

Special Lecture 1

The Introduction of Diagnostic Tests with Stable Isotopes into Health Care Services and Their Potential Benefits

Peter D. KLEIN and E. Roseland KLEIN

*Stable Isotope Laboratory, Children's Nutrition Research Center USDA. ARS,
Baylor College of Medicine and Texas Children's Hospital
6608 Fannin Avenue, Houston, Texas 77030, U.S.A.*

The use of stable isotopes for diagnostic and research purposes in nuclear medicine has a number of advantages to offer the clinician. In particular, the benefits of existing diagnostic, non-imaging, tests with ^{14}C can be exploited to improve diagnoses in children and woman of child-bearing age when the stable non-radioactive isotope ^{13}C is used. The use of stable isotopes in health care services has been very limited for a variety of reasons: the availability of ^{13}C , the availability of suitably labeled compounds and the need for specialized instrumentation for analysis of isotope concentration. Recent progress in the definition of diagnostically useful substrates, in the clinical validation of their use and in the development of highly automated analysis systems for $^{13}\text{CO}_2$ has eliminated earlier barriers to the use of stable isotopes. At present, the remaining tasks to be completed include compliance with the legal requirements of the Food and Drug Administration to demonstrate diagnostic efficacy of the procedure, calculation of the cost structures and of the offsetting costs for alternative procedures. When the net benefit to the patient, including absence of radioactivity but also improved or less costly diagnosis results are determined, it will be possible to initiate the use of stable isotopes in today's health care programs. The most important consequence of this incorporation of stable isotopes will be that expansion of stable isotope usage will no longer be limited by the availability of research funds, but will reflect their true contribution to improved health care services.