# Recovery from Schizophrenia

## Etiological Models and Evidence-Based Treatments

Glenn D. Shean

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For my brother Walter (Red) Shean (1935–2004)

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# Preface

Schizophrenia is a devastating disorder that has a profound impact on the lives of those diagnosed, and on the lives of those who care about them. The symptoms of schizophrenia can be frightening, confusing, and debilitating. Schizophrenia affects about 0.7 cases per 1000 worldwide, and accounts 3% of healthcare expenditures. About 80% of the direct costs of care for schizophrenia are associated with hospital or other residential care. Individuals with this diagnosis often experience cycles of remission and relapse throughout their lives. There is a need for ongoing research to identify and implement treatments that are effective in fostering both symptom reduction and social recovery.

After years of teaching, doing research, and working clinically with individuals diagnosed with schizophrenia I remain most impressed by the diversity of abilities, deficits, sensibilities, talents, and patterns of course, outcome and recoveries observed among persons given this diagnosis. Researchers have achieved significant advances in our knowledge of genetic factors and brain-based deficits, and these advances may eventually result in a "cure" for schizophrenia. It is also possible that the concept of "cure" is not appropriate for thinking about recovery from this disorder. Recovery from schizophrenia today is typically a lengthy process with periods of progress in returning to meaningful social participation, as well as occasional relapses and setbacks. When one considers the complexity and diversity of individuals diagnosed with this disorder it seems plausible that recovery as process and outcome is more appropriate framework for thinking about positive change than cure. Properly prescribed and monitored antipsychotic medications often help control symptoms and reduce the likelihood of relapse. Psychosocial therapies in combination with medications are effective in helping many individuals achieve satisfying and functional lives in the community.

The clinical literature tends to emphasize deficits, symptoms, and what has gone wrong in a persons life. It is equally important to recognize the range of individual differences, cognitive abilities, talents, needs, and potentials for growth and change represented by individuals given this diagnosis. Schizophrenia may or may not be adequately understood as the result of the unraveling of genetic code into neuronal deficits and "broken

brains." Whatever advances are made in neuroscience, individuals, their past experiences, self concepts, goals, beliefs, values, hopes, relationships, talents, and expectations also remain important to understanding how lives unfold, progress, and regress. Genes, brain cells, life experiences, and life circumstances affect one another in a reciprocal manner throughout the life cycle. These effects are reciprocal rather than linear or unidirectional. Each scientific discipline focuses on an aspect of the phenomena under study, each can provide important insights and contributions to our knowledge base. At the same time each discipline imposes blinders on our ability to see the "whole" or gestalt, particularly when the subject of study is human behavior and experience. The "truth" about schizophrenia its causes and treatments, is unlikely to be discovered at any single level of analysis. Contemporary literature on schizophrenia often resembles the tale of the five blind men who separately set out to describe an elephant. Each examined a different body part. One stroked the trunk of the elephant and described its length, shape, texture, smell, and sounds. Another described the elephants tail, a third a hind leg and foot, a fourth an ear, and the fifth described the stomach. Each provided a detailed and accurate description of what was observed, and was convinced that his description was accurate. The "essence" of the elephant is however more complex than the separate parts the men described, or even the sum of the separate parts. Scientific and clinical research may eventually result in development of a comprehensive theoretical framework that will enable the integration knowledge from different levels of scientific analysis. Until then it is advisable to remain circumspect about claims about the causes of schizophrenia.

This book attempts to provide a balanced overview of the history, as well as current etiological research and theory, and empirically validated treatments for schizophrenia. It is intended for a broad audience of students, professionals, practitioners, and lay persons who are open to and interested in learning more about what we currently know and do not know about this complex topic.

