Clinical Research Transformed
Olli S. Miettinen, Johann Steurer, and Albert Hofman, 2019, 302 pages, Springer, $179.99

Review by Norman M. Goldfarb

*Clinical Research Transformed* offers a no-holds-barred discussion of the fundamental theory, conceptions, assumptions and principles of clinical research, along with recommended changes to the way we think about and conduct clinical research. Given the problematic state of the clinical research enterprise today, a fundamental rethinking is justified.

**Extract**

The following extract illustrates the precision and density of the authors’ writing:

**Transformative Ideas about Gnostic Clinical Research**

Specific to diagnostic research, the transformative idea advocated in this book is an alternative to the prevailing doctrine that this research is to address the “properties” — result distributions — of diagnostic tests and also of diagnostic indicators more generally, in both the presence and the absence of the illness targeted for diagnosis. The corresponding transformative idea is, fundamentally, that diagnostic research is to address, directly, that which diagnoses are about, namely the probabilities of the presence of the illness in question conditional on the various possible diagnostic profiles of the cases. This means, more specifically, that the research is to address the diagnostic probabilities for the illnesses at issue as joint functions of sets of diagnostic indicators, these for defined domains of case presentation for diagnosis; it is to address such diagnostic probability functions, “DPFs.”

This transformative idea about diagnostic research is paradigmatic for the other species of gnostic clinical research as well — etiognostic and prognostic in addition to diagnostic — with particularly notable importance for the development of the scientific knowledge base for decisions about treatments of choice, conditionally on the prognostic profiles of patients.

The overall idea is simply this: Directly practice-serving, gnostic, clinical research would address gnostic probability functions specific to defined domains of doctors’ need to know about (profile-specific) gnostic probabilities.

The authors found it useful to create new terminology, including the following:

**Etiogenetic/etiognostic study:** Study producing evidence about etiognostic probabilities for an antecedent of cases of an illness (or sickness not due to illness), specific to the etiognostic profiles of the cases. See Etiognostic probability, Diagnostic study, and Intervention-prognostic study. Note: A first-principles etiogenetic/etiognostic study has a singular essence, that of the case-base/case-referent study. See Case-base/case-referent study.

**Etiognosis (in clinical medicine):** A doctor’s first-hand knowing (esoteric) about whether a particular antecedent of the case (of illness, or sickness not due to illness) known to have been present, actually was causal — etiogenetic/etiologic — to the case. Note: Commonly, only uncertain knowing of this type is possible, even in principle; and hence, etiognosis about a particular antecedent (known) of the case is,
specifically, knowing about the probability of its etiogenetic role (with certainty a special case of this).

**Etiognostic probability:** The probability – theoretical, abstract — with which an antecedent (actual) of a health outcome was etiogenetic to the outcome, given the etiognostic profile of the case. Note: Etiognostic probability is (numerically) the proportion of cases of the profile (of the antecedent-outcome-host complex) in general — in the abstract — such that the antecedent of the outcome was causal (etiogenetic) to it.

The book includes 25 chapters:
- The Essence of Clinical Medicine
- The Essence of Clinical Research
- Clinical Research and Clinical Medicine at Present
- Clinical Research Transformative of Clinical Medicine
- Core Concepts of Epidemiology and Epidemiological Research
- The Epidemiological Interface of Gnostic Clinical Research
- The Logistic Regression Model
- Statistics from the Model’s Fitting to Gnostic Data
- The Types of Diagnostic Challenge and Needs for Knowledge
- Harvesting Experts’ Diagnostic Probability Estimates
- Objects Design for a Diagnostic Probability Study
- Methods Design for a Diagnostic Probability Study
- The Bayes’ Theorem Framework for Diagnostic Research
- Research Focused on Diagnostic Tests
- Introduction to Etiognostic Research
- Objects Design for an Etiognostic Study
- Methods Design for an Etiognostic Study
- Introduction to Prognostic Research
- Example: Research on ‘Hormone Replacement Therapy’
- Prognostic Probability Functions from Clinical-Trial Data
- Non-experimental Intervention-Prognostic Studies
- Intervention-Prognostic Derivative Research
- Theory of Medicine Defining the Essential Missions
- Theory of Clinical Research for its Gnosis-Serving Missions
- Toward Worldwide Scientific Medicine

**Reviewer**

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