Use of an Artificial Intelligence-Derived, Computer Assisted Tutor to Teach to and Assess Diagnostic Competencies

Friday, January 19, 2007 with special guest Frank Papa, D.O., Ph.D. Assistant Dean, Curricular Design and Educational Technologies, University of North Texas Health Sciences Center

Learning Objectives

At the completion of this presentation, participants will be able to:

- Understand the cognitive models researchers use to explore the knowledge base structures and information processing methods hypothesized as underlying the development of diagnostic competence.

- Understand the psychometric deficiencies associated with current assessments of diagnostic competence.

- Understand the advantages of new, "Problem-Specific" instructional and assessment approaches to developing diagnostic competence.

January 2007 EGR Presenter

Frank Papa, D.O., Ph.D., began his career in the private practice of Emergency Medicine in 1976. He accepted an academic position in Emergency Medicine in 1979 at the University of North Texas Health Sciences Center. In 1981 he had an encounter with a medical student that would change his career—the student asked him how he had just diagnosed a somewhat atypical patient presentation of myocardial infarction. He proceeded to give the student "the usual" academic explanation—listing the patient's signs and symptoms and then describing how they were associated with a cardiac event. The student said thanks but then replied—"that's not my question—I want to know how your mind was using/processing those signs and symptoms to arrive at a diagnosis." Dr. Papa proceeded to open his mouth and respond, but nothing came out. He didn't really know how he was processing information in order to make a diagnosis.

Dr. Papa had some experience with computers and artificial intelligence techniques, and within a year, created a rudimentary, computer-based model of how information might be processed in arriving at a diagnosis. With some success, he subsequently went on to perform a number or preliminary trials utilizing that model (subsequently called KBIT – Knowledge Based Inference Tool) to compare and contrast the knowledge base and information processing methods of clinical novices (students) and expert clinicians. With mounting evidence of the model's validity, he went on to pursue a Ph.D. in Higher Education within the Department of Computer Education and Cognitive Systems at the University of North Texas.

Over the past 25 years, Dr. Papa has presented and published over 100 works describing the cognitive elements underlying the development of diagnostic competence. Over the past seven years, he has focused his research efforts towards the development of an artificial intelligence-derived, computer-assisted tutor designed to instruct and assess diagnostic competencies. Dr. Papa currently serves as professor of Emergency Medicine and Medical Education, and as Assistant Dean, Curricular Design and Educational Technologies at the University of North Texas Health Sciences Center.