

The Common Biology of Mental Illness and Substance Dependence  
Craig Strickland, PhD

**1. Webinar title:** The Common Biology of Mental Illness and Substance Dependence

**2. Course Description:**

The purpose of this presentation is to provide the biological background which links chronic mental illness, substance abuse and behavior. Understanding these links assists in understanding why the two diagnoses so often co-occur. Participants should be aware that neuropsychology, like psychopharmacology, are very young sciences. As a consequence, presented topics will require much more research in order to answer many of the questions related to neuroscience and psychopharmacology.

**3. Learning Objectives: By the end of the session, participants will be able to:**

- Describe the common brain mechanisms underlying major mental illness (schizophrenia in particular) and substance abuse
- Compare and contrast the symptoms of the major mental illness and those of intoxication, withdrawal, and abstinence
- List three similarities in brain chemistry between mental illness and substance intoxication
- Summarize a simple 2x2 model of mental illness and intoxication/withdrawal used in diagnosing

**4. Content level: Beginner-Advanced**

**5. Course Outline with Timeframes**

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|--|-------------------|
| 1. Overview  | 9:30-10:00 AM     |
| a. Basic terminology                                   |                   |
| b. Nervous system structure and function               |                   |
| i. Central nervous system                              |                   |
| ii. Peripheral nervous system                          |                   |
| 2. Neuroanatomy of mental illness (schizophrenia)      | 10:00 to 10:40 AM |
| a. Limbic system                                       |                   |
| b. Cortical areas                                      |                   |
| c. Basal ganglia                                       |                   |
| 3. Neuroanatomy of substance abuse                     | 10:40-11:10 AM    |
| 4. Neurochemistry                                      | 11:10 to 11:45AM  |
| a. Basic neural structure and function (communication) |                   |
| b. Neurochemistry of mental illness                    |                   |
| c. Neurochemistry of substance abuse                   |                   |
| 5. Behavioral analysis                                 | 11:45 to 12:15 PM |
| a. Positive versus negative symptoms                   |                   |
| b. Intoxication versus withdrawal                      |                   |
| c. Differential Diagnoses                              |                   |
| 7. Summary/Q&A   | 12:15-12:30 PM    |

## 6. References

- Agabio R, Trogu E, Pani P. (2018) Antidepressants for the treatment of people with co-occurring depression and alcohol dependence. *Cochrane Database Syst Rev.*, 4(4):CD008581. doi: 10.1002/14651858.CD008581
- Kesby JP, Eyles DW, McGrath JJ, Scott JG. (2018) Dopamine, psychosis and schizophrenia: the widening gap between basic and clinical neuroscience. *Transl Psychiatry*, 31;8(1):30. doi: 10.1038/s41398-017-0071-9.
- Lawrence A. (2021) Should we or shouldn't we?: Preface to the Special Issue "Neurochemistry of Reward-Seeking". *J Neurochem*, 157(5):1405-1407. doi: 10.1111/jnc.15317
- Peyton L, Oliveros A, Choi D. and Jang M. (2021) Hippocampal regenerative medicine: neurogenic implications for addiction and mental disorders. *Exp Mol Med.*, 53(3):358-368. doi: 10.1038/s12276-021-00587-x

## 7. Brief Instructor bio:

Dr. Strickland graduated from Bryn Mawr College in with a Doctorate in Psychology and a focus on experimental research and neuroscience. Past positions include a faculty position at the Medical College of Pennsylvania and affiliate faculty positions at Widener University and Springfield College. He currently has guest lecturer privileges at the Bryn Mawr Graduate School of Social Work and Social Research, the Rutgers School of Social Work and an affiliate professor position at Thomas Jefferson University, East Fall Campus in the Community and Trauma Counseling program. Dr. Strickland is the owner of Biobehavioral Education and Consultation, LLC.

## 8. CV on file

## 9. Handouts to be provided