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A clinician’s perspective: Occupational Therapy for persons with renal disease

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Abstract

The webinar will provide OT clinicians a perspective on Occupational Therapy intervention for persons with renal disease. It will review the disease process and clinical reasoning for treatment techniques and methods respective of disease stage. It will include current evidence that supports the use of techniques in clinical practice.
As a result of this course, participants will be able to:

1) Identify the stages of renal disease and state common problems clients may experience that could be addressed by an occupational therapy intervention program
2) Explain the clinical reasoning for the focus and approach to care depending on the client’s medical intervention plan
3) Describe realistic, achievable goals for clients to remain participation and engaged in their daily living despite the need for aggressive medical care

The medical conditions and comorbidities that predispose...

A person to develop kidney disease

- Hypertension
- Type 2 diabetes (microvascular disease)
- Lupus
  - an autoimmune disease that can affect almost any part of your body, most often your joints, skin, kidneys, heart, lungs, blood, or brain.
  - Lupus nephritis is the term used when lupus causes inflammation in your kidneys, making them unable to properly remove waste from your blood or control the amount of fluids in your body.
Hypertension and kidney disease

- **Kidneys** are supplied with dense blood vessels, and high volumes of blood flow through them. Over time, uncontrolled **high blood pressure** can cause arteries around the **kidneys** to narrow, weaken or harden. These damaged arteries are not able to deliver enough blood to the **kidney** tissue. (American Heart Association, Jun 29, 2016).

- There is also a debate whether it is enough to take medication to treat hypertension, or whether the medication just staves off the ill effect of having the underlying condition (which is truly cardiovascular disease). If people who have hypertension do not adhere with their medications, science informs us that they do have a significantly higher rate of heart attack and stroke.

- Lifestyle redesign and adherence to a health lifestyle is probably the most effective method of working on the root cause of the issue (inclusive of genetic predisposition and dietary/ exercise/stress reducing habits).

Habits that can cause damage to your kidneys:

- Insufficient water consumption
  - Dehydration stresses renal function
- Smoking
  - Causes microvascular disease
- Alcohol
  - Over 8 oz. of alcohol daily can suppress function. Alcohol also causes release of water from the body and can lead to dehydration
- Medications
  - Mostly chemically based and tax the organs ability to filtrate out byproducts
  - High protein diet
    - Too much protein in the diet taxes the metabolic capacity of the kidney
- Physical inactivity
  - Generation of kidney stones
Habits that can cause damage to your kidneys:

- Sleeplessness
  - Increases toxins that the kidney must filtrate
- Over-consumption of salt and sugar
  - Need less than 2300 mg of salt/day and less than 6 teaspoons of sugar
- Delaying urine release
  - Leads to urinary tract infection and absorption of bacteria into the bloodstream
- Dietary deficiencies
  - The kidney needs vitamins & minerals
  - Most of us lack adequate amounts of magnesium

Habits that can cause damage to your kidneys:

- Failing to medically treat viral and bacterial infections
  - Having many infections can be a signal of reduced kidney function brought on by a toxin buildup
- Ignoring symptoms
  - Changes in urine color, loss of breath, fatigue, bad breath, leg and waist pain, swelling, frequent feelings of coldness, dizziness, vomiting and itchy skin
There is a role for self-care relative to prevention

- Psychosocial realm:
  - Health Ownership
    - Provide information/education on behaviors and habits that can cause strain to kidney function
    - Encourage making healthy choices
    - Assist with developing schedules to include activities that support health and well-being
    - Assist with developing new habits that support health and wellbeing

Signs and symptoms of chronic kidney disease

- Vomiting
- Loss of appetite
- Fatigue and weakness
- Sleep problems
- Changes in how much you urinate
- Decreased mental sharpness
- Muscle twitches and cramps
- Swelling of feet and ankles
- Persistent itching
- Chest pain, if fluid builds up around the lining of the heart
- Shortness of breath, if fluid builds up in the lungs
- High blood pressure (hypertension) that’s difficult to control

Chronic Kidney Disease Stages 1 to 2 - Early chronic renal insufficiency

- Physical symptoms
  - Very few
  - Urine may be frothy if you are losing a lot of protein in the urine
- Blood work
  - Slight elevation in serum creatinine (by the time it is elevated, the person may already have 50% loss of function)
  - Progression of the IgAN (immunoglobulin A) indicating nephropathy is present
- Urinalysis
  - Presence of protein or blood

