Rapid Simultaneous Gas–Liquid Chromatographic Determination of Five Local Anesthetic Drugs in Serum, Marin Prat and Bernard Bruguierolle (Laboratoire de Pharmacologie Médicale et Clinique CHU Timone, 27 Bd J. Moulin, F 13385 Marseille Cedex 5, France; direct correspondence to B.B.)


We needed a simple, rapid gas–liquid chromatographic method involving flame-ionization detection for simultaneous assay of prilocaine, etidocaine, lidocaine, mepivacaine, and bupivacaine. Thus we developed the following alternative method for determining these five local anesthetics in serum.

We used a Hewlett Packard chromatograph fitted with a 1.8 m × 2.0 mm (i.d.) glass column that was packed with 3% OV 17 on 80–100 mesh Chromosorb WAW/DMCS. Oven temperature was 230°C. Nitrogen carrier-gas flow was maintained at 35 mL/min. Air and hydrogen flow rates were 300 and 60 mL/min, respectively. We used the following analytical procedure. To 300 µL of serum add 500 µL of 0.6 mol/L trichloroacetic acid and 30 µL of 100 mg/L internal standard; vortex-mix for 30 s and centrifuge (2000 rpm) for 5 min. Separate the aqueous layer and add 100 µL of 5 mol/L NaOH and 3 mL of methylene chloride. Vortex-mix and centrifuge. Separate the methylene layer and evaporate it under nitrogen. Reconstitute the residue in 20 µL of carbon disulfide and inject 5 µL of this solution into the chromatograph.

Under these conditions the drugs had the following retention times (in minutes): prilocaine 1.32, lidocaine 1.43, etidocaine 2.39, mepivacaine 3.32, and bupivacaine 6.30. Thus these drugs may be quantified simultaneously by this method—except for prilocaine and lidocaine; the recorder did not reach baseline between these two anesthetics.

For all these agents the standard curve was linear over the entire concentration range. Within-day and inter-day CVs were <3%. In each case, sensitivity and linearity sufficed for measuring subtherapeutic, therapeutic, and toxic concentrations of the drugs.

Evaluation of a Photometer for the Physician’s Office Laboratory, Roy L Alexander, Jr. (Dept. of Pathol., St Louis University School of Medicine and Clinical Laboratories, The University Hospital, St. Louis, MO 63104)

I have evaluated a grating photometer (Physicians Diagnostics, Inc., St. Louis, MO 63132) that provides an absorbance or concentration readout at 340, 410, 510, 540, 610 and 680 nm. The photometer gave a linear response up to approximately 1.0 A at 340 and 410 nm, 1.3 A at 510 and 540 nm, and 1.1 A at 610 and 680 nm. Photometric accuracy was within ±3% of the absorbances of reference solution measured in a Beckman Model 25 spectrophotometer that had been checked against a National Bureau of Standards neutral density filter SRM No. 930 D. Spectral drift was 0.005 A/h at 680 nm. Heat generated by the halogen light source is not removed from the instrument and maintains a temperature of about 58°C in the area of the cuvet holder. The temperature of a solution in the light path increases about 3 °C/min, resulting in an appreciable change in the absorbance of heat-sensitive solutions that are not removed within a few seconds after the cuvet is inserted into its holder.

Chemistry kits (Physicians Diagnostics, Inc.) are available for use with this photometer. These kits contain round borosilicate glass vials that serve both as reaction vessel and cuvet. Variations in the wall thickness of these vials can produce as much as 0.04 A change, depending on the position of the vial in the cuvet holder and the absorptivity of the solution being measured. This produced differences of 2 to 21% in values for serum glucose and 3 to 5% in values for blood hemoglobin assays. I could improve the precision of these assays (within-run CVs <2%) if I measured the final absorbance in a cuvet having a uniform bore and wall thickness.

This type of chemistry system can be used in the physician’s office laboratory if careful technique and continuous quality control measures are maintained by the analyst.

Falsely High Results for Triglycerides in Patients Receiving Intravenous Nitroglycerin, Ronald H. Ng, Rick Guillemin, Marcia Altfofer, and Bernard E. Stiiai (Dept. of Lab. Med., University Hospital, Boston University Medical Center, Boston, MA 02118)

Triglycerides in serum are measured colorimetrically in our laboratory with the RA-1000® (Technicon Instrument Corp., Tarrytown, NY) using RA-1000 reagent in an equilibrium (endpoint) assay. A new RA-1000 reagent for measuring triglycerides became available this year, and we have been analyzing patients’ specimens with both the present reagent (product no. T01-1512) and the new reagent (product no. T01-1863-01) for comparison. We noted that the results for triglycerides in specimens from two patients in