A filter-paper disk coated with goat anti-CEA is placed into each well. The same procedure is repeated with prediluted standards and a control sample included in the kit. The plate is agitated at room temperature for 4 to 6 h and the fluid is aspirated. After the paper disk is washed with physiological saline, 100 μl of labeled anti-CEA is added to all wells and the plate is agitated for at least 16 h at room temperature. After being washed with saline, the disks are transferred to properly labeled test tubes and the radioactivity is counted.

Using this system, we obtained an intra-assay standard deviation of 0.36 μg/liter, a mean serum CEA value of 3.85 μg/liter (n = 10), and a CV of 9.3%. Inter-assay determinations performed with the control sample included in the kit (CEA, 4 to 6 μg/liter) gave a mean of 4.45 μg/liter, with a deviation of 0.38 μg/liter, which corresponds to a coefficient of variation of n = 6.

Because clinicians were already used to CEA values obtained by the Roche CEA assay, we measured CEA in sera of 94 patients by both assays. Because the Roche assay gives a plateau for values exceeding 20 μg/liter (the evaluated assay gave a near-linear relationship for values varying from 0 to 100 μg/liter), patients’ sera with values greater than 20 μg/liter were excluded. The means were 4.24 (Roche) and 5.97 (Abbott) μg/liter. The correlation coefficient was 0.70 and P < 0.001. When 17 sera were measured with the CEA-Abbott method in two different laboratories, a correlation of 0.98 (P < 0.001) was obtained between the two sets of CEA values. (Abbott RIA values were multiplied by 2, to correct for dilution.)

In general, we find the values obtained with either assay to be comparable, but for values exceeding 15 μg/liter the Abbott CEA assay gives a higher value than that obtained with the Roche CEA assay because the latter gives a nearly flat curve in this region. The new test requires about 3 h of technician time as compared to 5 h with the Roche assay, but the total time required for the assay is the same because of the longer incubation required in the solid-phase assay. In addition, the Abbott CEA test offers the advantage of eliminating dilution and errors due to fluctuation in pH and ionic strength, which are the main drawbacks of the Roche CEA assay.

References

More on Serum Enzymes in Cancer Patients

To the Editor:
In a recent issue of Clinical Chemistry [25, 2034 (1977)] a study appeared on activities of 5-nucleotidase (5-NT), γ-glutamyltransferase (GGT), alkaline phosphatase (AP), and glutamate dehydrogenase (GLDH) in sera of cancer patients. This paper quotes our earlier work on this subject (1) but later papers (2, 3) dealing with these and other enzymes in cancer patients are not discussed. Obviously, the reason is that our work, well known in Europe, was published in a journal not generally found in American hospital libraries. We think it would be useful to summarize the results of our work for your readers. A review may help to preclude work already published being duplicated without comparison of the earlier results. A well-documented description of patients and materials will be found in the references listed below.

We were first to report a method for measuring serum 5-NT in which adenosine deaminase is used to generate NH₃ from adenosine during incubation. The NH₃ is measured by the indophenol re- action of Berthelot (4), which terminates the incubation without deproteinization.

In a following paper (5) the addition of phenyl phosphate as a successful inhibitor of the apparent nucleotidase effect of bone phosphatase was described, and later several conditions affecting the assay using adenosine deaminase were amply discussed. In 1969 we undertook comparative studies on AP—with special reference to bone phosphatase—5-NT, alanine aminotransferase, and aspartate aminotransferase (2) in the follow-up of cancer patients during various kinds of therapy. The study was continued until 1974, including GGT in another series of patients, making a total of more than 1000 subjects involved.

An important point in such studies is that serum enzymes in cancer patients...