- Treatment
  - Protein restriction in the diet
  - Antihypertensive meds: ACE inhibitor class, the angiotensin II receptor class
- Blood pressure
  - Rise in baseline BP
  - Closely associated with IgAN levels
- Anemia
  - Rare at this stage, but if occurs
  - Usually from having heavy proteinuria

NationalKidneyCenter.org

Chronic Kidney Disease Stages 3 to 4 - Advanced chronic renal insufficiency

- Physical symptoms
  - May have some/ may have none
- Serum creatinine
  - Higher levels than before (may have less than 30% kidney function at this stage)
- Tiredness or fatigue
  - Sleeping more, remaining sedentary, needing to pace through activities
- Swelling: eyes, hands, feet/ankles
- Back pain: dull ache mid to low back, flank pain or loin pain
- Change in appetite
  - Foods taste funny
  - Change in appetite or eating pattern
- Urine
  - Amount, color or frequency change
- Blood pressure
  - Hypertension is evident
- Digestion
  - Poor digestion
  - Gastroparesis, slowed digestion

NationalKidneyCenter.org
When does someone need dialysis?
End Stage Renal Disease (ESRD)

- by the time you lose about 85 to 90 percent of your kidney function and have a GFR of <15.
- In chronic or end stage kidney failure, your kidneys do not get better and you will need dialysis for the rest of your life. If your doctor says you are a candidate, you may choose to be placed on a waiting list for a new kidney.

What are the Stages of Chronic Kidney Disease (CKD)?

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>(GFR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kidney damage with normal kidney function</td>
<td>90 or above</td>
</tr>
<tr>
<td>2</td>
<td>Kidney damage with mild loss of kidney function</td>
<td>89 to 60</td>
</tr>
<tr>
<td>3a</td>
<td>Mild to moderate loss of kidney function</td>
<td>59 to 44</td>
</tr>
<tr>
<td>3b</td>
<td>Moderate to severe loss of kidney function</td>
<td>44 to 30</td>
</tr>
<tr>
<td>4</td>
<td>Severe loss of kidney function</td>
<td>29 to 15</td>
</tr>
<tr>
<td>5</td>
<td>Kidney failure</td>
<td>Less than 15</td>
</tr>
</tbody>
</table>

Your GFR number tells you how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

* GFR: glomerular filtration rate

https://www.kidney.org/atoz/content/dialysisinfo

Hemodialysis: shunt or fistula:

blood is removed, filtered through a machine to remove impurities and then returned to circulation.
Peritoneal dialysis (PD):
can be done at home

- Catheter into the peritoneum
- Dialysate is placed into the peritoneum and stays there for several hours
- Toxins diffuse into the dialysate after which dialysis is drained out. This is called an exchange. It is repeated 4-5x a day
- CAPD continuous ambulatory PD
- CCPD continuous cycling PD
- NIPD nocturnal intermittent PD

Continuous Ambulatory Peritoneal Dialysis (CAPD)

Pros
- Can be done in many locations, which makes it easier to travel.
- No needles.
- Control over-schedule/freedom.
- No machine needed
- Less restricted diet

Cons
- Treatments are every 4-6 hours every day.
- Your abdomen is always full of fluid, which may increase the size of your belly.
- You have a catheter in your abdomen.
- Everything must be very clean during the exchange.
- Increased risk of infection either in the peritoneal cavity or at the site of your catheter
- Storage of supplies.

http://biology-forums.com/index.php?action=gallery;sa=view;id=9290

https://www.aakp.org/education/resourcelibrary/dialysis-resources/item/the-facts-of-peritoneal-dialysis.html
Continuous Cycling Peritoneal Dialysis (CCPD)

Pros
• You can go about your daily routine.
• You don’t need a partner.
• Dialysis is usually done while you sleep.
• You have fewer fluid and diet restrictions.
• No needles needed.
• You can easily switch to CAPD when traveling.