# Part 1

# Diagnosis, Epidemiology, Course, and Outcome

# 1 Schizophrenia an Evolving Diagnosis

## 1.1. The Origins of the Concept

Schizophrenia is a major public health problem worldwide. The direct and indirect costs of treating and caring for schizophrenia in the U.S. alone are well over $62 billion each year (Wu [28]). Schizophrenia accounts for 75% of all U.S. mental health expenditures, and over 40% of Medicaid reimbursements (Martin and Miller [22]). These cost estimates are conservative since costs to organizations in the public sector outside of mental health (e.g., social service agencies, housing programs, and the criminal justice system) are huge, and typically overlooked in published estimates, as are services costs to charities and other nongovernmental organizations. The "costs" in terms of distress, pain, and impoverished quality of life experienced by patients and their families are not measurable in monetary units. Suicide and mortality rates are also high among patients diagnosed with schizophrenia, and the rate of unemployment for former patients in the U.S. is well over 80% (Heila and Lonnqvist [15]). Given the seriousness of the problems associated with this diagnosis, and the many opinions that are expressed about the disorder, it may prove worthwhile to review the history and background of the idea that there is a mental disorder we call schizophrenia.

## 1.2. History

In 1896 Emil Kraepelin published the fifth edition of his textbook on psychiatry in which he introduced a new nosological system. Kraepelin broadened earlier clinical descriptions of several specific symptom syndromes that had been previously identified, including demence praecox, catatonia and hebephrenia, and added the category dementia paranoids. Kraepelin

argued that these disorders are not separate, but subtypes of a single disorder, *dementia praecox.* Kraepelin based his argument on what he viewed to be the common course of the symptoms, that all patients evidenced a common pattern of early deterioration and inexorable mental decline. In a later edition of his textbook (1899), Kraepelin provided more detailed descriptions of the subtypes of dementia praecox, and identified the common symptoms that unified these patterns included, thought blocking, negativism, impaired judgment, decreased psychological productivity, motor impairment, lack of energy, and affective disturbance. Kraepelin brought order to psychiatric classification of psychotic disorders by grouping these symptoms into subtypes of a single disorder, and by more explicitly differentiating dementia praecox from manic-depressive disorder. He identified two broad deficits to capture what he believed to be the fundamental descriptive unity of proposed syndrome.

*There are apparently two principal groups of disorders that characterize the malady. On the one hand we observe a weakening to those emotional activities which permanently form the mainsprings of volition. Mental activity and instinct for occupation become mute. The result of this highly morbid process is emotional dullness, failure of mental activities, loss of mastery over volition, of endeavor, and ability for independent action. The second group of disorders consists in the loss of the inner unity of activities of intellect, emotion, and volition in themselves and among one another. The near connection between thinking and feeling, between deliberation and emotional activity on the one hand, and practical work on the other is more or less lost. Emotions do not correspond to ideas (1919, pages 74-75).*

Kraepelin's logic for proposing that the subtypes were actually manifestations of a single underlying disorder was based on two main tenets (Reider [23]). First, the subtypes of dementia praecox have many symptoms in common, for example, hallucinations, impaired judgment, delusions, withdrawal, impulsiveness, shifting attention and interests, disturbances of emotion and volition, and loss of inner unity of activities of intellect, emotion, and volition. Second, he believed that symptom onset typically begins relatively early in life, and leads to progressive decline to a similar end state of dementia.

*The nature of the disease process in dementia praecox is not known, but it seems probably, judging from the clinical course, and especially in those cases where there has been rapid deterioration, that there is a definite disease process in the brain, involving cortical neurones (1907, page 221).*

Following the model of internal medicine Kraeplein assumed that patients with similar symptoms and a deteriorating course must suffer from a common underlying cerebral disease process or deficit.

