

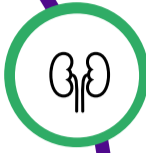


# Standard Treatment Workflow (STW) for the Management of **GLOMERULONEPHRITIS**

**ICD-10-N05.9**

## WHAT IS GN?

Glomerulonephritis refers to an inflammation of the glomerulus hence it is not strictly a single disease, its presentation depends on the specific disease entity. It may present as symptomatic urinary abnormalities/ nephrotic syndrome/ nephritic syndrome/ AKI/ CKD



### IDENTIFY THE PRESENTING CLINICAL SYNDROME

Acute nephritic syndrome: Sudden onset, hematuria, oliguria, edema, hypertension, reduced eGFR

Nephrotic syndrome: proteinuria (>3.5 g/1.73m<sup>2</sup>/d; 50 mg/kg/d in children), edema, hypoalbuminemia, hyperlipidemia

Asymptomatic urinary abnormalities: proteinuria, hematuria

RPGN: doubling of serum creatinine over days to weeks

### EVALUATION OF A PATIENT WITH GN

- Full history and clinical examination
- Urinalysis: urine routine exam, microscopy
- proteinuria quantitation: 24 h UP; ACR/PCR for follow up
- Assess eGFR using age-appropriate formula
- Renal imaging
- Serologic testing
- Kidney biopsy

### KIDNEY BIOPSY

- Age <1 y or >12 y
- Steroid resistant state
- Family history of kidney disease
- Features suggestive of systemic disease
- Diagnosis unclear, therapeutic uncertainty
- Doubling of serum creatinine over days-weeks

### SEROLOGY

- ASO
- HIV (high risk)
- ANA
- Anti-GBM antibody
- Anti-PLA2R
- HBsAg, anti-HCV
- C3
- ANCA
- SPEP (>50 y)

### IN CHILDREN <12 Y WITH NEPHROTIC SYNDROME DO NOT

- Give any vaccine while on steroids or within 3 months of stopping
- Prescribe bed rest unless indicated
- Restrict salt in children with nephrotic syndrome
- Restrict fluids
- Use ACE inhibition in children with renal dysfunction, or in steroid sensitive nephrotic syndrome

### BEFORE STARTING STEROIDS IN CHILDREN, REMEMBER TO

- Look for latent TB (Mantoux test, Chest X-ray)
- Start 6 months INH therapy (5mg/kg day) if asymptomatic Mantoux +ve
- Be on the lookout for common infections (e.g. peritonitis, pneumonia and skin infections)

### CAUTION

- Non-nephrotic proteinuria: rule out orthostatic cases
- Isolated hematuria: rule out urological causes

### LOOK FOR COMPLICATIONS

- Malnutrition
- Hypovolemia
- AKI
- Thromboembolism
- Infections

### TREATMENT



### RECOMMENDED PHARMACOLOGICAL TREATMENT

#### CHILDREN

- Prednisolone 2 mg/kg x 6 w followed by 1.5 mg/kg A/D x 6w
- In case of relapse- Prednisolone 2 mg/kg x 2w followed by 1.5 mg/kg A/D x 4w

#### ADULTS

- Treatment Depends on diagnosis (biopsy, serology)
- Therapeutic choices include
  - Corticosteroid (Prednisolone, IV methylprednisolone)
  - CNIs (cyclosporine/tacrolimus)
  - Cyclophosphamide
  - Azathioprine
  - Mycophenolate mofetil
  - Levamisole
  - Rituximab

### THROMBOSIS PROPHYLAXIS

Evaluate bleeding risk: Do not use if risk high

S alb <2 ± non-ambulatory: start aspirin, OAC if high risk

## MANAGEMENT

### PHC/CHC

- Detailed history and clinical examination
- Urine dipstick test
- Serum creatinine, electrolytes
- Stabilize
- Start antihypertensives and diuretics if needed

### INDICATIONS FOR REFERRAL

- All cases >12 years old and less than 1 year old
- In children:
  - Frequent relapses (=>3 per year)
  - Steroid dependent or resistant state
- Recent rise in serum creatinine
- Appearance of complications related to disease or treatment
- Pregnancy
- Persistent asymptomatic urinary abnormalities (>6 months)

### DISTRICT HOSPITALS

- Detailed history and clinical examination
- 24-hr urinary protein estimation
- Serum creatinine, electrolytes, serum albumin, lipid profile
- Imaging of kidneys
- Evaluate for secondary causes
- Look for and treat complications
- Start general treatment
- Can treat
  - Uncomplicated NS in 1-12 y old
  - Infrequent relapses
- Prepare treatment plan and refer back to primary care

**ADMISSION CRITERIA:** Initial evaluation, kidney biopsy, or management of complications

### TERTIARY CARE HOSPITALS

- Detailed history and clinical examination
- 24-hr urinary protein estimation
- Serum creatinine, electrolytes, serum albumin, lipid profile
- Imaging of kidneys
- Evaluate for secondary causes
- Look for and treat complications
- Start antihypertensives and diuretics
- Kidney biopsy
- Prepare treatment plan and refer back to primary care

### RED FLAG SIGNS

Cold Peripheries

Accelerated hypertension

**DO NOT USE DIURETICS**  
ALBUMIN can be given in severe Hypoalbuminemia

Seizures

Increased capillary filling time

Altered Sensorium

**KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES**