## Title: Getting a Grip on Causal Inference

John F. Inciardi PharmD, DSc (Clinical Epidemiology),
Adjunct Clinical Professor, Touro University, California, USA

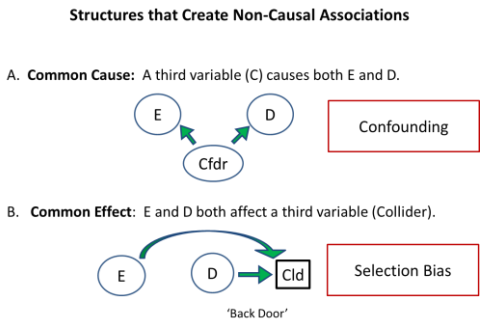
**Abstract**

When judging the effects of treatment, health-care providers face the critical task of distinguishing truly causal relationships apart from mere (non-causal) associations. However, the task of identifying 'biasing pathways' that alter the true effect of an exposure is often a daunting and a frequently overlooked adventure. As a result, today's health-care provider faces a bewilderment of seemingly contradictory reports, some of which appear in highly regarded medical journals.

Epidemiologic studies are commonly constructed around three types of variables: an exposure, an outcome and a 'third' variable that carries the potential to bias the exposure-outcome relationship. The recent merger of graphical probability theory with recently established methods for constructing causal diagrams has led to the creation of sophisticated yet highly intuitive tools for establishing causal inference.

This seminar will provide an update on contemporary methods for identifying common threats to the validity of a clinical investigation. The speaker will argue that health care providers by virtue of their education and training are uniquely qualified to provide the expert knowledge requisite for establishing causal inferences. Attendees should be able to meet the following course objectives:

1. Explain the basic laws of graphical probability theory as they pertain to bias.
2. Identify sources of confounding and selection bias given a directed acyclic graph that accurately conveys the expert knowledge of the investigator.
3. Create strategies to adjust or remove biasing pathways responsible for creating confounding and selection bias.




**Recent Publications**

1. Glymour M, Greenland S (2008). Causal Diagrams. In: Rothman KJ, Greenland S, Lash TD, eds. *Modern Epidemiology*, 3rd edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2008.
2. Greenland S. Quantifying biases in causal models: Classical confounding versus collider-stratification bias. Epidemiology 2003;1414:300-306.
3. Hernán MA, Robins JM. Causal Inference. Boca Raton: Chapman & Hall/CRC, 2018.
4. Cole S, Platt R, Schisterman E et al. Illustrating bias due to conditioning on a collider. Inter J Epi 2010;39:417-420.
5. Howards P, Schisterman E, Poole C, et al. "Toward a Clearer Definition of Confounding" Revisited with Directed Acyclic Graphs. Am J Epi 2012;176(6):506-511.



**Biography:**

Over the last several decades, John F. Inciardi has lectured extensively at home and abroad on topics related to causal inference. During this time he developed and delivered coursework related to this topic at several universities and has received numerous teaching awards in recognition of these efforts. As a faculty member of the Department of Internal Medicine at the University of California, Dr. Inciardi has been a long-time mentor to residents and fellows during the design and analysis phases of their health-related investigations. He holds doctoral degrees in both pharmacy and clinical epidemiology.

**Email:** John.Inciardi@tu.edu