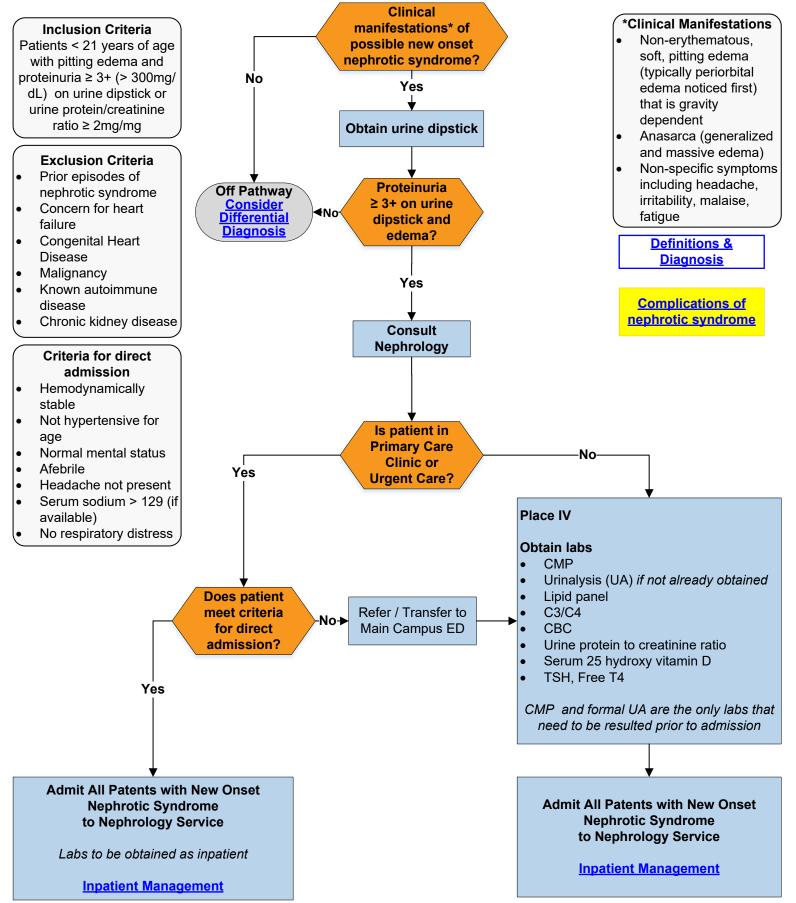


New Onset Nephrotic Syndrome

Inpatient, Outpatient, Urgent Care & Emergency Department

Center for Clinical Excellence



CPP-ED-IP-OP-UC New Onset Nephrotic Syndrome Published: 11/3/2022 Revised: 11/3/2022

Definitions & Diagnosis

- Nephrotic range proteinuria: Protein to Creatinine Ratio (PCR) ≥2mg/mg (or urine protein dip at least 3+ dipstick)
- Hypoalbuminemia: serum albumin < 3.0 g/dL
- **Nephrotic Syndrome:** Nephrotic range proteinuria and either hypoalbuminemia or edema (when albumin is not available)

Typical Urine dipstick results are expressed semi quantitatively as follows, or as stated by manufacturer:

- Negative: 0 to < 15 mg/dL
- Trace: 15 to < 30 mg/dL
- 1+: 30 to < 100 mg/dL
- 2+: 100 to < 300 mg/dL
- 3+: 300 to < 1000 mg/dL
- 4+: ≥ 1000 mg/dL

Initial Evaluation



Differential Diagnosis

Alternate causes of edema

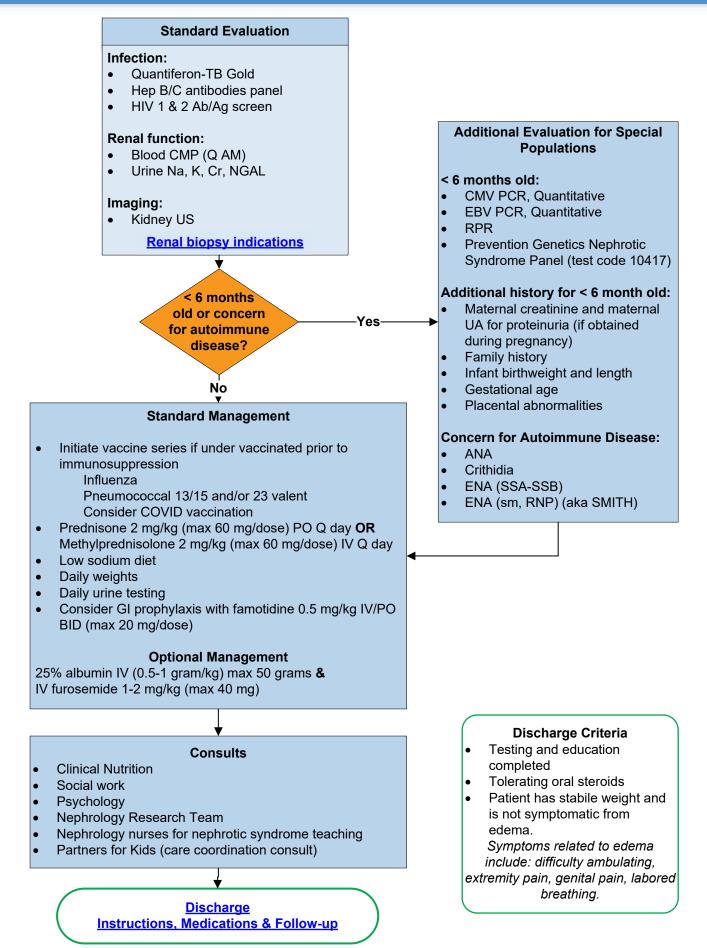
- Heart failure
- Angioedema
- Lymphatic dysfunction/obstruction
- Medications: Calcium channel blockers, Minoxidil
- Hypothyroidism

