



## Nursing Perspectives on the Management of Diabetic Nephropathy: Strategies for Improved Patient Outcomes: An Updated Review

1- Ahmed Mohammed Algafl, 2-Afnan Obeid Saeed Alanzi, 3-Ahmed Atiah Ali Dawshi, 4-Ali Ahmed Hakami, 5-Ashwag Edriss Hamad Areshy, 6-Khuluod Attallah Hajjaj Albalwi, 7- Gawher Ahmed Marzoog Albalawi, 8-Anas Mohammad Ibrahim Aljohani Anas, 9-Faez Saud Almutairi, 10- Tahani Rashed Awad Alruwaili, 11-Salha Mohammed Alhatemi, 12-Nahlah AHMED Alareshi, 13- Randa Mahammed Aqeel Bshkor, 14- Manjiah Mahammed Aqil Bshkor, 15-BASIM IBRAHIM SHOEI ALATTAR

1. Ksa, Ministry Of Health, King Fahad Hospital Hofuf
2. Ksa, Ministry Of Health, Primary Health Care In Al-Murooj, Tabuk
3. Ksa, Ministry Of Health, King Fahad Hospital
4. Ksa, Ministry Of Health, King Fahad Hospital
5. Ksa, Ministry Of Health, Phc Al Saad Abuarish
6. Ksa, Ministry Of Health, Alfariah Dispensary Alwajh
7. Ksa, Ministry Of Health, Bada Dispensary Alwaih
8. Ksa, Ministry Of Health, Alwajhgeneralhospital
9. Ksa, Ministry Of Health, Wethelan General Hospital Riyadh
10. Ksa, Ministry Of Health, Sawyer Health Care Center
11. Ksa, Ministry Of Health, Psychological Health Hosptal
12. Ksa, Ministry Of Health, Psychological Health Hosptal
13. Ksa, Ministry Of Health, Jazan General Hospital
14. Ksa, Ministry Of Health, Jazan General Hospital
15. Ksa, Ministry Of Health, Sabya General Hospital

### Abstract:

#### Background:

Diabetic kidney disease (DKD) is a major cause of end-stage kidney disease (ESKD), primarily seen in patients with diabetes mellitus (DM), including both type 1 and type 2. It progresses from microalbuminuria to reduced glomerular filtration rate (GFR), making early detection and management critical. Key interventions such as optimal glycemic control, blood pressure management, and the use of renin-angiotensin system blockers can significantly slow progression.

**Aim:** This review aims to update nursing perspectives on the management of diabetic nephropathy (DN), emphasizing early intervention strategies, clinical assessment, and nursing management to improve patient outcomes.

**Methods:** An updated review of current literature on diabetic nephropathy and its nursing management was conducted. Sources include clinical trials, medical guidelines, and evidence on pharmacotherapy, nursing practices, and patient education. Information on diagnostic tools, disease management, and nursing interventions in the context of DKD is synthesized.

**Results:** Early intervention, including strict glycemic and blood pressure control, has proven effective in reducing the progression of diabetic nephropathy. The use of angiotensin receptor blockers (ARBs) and ACE inhibitors has demonstrated positive outcomes in slowing kidney disease progression. Pharmacotherapy, such as finerenone and SGLT2 inhibitors, holds promise in improving renal outcomes. Nurses play a crucial

role in monitoring patient progress, managing symptoms, and educating patients about lifestyle changes, including smoking cessation and dietary modifications.

**Conclusion:** Effective nursing management for diabetic nephropathy involves regular monitoring, patient education, and collaboration with interdisciplinary teams. Early intervention to control blood glucose and blood pressure is critical in preventing progression to ESKD. Nurses must also advocate for patient involvement in self-care practices and timely medical interventions to maintain kidney health.

**Key Words:** Diabetic nephropathy, diabetic kidney disease, nursing management, glycemic control, blood pressure, renal failure, patient education, pharmacotherapy.

