

**David Dean, Ph.D.**  
**ABSTRACT**

**CASING OUT THE BRAIN: COMPOSING NEUROSCIENCE CASE STUDIES.** Zachary Gordon, Brian Oommen, David Dean PhD, Krishan Chandar MD. *Case Western Reserve University School of Medicine.*

**PROBLEM:** Historically medical school neuroscience has been presented in a large group lecture format. The School of Medicine's new WR<sub>2</sub> curriculum uses small-group Problem-Based Learning (PBL) cases to teach medical subjects to students. Our goal is to develop PBL cases for the Neuroscience portion of Block 6, "Cognition, Sensation and Movement".

**OBJECTIVES:** (1) Identify themes, and their component learning points, that are best-suited for PBL cases. (2) Write PBL cases for each topic. This requires setting learning objectives, writing the case, integrating learning resources, such as radiographic images and histopathology, and writing the facilitator's guide. (3) Develop methods for curricular assessment, essay type and multiple choice questions, and future revision.

**DESCRIPTION:** The goal of the Neuroscience section of this block is for students to master neuroanatomy, know motor and sensory pathways, understand neuromuscular physiology, and know the basic functional units of the brain. The topics explored in PBL cases will allow students to deeply explore the most salient neuroscience topics. Students' understanding will be assessed by answering essay questions on the topics covered in these cases.

**FINDINGS:** (1) We have identified 5 topics that might be well covered by 10 PBL cases: Spinal Cord Disease, diseases of the motor systems including the basal ganglia (Parkinson's Disease, Huntington's), Stroke (ischemic and hemorrhagic), Headache, and diseases involving the neuromuscular junction (ALS, Myasthenia Gravis). These topics were selected because they are diseases that demonstrate core concepts in neuroanatomy or neurophysiology. Additional neuroscience topics will be learned via medium-group sessions or lectures. (2) For each case we will set specific learning objectives and identify resources that can be used to meet these learning objectives. (3) We will incorporate radiographic images, histopathology, videos or demonstrations, and other tools to help students integrate neuroanatomical and clinical information. (4) We have been learning the Case IQ format for PBL as we have been trying to accomplish these goals.

**KEY LESSONS LEARNED:** (1) Encouraging self-directed learning of basic material while simultaneously illustrating its clinical significance has been a challenging task. (2) We recognize the significance of determining the resources that will be needed for this type of self-directed learning.

**QUESTIONS:** (1) How will we pilot the cases that result? (2) How will we evaluate the effectiveness of these cases? (3) Are these the most appropriate topics for PBL neuroscience cases? (4) How well will these cases integrate with the rest of the block?

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