A Case of Solid Blood
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CASE DESCRIPTION
A 53-year-old man with a noncontributory medical history presented to the hospital with blurry vision, intermit-
tently blue fingers, and slowly progressive dyspnea. Blood test results showed the following: hematocrit, 16% (reference interval, 40%–51%); white blood cells, $15.5 \times 10^3/\mu$L (reference interval, $4.2 \times 10^3/\mu$L to $9.1 \times 10^3/\mu$L); platelet count, $50 \times 10^3/\mu$L (reference interval, $150 \times 10^3/\mu$L to $330 \times 10^3/\mu$L). The phlebotomists had a difficult time drawing the patient’s blood because it would immediately solidify in the tubes (Figure 1).

QUESTIONS
1. What conditions could have caused blood to solidify in the tubes?
2. What test can help determine the patient’s medical condition?
3. What steps could be taken to measure chemistry values in this sample?

The answers are on the next page.
Blood can form a gel when there are high concentrations of proteins, such as IgM and/or IgG antibodies, that precipitate at low temperatures (cryoglobulins) or agglutinate red blood cells (cold agglutinins) (1, 2). A bone marrow biopsy performed on this patient revealed Waldenström macroglobulinemia, which produces large amounts of IgM (3, 4). Warming this patient’s sample in a water bath, keeping it on heat packs during transport, and diluting it with warm diluent can reliquefy the sample.

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References


Economic Rewards for Blood Donation: Validity of the Donor Questionnaire as Litmus Test

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In a recent issue of Science, Lacetera, Macis, and Solnim summarize new information regarding the impact that economic rewards have on the blood supply and safety (1). For many years, the WHO has taken the stance that economic incentives decrease the safety of the blood supply. In support of the WHO position, the establishment of an all-volunteer blood supply led to a dramatic decrease in the incidence of posttransfusion hepatitis C. The authors submit, however, that the position of the WHO is based on studies that failed to control for several confounding variables (percentage of first-time donors, location of donation, and use of prisoners). Recent randomized field surveys reviewed by the authors found that economic incentives increase donations. Furthermore, they identified a direct relationship between the dollar value of the incentive and blood donation. It is important to maintain the distinction between a token of appreciation (allowed by WHO) and something with transferable cash value (not allowed by WHO). Donor centers, who are responsible for maintaining an adequate blood supply, must negotiate this fine line. For some time, reward programs have been known to increase the number of donations, yet “too much” of a reward (something with transferable cash value) may give a donor a reason to lie on the donor questionnaire. It is critical to appreciate that the donor questionnaire provides a substantial layer of safety to the blood supply. If answered honestly, the donor questionnaire protects the blood supply from window-period infections (after inoculation, but before testing results are positive), infections that do not have testing available, and emerging infections. Lying about recent intravenous drug use may not be worth a T-shirt with the donor center logo, but $20 in cash or a gift card might be. The most valuable reward discussed by the authors is a day of paid vacation. Although a day of paid vacation is highly valuable, donors cannot sell this day to another individual; furthermore, the donors receive this day of paid vacation even if they...