**Received:** 07 october 2023    **Revised:** 22 November 2023    **Accepted:** 06 December 2023

---

## **Introduction:**

Diabetic kidney disease (DKD) is the predominant cause of end-stage kidney disease (ESKD) in developed nations, including the United States [1]. Classified as a microvascular complication, DKD affects individuals with both type 1 diabetes mellitus (T1DM) and type 2 diabetes mellitus (T2DM). It is characterized by persistent albuminuria and a progressive reduction in the glomerular filtration rate (GFR). Extensive research indicates that early intervention can effectively delay or prevent the progression of DKD. Diagnostic tools such as urine albuminuria assessments and estimated GFR (eGFR) are critical for accurate detection and monitoring. Furthermore, achieving optimal glycemic control and maintaining appropriate blood pressure levels are fundamental to halting disease progression [2].

## **Clinical Manifestations and Nursing Diagnosis**

Patients with DKD often present with a range of clinical signs and symptoms, including frothy urine, confusion, elevated blood pressure, edema, altered urine output, pruritus, skin discoloration, hyperglycemia, vision changes, and auscultatory findings such as rales and crackles. These manifestations reflect the systemic impact of DKD and emphasize the need for comprehensive nursing assessments.

## **Etiology**

Approximately 30% to 40% of individuals with diabetes mellitus (DM) develop diabetic nephropathy [3]. While the precise pathophysiology remains uncertain, several mechanisms have been implicated, including insulin resistance, genetic predisposition, hyperglycemia, and autoimmune processes. These factors interact to promote structural and functional kidney damage, culminating in DKD.

## **Risk Factors**

The risk of diabetic nephropathy varies between T1DM and T2DM due to differences in disease onset. In type 1 diabetes, nephropathy typically manifests 15 to 20 years after diagnosis, whereas individuals with type 2 diabetes may already have albuminuria at the time of diabetes detection due to delayed diagnosis. Diabetes-induced structural and functional renal alterations, such as proteinuria and hypertension, are hallmark features of nephropathy. Certain racial and ethnic groups, including African Americans, Native Americans, and Mexican Americans, are disproportionately affected by DKD. Familial clustering further supports a genetic component, with polymorphisms in angiotensin-converting enzyme (ACE) and angiotensin receptor genes being actively studied for their potential roles in disease susceptibility.

## **Clinical Assessment**

Key risk factors for the development of diabetic nephropathy include prolonged duration of diabetes, poor glycemic control, and uncontrolled hypertension. A family history of hypertension or cardiovascular events in first-degree relatives, alongside obesity, smoking, and hyperlipidemia, further exacerbates the risk. Males are more predisposed to developing DKD compared to females. Diagnosis relies on detecting persistent albuminuria on at least two occasions, separated by a minimum of three months, using early morning urine samples. Persistent albuminuria is defined as urinary albumin excretion exceeding 300 mg over 24 hours or greater than 200 micrograms per minute, while moderately increased

albuminuria ranges between 30 to 300 mg over 24 hours, serving as an early indicator of DKD. Urinalysis is essential to exclude urinary tract infections as a differential diagnosis. In the early stages of DKD, patients are usually asymptomatic and are identified through routine screenings revealing albuminuria levels of 30 to 300 mg/g creatinine. As the disease progresses, symptoms such as fatigue, foamy urine (indicative of proteinuria exceeding 3.5 g/day), and pedal edema due to hypoalbuminemia and nephrotic syndrome become apparent. Coexisting conditions, including peripheral vascular disease, hypertension, coronary artery disease, and diabetic retinopathy, are commonly observed.

## **Evaluation**

Proteinuria is the primary clinical marker of diabetic nephropathy. In patients with T1DM, the absence of retinopathy decreases the likelihood of DKD. Diagnosing DKD in T2DM is more challenging due to the uncertainty surrounding the exact onset of the disease. A detailed history and thorough physical examination remain indispensable tools in establishing the diagnosis, particularly in T2DM cases. This comprehensive understanding of DKD underscores the critical role of early detection, targeted interventions, and ongoing evaluation in mitigating disease progression and improving patient outcomes.

