

A 3-year-old boy is brought to the physician with a 1-week history of generalized edema that is gradually worsening. He has not been ill recently and his past medical history is unremarkable. He is not taking any medications and his vaccinations are up to date. His temperature is 36.7 C (98 F), blood pressure is 110/80 mm Hg, pulse is 85/min, and respirations are 18/min. On examination, he has periorbital edema and 1+ pretibial pitting. The remainder of the physical examination is normal. Laboratory findings are as follows:

Sodium	140 mEq/L
Potassium	3.7 mEq/L
Creatinine	0.8 mg/dL
Total protein	5.5 g/dL
Albumin	2.1 g/dL
Aspartate aminotransferase	17 U/L
Alanine aminotransferase	24 U/L
Total bilirubin	0.9 mg/dLM
Direct bilirubin	0.3 mg/dL

Urinalysis shows 4+ proteinuria and no red blood cells. What is the best next step in the management of this patient?

- ☐ A. Echocardiography
- ☐ B. Intravenous albumin
- ☐ C. Liver ultrasound
- ☐ D. Prednisone
- ☐ E. Renal biopsy
- ☐ F. Renal scintigraphy

Submit

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- ☐ A. Echocardiography [1%]
- ☐ B. Intravenous albumin [4%]
- ☐ C. Liver ultrasound [1%]
- ☒ D. Prednisone [75%]
- ☐ E. Renal biopsy [16%]
- ☐ F. Renal scintigraphy [3%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Minimal change disease	
Epidemiology	<ul style="list-style-type: none"> • Most common cause of nephrotic syndrome in children • Median age 2–3; 85% of cases occur before 10 years of age
Pathogenesis	<ul style="list-style-type: none"> • T-cell mediated injury to podocytes causes increased molecular permeability to albumin • Majority of cases are idiopathic
Clinical features	<ul style="list-style-type: none"> • Edema • Fatigue • No hematuria
Diagnosis	<ul style="list-style-type: none"> • Proteinuria • Hypoalbuminemia • Renal biopsy without microscopic changes
Treatment	Corticosteroids

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Minimal change disease (MCD) is the **most common cause** of nephrotic syndrome in children age <10 (accounting for approximately 80% cases). In general, affected children have significant **edema** and **proteinuria**. The edema may be periorbital in the morning but becomes more pronounced in the legs and genitals later in the day. Confirmation of nephrotic-range proteinuria is generally accomplished with a 24-hour urine collection, although a random level can be used in the appropriate clinical situation, such as in this case.

MCD is a highly steroid-sensitive condition, and the diagnosis of MCD is based on age, clinical presentation, and response to steroids. Empiric **steroid therapy** should be initiated upon suspicion of the diagnosis. Approximately 85% of children will respond to their first steroid course.

(Choice A) Echocardiography would be the test of choice to evaluate for the presence

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(Choice A) Echocardiography would be the test of choice to evaluate for the presence of heart failure, which can present with signs of volume overload and fatigue. However, this boy has no tachycardia, abnormal heart sounds (eg, gallop), or congestive hepatomegaly to suggest heart failure.

(Choice B) Hypoalbuminemia is common in children with nephrotic syndrome (as seen in this patient). However, the inherent problem is increased glomerular permeability to albumin; infusing additional albumin will not correct it and may contribute to volume overload instead.

(Choice C) Liver ultrasound would be warranted if hepatic failure was suspected to be the cause of this child's hypoalbuminemia. However, the normal liver function tests and bilirubin make hepatic dysfunction unlikely.

(Choice E) Renal biopsy is indicated in children age >10 with nephrotic syndrome, or in any child with nephritic syndrome or minimal change disease that is unresponsive to steroids. Biopsy is invasive and unlikely to change management when MCD is the most likely diagnosis.

(Choice F) Renal scintigraphy is used to evaluate renal function and is useful in the setting of kidney dysfunction. However, this patient has normal creatinine and urine output, suggesting no renal insufficiency. Scintigraphy would not be beneficial.

Educational objective:

Minimal change disease is the most common cause of nephrotic syndrome in young children. Renal biopsy is not required for initial diagnosis as the condition is highly responsive to steroids.

References:

1. [Minimal change nephrotic syndrome in children: new aspects on pathogenesis and treatment](#)
2. [The nephrotic syndrome](#)