Annotated Bibliography

Fostering Critical Thinking Skills
Richard M. Schwartzstein, M.D.

Dr. Guerrero describes a detailed approach to mechanistic thinking that specifically addresses problem-based learning in pathophysiology courses in medical school. However, the basic concepts described in this paper are applicable to teaching critical thinking at all levels.

This well documented article details many of the prevalent notions about how doctors reason in the clinical setting when formulating differential diagnoses. It focuses on “problem representations,” which are a modified form of pattern recognition, and hypothesis generation. The paper contains an interesting table that outlines strategies for analyzing problems that a student or resident might have in the assessment of a patient, and ideas for how a teacher might assist the learner in addressing these problems.

This paper offers a brief, but nicely detailed, overview of learning theories that frames much of the discussion about critical thinking. The authors delineate the cognitivist orientation and the factors that contribute to critical thinking skills.

Norman offers an overview of the evolution of cognitive theories over the past 30 years and their impact on how we view critical thinking and clinical reasoning.

This paper outlines an interesting research study that examined how students tried to solve a CPC case from the New England Journal of Medicine. Students who were able to employ “higher order concepts” were able to construct a more robust differential diagnosis and were more likely to arrive at the correct diagnosis.

Croskerry P. The importance of cognitive errors in diagnosis and strategies to minimize them. Acad Med. 2003;78:775-780.
This paper, written by an emergency medicine faculty member at Dartmouth Medical School who has studied errors in clinical reasoning for a number of years, describes a number of classical thinking errors made by physicians when making decisions about patient care. In particular, he details errors characterized as “cognitive dispositions to respond.”
   The author delineates errors in thinking and links them to cognitive theories.

   The authors put forward an interesting discussion about expertise, making the distinction between routine experts and adaptive experts.

   This article is a review of the cognitive theory underlying the principle of encapsulation of knowledge and its application to clinical reasoning. Specific attention is given to “illness scripts” in medicine.