which was 25% of that used in this author’s application of the column method of Mauzerall and Granick (3), but this could be readily overcome by testing such urine samples at higher dilution.

The procedure removed ~70% of the PBG compared with the column method. A further elution under the same conditions yielded another 15–20%, consistent with retention in the dead volume (0.50–0.55 mL) of the resin-containing sack. Although the total color yield was less than that of column methods after a single elution step with 2 mL of 0.2 mol/L acetic acid, this was offset by the simplicity and increased speed of the procedure.

Columns are generally eluted with at least 3 column volumes, but only 2 mL of eluate is used in the Ehrlich reaction. The reaction concentration with the present method is therefore likely to be greater, with a corresponding increase in sensitivity.

In summary, a simple modification of the method of Mauzerall and Granick (3) extends its application as a sensitive and specific screening test for urinary PBG.

References

Preanalytical Factors in the Measurement of Intact Parathyroid Hormone with the DPC IMMULITE Assay, Paul Glendenning,* Alexander A. Musk, Mario Taranto, and Samuel D. Vasikaran (Department of Core Clinical Pathology & Biochemistry, Royal Perth Hospital, Perth 6000, Western Australia; * author for correspondence: fax 618-9224-2491, e-mail paul.glendenning@health.wa.gov.au)

Intact parathyroid hormone (iPTH) is commonly measured with two-site immunometric assays. The DPC IMMULITE 2000 assay (Diagnostics Products Corporation) measures iPTH by a chemiluminescence reaction with a monoclonal murine capture antibody and a polyclonal caprine signal antibody conjugated to alkaline phosphatase. Accurate and precise iPTH measurements are needed for the correct triage of individuals with hyper- or hypocalcemia and for the evaluation of PTH function in bone and mineral disorders (1, 2). In end-stage renal failure, iPTH measurements are commonly used to determine medical management (administration of vitamin D) and surgical therapeutic options (subtotal parathyroidectomy for extreme hyperparathyroidism) (3, 4). Collection of whole blood into EDTA-containing sample tubes offers increased iPTH stability at room temperature (5) compared to serum samples (6) and is recom-

Minimizing Error in the Determination of $P_{50}^*$
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The measurement of $P_{50}$ in whole blood, defined as the oxygen tension corresponding to 50% oxygen saturation, gives a quantitative measure of hemoglobin oxygen affinity. The determination of $P_{50}$ is useful for screening for hemoglobin variants in cases of unexplained anemia or erythrocytosis, both because it is easily performed and because many hemoglobin variants with abnormal oxygen affinity are “silent”, i.e., not detectable with conventional electrophoretic techniques (1).

The determination of $P_{50}$ previously required obtaining several points on the oxyhemoglobin dissociation curve. The procedure was seldom performed because of the labor and specialized apparatus required. However, it was suggested >25 years ago that $P_{50}$ could be accurately calculated from single measurements of oxygen tension ($P_{O_2}$) and the corresponding oxygen saturation ($S_{O_2}$) (2). Since then, an improved mathematical model of the oxyhemoglobin dissociation curve (3) has been incorporated into a guideline for the so-called “single-point” determination of $P_{50}$ (4) that has been tested (5, 6) and subsequently approved by the IFCC. The single-point approach is based on the fact that a plot of log $P_{O_2}$ vs log[$S_{O_2}/(1 – S_{O_2})$], the so-called Hill plot, is linear over a fairly wide interval. Therefore, if one knows both the slope and one point on the line, any other point on the line can be determined.

There have been different recommendations for the interval within which the single-point method is valid. Some studies have suggested that it can be used for oxygen saturations as low as 20% (5). The original IFCC guideline (4) specified saturations in the interval between 40% and 80%, and a subsequent IFCC document on definitions of quantities used in blood pH and gas analysis (7) extended the upper limit to 90% saturation. To facilitate the calculation, many blood gas analyzers incorporate an algorithm for $P_{50}$ into the internal microprocessor, so that $P_{50}$ can be printed automatically if the measured saturation is within an interval preset by the manufacturer. These intervals are chosen to correspond to the region of the Hill plot deemed to be close enough to a straight line that $P_{50}$ can be accurately estimated. However, a more rigorous error analysis has not been per-

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References