick tests/Dip tests
  • 24-hour urine tests
  • Glomerular Filtration Rate test – GFR
• The GFR is a standard means of expressing overall kidney function. As kidney disease progresses, GFR falls. The normal GFR is about 100-140 mL/min in men and 85-115 mL/min in women.

LABS FOR CKD

• Urine labs are checked often for changes in protein levels
• Creatine levels
• BUN
• Albumin
• Calcium
• Potassium
• Sodium
• Cholesterol

STAGES OF CKD

• The development of CKD can take months or years, and can go undiagnosed for just as long

<table>
<thead>
<tr>
<th>Stage of CKD</th>
<th>Description</th>
<th>GFR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage with normal or slightly lower GFR</td>
<td>Greater than or equal to 90</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage with mild decrease in GFR</td>
<td>60-89</td>
</tr>
<tr>
<td>3</td>
<td>Moderate decrease in GFR</td>
<td>30-59</td>
</tr>
<tr>
<td>4</td>
<td>Severe decrease in GFR</td>
<td>15-29</td>
</tr>
<tr>
<td>5</td>
<td>Kidney Failure</td>
<td>Less than 15</td>
</tr>
</tbody>
</table>

NUTRITION AND CKD

• While the management of CKD takes a team or Doctors, Nurses and Registered Dieticians there are some things you can do at home.
  • Limiting protein intake
  • Reducing the amount of added salts
  • Balance of fluid intake
  • Controlling blood glucose levels
  • Taking prescribed medications:
    • Insulin
    • HTN medications

END-STAGE RENAL DISEASE

• Chronic Kidney Disease can eventually lead to End Stage Renal Disease
• End-stage Renal Disease (ESRD) is when the kidneys are no longer able to work at a level needed for day-to-day life.
• The most common causes of ESRD in the U.S. are diabetes and HTN.
• ESRD almost always comes after CKD. The kidneys may slowly stop working over 10 - 20 years before end-stage disease results.

TREATMENT FOR CKD

• Unfortunately, there is no cure for chronic kidney disease. The four goals of therapy are to:
  • 1. Slow the progression of disease;
  • 2. Treat underlying causes and contributing factors;
  • 3. Treat complications of disease; and
  • 4. Replace lost kidney function.
**RENAL REPLACEMENT THERAPIES**

- In end-stage kidney disease, kidney functions can be replaced only by dialysis or by kidney transplantation.

**MNT FOR DIALYSIS**

- Diets for patients on Dialysis
  - Adequate protein intake (1.2g/kg), DaVita recommends 6-9oz of lean protein per day
  - Maintain adequate energy needs (35kcal/kg)
  - Limit Calcium rich foods
  - Limit added salts
  - Restricting fluid intake
  - Maintaining Potassium levels
  - Maintaining Phosphate levels
  - Taking Phosphate Binders with each meal/snack


**SAMPLE MENU**

**Sample Menu Plan for Individuals with potassium, phosphorus and fluid restriction**

**Breakfast:**
- Scrambled egg whites with a thin slice (2-oz) Canadian bacon on an English muffin
- Grape Juice, 4-oz

**Lunch:**
- 1 cup Romaine lettuce tossed with 1/8 cup raw broccoli and 1 tablespoon slivered almonds. Top with 3-oz of cooked salmon and reduced fat peppercorn dressing.
- White roll with trans-free margarine
- Diet soda, 4-oz or 4-oz water

**Dinner:**
- 3-oz cooked skinless chicken with 1/2 cup squash, 1/2 cup of cabbage served on top of 1 cup of cooked pasta tossed with 2 tablespoons of olive oil and 1/2 cup reduced-sodium chicken broth
- Cherries 1/2 cup
- Iced Tea, 4-oz

**Snacks:**
- Low-sodium crackers
- Orange Sherbet

**PROGNOSIS FOR CKD**

- There is no cure for chronic kidney disease. The natural course of the disease is to progress until dialysis or transplant is required.
  - People undergoing dialysis have an overall five year survival rate of 32%. The elderly and those with diabetes have worse outcomes.

