

Figure 1—Rate of clearance of  $^{99m}\text{Tc}$ -labeled polystyrene beads bearing triethylenetetramine functions from the stomach of a normal human male subject (half-time of gastric emptying = 51 min).

these subjects exhibited longer gastric emptying times (115 min) (Fig. 2).

Measurement of gastric emptying is an important aid to the clinician studying gastroduodenal disease, dumping syndrome, and postvagotomy disturbances. Gastric emptying is delayed in malignant disease of the stomach, gastric ulcers, and pyloric stenosis. On the other hand, hastened emptying has been associated with duodenal ulcers. Symptoms of dumping syndrome and diarrhea following gastrectomy and vagotomy are due to altered gastric emptying (10). A simple, accurate, and noninvasive technique for measuring gastric emptying is needed.  $^{99m}\text{Tc}$ -Labeled I has a great potential for becoming a popular radiodiagnostic agent for routine clinical determinations of gastric emptying times.

Gastric emptying has been suggested to be a major determinant in the absorption rate of drugs. Individual

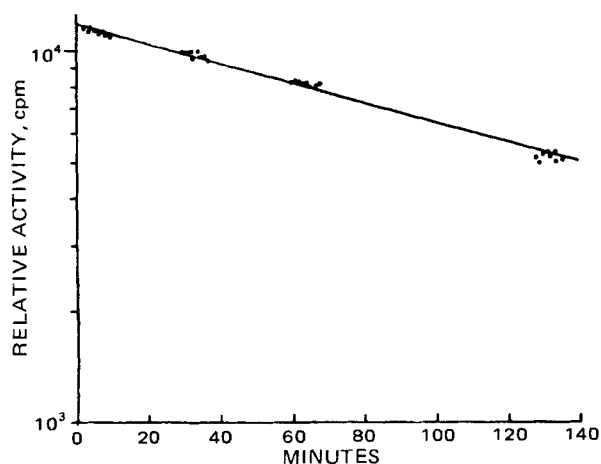


Figure 2—Rate of clearance of  $^{99m}\text{Tc}$ -labeled polystyrene beads bearing triethylenetetramine functions from the stomach of a female patient with pyloric stenosis (half-time of gastric emptying = 115 min).

variations in the rate of drug absorption from any one dosage form may be due largely to differences in the rate of gastric emptying (13, 14). Experiments are now in progress to assess  $^{99m}\text{Tc}$ -labeled I in studying the effects of drugs on the gastric emptying rate as well as the gastric emptying influence on drug bioavailability.

- (1) R. F. Harvey, N. J. Brown, D. B. Mackie, D. H. Keeling, and W. T. Davies, *Lancet*, 1, 16 (1970).
- (2) G. H. Griffith, G. M. Owen, S. Kirkman, and R. Shields, *ibid.*, 1, 1244 (1966).
- (3) R. C. Heading, P. Tothill, A. J. Laidlaw, and D. J. C. Shearman, *Gut*, 12, 611 (1971).
- (4) T. K. Chaudhuri, *J. Nucl. Med.*, 15, 391 (1974).
- (5) E. Signer and R. Fridrich, *Acta Paediatr. Scand.*, 64, 525 (1975).
- (6) A. P. M. van Dam, *Radiology*, 110, 155 (1974).
- (7) M. Calderon, R. E. Sonnemaker, T. Hersh, and J. A. Burdine, *ibid.*, 101, 371 (1974).
- (8) R. C. Heading, P. Tothill, and G. P. McLoughlin, *Br. J. Radiol.*, 48, 508 (1975).
- (9) A. R. Cooke, *Gastroenterology*, 68, 804 (1975).
- (10) T. K. Chaudhuri, A. J. Greenwald, R. C. Heading, and T. K. Chaudhuri, *Dig. Dis.*, 20, 1063 (1975).
- (11) M. B. Shambhu, M. C. Theodorakis, and G. A. Digenis, *J. Polym. Sci.*, in press.
- (12) M. C. Theodorakis, Ph.D. thesis, University of Kentucky, Lexington, Ky., 1975.
- (13) R. C. Heading, J. Nimmo, L. F. Prescott, and P. Tothill, *Br. J. Pharmacol.*, 47, 415 (1973).
- (14) J. B. Houston and G. Levy, *J. Pharm. Sci.*, 64, 1504 (1975).

George A. Digenis<sup>\*</sup>

Robert M. Beihn

Michael C. Theodorakis

Manvendra B. Shambhu

Divisions of Medicinal Chemistry

and Nuclear Medicine

Colleges of Pharmacy and Medicine

University of Kentucky

Lexington, KY 40506

Received March 16, 1976.

Accepted for publication December 9, 1976.

We thank Ms. S. Yonts for assistance and Dr. F. DeLand for guidance and encouragement.

<sup>\*</sup> To whom inquiries should be directed.

## Identification of an Impurity in Illicit Amphetamine Tablets

**Keyphrases** □ Amphetamine—illicit tablets, impurity identified as  $\alpha$ -benzylphenethylamine ■  $\alpha$ -Benzylphenethylamine—identified as impurity in illicit amphetamine tablets ▣ Contaminants— $\alpha$ -benzylphenethylamine identified in illicit amphetamine tablets

To the Editor:

An impurity detected in exhibits of illicit amphetamine tablets has been identified as  $\alpha$ -benzylphenethylamine (I). The tablets, of a type known as "mini-bennies," were found to contain caffeine as well as *dl*-amphetamine (II), the latter as a sulfate salt. TLC examination on silica gel plates<sup>1</sup> revealed an additional spot,  $R_f$  0.7, which, upon

<sup>1</sup> Mobile phase consisted of ammonia-saturated chloroform-methanol (18:1); visualization was by shortwave UV.

