the Clinical Chemist

What Is Your Guess?

The Case of the Blue-Green Urine

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CASE DESCRIPTION

A random urine sample was received for routine urinalysis from a 62-year-old patient who had undergone multiple surgeries 9 months earlier to treat metastatic bladder cancer. The patient was at that time prescribed amlodipine, fosinopril, omeprazole, pravastatin, Prosed[™] DS (Ferring Pharmaceuticals), and VESIcare (Astellas Pharma).



QUESTIONS

- 1. What is responsible for the unique color of this urine sample (Fig. 1)?
- 2. Will the color interfere with urinalysis?
- 3. Could the cause of the color affect other laboratory tests ordered for this patient?

The answers are on the next page.

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Answers

The blue-green discoloration was caused by treatment with Prosed DS, an oral analgesic, antiseptic, and antispasmodic medication that contains a variety of compounds, including methylene blue (1). Urinary excretion of methylene blue peaks approximately 2-6 h after oral administration and may remain detectable after 24 h (2). Blue-green urine can also be caused by amitriptyline, carmine dye, triamterene, and methocarbamol (3). Extreme discoloration may interfere with the interpretation of yellow colorimetric chemical-reagent strips for tests such as glucose and total protein by masking or falsely enhancing positive color changes (3). Additionally, methylene blue may falsely increase blood methemoglobin measurements made by cooximetry calculated with only 8 wavelengths (4) and may cause turbidity interferences at concentrations >6 mg/L with machines that capture broader spectrums (e.g., Radiometer ABL800, unpublished data).

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News & Views

Helen Free Receives National Honor

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Dr. Helen Free, a past president of the AACC (1990), was recently awarded the nation's highest honor for inventors and engineers. In November 2010, she received the National Medal of Technology and Innovation (NMTI) from President Obama at a White House ceremony.

Free, along with her late husband Alfred Free, developed the first dip-and-read diagnostic test to monitor glucose concentrations in urine. Marketed as Clinistix by their employer, Miles Laboratories, the test enabled diabetics to conduct convenient at-home testing and ushered in a new era for self-monitoring of blood sugar concentrations.

As a student at the College of Wooster in Ohio, Free was encouraged to enter the field of chemistry after the Pearl Harbor attacks prompted many male students to join the military. Al Free hired her at Miles upon her graduation, and she married him 2 years later. Early in her career, she worked on tests that used tablets to detect abnormal amounts of substances, such as bilirubin, ketones, and protein, in urine.

Together, they worked as a research team for more than 50 years at Miles, now known as Bayer Healthcare. In addition to Clinistix, other products Free and her husband developed included Ketostix, Uristix, and Multistix. Their 1975 book, *Urinalysis in Laboratory Practice*, is still a notable work in the field.

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