

# Chronic Kidney Disease-Associated Pruritus Fact Sheet

## General Overview

*Chronic kidney disease-associated pruritus* (CKD-aP) is formally defined as itching related to kidney disease. It is marked by an unpleasant sensation and the desire to scratch. It can be acute in nature or chronic. Chronic pruritus is diagnosed when symptoms last longer than 6 weeks. The persistent presence of CKD-aP can have considerable effects on health outcomes for patients who suffer from this ailment (Makar et al., 2021). This condition has been associated with decreased quality of life, poor sleep patterns, depression, and increased mortality (Shirazian et al., 2017).

## Risk Factors

Data were conflicting over which variables are associated with CKD-aP; however, some risk factors have more consistent associations with the presentation of symptoms. These factors include:

- Gender.
- Mineral and bone metabolism.
- Dialysis vintage.
- Dialysis efficiency.

## Gender

In several large studies, male gender has been associated with the emergence of CKD-aP. In a study which reviewed the Dialysis Outcomes and Practice Patterns Study (DOPPS) database, male gender was associated with 1.1 greater odds of having moderate to severe pruritus (Shirazian et al., 2017).

## Mineral and Bone Metabolism

There have been associated links between specific bone mineral markers and the occurrence of CKD-aP. For example, a study by Narita and colleagues (2006) found hypercalcemia and hyperphosphatemia are associated with severe pruritus. In addition, they found lower calcium and parathyroid hormone reduced the risk of pruritus. In the study, patients with a calcium phosphorus product greater than 80 had 1.5 times greater odds of pruritus compared with those having a product of 50 to 60.

## Dialysis Vintage and Efficiency

Time in which an individual has received hemodialysis treatments may correlate with the presence of pruritus. A DOPPS study revealed individuals receiving dialysis treat-

ment up to and including 3 months, there was a higher risk of CKD-aP. In addition, those persons on dialysis longer than 10 years were shown to have a reduced risk of pruritus. The reduced risk was also found in patients who were receiving peritoneal dialysis. It is believed there may be an association with dialysis efficiency. In a 5-year prospective study by Ko and colleagues in 2013, of 111 hemodialysis patients,  $Kt/V \geq 1.5$  and use of high-flux dialyzers were associated with a decreased intensity of pruritus.

## Co-Morbid Conditions

Several large studies have concluded co-morbid conditions which result in inflammatory responses can be associated with CKD-aP. These include diabetes mellitus, lung disease, cardiovascular disease, neurological disease, liver disease, smoking, hypertension, higher body mass index, elevated white blood cell count, lower hemoglobin, and lower serum albumin (Shirazian et al., 2017).

## Signs and Symptoms

Presentation of CKD-aP can vary, making identification and diagnosis difficult. The severity of itching symptoms can vary from inconsistently occurring to incessantly interfering with quality of life. CKD-aP is not marked by a recognizable pattern or distribution. In general, the distribution is a variable in up to 50% of cases. When the itching is generalized, it tends to occur symmetrically; however, it can be localized on particular areas, such as the arm, leg, face, back, and access site. The condition can be complicated by compounding factors superimposed by excoriations caused by persistent scratching. These includes impetigo, linear crusts, papules, ulcerations, and prurigo nodularis (Shirazian et al., 2017).

## Complications

Untreated, chronic pruritus has been associated with increased morbidity and mortality (Shirazian et al., 2017). Additional co-morbidities and complications frequently associated with CKD-aP include:

- Depression.
- Poor sleep quality.
- Feeling drained or washed out.
- Increased frequency of missed dialysis treatments.
- Reduced quality of life.
- Increased cardiovascular and infection-related morbidity.

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## Diagnosis

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No standardized lab or diagnostic testing for the diagnosis of CKD-aP is available. A complaint of pruritus in someone with a diagnosis of CKD is presumed CKD-aP unless assessment determines a different diagnosis. (Shirazian et al., 2017).

## Assessment

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The nephrology nurse may be the first person to hear about a patient's complaints of pruritus. The nursing assessment can aid in providing timely diagnosis and treatment. Assessment should include the following:

- Detailed examination of the skin.
- Full medical history.
- Evaluation of the impact on the patient's quality of life.
- Medications review. Drugs which may be associated with pruritus include allopurinol, clonidine, furosemide, angiotensin-converting enzyme inhibitors, beta blockers, and calcium channel blockers (Manenti & Leuci, 2021).

## Pruritus Scales

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Three numeric scales have been validated for reliability in identifying the severity of the pruritus and have been found to strongly correlate with each other: the verbal rating scale, numeric rating scale, and visual analog scale (Jang et al., 2020). Validated scales which assess additional factors related to the pruritus and the impact on quality of life include the 5-D itch scale (Elman et al., 2010); Itch Severity Scale (Majeski et al., 2007); Kidney Disease Quality of Life-Short Form, Dermatology Quality Life index, and the Skindex (Verduzco & Shirazian, 2020). These scales can be administered intermittently to determine effectiveness of treatment.