## **Medical Management**

The treatment of diabetic nephropathy (DN) is directed toward addressing four primary therapeutic objectives: the reduction of cardiovascular risk, optimal glycemic control, management of blood pressure, and inhibition of the renin-angiotensin system (RAS). The modification of risk factors, such as smoking cessation and the implementation of effective lipid-lowering strategies is essential for mitigating cardiovascular risks. Substantial evidence supports the importance of tight glycemic control in preventing the onset of diabetic nephropathy. Specifically, studies such as the Diabetes Control and Complications Trial (DCCT) and the Epidemiology of Diabetes Interventions and Complications (EDIC) study have demonstrated that intensive diabetes management in individuals with type 1 diabetes mellitus (T1DM) significantly reduces the incidence of proteinuria and microalbuminuria [4]. The benefits of early, rigorous glycemic control persist over time, even after long-term follow-up, underscoring the concept of "metabolic memory," a phenomenon described by the DCCT/EDIC investigators. This effect highlights the enduring positive impact of early intervention, even when glycemic control in both study groups eventually becomes comparable in later stages. For individuals with type 2 diabetes mellitus (T2DM), the United Kingdom Prospective Diabetes Study (UKPDS) established that maintaining an HbA1C target of 7% is associated with a decreased risk of microvascular complications, including diabetic nephropathy [5]. Furthermore, blood pressure control has been shown to contribute to reduced cardiovascular mortality in this population.

The use of angiotensin receptor blockers (ARBs) has also proven beneficial in slowing the progression of diabetic nephropathy. Clinical trials, including the Reduction of Endpoints in NIDDM with the Angiotensin II Antagonist Losartan (RENAAL) study and the Irbesartan Diabetes Nephropathy Trial (IDNT), have demonstrated that ARBs significantly delay kidney disease progression [6][7]. These studies revealed that blood pressure achieved during treatment, rather than initial blood pressure at study entry, is a more reliable predictor of kidney outcomes, emphasizing the critical importance of blood pressure management. The UKPDS further supported the advantage of blood pressure control, showing a reduction in DM-related complications, such as death, adverse cardiovascular events, and microvascular events. However, the benefits of aggressive systolic blood pressure control (targeting less than 120 mm Hg) were not observed in terms of improved cardiovascular outcomes or the incidence of end-stage renal disease, compared to more conventional management (targeting less than 140 mm Hg systolic). Current guidelines, including those from the Eighth Joint National Committee (JNC 8), recommend a target blood pressure of less than 140/90 mm Hg for most patients with T2DM and diabetic nephropathy, although individualized approaches are encouraged [8]. Recent diabetes society guidelines have advocated for a more stringent target of 130/80 mm Hg.

While RAS blockade is a cornerstone in preventing the development of diabetic nephropathy, multiple studies suggest that initiating therapy in individuals with T1DM is ineffective in preventing the

onset of microalbuminuria. In contrast, studies such as the Randomized Olmesartan and Diabetes Microalbuminuria Prevention (ROADMAP) trial have shown that RAS blockade can prevent the development of microalbuminuria in individuals with T2DM [9]. The Irbesartan in Microalbuminuria, Type 2 Diabetic Nephropathy (IRMA2) study demonstrated the efficacy of ARBs in preventing the progression of proteinuria in patients with microalbuminuria [10]. Additionally, ACE inhibitors have been shown to slow the progression of diabetic nephropathy in patients with T1DM and overt proteinuria. The IDNT and RENAAL studies further supported the efficacy of ACE inhibitors and ARBs in slowing the progression of kidney disease in T2DM patients. These findings underscore the significant benefit of RAS blockade in slowing the progression of diabetic nephropathy, independent of its effects on blood pressure. However, the concomitant use of multiple RAS-blocking agents has been associated with adverse outcomes, including acute renal failure, leading to a decline in their clinical use.

Recent advancements in pharmacotherapy include the introduction of finerenone, a third-generation mineralocorticoid receptor antagonist, which has demonstrated a reduction in albuminuria in patients with diabetic nephropathy at 90 days, particularly in those already receiving ARB therapy [11]. Furthermore, clinical trials such as EMPAREG and CANVAS have shown that sodium-glucose co-transporter 2 (SGLT2) inhibitors, which prevent glucose reabsorption in the renal tubules, significantly reducing cardiovascular mortality [12]. Although these trials primarily focused on cardiovascular outcomes, secondary analyses revealed that SGLT2 inhibitors also contributed to improved kidney outcomes, including albuminuria reduction and a reduction in composite renal events. While promising, the primary aim of these trials was cardiovascular benefit, and ongoing studies are investigating the potential of SGLT2 inhibitors in preventing the progression of diabetic nephropathy.