Cons
• A machine is needed.
• You may have to do an exchange during the day.
• You may be awakened during the night by the machine’s noises.
• You have a catheter in your abdomen.
• Everything must be very clean during the exchange.
• Increased risk of infection either in the peritoneal cavity or at the site of your catheter.
• Storage of supplies.

https://www.aakp.org/education/resourcelibrary/dialysis-resources/item/the-facts-of-peritoneal-dialysis.html

NIPD nocturnal intermittent PD

• A machine-aided form of peritoneal dialysis.
• NIPD differs from CCPD in that six or more exchanges take place during the night, and the NIPD patient does not perform an exchange during the day.
Common mental health problems experienced by clients with renal disease?

- #1: Anxiety and Depression
  - Drugs used to treat anxiety and depression often have effects on renal function.
  - Depression is more prevalent than anxiety.
  - People with end stage renal disease are reliant upon the success of dialysis treatment (machinery) and upon their caregivers.

- #2 Suicidal behavior: by missing treatments; or by binging on foods rich in potassium, they can kill themselves. Voluntary withdrawal from treatment is tantamount to suicide.

- #3 Delirium: electrolyte imbalance, or dialysis disequilibrium syndrome. Pts can develop uremia, anemia and hyperthyroidism. Antipsychotics, lorazepam and neurotropics (e.g. Galantamine) may be useful with close monitoring. By maintaining high levels of acetylcholine, cognitive functions improve. Some suggest that inhibitors of acetylcholinesterase may have neuroprotective properties.

Which factor most commonly interferes with a client who has renal disease regarding participation in therapy? Fatigue

- Anemia can cause extreme fatigue and can worsen existing heart problems. Anemia is common in people with CKD, as well as those on dialysis, because the damaged kidneys slow the production of the hormone erythropoietin (EPO), which helps the bone marrow make red blood cells.

- Aerobic and resistance exercise are beneficial not only in improving physical functioning, including maximal oxygen uptake and muscle strength, but also in improving anthropometrics, nutritional status, hematological indexes, inflammatory cytokines, depression, and health-related quality of life.

Exercise rationale

- Muscle wasting, abnormalities in muscle function, and effects on exercise performance are common in patients with ESRD. Not only uremia per se, but also chronic inflammation, metabolic acidosis, oxidative stress, malnutrition, inactivity, androgen deficiency, insulin resistance, hemodialysis procedures, and concurrent illnesses are all related to muscle wasting. A specific form of muscle wasting in patients with ESRD is defined as the so-called protein-energy wasting, or PEW.

- Exercise is one of the possible preventive maneuvers to reduce muscle protein loss and maintain muscle function. Recently, many studies have shown the importance of exercise or regular physical activity to prevent muscle wasting in ESRD patients. Intradialytic exercise done while receiving dialysis is under investigation.

- Numerous studies have suggested that exercise could improve many indicators of physical functioning, improve self-reported physical functioning, and also improve QOL in ESRD patients. In addition, considering that cardiovascular disease (CVD) is the major cause of death in patients with advanced CKD, exercise and regular physical activity have the potential to reduce cardiovascular mortality in ESRD patients.

- Some data are available to show the cardiovascular benefits of exercise in this population. Observational data have shown that sedentary behavior was associated with higher cardiovascular mortality in ESRD patients.

(Jung, et. al., 2011)

Exercise considerations with renal disease

- Aerobic: Intradialytic exercise programs are mostly composed of aerobic exercises. Cycle ergometer or bicycle training is used for aerobic exercise. The exercise program mostly consists of two or three times a week (during hemodialysis), with moderate or vigorous intensity for 30 minutes or more, and lasting from 8 weeks to 12 months. When aerobic exercise is planned, heart rate reserve (HRR) or rating of perceived exertion (RPE; Borg) should be considered to tailor exercise intensity in individual patients.

- Combined aerobic and resistance:

(Jung, et. al., 2011)
Exercise considerations with renal disease

- **Resistance exercise**: In supine or sitting. Various resistance exercises can be done for upper extremity strengthening with progressive resistance training (PRT) with free-weight dumbbells, lower extremity strengthening with weighted ankle cuffs, or use of the Thera-band stretch strap (The Hygenic Corp, Akron, OH, USA) in a sitting position.

- Many specific exercises can be used, as follows: shoulder press, side shoulder raise, triceps extension, biceps curl, and external shoulder rotation for upper extremity strengthening; seated knee extension, supine hip flexion, supine hip abduction, supine straight-legged raise, and seated leg curl for lower extremity strengthening; and bilateral straight-leg raises in a supine position or bilateral leg lifts in a seated position for abdominal strengthening.

