In children, protein in the urine is common and usually benign. The most widely used method of screening is the urine dipstick test. Proteinuria is present when urine protein excretion >4mg/m2/hour or 100mg/m2/day.

Spot urine (ideally first morning urine sample) results indicate proteinuria when:
- >0.2mg protein/mg creatinine for patients >2 years of age
- >0.5mg protein/mg creatinine in patients 6 to 24 months of age.

**ASSESSMENT**
Perform detailed history focused on description and timing of abdominal/scrotal/leg swelling.
Perform complete physical exam focused to evaluate swelling of the abdomen, genitalia and lower extremities. Medical imaging (ultrasound) is unnecessary.

**HPE (HISTORY AND PHYSICAL EXAM) RED FLAGS**

**History of Present Illness:**
- Swelling around eyes in the morning
- Swelling in legs in the afternoon, socks leaving prints on legs
- Swollen joints
- Abdominal pain
- High blood pressure: headaches, chest pain, shortness of breath
- Changes in urine output, dysuria
- Skin lesions

**Patient History**
- Growth history
- Medication intake (NSAIDS, lithium, heavy metals, opioid use particularly heroin)

**Family History**
- Kidney disease
- Dialysis
- Kidney transplant
- Deafness
- Visual disorders

**MANAGEMENT/TREATMENT**
If dipstick shows proteinuria, obtain a first morning urine for protein and creatinine ratio.

If urine dipstick is obtained at the time of intercurrent illness and positive for protein, repeat when patient has returned to baseline.

**WHEN TO REFER**
Refer patients with any of the following to Cincinnati Children’s Nephrology:
- Protein/creatinine ratio of >0.2
- Presence of hematuria in addition to proteinuria
- Elevated blood pressure
- Presence of edema and/or rash
- Red flags as described

If you have clinical questions about a patient who with proteinuria, call 513-636-4531 or email nephrology@cchmc.org.

If you would like additional copies of this tool, or would like more information, please contact the Physician Outreach and Engagement team at Cincinnati Children’s.
Proteinuria

**Patient Presents**

**Standard Workup**

- **History of Present Illness**
- **Family History**
- **Physical Exam**
  - Assess for edema
  - Check blood pressure

**HPE (HISTORY AND PHYSICAL EXAM) RED FLAGS**

**History of Present Illness**
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**Evaluation of Persistent Proteinuria in Children/Adolescents**

- ≥ 1+
  - Abnormal urine dipstick protein in an afebrile child
- Trace
  - Repeat dipstick on first morning void in one year
- ≤0.2 mg protein per mg creatinine and normal U/A

**Method** | **Indications** | **Normal Range** | **Comments**
--- | --- | --- | ---
Dipstick testing | Routine screening for proteinuria performed in the office | Negative or a trace in a concentrated urine specimen (specific gravity >1.020) or very concentrated (specific gravity >1.025) | False positive can occur if urine is very alkaline (pH >8.0)
24-hour urine for proteinuria and creatinine excretion | Quantitation of proteinuria as well as creatinine clearances | <100 mg/m2/24 h | More accurate than spot urine analysis
Spot urine for protein/creatinine ratio, preferably on first morning urine | Semi-quantitative assessment of proteinuria | <0.2 mg protein/mg creatinine in children >2 years old <0.5 mg protein/mg creatinine in children age 6–24 months | Simplest method to detect proteinuria. Less accurate than 24-hour test
Micro-albuminuria | Assess risk of progressive glomerulopathy | <30 mg urine albumin/g creatinine on first morning urine | Therapy should be intensified in diabetics with MA in DM

Consult with a pediatric nephrologist who will consider a kidney biopsy and define appropriate therapy based on the findings

For urgent issues, or to speak with the specialist on call 24/7, call the Physician Priority Link® at 1-888-987-7997.