### **Renal Replacement**

As diabetic nephropathy progresses to end-stage renal disease, characterized by a glomerular filtration rate (GFR) of 10-15 ml/min, renal replacement therapy becomes necessary. Several options are available for renal replacement, including peritoneal dialysis, hemodialysis, and kidney transplantation. Among these, renal transplantation is generally considered the most effective long-term solution, and discussions regarding this option should occur early, involving both the patient and their family.

### **Nursing Management**

Nursing management for patients with diabetic nephropathy involves continuous monitoring and patient education to optimize health outcomes. Key interventions include regularly assessing blood pressure, which is critical for managing the disease and reducing the risk of progression. Nurses should educate patients on the nature of the disease, its complications, and the importance of adhering to prescribed treatments. Monitoring urine for protein is essential, as the presence of proteinuria indicates renal impairment and progression of nephropathy. Additionally, laboratory tests, particularly for blood urea nitrogen (BUN) and creatinine levels, are vital for assessing kidney function. A low-protein diet should be advocated for patients with diabetic nephropathy, as reducing protein intake helps to alleviate renal strain and slow disease progression. Nurses should also counsel patients on the dangers of smoking and the use of nonsteroidal anti-inflammatory drugs (NSAIDs), both of which can exacerbate kidney damage. Instruction on home blood glucose monitoring is important for patients to gain better control over their diabetes, which directly impacts kidney function.

Encouraging physical activity, including ambulation and exercise, is essential in promoting overall health and improving blood circulation. Nurses should provide education on the importance of medication adherence, emphasizing the role of prescribed drugs in managing blood pressure and preventing further renal damage. Additionally, patients should be informed about dialysis options and the importance of timely intervention should their renal function deteriorate. Nurses should also monitor fluid intake and output to detect any changes in kidney function, as well as assess for edema, which can signal fluid retention due to compromised renal function. Auscultating the lungs for rales and crackles is another crucial assessment, as

these sounds can indicate fluid overload and potential heart failure, which may accompany advanced kidney disease.

### **When to Seek Help**

Patients should be instructed to seek medical attention immediately if they experience altered mental status, which could be a sign of uremic encephalopathy, or if their blood pressure becomes uncontrollably high. A sudden lack of urine output is a concerning symptom that requires urgent evaluation, as it may indicate acute renal failure. Elevated potassium levels, which can lead to life-threatening cardiac arrhythmias, also warrant immediate attention. Other critical signs that necessitate seeking medical help include the development of rales and crackles in the lungs, shortness of breath (dyspnea), or the presence of a fever, as these can signal infection or worsening heart failure.

### **Outcome Identification**

The primary outcomes for nursing management of diabetic nephropathy include the restoration or preservation of urine output, the stabilization of laboratory values (including BUN and creatinine levels), and the achievement of controlled blood pressure. Successful management is also indicated by a reduction in proteinuria, which suggests a slowing or reversal of kidney damage. Nurses should work collaboratively with the patient and interdisciplinary team to monitor these outcomes and adjust the care plan as needed to optimize kidney health and overall well-being.

### **Coordination of Care**

Interdisciplinary clinical teams play a vital role in managing patients with diabetic nephropathy, particularly in reducing cardiovascular risk factors, improving glycemic control, and decreasing the risk of complications. These teams have demonstrated effectiveness across various countries [13]. It is now widely recommended that the patient be integrated as a core member of the interprofessional treatment team to achieve optimal outcomes. Nurses are tasked with educating the patient on the significance of glycemic control and maintaining a balanced, nutritious diet. Pharmacists, on the other hand, focus on ensuring medication adherence. Additionally, patients should be trained in how to monitor and manage their blood glucose levels independently at home. Research indicates that individuals who diligently monitor their blood glucose levels at home experience a delay in the onset of renal dysfunction, underscoring the importance of consistent self-management [14].