*Judging from our experience in internal medicine it is a fair assumption that similar disease processes will produce identical symptom pictures, identical anatomy, and an identical etiology. Cases of mental disease originating in the same causes must also present the same symptoms, and the same pathological findings. In accordance with this principle, it follows that a clinical grouping of psychoses must be founded equally upon all three of these factors, to which should be added the experience derived from the observation of the course, outcome, and treatment of the disease (1907, page 117).*

Kraepelin believed that premorbid levels of functioning could never be fully recovered in dementia praecox, so if good or full recovery occurred the patient must have been misdiagnosed. He described the prodromal signs of the disorder as beginning gradually with disturbances in sleep, appetite, sensory disturbances, loss of affective control, irritability, withdrawal or bursts of energy, confusion, giddiness, or preoccupation with cosmological beliefs. Hallucinations, especially auditory experiences of abuse, threats, demands, and whispers are also common during stages of acute exacerbation along with exaggerated hypochondriacal concerns, suspiciousness, and uncanny sensory, and perceptual experiences. Kraepelin noted that these disturbances in dementia praecox inevitably progress to a condition manifested by a kaleidoscope of bizarre delusions, withdrawal, deterioration, and bizarre, eccentric behaviors. This process of progressive deterioration may be interrupted by unpredictable acute episodes in which outbursts of florid excitement, hallucinations, delusions, and bizarre behaviors may reoccur, intermittent with a return to varying degrees of dementia. Kraepelin believed that the unique form of dementia observed in dementia praecox was evident in loss of the ability to comprehend and develop new ideas, to connect experiences and ideas in such a way that new concepts, to reach coherent conclusions, and make rational judgments. He recognized that impairment differed from and was more subtle than the forms of dementia observed in neurological disorders, and struggled to provide an adequate description of the essence of this unusual pattern.

*Some patients may still achieve a certain standard of rote learning, while others may take days to master a few words or proverbs. They are always, however, completely incapable of comprehending and developing new ideas. Individual components of experience are no longer connected; there is no interaction between them; they lead to no concepts, judgments or conclusions. In spite of the good memory retention, therefore, there is still an inevitable and progressive mental deterioration, the most striking features of which are the patient's inexplicable lack of judgment and the incoherence of all his thinking (1883, pages 426-427).*

In later editions of his textbook Kraepelin noted that the essence of dementia praecox was observable in the destruction of conscious volition which is expressed as a loss of interests, energy and drive, disjointed volitional behaviors, impulsive instinctual activity, and lack of planned reflection or suppression of impulses. He speculated that involvement of the frontal lobes explained the loss of will and inner harmony of psychic functions, and temporal lobe involvement accounted for the peculiar speech and auditory hallucinations.

In summary, Kraepelin applied two basic tenets of nosology in medicine (1) symptoms, signs, and disease course form syndromes that can be distinguished from normal behavior by clear boundaries and (2) symptoms are the direct expression of underlying biological dysfunctions. Among the signs that Kraepelin considered central to the diagnosis, in addition to age of onset, course and outcome, were discrepancies between thought and emotion, negativistic and stereotyped behaviors, unconnected ideas, hallucinations, delusions, and general deterioration that was evidenced in the form of a global loss of "will" or "psychic integration." Kraepelin believed he had identified a brain disorder and did not consider psychosocial factors as playing any significant role in the symptoms, etiology, course, or outcome.

### 1.3. Challenges to Kraepelin's Views

By the beginning of the twentieth century several contemporaries challenged Kraepelin's views, in particular his emphasis on the inevitability of deterioration of patients diagnosed with dementia praecox. Critics noted that while many patients evidenced the course described by Kraepelin, others stabilized, some evidenced periods of good recovery between episodes, and others made good long-term recoveries. Diagnostic disputes arose over whether patients who did not permanently deteriorate should be diagnosed with dementia praecox or some other disorder. Kraepelin struggled with this issue himself, and in 1919 attempted to resolve this issue by narrowing the concept of dementia praecox to exclude both catatonic and paranoid cases that started in middle adulthood and did not show a progression to dullness and indifference. In later editions of his textbook Kraepelin referred to patients who evidenced signs of recovery as suffering from conditions that "border on dementia praecox." In addition, Kraepelin's emphasis on dementia as a key defining feature of the disorder, and the absence of any attempt to understand aspects of the disorder in the context of psychosocial influences did not sit well with many clinicians, especially those who were directly or indirectly influenced by Freud's writings.

