nina, 0.1 mol/L for the untreated alunina to minimize the elution of compounds interfering with HPLC detection. After 15 min the acid was trained into clean tubes for the HPLC assay, and 100 μL of each extract was injected onto a C18 Resolve 150 × 4 mm column (Waters Associates, Milford, MA). The samples were eluted with a mobile phase of 50 mmol of sodium dihydrogen phosphate, 20 mmol of sodium citrate, 2 mmol of sodium heptanesulphonate, 2 mmol of ethylamethylene ammonium hydroxide, 0.04 mmol of EDTA, and 70 mL of nethanol per liter (pH 4.0) at a flow rate of 1 mL/min. Retention times were confirmed by electrochemical detection with a glassy carbon electrode set 0.65 V vs a Ag/AgCl electrode. We collected fractions of the column eluate every 20 s for measurement of radioactivity by scintillation spectrometry.

Figure 1 shows the radiochromatograms from plasma extracts taken 45 and 50 min after the start of a [3H]norepinephrine infusion. In both assays a peak of radioactivity eluting with a retention time similar to that of HPG is seen in the untreated alunina extracts, but is absent in the carbonate-washed extracts. The relatively low concentrations of tritium in the untreated extract are related to the need for elution with low perchloric acid concentrations to minimize chromatographic interferences. Analytical recovery of [3H]norepinephrine from carbonate-treated alunina ranged from 50% to 70%. We conclude that the addition of the simple step of carbonate washing to the assay not only yields an extract suitable for measuring catecholamines by HPLC, but also removes extract contaminants of norepinephrine. We therefore recommend that this procedure be a routine part of any such assay to minimize the effect of unsuspected radioactive impurities.

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References

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Positive Interferences with the Ektachem Total CO2 Assay from Therapy with Topical Cerous Nitrate

To the Editor:

A recent discrepancy in a patient’s CO2 values concerned a calculated mixed venous CO2 content of 25 mmol/L, based on pH and blood gas measurements, and a total venous CO2 content of 48 mmol/L from the Kodak Ektachem 700™ analyzer (Eastman Kodak, Rochester, NY) by ion-selective electrode for samples obtained at the same time. The anion gap from values determined by the Ektachem analyzer was −13 mmol/L. Re-assay of the sample that produced a value of 48 mmol/L (Ektachem) with an Olympus AU5000™ analyzer (Olympus Corporation, Lake Success, NY) by enzymatic method (I) gave a total CO2 of 26 mmol/L. Subsequent samples from this patient over the next 21 days consistently gave CO2 values that were 10–20 mmol/L higher on the Ektachem 700 analyzer than were the values obtained with the Olympus AU5000 analyzer or the blood gas instruments.

The patient, a 54-year-old white man, had presented to the hospital with severe fever and whole body rash after taking trimethoprim and sulfamethoxazole for a urinary tract infection. This rapidly progressed to toxic epidermal necrolysis syndrome over 90–95% of his body surface area. The patient was treated with ceros nitrate-saturated (17.5 g/L) dressings twice a day for 21 days. The discrepancies in total CO2 results were first noticed 48 h after initiation of this therapy.

The manufacturer’s (Eastman Kodak) literature states that silver nitrate can produce a positive interference of 0.5 mmol/L for total CO2 for every 1 mmol/L of silver nitrate and refers to an abstract describing a patient with discrepant CO2 values similar to those for the patient we describe (2). However, the interference was not quantitatively defined and the ion responsible for the interference was not described. Therefore, we performed an in vitro study by adding Ce(NO3)3, CeCl3, NaNO2, or NaNO3 to a serum pool to final concentrations of 0.4 to 10.0 mmol/L and assaying with the Ektachem and AU5000 analyzers. CeCl3 produced no effect on CO2 values from either instrument at any concentration tested. However, we observed a direct relationship between the concentration of NO3− or NO2− ions (y) and the magnitude of the falsely increased CO2 values (y) obtained with the Ektachem analyzer (Figure 1). For three separate experiments these relationships are described by y = 5.02x − 4.03 (r = 0.98) for NO3− and y = 1.55x − 1.60 (r = 0.98) for NO2−. Indeed, using these

![Graph 1](image.png)

Fig. 1. Differences in total CO2 values (y-axis; Ektachem value minus AU5000 value) obtained from a serum pool containing various concentrations of Ce(NO3)3 (□), NaNO3 (○), or NaNO2 (△) for three separate experiments

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relationships, we could estimate that our patient had serum NO$_3^-$ concentrations of 3–6 mmol/L.

This finding confirms the potential magnitude of this interference for burn patients undergoing topical NO$_3^-$ therapy and defines nitrate and (or) nitrite as the ion responsible for the interference. Furthermore, we found the extent of the interference to be eight- to 10-fold greater than described in the manufacturer’s literature. When we examined three other patients, whose burns affected only 8–25% of their body surface area, we found 20% positive interferences for total CO$_2$ values determined with the Ektachem analyzer. We therefore recommend that users of this analyzer inform their burn units of the potential risk for significant CO$_2$ interferences, and that they use an alternative method for CO$_2$ measurements of patients treated with topical silver or cerous nitrate.

References

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A spokesman for Eastman Kodak comments:

To the Editor:

Daoud et al. recently alerted us to the increased interference they observed with our CO$_2$ method due to nitrate therapy for burn patients. We appreciate that they let us know promptly of their findings through our Customer Support Center. We have since confirmed the magnitude of interference they reported and are revising our product labeling accordingly. Our current labeling was based on the earlier report of Gross et al. (1).

We are also investigating ways to improve the specificity of the Kodak Ektachem clinical chemistry slides for CO$_2$. The enzymatic approach reported by Nealon et al. (2) will completely eliminate the interference.

References

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False-Positive Pregnancy Test

To the Editor:

In our laboratory we use two different pregnancy tests. One, a slide method (Neo-Planotest, Duolcim; Organon Teknika Corp., Durham, NC), is used routinely on urine samples, with a detection limit for choriongonadotropin (hCG) of 500 int. units/L. The second, an enzyme immunoassay (Icon II; Hybritech Inc., San Diego, CA), can be used on urine or serum, with a detection limit of 20 int. units/L in urine samples, this test is usually used in cases of suspected ectopic pregnancy. We have also been evaluating another enzyme immunoassay (CARDS; Pacific Biotech Inc., San Diego, CA), which can be used on urine or serum, with a detection limit of 25 int. units/L (All values refer to the WHO First IRP standard.)

A presurgical, morning urine sample from a patient scheduled for a hysterec- tomy gave a positive pregnancy result (hCG >500 int. units/L) with the slide test, but this was questioned. A second urine sample obtained 1 h later was negative by the slide test, as was a third sample.

Because the specimens were moderately turbid, we centrifuged the first at 900 × g, but we were still given a positive result. After centrifugation at 9500 × g, the supernate of the first specimen then gave a negative slide-test result, as did a filtrate of the turbid urine.

The original turbid urine gave a negative result with the Hybritech test, although the appearance of an almost imperceptible color at the negative control spot indicated a potential problem; this was probably caused by the turbid material, because a clear urine sample is supposed to be used with this test. The sample gave a neg-