## For the Advanced Practice Provider

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Advanced practice providers should consider alternative causes for the patient's symptoms and determine if additional testing is needed.

### Differential Diagnoses

- Inadequate dialysis: Ko and colleagues (2013) found a Kt/V  $\geq 1.5$  using high flux dialysis was associated with reduced pruritus severity.
- Dermatologic: xerosis, atopic dermatitis, psoriasis, urticaria, contact dermatitis, lichen planus, scabies, tinea, bacterial infection, sicca syndrome. Consider skin biopsy in these.
- Systemic: liver disease, thyrotoxicosis, lymphoma, gastric carcinoid, systemic lupus erythematosus.
- Neurologic: multiple sclerosis, postherpetic neuralgia, peripheral neuropathy.
- Other: drug itch (use of opioids, cocaine, amphetamines), psychogenic itch.

### Additional Tests/Diagnostics to Consider if Does Not Respond to Routine Treatments

- Skin biopsy for potential dermatologic cause.
- Complete blood count with differential (anemia, increased eosinophils, white blood cells).
- Liver function testing and hepatitis testing.
- Thyroid stimulating hormone.
- Chest X-ray, computed tomography scan, magnetic resonance imaging.

## Treatment

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It is best to use a stepwise approach to treatment. First, remove any offending agents, such as alcohol which provides initial relief in the form of cooling, but contributes to skin dryness which exacerbates itching. One should also examine dialysis related factors contributing to pruritus such as inadequate Kt/V. At the same time, topical agents should be added for immediate relief. Systemic agents have not been demonstrated to be effective for many patients. Currently, there is an intradialytic agent that has shown significant efficacy.

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## Topicals

Table 1.

Medication	Side Effects/Cautions/Comments
Capsaicin cream	May cause localized burning where applied; avoid contact with mucous membranes and eyes; use for localized areas, not generalized pruritus
B Emollients, such as glycol stearate, glyceryl stearate, lanolin	One with high water content
Tacrolimus cream	Not recommended for long term use
Pramoxine	Found in various over the counter products
Cromolyn sodium	Mast stabilizer; unpleasant taste; irritating to eyes and throat
Caladryl	Found in various over the counter products

## Systemic Agents

Table 2.

Medication	Dose	Side Effects/Cautions
Ergocalciferol	50,000 IU weekly	In study by renal nutritionists, found to be ineffective (Shirzaian et al., 2013)
Gamma-linolenic acid	2.2% cream applied daily	Rarely associated with rash
Gabapentin	Usually divided doses with maximum 300 mg daily; dose after hemodialysis	Sleepiness, gastrointestinal upsets, dry mouth, blurred vision
Pregabalin	25 to 75 mg daily	Somnolence and dizziness
Antihistamines	Varies among products	May only help short term, sedating
Sertraline	50 mg daily	May take 4 to 5 weeks to be effective
K-opioid receptor agonists (difelikefalin)	Currently only given in hemodialysis	Mild gastrointestinal effects
μ-opioid receptor antagonist	50 mg daily	Effectiveness seems to depend on intensity

## Other

Ultraviolet light therapy has shown to be useful in a small number of studies. It is thought to work by decreasing inflammatory markers; however, often the pruritus is refractory when the therapy stops. Acupuncture found to be effective with treatments three times a week in two small studies (Mettang & Kremer, 2015).

## Care of Client

Because of the significant impact on quality of life and morbidity and mortality, it is best to use a team-based approach in caring for those with CKD-aP. In the dialysis setting, nephrology nurses or advanced practice providers should educate all staff about CKD-aP and the impact on

patients. Patients will often bring up complaints of pruritus to the members who provide direct care during dialysis, so the entire care team needs to be involved in the recognition and treatment. Since CKD-aP also affects those with advanced kidney disease who are not on dialysis, outreach to primary care providers can help with earlier recognition and appropriate management.

## Implications for Nursing Practice

Nurses play a vital role in the success of treatment for patients with CKD-aP as they are instrumental in collaborating with the patient to develop a plan of care that accommodates patient preferences and lifestyle. Plans of care that are reasonable and incorporate activities of daily living and support and uphold patient wishes are important

factors in treatment success. The nurse's role in developing and sustaining partnerships with the patients is essential to treatment success.

While collaboration is a central part of the nurses' role in the management of CKD-aP, nurses also play a role in patient assessment and addressing physical and psychological needs of the patient. Nurses may also coordinate care and ensure access to additional supportive measures, such as patient education materials, support groups, and specialist referrals.

In the nephrology setting, nurses can systematically and regularly evaluate the response of the patient to treatment interventions. They assist in determining the progress toward the achievement of patient-centered goals and often substantially contribute to the revision of treatment plans as necessary. Nurses are advocates and educators for patients who, far too often, suffer in silence.

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### Additional Information:

American Nephrology Nurses Association  
Box 56  
Pitman, NJ 08071-0056  
(856) 256-2320  
1 (888) 600-2662

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Pitman, NJ

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