NEUROSCIENCE CURRICULUM INTEGRATION

University of Chicago

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OVERVIEW

We are a small academic program with 6 residents per year. We do have access to faculty with expertise in neuroscience and are in a continual process of trying to expose residents to those resources in a way which can be meaningful to residents (who crave clinical connections in the material) and a positive experience for faculty (who are accustomed to more scientifically-oriented audiences). The NNCI materials have served to augment our neuroscience curriculum with learner-centric, clinically-connected modules.

Our curriculum is set up in one half-day protected each PGY-year. The PGY-3s have two half days of protected classes, one of which is a combined with the PGY-4s. The classes are structured in curricular "columns" dedicated to 1) psychopathology and phenomenology, 2) psychotherapy, 3) psychopharmacology and somatic treatments, 4) neuroscience, and 5) research training. We have integrated NNCI materials into introductory classes in the neuroscience column, to help teach basic neuroanatomy to PGY-1s; in the psychopathology and phenomenology column in the PGY-2 neuropsychiatry course; and in the advanced pharmacology and somatic treatments course for PGY-3s and 4s. We also have advanced psychiatric neuroscience courses for our PGY-2s and PGY-3s, where we are looking at ways to integrate more of the growing library of NNCI materials.

NNCI INTEGRATION

PGY-1: Introduction to Neuroantatomy

1. NNCI Basic Neuroscience: PlayDoh Brain
2. NNCI Basic Neuroscience: 3-D Brain App
3. Adaptations of the NNCI PlayDoh Brain concept:
   - PlayDoh Temporal Lobe
   - PlayDoh Visual Streams

PGY-2: Neuropsychiatry

1. NNCI Brief, Accessible Review: Magnetic Resonance Imaging in Psychiatry
2. NNCI Fundamentals of Neuroscience: Cut and Paste Clinical Pathology: Neurodegenerative Disorders
3. NNCI Neuroscience in the Media: Foreign Accent Syndrome

PGY-3: Advanced Psychopharmacology and Somatic Treatments

1. NNCI Translational Neuroscience: Psychopharmacology and Major Depression
2. NNCI Translational Neuroscience: Bipolar Disorder
3. NNCI Translational Neuroscience: Alzheimer's Disease: Now is the Time
4. NNCI Neuroscience in the Media: Transcranial Direct Current Stimulation

ADDITIONAL NEUROSCIENCE TAUGHT

More traditional formats:

PGY-2: Neuropsychiatry

This course aims to review major cortical networks and their role in the cognitive and behavioral presentations seen in presentations of structural brain disease. An emphasis is placed on structure-function relationships and practical bedside approaches to evaluation.

1. Neuroanatomy revisited
2. Cortical networks and landmark cases
   - 'Tan,' Broca, and Wernicke
   - Phineas Gage
   - H.M. (Henry Molaison and the role of the hippocampi in memory formation)
   - The man who fell out of bed
   - The man who mistook his wife for a hat
3. Neuropsychiatric evaluation – Part 1
   - History and physical
4. Neuropsychiatric evaluation – Part 2
   - Cognitive examination and diagnostic workup
5. Dementia Part 1 – Alzheimer's, Vascular, Mild Cognitive Impairment (MCI)
6. Dementia Part 2 – Frontotemporal Dementia (FTD), Primary Progressive Aphasia (PPA), Corticobasal degeneration (CBD), Progressive Supranuclear Palsy (PSP), Dementia with Lewy Bodies (DLB), Parkinson's Disease (PD)
7. Traumatic brain injury
8. Epilepsy
9. Rapidly progressive dementia and autoimmune conditions
10. Pharmacologic considerations in neuropsychiatry

PGY-2: Meet the Brain: Intro to Neuroscience in Psychiatry
This course aims to provide a background in 1) cellular and molecular and 2) circuits-based neuroscience. This provides the framework for understanding the neurobiology of complex psychiatric disorders.

1. Introduction to neuroscience in psychiatry
2. Ion channels
3. Cortical structure and circuits / GABA
4. The synapse and glutamate
5. Monoamine neurotransmitters
6. Sleep and arousal
7. Memory
8. Appetite
9. Fear conditioning
10. Stress reactivity
11. Addictive disorders
12. Pleasure and pain
13. Executive function and working memory
14. Empathy and theory of mind
15. Social neuroscience

PGY-3-4: Psychiatric Neuroscience
This course explores current cutting edge neurobiological research on psychiatric disorders, exploring each topic in depth from both human and animal model points of view.

1. Schizophrenia – human studies
2. Schizophrenia – animal studies
3. OCD – human studies
4. OCD – animal studies
5. Anorexia nervosa – human studies
6. Anorexia nervosa – animal studies
7. Mood disorders – human studies
8. Mood disorders – animal studies
9. Autism – human studies
10. Autism – animal studies