Eugen Bleuler introduced the term schizophrenia as an alternative to Kraepelin's concept of dementia praecox in 1911. Bleuler agreed with Kraepelin's assumption of an organic cause for the disorder, but disagreed with several aspects of Kraepelin's understanding of the disorder. Bleuler described several reasons for introducing the alternative term. (1) The term dementia praecox describes the disease but not the person afflicted. (2) The term leads to a misconception that the disease must begin during adolescence and end in a state of dementia. This is not always the case. (3) The proposed substitute name schizophrenia (from the Greek roots *schizo*-meaning split and *phrenos*-mind) is descriptive of important characteristics of the disorder and does not imply either early onset or progressive dementia. Bleuler concluded: "as the disease need not progress as far as dementia and does not always appear praecociter, that is, during puberty or soon after, I prefer the name schizophrenia" (1924, page 373). He also argued that the course of the disorder could not be predicted from the symptoms, since "it may come to a standstill at any stage and many symptoms may clear up very much or altogether" (page 373). Bleuler placed greater importance on symptom content, and introduced a markedly different set of diagnostic criteria that those described by Kraepelin.

Bleuler grouped the symptoms of schizophrenia into two broad categories, fundamental and accessory symptoms. He argued that the fundamental symptoms were present in all patients with schizophrenia and were unique to this disorder. The accessory symptoms were not diagnostic and could occur in a variety of different disorders. The fundamental symptoms of schizophrenia that could be used to definitively diagnose the disorder were associational disturbance, affective disturbance, ambivalence, autism, loss of volition, and attentional disturbance (Andreasen [6]).

*Certain symptoms of schizophrenia are present in every case and in every period of the illness even though, as with every other disease symptom, they must have attained a certain degree of intensity before they can be recognized with any certainty. Besides the specific permanent or fundamental symptoms, we can find a host of other, more accessory manifestations such as delusions, hallucinations, or catatonic symptoms. As far as we know, the fundamental symptoms are characteristic of schizophrenia, while the accessory symptoms may also appear in other types of illness. (1950, page 13.)*

Disturbance of associations was the *sine qua non* of the diagnosis, the most important and fundamental symptom in Bleuler's model. He believed that "weakness of the associations" allowed affects to dominate over the train of thought, so that individuals could not organize the elements of ideas into meaningful sequences. Dereistic (fantasy driven) thinking that often predominates in schizophrenia and delusions are formed as

a result of the associational disturbance. This disturbance leads to a turning away from reality and reliance on psychological mechanisms to create fantasies and substitute sources of gratification. Pressured speech, incoherent thought, perseveration of ideas, and poverty of speech are understood as accessory or secondary symptoms, the consequences of the basic underlying disturbance of association that Bleuler believed to be at the core of schizophrenic disturbance. Bleuler believed that other basic mental functions such as sensation, memory, orientation, and motility were not directly disturbed in schizophrenia. He explained deficits in these functions as secondary effects of the fundamental symptoms. Incorrect and nonsensical responses to questions given by patients for example, were viewed as secondary consequences of characteristics such as negativism, delusions, and lack of interest or motivation. Perceptions and orientation could also be indirectly distorted by hallucinations and illusions that altered the patients' orientation to their own situation. Bleuler also argued that symptoms such as delusions and hallucinations were consequences of the fundamental symptoms that complicate the underlying symptom picture of schizophrenia, in some cases permanently and in other cases in transient appearances. He placed himself at the center of two divergent approaches to the understanding of mental disorders. One, associated with Kraepelin, was widely recognized and influential; the other, of which Freud was the chief proponent was novel and highly controversial.