### **Health Teaching and Health Promotion**

Patients should be advised to maintain protein intake at approximately 0.8 grams per kilogram of body weight to mitigate strain on the kidneys.

### **Discharge Planning**

At the time of discharge, it is essential to ensure that the patient remains an active participant in the interprofessional treatment team. Nurses should continue to educate the patient on the critical importance of glucose control, physical activity, dietary habits, and regular follow-up visits. Pharmacists must reinforce the importance of medication adherence and blood pressure management. It is also recommended that the patient receive a dietary consultation to guide them in selecting low-protein foods that align with their health needs. Social workers should be involved to confirm that the patient has access to the necessary support systems and financial resources to sustain treatment. Nephrologists and dialysis nurses play a crucial role in educating patients about renal replacement therapy options, while transplant nurses should provide information on the indications and advantages of kidney transplantation. Further, reinforcing self-monitoring of blood glucose levels remains an essential component of patient education, as studies show that patients who are compliant with home glucose monitoring typically experience delayed progression of renal dysfunction [14].

### **Evidence-Based Issues**

The evidence consistently supports the effectiveness of working within an interdisciplinary team characterized by open communication to achieve the best possible outcomes for patients. This collaborative approach ensures a comprehensive, well-coordinated care plan that addresses all aspects of the patient's condition, from disease management to social and psychological support, optimizing patient outcomes [15-16].

### **Nursing Intervention Plans for Dialysis:**

Effective nursing intervention in the context of dialysis for patients with diabetic nephropathy is critical for optimizing health outcomes and improving quality of life. Diabetic nephropathy, as a progressive renal condition, often requires dialysis when patients reach end-stage renal disease (ESRD), defined by a glomerular filtration rate (GFR) of less than 15 mL/min. The nursing interventions for these patients must focus on both the physiological and psychological aspects of care, ensuring that patients receive the appropriate treatments while maintaining their mental well-being.

#### **1. Pre-Dialysis Assessment and Preparation**

The first critical step in nursing intervention for dialysis patients is thorough pre-dialysis assessment. Nurses should regularly monitor the patient's vital signs, including blood pressure, heart rate, and oxygen saturation levels, as fluctuations can complicate dialysis sessions. It is essential to evaluate laboratory results, such as serum potassium, sodium, BUN, creatinine, and albumin levels, to determine the patient's readiness for dialysis and to identify any immediate risks or complications. For instance, elevated potassium levels (hyperkalemia) can be life-threatening and may require urgent correction before starting dialysis. Moreover, nurses must ensure that the patient has appropriate vascular access for dialysis, which can be achieved through arteriovenous (AV) fistula, AV graft, or central venous catheter (CVC). Education on vascular access care is vital to prevent infection and clotting. Nurses should provide clear instructions on how to protect the access site and signs of complications such as thrombosis or infection. The patient must also understand the dialysis process, including the goals, duration, and potential side effects, to reduce anxiety and enhance cooperation.

#### **2. Dialysis Procedure and Patient Monitoring**

During dialysis, nurses play a central role in closely monitoring the patient's condition throughout the procedure. Continuous assessment of the patient's fluid balance, electrolyte levels, and hemodynamic status is necessary to identify any adverse reactions. Monitoring complications, such as hypotension, arrhythmias, or blood loss, is a priority. Ensuring that the patient is comfortable and minimizing any adverse symptoms, such as nausea, cramps, or fatigue, is an essential aspect of the nursing intervention. The nurse should also provide emotional support during dialysis, as many patients experience anxiety or discomfort. This involves creating a calm environment, providing reassurance, and offering distractions, such as music or reading materials, to help alleviate stress and discomfort. Additionally, nurses should assess and manage pain, especially if there are issues with the dialysis access site, ensuring that the patient receives appropriate pain relief.