Alternate causes of hypoalbuminemia

- Liver disease
- Protein losing enteropathy
- Severe malnutrition

Increased capillary permeability

Initial Evaluation



Epic Tools

- ED/UC Order Panel/Order Set
- AMB Smart Set
- IP Order Set

Initial Evaluation



Indications for Renal Biopsy

- New onset nephrotic syndrome ≥ 12 years of age
- High index of suspicion for a different underlying pathology (macroscopic hematuria, extra-kidney symptoms, hypocomplementemia)
- AKI at onset not related to hypovolemia

Initial Evaluation	Inpatient Management

Infection

Increased risk of developing serious bacterial infection, especially with encapsulated bacteria:

Pneumonia Empyema Peritonitis Sepsis (see Sepsis Clinical Pathway) Meningitis Cellulitis

Increased risk for more severe common viral infections

Varicella may be observed in patients receiving immunosuppressive therapy

Thromboembolism

Patient with nephrotic syndrome are hypercoagulable and at risk for:

Pulmonary Embolism (see Pulmonary Embolism Clinical Pathway) Renal Vein Thrombosis Sagital Sinus Thrombosis DVT Catheter-associated thrombosis

Renal insufficiency due to hypovolemia, acute kidney injury or underlying glomerular pathology

Intravascular Depletion / Hypovolemia despite an increase in extracellular fluid volume

Hypertension

Fluid overload

Pleural effusions Pulmonary edema Anasarca

Electrolyte abnormalities

Hyponatremia Hypocalcemia (ensure to correct for level of serum albumin)

Initial Evaluation

Discharge

Medications:

- Prednisone 2 mg/kg (max 60 mg) daily x 6 weeks, then 1.5 mg/kg (max 40 mg) QOD x 6 weeks
- Famotidine 0.5 mg/kg BID (max 20 mg/dose)
- Albustix Reagent Misc Strip Dispense 1 bottle
- Dispense 3 urine cups
- Oral Lasix if needed

Nursing follow-up:

Nephrology clinic nurses to call family weekly while on daily Prednisone dosing and every 2 weeks while on alternate day treatment

Clinic follow-up:

- 1-2 weeks after hospital discharge coordinate nutrition consult with this visit
- 6-7 weeks after hospital discharge
- 12-13 weeks after hospital discharge

Family instructions:

- Continue Prednisone as prescribed until next clinic visit
- Test urine daily at home and record urine protein
- Record daily weight
- Call nephrology nurse when urine protein is negative or trace x 3 days
- Call nephrology nurse if your child develops fever (≥ 38.0 / 100.4), abdominal pain, blood in urine, trouble breathing, severe headache, worsened swelling, vision changes, or decreased urinary output (no urine output in 24 hours)

Initial Evaluation

Quality Measures

Goals:

- Decrease annual nephrotic syndrome relapse rates.
- Reduce complications of nephrotic syndrome.
- Decrease repeat hospitalizations after initial diagnosis.

Process Measures:

- Use of ED/UC Order Panel/Order Set
- Use of AMB Smart Set
- Use of IP Order Set

Outcomes Measures:

- ED/UC LOS
- IP LOS
- Minimize annual nephrotic syndrome relapse rates

Balancing Measure:

7 and 30 day readmission rates

Initial Evaluation

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Initial Evaluation

<u>Inpatient</u> <u>Management</u>

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Clinical Pathway Development

This clinical pathway was developed using the process described in the NCH Clinical Pathway Development Manual Version 6, 2022. Clinical Pathways at Nationwide Children's Hospital (NCH) are standards which provide general guidance to clinicians. Patient choice, clinician judgment, and other relevant factors in diagnosing and treating patients remain central to the selection of diagnostic tests and therapy. The ordering provider assumes all risks associates with care decisions. NCH assumes no responsibility for any adverse consequences, errors, or omissions that may arise from the use or reliance on these guidelines. NCH's clinical pathways are reviewed periodically for consistency with new evidence; however, new developments may not be represented, and NCH makes no guarantees, representations, or warranties with respect to the information provided in this clinical pathway.

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Initial Evaluation



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