- Heart rate should be monitored.

- Intensity is generally 10RM, repetition maximum, or the most weight one can lift for a defined number of exercise movement.

(Jung, et. al., 2011)

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Exercise considerations with renal disease

- **Combined aerobic and resistance**: Mostly, cycling is used as the aerobic exercise and knee flexor and/or extensor strengthening is used as the resistance exercise. Resistance exercise is usually taken earlier than aerobic exercise because some patients cannot advance to resistance exercise owing to fatigue after a relatively long time of aerobic exercise during hemodialysis (cardiac decompensation may preclude exercise after 2 hours of hemodialysis).

- Intradialytic exercise can be safely done in the first 2 hours of dialysis without cardiac decompensation. There is a lower rate of recidivism using intradialytic exercise than using exercise at other times.

(Jung, et. al., 2011)
Exercise: to sum up

- With kidney failure, exercise is recommended
- Fatigue will make the person who receives dialysis want to refuse or to work suboptimally
- The benefits far outweigh the risks of exercising even during a dialysis session
- Heart rate and clinical signs should be monitored during exercise

Laws currently protect a person with kidney disease from discrimination in the workplace?

The Civil Rights Act, the Rehabilitation Act, and the Americans with Disabilities Act all protect persons who have chronic kidney disease. EEO and FMLA also provide some rights/protections under the law.

- Civil Rights Act: Titles II and VII of the 1964 Civil Rights Act prohibit discrimination against Americans with physical and mental disabilities in employment.
- Rehabilitation Act: Examples of discrimination include being fired or being turned down for a job or a promotion because of an illness or condition that does not affect your ability to do your job. The Department of Labor handles complaints filed under the Rehabilitation Act.
- Americans with Disabilities Act: If you work for a company with 15 or more employees, the Americans with Disabilities Act (ADA) requires your employer to make any “reasonable accommodations” that you might need in order to work. Examples include:
  - Making parking lots, bathrooms, and work areas handicapped accessible
  - Having flexible work schedules
  - Reassigning you to a less strenuous job if you request one and one is available
  - Assigning any of your non-essential tasks to other employees, at your request

https://www.kidney.org/atoz/content/working
Which lifestyle changes will support a person’s health who has a moderate level of renal disease?

- Smoking cessation
  - Microvascular disease increases when one smokes.
  - If a person smokes and is diabetic, they have an increased risk for CKD
- Adhering to a renal diet
  - A renal failure diet controls the amount of protein and phosphorus in your diet. You may also have to limit calcium, sodium, and potassium. A renal failure diet can help decrease the amount of waste made by your body, which can help your kidneys work better. It may also help to delay total renal failure.
- Regularly taking prescribed medications
  - Controlled hypertension is essential
  - Controlled blood sugar levels prevent progression of microvascular disease

the three most common forms of motor dysfunction that people who have renal disease experience?

- Muscle pain
  - Back pain: dull ache mid to low back, flank pain or loin pain
- Edema
  - In the face, hands, legs & feet make it difficult to use ones hands, to get up and walk around, to engage in social interactions
- Weakness
  - Avoidance of physical activity because of fatigue, depression, pain, swelling or shortness of breath, over time leads to muscle wasting and weakness
When people are receiving hemodialysis

- they can do work while tethered to the machine (such as computer work, reading, light handicrafts)
- They can exercise while tethered to the machine
  - Initially there was over-caution about engaging people receiving dialysis in progressive exercise. Now, studies are supporting the concept of
    - A captive audience leads to better exercise compliance
    - Exercising while dialyzing makes the dialysis more efficient
    - Participation functionally outshines inactivity form a quality of life perspective
    - Engagement thwarts anxiety and depression

The greatest infectious disease risk to healthcare workers who work with people receiving dialysis is...

- Hepatitis:
  - Blood borne pathogen
  - Hepatitis B is the most prevalent amongst persons receiving hemodialysis
  - Hepatitis C is at epidemic proportions amongst middle aged adults and young older adults in American Society today
  - Is preventable if one uses standard precautions
The Greatest benefits of receiving OT for a person with renal disease

- Prevention of loss of function
- Participating in life and living, instead of linking life from dialysis appointment to dialysis appointment
- Lifestyle redesign to change habits and embrace healthy behaviors that support participation in meaningful life tasks and social circumstances

References


Questions?

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