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Nursing Management of Patients with Disorders of the Renal and Urinary System

Medical Surgical Nursing

Urinary tract infection, glomerulonephritis, pyelonephritis, renal calculi, acute kidney injury, chronic kidney disease, nephrotic syndrome, renal failure and urinary obstruction.

For educational purposes only.

CHAPTER 08 / MEDICAL-SURGICAL NURSING 08. Nursing Management of Patients with Disorders of the Renal and Urinary System

1. Renal assessment

Assess urine volume, dysuria, haematuria, flank pain, oedema, BP, weight and medications. Common tests: urinalysis, culture, urea, creatinine, eGFR, urine albumin-creatinine ratio, electrolytes and ultrasound. Creatinine depends on muscle mass and may lag behind acute injury; assess trends and output.

Urinary tract infection and pyelonephritis

Definition and pathophysiology: Ascending bacterial infection; cystitis affects bladder, pyelonephritis affects renal parenchyma.

Clinical features and investigations: Dysuria, frequency, urgency; flank pain and fever suggest upper infection. Urine culture when indicated.

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Management and nursing care: Prescribed antimicrobial therapy based on site/resistance, hydration as appropriate, assess sepsis and obstruction. Avoid treating asymptomatic bacteriuria routinely except specific indications.

Glomerulonephritis

Definition and pathophysiology: Glomerular inflammation due to immune/infectious causes; nephritic presentation.

Clinical features and investigations: Haematuria, hypertension, oedema, reduced GFR, variable proteinuria; urine microscopy, complement and disease-specific testing, biopsy if indicated.

Management and nursing care: Control BP/fluid and treat cause; monitor renal function, potassium, output and pulmonary oedema.

Nephrotic syndrome

Definition and pathophysiology: Glomerular barrier injury causes heavy proteinuria and hypoalbuminaemia.

Clinical features and investigations: Generalized oedema, foamy urine, hyperlipidaemia; quantify protein, albumin, renal function.

Management and nursing care: Treat cause, manage oedema and BP, monitor infection and thromboembolism; individualized sodium/nutrition advice and prescribed immunotherapy when indicated.

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Renal calculi

Definition and pathophysiology: Crystallization of urinary solutes; calcium stones common, also uric acid and infection stones.

Clinical features and investigations: Colicky flank pain radiating to groin, haematuria, nausea; urinalysis and ultrasound/CT.

Management and nursing care: Analgesia, appropriate fluids and specialist stone management. Fever plus obstruction, anuria or uncontrolled pain requires urgent referral; straining urine may help analysis.

Acute kidney injury (AKI)

Definition and pathophysiology: Acute decline in renal function from pre-renal hypoperfusion, intrinsic injury or post-renal obstruction.

Clinical features and investigations: Creatinine rise >= 0.3 mg/dL in 48 h, >= 1.5 times baseline within 7 days, or urine output <0.5 mL/kg/h for 6 h (KDIGO criteria).

Management and nursing care: Review haemodynamics, nephrotoxins and obstruction; manage cause and electrolytes, accurate intake/output, assess need for renal replacement therapy. Avoid automatic fluid boluses in overload.

Chronic kidney disease (CKD) and kidney failure

Definition and pathophysiology: Abnormal kidney structure/function persisting over 3 months. Advanced disease may cause uraemia, anaemia, acidosis and mineral-bone disorder.

Clinical features and investigations: Often asymptomatic early; eGFR and albuminuria determine risk; fatigue, pruritus, nausea and oedema in advanced disease.

Management and nursing care: BP/diabetes control, kidney-protective treatment when indicated, dietitian support, adjust drugs, monitor anaemia/electrolytes; plan dialysis/transplant and conservative care according to goals.

Urinary obstruction

Definition and pathophysiology: Impaired urine flow from BPH, stone, tumour or stricture.

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Clinical features and investigations: Retention, suprapubic distension, reduced output or hydronephrosis; bladder scan/ultrasound.

Management and nursing care: Urgent decompression when indicated using authorized catheterization/specialist procedure; monitor post-obstructive diuresis, electrolytes and infection.

2. Dialysis

Haemodialysis removes solutes and water across an extracorporeal membrane; peritoneal dialysis uses the peritoneum. Check pre/post weights, vital signs and access. Protect AV fistula from BP cuffs and venepuncture; assess thrill/bruit. For peritoneal dialysis maintain aseptic technique and promptly report cloudy effluent, fever or abdominal pain. Complications include hypotension, infection, electrolyte shifts and access problems. Dialysis indications include refractory hyperkalaemia, acidosis, overload, selected toxin exposures and uraemic complications.

3. Nursing care

Review prescribed fluid/salt/potassium limits individually; teach medication reconciliation and avoid unapproved nephrotoxic medicines. Monitor skin, fatigue, nutrition, falls, access and psychosocial burden. Involve patients in modality decisions and refer for follow-up.

4. Important Examination Questions

Long Answer Questions

1. 1. Compare AKI and CKD
2. 2. explain dialysis and nursing care.

Short Answer Questions

1. 1. Differentiate nephritic and nephrotic syndrome
2. 2. describe UTI assessment
3. 3. explain urinary obstruction.

Very Short Answer Questions (with answers)

1. 1. What is eGFR? - Estimated glomerular filtration rate.
2. 2. What does cloudy PD effluent suggest? - Possible peritonitis.

5. Quick Revision

- AKI can occur despite urine production.
- CKD requires chronicity.
- Protect vascular access.

6. Conclusion

AKI can occur despite urine production. CKD requires chronicity. Protect vascular access.

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Practice questions

Choose one best answer. The answer key and explanations follow the questions.

1. Which mechanism produces nephrotic syndrome?

A. Bladder outlet narrowing alone
B. Ascending infection limited to the bladder
C. Renal hypoperfusion without heavy protein loss
D. Glomerular barrier injury causing heavy proteinuria and hypoalbuminaemia

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2. Which findings suggest an upper urinary tract infection rather than cystitis alone?

A. Flank pain and fever

B. Isolated urinary frequency without systemic features

C. Painless bilateral ankle swelling alone

D. A weak urinary stream without fever

3. Why are urine output and creatinine trends important when assessing possible AKI?

A. Creatinine rises immediately in every acute injury

B. Creatinine may lag behind acute injury

C. Urine output is unrelated to kidney function

D. Muscle mass never affects creatinine

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Answer key and explanations

1. D - Glomerular barrier injury causing heavy proteinuria and hypoalbuminaemia

Damage to the glomerular barrier allows heavy urinary protein loss and lowers serum albumin.

2. A - Flank pain and fever

Flank pain and fever suggest renal involvement such as pyelonephritis.

3. B - Creatinine may lag behind acute injury

Creatinine can lag after injury and depends on muscle mass, so trends and output add important information.

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