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EDITORIAL
Gastric Emptying

Nuclear medicine techniques have been used to measure gastric emptying for twenty-five years. The first technique employed a simple renogram-type probe to measure gastric emptying (*1*). Initial investigations were designed to explore the physiology of gastric emptying and its relationship to both gastric and duodenal ulcer disease (*2*).

Recent interest in gastric emptying studies has been heightened principally by:

1. New nuclear medicine techniques, which permit physiologic and reproducible measurement of gastric emptying that cause little, if any, discomfort or risk to the patient.
2. An aging population with an ever increasing use of medications which alter gastrointestinal transit.
3. The development of specific pharmacologic agents, which are able to either increase or decrease the rate of gastric emptying.

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From the early days of the simple probe and physiologic test meal, the technique of measuring gastric emptying has been refined (*1,3–9*). First, rectilinear imaging of the stomach was added to probe measurements, followed by the use of both an anterior and posterior probe to calculate the geometric mean of gastric emptying. Subsequently, physiologic test meals were developed that employed dual labels for measuring the differential emptying of both solids and liquids. Presently, the probe systems have been replaced by gamma cameras interfaced to digital computers, thereby permitting the simultaneous measurement of emptying of both solids and liquids.

These newer methods of gastric emptying measurement, initially developed for research purposes, are now at the fingertips of both clinicians and clinical investigators. Altered gastrointestinal transit is now recognized as being present in a number of diseases and clinical syndromes and may be responsible for a range of vague and nonspecific abdominal complaints. Patients previously labeled as having a psychologic basis for their nonspecific complaints are now found to have delayed or rapid transit. Furthermore, the effectiveness of both medical and surgical therapy in these individuals can now be readily quantitated (*10*).

Two current articles reemphasize the importance of radionuclide methodology in assessing gastrointestinal dynamics, either at the early pre-clinical level in the animal model, or in clinical investigative studies of symptomatic patients. In the first article by Gould, an oral CCK antagonist is shown to accelerate gastric emptying in cats, and serves not only to elucidate the role of CCK in the normal regulation of gastric function, but to spur interest in the investigation of other receptor-binding agents. In the second article by Urbain, the common antibiotic, erythromycin, is seen to accelerate the gastric emptying of both liquids and solids in diabetics with gastroparesis and in normal control subjects. This article opens the door to the development of new gastrokinetic agents based on the macrolide (lactone-ring) structure.

These exciting developments in the measurement of gastric emptying are but the tip of the iceberg, as similar methodologies are now being used to study the function of other hollow viscus organs of the gastrointestinal tract. Given the prevalence of both malignant and non-malignant disease of the colon

in Western society, the opportunities for a better understanding of the role of diet and function in colonic physiology are limitless. The measurement of colonic transit by nuclear medicine techniques will not only undoubtedly figure prominently in improving our knowledge of the causes of colonic disease in our culture, but most importantly in eventually reducing the toll of human suffering from such common disorders as diverticulitis and carcinoma of the large bowel.

Over a decade ago, Henry N. Wagner, Jr., MD, commented that many of the advances in gastrointestinal nuclear medicine would not find acceptance until therapies were readily available for the abnormalities described. That insight has proven to be correct, as presently scores of investigators and clinicians armed with newly approved or developing pharmacologic therapies are now employing radionuclide gastrointestinal systems for measurement of function at an ever increasing rate.

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