**CASE STUDY**

- Enez Joaquin
- 24 years old
- Secretary
- Lives with husband age 26, daughter age 7
- Pima Indian

**PATIENT HISTORY**

- Enez complains about anorexia, nausea, vomiting, plus a 8.4 lb weight gain in 2 weeks.
- She displays shortness of breath with orthopnea, muscle cramps, edema, and inability to urinate.
- Diagnosed with type 2 diabetes at age 13, and has a history of poor compliance with medications.
- She has been monitored for kidney function for past 7 years.
- She also has high blood pressure.
**PATIENT HISTORY**
- Intake poor due to anorexia, nausea, and vomiting.
- Tries to follow the diet she was taught for diabetes 2 years ago, describes “It went pretty well for awhile, but is too hard to keep up with.”
- Currently taking Glucophage and Vasotec.
- Had previous nutrition therapy 2 years ago when diagnosed with stage 3 CKD.
- Medical DX: Chronic Kidney Disease; Type 2 DM.

**ASSESSMENT**
- Height: 5’0
- Weight: 170 lbs.
- BMI: 33.2 (obese)
- IBW: 100 lbs (170%, had about 8 lb. weight gain in past 2 weeks)
- UBW: 160 lbs (106% of UBW)

**USUAL DIETARY HISTORY**

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Cold cereal, bread or fried potatoes, fried egg (occasionally)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lunch</td>
<td>Bologna sandwich, potato chips, Cake</td>
</tr>
<tr>
<td>Dinner</td>
<td>Chopped meat, fried potatoes</td>
</tr>
<tr>
<td>Snacks</td>
<td>Crackers and peanut butter</td>
</tr>
</tbody>
</table>

**PERTINENT LABS**

<table>
<thead>
<tr>
<th>Lab</th>
<th>Normal</th>
<th>Patient’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>9-11</td>
<td>8.2 L</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>120-199</td>
<td>220 H</td>
</tr>
<tr>
<td>Sodium</td>
<td>136-145</td>
<td>130 L</td>
</tr>
<tr>
<td>Potassium</td>
<td>3.5-5.5</td>
<td>5.8 H</td>
</tr>
<tr>
<td>PO4</td>
<td>2.3-4.7</td>
<td>9.5 H</td>
</tr>
<tr>
<td>Glucose</td>
<td>70-110</td>
<td>282 H</td>
</tr>
<tr>
<td>Creatine</td>
<td>0.6-1.2</td>
<td>12 H</td>
</tr>
<tr>
<td>BUN</td>
<td>8-18</td>
<td>69 H</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>35-135</td>
<td>200 H</td>
</tr>
</tbody>
</table>

**ENERGY AND PROTEIN NEEDS**
- EER: 655+(9.6x77.2)+(1.8x152)-(4.7x24)= 1557 kcals
  - 1557X1.2=1868 kcals
- Protein: 77.2 kg x 1.2 g/kg=
  - 92 grams Protein

**NUTRITION DIAGNOSIS**
- Food and nutrition related knowledge deficit (NB-1.1) related to new hemodialysis treatment and new nutrition therapy for dialysis as evidenced by patient report.
- Limited adherence to nutrition related recommendations (NB-1.6) related to new nutrition therapy for dialysis as evidence by patient report.
INTERVENTION/GOALS

- Nutrition Related Behavior Modification Therapy (C-1) using motivational interviewing to discuss the following topics:
  - Counsel patient on the importance of medication adherence (phosphate binders with meals).
  - Counsel patient on the importance of fluid and sodium restricted diet.

GOALS

- Client will adhere to diabetes medication to control blood sugars below 150 mg/dL.
- Client will adhere to a low potassium diet to lower potassium levels below 5.5 mg/dL.
- Client will adhere to a fluid restricted, low sodium diet to alleviate edema.

MONITORING AND EVALUATING

- Check labs for potassium, sodium and phosphate for normal ranges. (over next week)
- Monitor patient’s adherence and tolerance to medications for kidney replacement therapy.
- Watch the patient’s blood glucose levels and adherence to diabetes medication to make sure it’s in normal range.

REFERENCES

- http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3315621/
- Protein energy wasting in chronic kidney disease: An update with focus on nutritional interventions to improve outcomes. Jadhav, Y., Kher, V. Indian J Endocrinol Metab. 2012 Mar-Apr; 16(2): 244–251.