Direct Bilirubin Higher Than Total Bilirubin?
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CASE DESCRIPTION
A 77-year-old man with multiple myeloma and recent cholecystostomy tube placement presented to the emergency department with pneumonia. His cholecystostomy tube was noted to be clamped shut. Total and direct serum bilirubin measurements were 0.2 and 1.66 mg/dL, respectively. Dilutions of the specimen were made, and the results are listed in Table 1.

QUESTIONS
1. How does the analysis of direct bilirubin differ from that of total bilirubin?
2. Can direct bilirubin ever be greater than total bilirubin?
3. What are the possible explanations for the results?

The answers are below.

ANSWERS
Both total and direct bilirubin measure the formation of azobilirubin, which is detected at 570/660 nm. The total bilirubin reaction contains surfactant and caffeine, which solubilize “indirect” bilirubin and accelerate the reaction (1). Direct bilirubin is a component of total bilirubin and therefore should always be smaller in value. The presence of a monoclonal immunoglobulin (2220 mg/dL) falsely increased the direct, but not the total, bilirubin measurement. Hemolysis and lipemia can also interfere at high concentrations (2).

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REFERENCES