#### **3. Post-Dialysis Care and Patient Education**

Post-dialysis care is equally important to prevent complications and ensure the patient's recovery. Nurses must monitor the patient for post-dialysis symptoms, such as hypotension, dizziness, fatigue, and nausea, which are common but manageable. A thorough assessment of the access site for bleeding, infection, or clotting is critical at this stage. Nurses should instruct patients on how to recognize early signs of complications, such as redness, swelling, or pain at the access site, which could indicate infection or thrombosis. Patient education after dialysis is crucial to promote self-management and adherence to treatment. Nurses should provide information on the importance of following prescribed fluid and dietary restrictions, such as limiting sodium, potassium, and phosphate intake, to prevent complications. Additionally, patients should be educated on the necessity of taking medications, such as phosphate binders and erythropoiesis-stimulating agents, as prescribed to manage symptoms of kidney failure and prevent further complications.

#### **4. Psychological and Social Support**

Beyond the physical management of dialysis, nurses must address the psychological and social needs of patients. Dialysis can be emotionally taxing due to the chronic nature of the disease and the frequent visits required for treatment. Nurses should be attentive to signs of depression or anxiety and provide referrals to counseling or social work services when necessary. Support groups and peer interactions can also be beneficial for patients to share experiences and reduce feelings of isolation. Encouraging family involvement and providing education on the dialysis process can also help in managing emotional stress for both patients and their families.

#### **5. Ongoing Monitoring and Long-Term Care**

Ongoing monitoring of the patient's renal function, fluid balance, and overall health is essential. Regular follow-up visits are necessary to assess the effectiveness of the dialysis, adjust the treatment plan, and manage any complications. Nurses should also continue educating the patient on maintaining a healthy lifestyle, including managing diabetes and hypertension, to prevent further renal decline. Ensuring that the patient has access to adequate resources, including social support and financial assistance, is essential to maintaining long-term dialysis care. In conclusion, nursing interventions for dialysis in patients with diabetic nephropathy require a comprehensive, patient-centered approach that includes pre-dialysis assessment, monitoring during dialysis, post-dialysis care, patient education, and psychological support. By addressing the physiological, psychological, and social aspects of care, nurses can improve the quality of life and health outcomes for these patients.

#### **Conclusion:**

Diabetic nephropathy (DN) is a leading cause of end-stage kidney disease (ESKD) globally, particularly in patients with diabetes mellitus (DM). With the progression of DN, early intervention plays a pivotal role in slowing its advancement and preventing irreversible kidney damage. Evidence-based strategies, including tight glycemic control, blood pressure management, and the use of renin-angiotensin system (RAS) blockers, have been shown to delay or prevent the onset of severe kidney disease. In particular, ACE inhibitors and angiotensin receptor blockers (ARBs) remain key therapeutic interventions in managing DN, as they effectively slow the progression from microalbuminuria to more severe stages of nephropathy. The introduction of newer pharmacological agents such as finerenone, a mineralocorticoid receptor antagonist, and sodium-glucose co-transporter 2 (SGLT2) inhibitors has added significant value to the management of DN. These drugs not only control blood glucose levels but also have nephroprotective effects, making them essential for preventing or mitigating kidney damage in diabetic patients. Studies on these agents highlight their potential in improving renal outcomes, particularly when used in combination with other treatments. From a nursing perspective, managing diabetic nephropathy involves a holistic approach that includes rigorous monitoring of kidney function, proteinuria, and overall health status. Nurses are essential in educating patients on the significance of lifestyle modifications, adherence to prescribed medication, and self-monitoring of blood glucose levels. Encouraging physical activity and a low-protein diet are also integral components of care to alleviate renal strain and prevent further damage. Nurses must work closely with multidisciplinary teams to ensure that patients receive comprehensive care, encompassing both pharmacological treatments and non-pharmacological interventions. Patient education is paramount in the nursing care of DN. By empowering patients with knowledge about their condition and encouraging active participation in managing their health, nurses can help reduce complications and improve overall outcomes. Key educational areas include understanding the nature of diabetic nephropathy, recognizing early signs of worsening kidney function, and adhering to prescribed treatments such as medication and dietary changes. As diabetic nephropathy progresses to end-stage renal disease (ESKD), renal replacement therapy such as dialysis or kidney transplantation becomes necessary. Nurses play a crucial role in preparing patients for these procedures by offering emotional support and providing education on options for renal replacement therapy. Furthermore, continuous monitoring for complications such as hypertension, edema, and fluid retention is essential in providing high-quality care to these patients. In conclusion, effective management of diabetic nephropathy relies on early detection, tight control of

diabetes and hypertension, and the use of appropriate pharmacotherapies. Nurses are integral in delivering care that improves patient outcomes by focusing on symptom management, patient education, and ensuring adherence to therapeutic interventions. Collaboration with interdisciplinary teams ensures a holistic approach to managing the complexities of diabetic nephropathy, ultimately improving the quality of life for patients and reducing the burden of end-stage renal disease.

