

reading of 55 percent. These values should translate to approximately 9.5 g per deciliter of deoxygenated hemoglobin, consistent with a very cyanotic patient, and not compatible with the statement, "A cursory physical examination showed no abnormalities."

Has modern technology eliminated our ability to detect clinical cyanosis?

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THE AUTHORS REPLY: We agree with Dr. Lam that a patient with an arterial oxygen saturation of 55 percent should have profound central cyanosis. Records from the initial assessment of the patient we described do not mention a skin examination, nor is there mention of perioral cyanosis. These omissions could reflect poor documentation, an unobservant clinician, or the fact that pulse oximetry and administration of supplemental oxygen often occur before the physician enters the room.

Lundsgaard and Van Slyke originally reported that cyanosis becomes evident when reduced hemoglobin levels are greater than 5 g per deciliter of capillary blood,¹ a value roughly equivalent to 3 g of deoxyhemoglobin per deciliter of arterial blood.² The latter value has been verified by other investigators and has high interrater reliability.³ Thus, the physical examination may be even more sensitive than Dr. Lam suggests.

Dr. Lam's comments underscore the continued importance of the physical examination.

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Translational and Clinical Science

TO THE EDITOR: I applaud Zerhouni's call (Oct. 13 issue)¹ for a new vision of translational research with the Clinical and Translational Science Awards. However, a key impediment to translational research remains unaddressed — namely, the limited incentives for basic scientists to collaborate with clinical investigators. Translational clinical research requires collaborations between clinician investigators with the requisite skills to design longitudinal studies and deal with regulatory and human-protection complexities and a range of scientists, such as molecular geneticists, electrophysiologists, and biomedical engineers. Unfortunately, the academic promotion process rewards individual accomplishments, particularly first or senior authorship and the principal investigator position. Generally, the academic career of a biomedical research scientist who spends considerable time collaborating with a team is short-lived. The approach in academia tacitly discourages the collaboration and team building needed for translational clinical research. Ideally, the

Clinical and Translational Science Awards program will encourage academic institutions to rethink their tenure process and modify their incentives to encourage multidisciplinary translational research. Basic scientists are a crucial part of the translational research process, and encouraging their collaboration must be a part of the new vision for the future.

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1. Zerhouni EA. Translational and clinical science — time for a new vision. *N Engl J Med* 2005;353:1621-3.

DR. ZERHOUNI REPLIES: Dr. Fox is correct in describing the current academic promotion process as one that rewards principal investigators, thereby providing no incentives for basic scientists to collaborate with clinical investigators. The National Institutes of Health (NIH) has recognized this issue and is providing a number of incentives to address it. For example, the NIH is developing a

new grant policy that formally recognizes more than one investigator as principal on an extramural award. We believe that this will encourage the academic promotion process to reward meaningful collaborations. Our new initiative, the institutional Clinical and Translational Science Awards, specifically calls for greater interactions among basic, clinical, and translational scientists. In addition, as part of the Roadmap effort to develop research teams of the future, the NIH is funding 21 investigator-initiated Exploratory Centers for Interdisciplinary Research. These three-year planning grants will begin interdisciplinary

research programs that address complex health problems ranging from antimicrobial resistance to new directions in stroke rehabilitation. They will prepare investigators for submitting a subsequent application to become part of an Interdisciplinary Research Consortium.

Through these and other mechanisms, the NIH is fostering the critical exchanges between basic and applied disciplines that are increasingly important to progress in the life sciences.

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Cullen's and Turner's Signs

TO THE EDITOR: Cullen's and Turner's signs have long been known to be associated with retroperitoneal bleeding, as illustrated in the images presented by Mookadam and Cikes (Sept. 29 issue).¹ However, the mechanisms underlying the appearance of these signs have only recently been clarified with a better understanding of the embryonic development of the various layers of the retroperitoneum.^{2,3} Cullen's sign arises from the spread of retroperitoneal blood into the falciform ligament and subsequently to subcutaneous umbilical tissues through the connective tissue covering of the round ligament. In contrast, Turner's sign is produced by hemorrhagic fluid spreading from the posterior pararenal space to the lateral edge of the quadratus lumborum muscle and thereafter to the subcutaneous tissues by means of a defect in the fascia of the flank.

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TO THE EDITOR: The patient presented by Mookadam and Cikes demonstrates clear Cullen's and Turner's signs. Additionally, however, the upper lateral aspect of the patient's thighs shows an ecchymosis having a sharply demarcated superior border paralleling but inferior to the inguinal

ligament. This is Fox's sign of retroperitoneal hemorrhage.^{1,2} Fox hypothesized that free blood can track extraperitoneally along the fascia of the psoas and iliac muscles, becoming subcutaneous in the upper thigh. He further hypothesized that the sharp superior border resulted from blockage of further blood movement at the junction of Scarpa's fascia with the fascia lata.¹ The blue scrotum sign of Bryant³ is a fourth eponymous sign of retroperitoneal hemorrhage.

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THE AUTHORS REPLY: Our reason for submitting these images was the rarity of having a patient with all three signs. We agree with Dr. Farzaneh-Far regarding the mechanisms underlying the appearance of Cullen's and Turner's signs, which we were unable to elaborate on because of space limitations. Recently, the anatomical pathways of the extravasated pancreatic enzymes leading to these ecchymoses, as well as the effects of the enzymes on the ecchymoses, were demonstrated by multiplanar reformation images obtained by helical computed tomography in a patient with severe acute pancreatitis.¹

We would like to thank Dr. Sotos for pointing