

# UPDATE W.O.R.K.S.H.O.P.S

## DISSECTION STRATEGIES EMPHASIZING THE UNIQUE ADVANTAGES OF ORGANISMS OVER MODELS AND AUDIOVISUAL ALTERNATIVES

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This workshop was presented to aid instructors of anatomy and physiology in rationally discussing the criticisms leveled at us concerning dissection and animal use in laboratory exercises. The workshop was organized to share the experiences of Sam Drogo, Bill Perrotti, and their colleagues at Mohawk Valley Community College (MVCC). They systematically document student and instructor observations and experiences while engaged in dissection and the use and examination of biological materials. They presented their findings on the unique educational value of a well-planned and well-executed dissection laboratory.

More and more, teachers of biology, and specifically anatomy and physiology, are challenged by individuals concerning the usefulness of dissection. These individuals (including some educators and administrators) insist that the availability of very realistic models, high quality audiovisuals and computer-assisted instruction provide equal or superior experiences to traditional laboratory activities. They conclude that the use of preserved specimens in laboratory classes are unnecessary and offer little of value to the student.

As background, Drogo and Perrotti presented an outline of the criticisms and their responses to those criticisms. One criticism is that dissection is outdated. Simply stated, dissection is good biology. The presenters quoted Barbara Bentley: "Plastic models and video programs, while often serving as effective supplementary materials, cannot substitute for the real thing. The exclusive use of such materials... transforms science in the classroom from an exciting and stimulating study of life into nothing more than games, dolls and TV." (Quarterly Review of Biology 66(4): 475-477, 1991.)

Another criticism is that students do not like dissection. Yet, with the proper professional attitude and instructor involvement, the student can develop an appreciation for the exercise. Starting with palpation, the student can develop a sense

of where structures are in relation to each other. The student can then begin to explore and visualize relationships. At MVCC, groups of five or six students perform a general dissection of a small cat early in the semester. This exercise is used to orient the student to the general vertebrate plan and provide exposure to and examples of membranes, body cavities, organs and organ systems. The key to the exercise is exploration and discovery rather than just naming parts. As the semester progresses, detailed dissection of another specimen is performed.

Discovery includes palpation of a structure or organ and exploration of its relationship to other structures that lie nearby. This could lead to a discussion on the structure's response to stress. Palpation can be used effectively to demonstrate structural adaptations such as: rugae, lingual papillae and dentition. Functional inferences and clinical applications can be presented. Examples included a demonstration of the elasticity of the thoracic cavity, a comparison of the differences between a "normal" and post-partum mammary gland, identification of structures that provide mechanical protection, an observation of the role of serous membranes in the body and examination of the physical characteristics of glandular tissues. The authors also presented microscopic structures for comparison.

Teamwork is utilized in animal dissection. For example, one student may do the actual dissection while the other students give suggestions or directions. Students may then have to come to consensus concerning the structure and its functional significance. Peer instruction is a valuable learning tool for everyone concerned. With this type of involvement, the Eureka! factor often comes into play.

The exclusive use of the models and/or video presentations instills a static view of anatomy. Students come away from the class with only an idealized view of anatomical structures and relationships. In contrast, the use of preserved specimens in the classroom encourages students to compare similarities and differences among specimens and thus provides a more realistic concept of animal structure and function.

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