Neuroimaging in the last quarter of the twentieth century was a cornerstone of the brain science revolution in psychiatry. In the first decade after completion of the human genome project, it is liable to have a very different “phenotype.” While 20th century functional neuroimaging studies were aimed at finding patterns associated with mental and cognitive states and with psychiatric disorders, studies in the 21st century will target biological characteristics related to genetic effects that underly risk for psychiatric disorders. Physiological phenotypes will be defined at the level of information processing patterns and dynamics defined with fMRI and MEG. Pharmacological imaging will identify genetically determined responses to specific drugs and the expression characteristics of specific proteins. It may be possible to use neuroimaging to quantify gene expression in the brain in vivo, and to monitor the effect of stem cell transplantation for the treatment of brain disease. Neuroimaging in the post genome era will be a cornerstone of clinical functional genomics.

Over the past 15 years, a wider range of medication options for the treatment of psychiatric disorders has become available. These options have different presumed mechanisms of action. Some agents are effective for some patients, while other medications are effective for different patients. Thus, recent efforts have focused on how to best organize (i.e., sequence or, when needed, combine) these options. As a consequence, practice guidelines, treatment algorithms, or disease management protocols have been developed, disseminated, and evaluated. While common in general medical practice over the last 2 decades, such efforts are new to psychiatry.

This presentation focuses on the conceptual and practical issues in developing, implementing, and evaluating various practice guidelines for the mentally ill. The types of evidence needed to form an empirically based treatment plan, and how to use available data sources, clinical consensus, and patient preferences to address guideline relevant questions will be discussed, as will the kinds of studies needed to provide information on what to do (strategies) and how to do it (tactics). The Texas Medication Algorithm Project (TMAP) and Sequenced Treatment Alternatives to Relieve Depression (STAR*D) will be used to illustrate the development, evaluation, and evolution of these guidelines.