## References:

1. Rabkin R. Diabetic nephropathy. Clin Cornerstone. 2003;5(2):1-11.
2. Diabetes Canada Clinical Practice Guidelines Expert Committee. McFarlane P, Cherney D, Gilbert RE, Senior P. Chronic Kidney Disease in Diabetes. Can J Diabetes. 2018 Apr;42 Suppl 1:S201-S209.
3. Umanath K, Lewis JB. Update on Diabetic Nephropathy: Core Curriculum 2018. Am J Kidney Dis. 2018 Jun;71(6):884-895.
4. DCCT/EDIC research group. Effect of intensive diabetes treatment on albuminuria in type 1 diabetes: long-term follow-up of the Diabetes Control and Complications Trial and Epidemiology of Diabetes Interventions and Complications study. Lancet Diabetes Endocrinol. 2014 Oct;2(10):793-800.
5. Genuth S, Eastman R, Kahn R, Klein R, Lachin J, Lebovitz H, Nathan D, Vinicor F, American Diabetes Association. Implications of the United kingdom prospective diabetes study. Diabetes Care. 2003 Jan;26 Suppl 1:S28-32.
6. Brenner BM, Cooper ME, de Zeeuw D, Keane WF, Mitch WE, Parving HH, Remuzzi G, Snapinn SM, Zhang Z, Shahinfar S., RENAAL Study Investigators. Effects of losartan on renal and cardiovascular outcomes in patients with type 2 diabetes and nephropathy. N Engl J Med. 2001 Sep 20;345(12):861-9.
7. Lewis EJ, Hunsicker LG, Clarke WR, Berl T, Pohl MA, Lewis JB, Ritz E, Atkins RC, Rohde R, Raz I, Collaborative Study Group. Renoprotective effect of the angiotensin-receptor antagonist irbesartan in patients with nephropathy due to type 2 diabetes. N Engl J Med. 2001 Sep 20;345(12):851-60.
8. Armstrong C., Joint National Committee. JNC8 guidelines for the management of hypertension in adults. Am Fam Physician. 2014 Oct 01;90(7):503-4.
9. Menne J, Ritz E, Ruilope LM, Chatzikyrkou C, Viberti G, Haller H. The Randomized Olmesartan and Diabetes Microalbuminuria Prevention (ROADMAP) observational follow-up study: benefits of RAS blockade with olmesartan treatment are sustained after study discontinuation. J Am Heart Assoc. 2014;3(2):e000810.
10. Parving HH, Lehnert H, Bröchner-Mortensen J, Gomis R, Andersen S, Arner P., Irbesartan in Patients with Type 2 Diabetes and Microalbuminuria Study Group. The effect of irbesartan on the development of diabetic nephropathy in patients with type 2 diabetes. N Engl J Med. 2001 Sep 20;345(12):870-8.
11. Bakris GL, Agarwal R, Chan JC, Cooper ME, Gansevoort RT, Haller H, Remuzzi G, Rossing P, Schmieder RE, Nowack C, Kolkhof P, Joseph A, Pieper A, Kimmeskamp-Kirschbaum N, Ruilope LM., Mineralocorticoid Receptor Antagonist Tolerability Study–Diabetic Nephropathy (ARTS-DN) Study Group. Effect of Finerenone on Albuminuria in Patients With Diabetic Nephropathy: A Randomized Clinical Trial. JAMA. 2015 Sep 01;314(9):884-94.
12. Rastogi A, Bhansali A. SGLT2 Inhibitors Through the Windows of EMPA-REG and CANVAS Trials: A Review. Diabetes Ther. 2017 Dec;8(6):1245-1251.
13. McGill M, Blonde L, Chan JCN, Khunti K, Lavalley FJ, Bailey CJ., Global Partnership for Effective Diabetes Management. The interdisciplinary team in type 2 diabetes management: Challenges and best practice solutions from real-world scenarios. J Clin Transl Endocrinol. 2017 Mar;7:21-27.
14. Mahnensmith RL, Zorzanello M, Hsu YH, Williams ME. A quality improvement model for optimizing care of the diabetic end-stage renal disease patient. Semin Dial. 2010 Mar-Apr;23(2):206-13.
15. Shen ZZ, Huang YY, Hsieh CJ. Early short-term intensive multidisciplinary diabetes care: A ten-year follow-up of outcomes. Diabetes Res Clin Pract. 2017 Aug;130:133-141.
16. Varghese, R. T., Jialal, I., & Doerr, C. (2023). Diabetic nephropathy (nursing). In *StatPearls [Internet]*. StatPearls Publishing.



