history of BPH in a patient eventually presenting with a carcinoma of the prostate. These data can be compared with those obtained in a larger population screen of sPAP (3) with use of a radioimmunoassay of 6320 men 45 to 80 years old; 444 (7%) had increased values. On recall, 275 were BPH, including three found to have a stage A prostate cancer, and 59 of 67 who had prostate biopsies for possible carcinoma were confirmed to have cancer.

In summary, in the present study only 16 patients out of 315 had sPAP values that warranted further investigation; one was shown eventually to have prostatic cancer, in three there was confirmation of BPH on repeat biopsy, and in 12 there is, to date, no accountable reason for this increased sPAP. We do not consider it cost-effective to use sPAP assays in the long-term follow-up of asymptomatic patients after transurethral resection for benign prostatic hyperplasia.

References

E. H. Cooper
N. B. Pidcock

Unit for Cancer Research
University of Leeds
Leeds LS2 9NL
Yorkshire, U.K.

R. Glashan
P. H. Smith
M. R. G. Robinson
B. Richards
D. Newling

Yorkshire Urological Cancer Research Group

Cyanide is Not Needed in the o-Cresolphthalein Complexone Determination of Serum Calcium

To the Editor:

The o-cresolphthalein complexone reaction is a popular method for determining serum calcium by continuous-flow analysis (1). When this method was first adapted to the AutoAnalyzer, potassium cyanide was included in the diethylenetriamine pentaacetic acid as a “stabilizing agent” (2). Potassium cyanide has been specified in the base reagent through most later modifications, and its role was even expanded to include removal of interference by heavy metal ions (3), although no data were presented to support this. In 1975, Clark et al. (4) showed that CN− is not necessary for the removal of heavy-metal interference or stabilization of the base in their direct, manual adaptation of this reaction. In 1978, Basson and Van Staden (5) stated that CN− is not necessary as a stabilizer if 2-amino-2-methyl-1-propanol is used as the base. However, in a recent review of calcium methods, Robertson and Marshall (6) still specify potassium cyanide in the base reagent.

We investigated the possible interference of heavy metals by separately adding mercury, lead, copper, and zinc ions to pooled-serum samples in the same molar concentration as calcium, then measuring calcium in an AutoAnalyzer II by the method of Moorehead and Biggs (7), with and without cyanide ion in the base reagent. As shown in the following tabulation, the added metal ions did not affect the values for calcium significantly, even though they were present in concentrations several times those reported in fatal overdoses (8).

<table>
<thead>
<tr>
<th>Metal</th>
<th>Conc., mg/L</th>
<th>Without cyanide</th>
<th>With cyanide</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>—</td>
<td>85.4</td>
<td>83.8</td>
</tr>
<tr>
<td>Cu</td>
<td>160</td>
<td>85.3</td>
<td>91.9</td>
</tr>
<tr>
<td>Zn</td>
<td>170</td>
<td>85.4</td>
<td>84.6</td>
</tr>
<tr>
<td>Hg</td>
<td>490</td>
<td>86.0</td>
<td>84.0</td>
</tr>
<tr>
<td>Pb</td>
<td>480</td>
<td>81.8</td>
<td>81.8</td>
</tr>
</tbody>
</table>

Lead had the largest effect, but the value for calcium was still 96% of that with no added lead. At a more reasonable lead concentration (160 mg/L), the response was 100% of that before the addition, and even this lead concentration is about 100-fold that reported in fatal overdoses (8). In fact, the concentrations of heavy metals in serum are usually much lower than that of calcium and would present no significant interference even if they reacted completely with the complexone system.

We next measured calcium in 163 patients’ serum samples (range: 50 to 130 mg/L), with and without cyanide in the base reagent. The correlation between the two sets of results was satisfactory, linear regression analysis producing the following values: slope = 0.992, intercept = 0.14 mg/L, and correlation coefficient (r) = 0.992. These 163 values were obtained during three months, with the same batch of reagents, which were stored at room temperature. Evidently, cyanide ion is not necessary to stabilize this base reagent.

We conclude that cyanide ion is not needed in reagent mixture used in determining calcium by the o-cresolphthalein procedure. It should be eliminated, for obvious environmental reasons.

References