Design of an ontology / conceptual graph-based gross anatomy dissection knowledgebase for real-time table-side implementation in a first-year medical dissection laboratory

HISLEY, Kenneth C., Larry D. ANDERSON*, Stacy E SMITH*, Stephen KAVIC*, Paul G NAGY*. Departments of Radiology, Anatomy and Neurobiology, and Surgery, University of Maryland School of Medicine, Baltimore, MD.

Abstract
Our stated goal here is to provide dissection students with 24/7 access to expert knowledge, maximize the information's relevance and completeness, while simplifying its presentation. Expert assistance to students "at the dissection table" is required for them to learn the synthesis and application of mental models during problem solving, and usually is present in distilled form as a "dissector". Types of information in such dissectors include: 1) didactic (text descriptions), 2) spatial (diagrams, cadaver and radiological image sets) and 3) procedural (sequential technique). Unfortunately, timely access to sophisticated face-to-face faculty guidance above and beyond the dissector is limited. To achieve our goal, we are developing an online web-based gross anatomy dissection guide using PROTÉGÉ, OWL, JAMBALAYA and XML software methods to visualize, capture and replay expert-level dissection knowledge and guidance. In our design, the ontology/conceptual graph of a given exploratory procedure in the human cadaver becomes a faculty member's "conceptual backbone" integrating multiple classes of teaching resources into the expert's sophisticated event sequence. This form of knowledge representation, an ontology and conceptual graphs comprise networks of conceptual nodes and associations linking successive steps of dissection viewpoints, suggested observations, potential discoveries, mechanical technique and anatomical illustrations supported by supporting hyperlinks embedded within the images at relevant points. Thus, dissection students will have distance-independent, on-demand access to the sophisticated knowledge of experts focusing on a well-constrained anatomical region and task.