#### الملخص:

الخلفية: يعد مرض الكلى السكري (DKD) من الأسباب الرئيسية للفشل الكلوي النهائي (ESKD) ، ويظهر بشكل رئيسي لدى المرضى المصابين بمرض السكري (DM) ، بما في ذلك النوع 1 والنوع 2. ويتقدم المرض من ميكروألبومينوريا إلى انخفاض في معدل الترشيح الكبيبي (GFR) ، مما يجعل الاكتشاف المبكر والإدارة أمرين حاسمين. يمكن أن تؤدي التدخلات الرئيسية مثل التحكم الأمثل في سكر الدم، وإدارة ضغط الدم، واستخدام مثبطات نظام الرنين-أنجيوتنسين إلى إبطاء تقدم المرض بشكل كبير.

الهدف: تهدف هذه المراجعة إلى تحديث وجهات نظر التمريض في إدارة اعتلال الكلية السكري (DN) ، مع التركيز على استراتيجيات التدخل المبكر، والتقييم السريري، وإدارة التمريض لتحسين نتائج المرضى.

الأساليب: تم إجراء مراجعة محدثة للأدبيات الحالية حول اعتلال الكلية السكري وإدارته التمريضية. تشمل المصادر التجارب السريرية، والإرشادات الطبية، والأدلة المتعلقة بالعلاج الدوائي، والممارسات التمريضية، والتعليم الصحي للمرضى. تم تجميع المعلومات حول الأدوات التشخيصية، وإدارة المرض، والتدخلات التمريضية في سياق مرض الكلى السكري.

النتائج: أثبت التدخل المبكر، بما في ذلك التحكم الصارم في سكر الدم وضغط الدم، فعاليتها في تقليل تقدم اعتلال الكلية السكري. لقد أظهرت استخدامات مثبطات مستقبلات الأنجيوتنسين (ARBs) ومثبطات ACE نتائج إيجابية في إبطاء تقدم مرض الكلى. كما أن العلاجات الدوائية مثل الفينيزينون ومثبطات SGLT2 تحمل وعدًا في تحسين النتائج الكلوية. يلعب الممرضون دورًا حيويًا في متابعة تقدم المرضى، وإدارة الأعراض، وتعليم المرضى حول التغييرات في نمط الحياة، بما في ذلك الإقلاع عن التدخين والتعديلات الغذائية .

الخلاصة: تشمل الإدارة التمريضية الفعالة لاعتلال الكلية السكري المراقبة المنتظمة، والتعليم الصحي للمرضى، والتعاون مع الفرق متعددة التخصصات. يعد التدخل المبكر للتحكم في سكر الدم وضغط الدم أمرًا بالغ الأهمية في منع تقدم المرض إلى الفشل الكلوي النهائي. يجب على الممرضين أيضًا دعم مشاركة المرضى في ممارسات الرعاية الذاتية والتدخلات الطبية في الوقت المناسب للحفاظ على صحة الكلى.

الكلمات الرئيسية: اعتلال الكلية السكري، مرض الكلى السكري، إدارة التمريض، التحكم في سكر الدم، ضغط الدم، الفشل الكلوي، التعليم الصحي للمرضى، العلاج الدوائي.