Bleuler maintained that life experiences have a strong influence on both symptomatology and the course of the disorder. He argued that a psychoanalytic view of schizophrenic symptoms did not explain the underlying causes of the group of disorders but, it did allow one to understand many aspects of what had previously been viewed as a mixture of meaningless, incomprehensible and bizarre, deranged behaviors. Bleuler's contribution was to formulate a metamodel that could incorporate two seemingly contradictory perspectives, Freud's psychoanalytic theory with Kraepelin's physiological assumptions. Bleuler argued that a weakness of the *Schaltspannung or Assoziationsspannung*, the force which keeps the associations organized and coordinated, is the basic underlying defect in schizophrenia. This concept was adopted by Bleuler to mediate between Kraepelinian assumptions and psychoanalytic constructs (Stierlin [25]). The biological cause of schizophrenia, according to Bleuler, was *a decrease in Shaltspannung, which corresponds to the nature of the illness, namely one which is not functional but which is the direct consequence of a direct chemical or anatomical or molecular brain alteration.* (1920, pages 12). Psychosocial factors played a role only in a secondary manner after the primary biological defect was expressed in associational disturbance … *psychic*

*experiences—usually of an unpleasant nature—can undoubtedly affect the schizophrenic symptoms. However, it is highly improbable that the disease itself is really produced by such factors. Psychic events and experiences may release the symptoms but not the disease … (1920, pages 345-346).*

Bleuler's ideas about schizophrenia had several unanticipated consequences (Stierlin [25]). First, the reshuffling of the diagnostic criteria that resulted from the distinction between fundamental and accessory symptoms ran counter to common usage, and implied that schizophrenia was no longer necessarily limited to individuals who displayed only extreme, bizarre, and highly deviant behaviors. Bleuler believed that the fundamental symptoms that were truly diagnostic were sometimes subtle and could be difficult to differentiate from normal behaviors and patterns of thought. He also argued that psychosocial factors could play an important role in the development of accessory symptoms such as delusions and hallucinations. In this way he placed schizophrenic disturbance closer to the realm of understandable human experience.

*Even normal persons, show a number of schizophrenic symptoms when they are emotionally preoccupied, particularly inattentive, or when their attention is concentrated on a single subject. Among these symptoms are peculiar associations, incomplete concepts and ideas, displacements, logical blunders, and stereotypes (1911, page 253).*

Bleuler not only humanized schizophrenia, he widened the concept, by suggesting that the "latent" form of schizophrenia was the most frequent form of the disorder. By emphasizing the similarities between exaggerated normal and schizophrenic experiences and the ubiquity of latent forms of the disorder, as well as the potential usefulness of psychodynamic understandings, Bleuler opened the door to the possibility that psychosocial factors could be relevant to understanding and treating schizophrenia. Bleuler titled his book *Dementia Praecox or the Group of Schizophrenias* and suggested that schizophrenia could be several different diseases that share certain phenomenological similarities … *it is apparent that the group includes several diseases (1950, page 8).* Bleuler's ideas were highly influential in shaping the definitions of schizophrenia included in DSM-I and DSM-II (American Psychiatric Association [1]).

### 1.4. Diagnostic and Statistical Manual I (DSM-I)

By the middle of the twentieth century the need for standardization of diagnostic practice in the United States was evident. In response to the need for greater uniformity of diagnostic practice the American Psychiatric Association published the first official diagnostic manual in 1952.

Psychoanalytic theory was the dominant perspective among American psychiatrists at the time. Psychoanalytic theory does not lead to an emphasis on the importance of precise diagnosis since symptoms are understood as expressions of underlying unconscious developmental issues. Schizophrenia was viewed as a disorder with vague boundaries and latent forms, as described by Bleuler; consequently disagnostic criteria were written in very general terms. The term Schizophrenic Reactions was used in DSM-I to emphasize the assumption that aspects of the disorder can be viewed as reactions to adverse life experiences. The DSM-I definition used in diagnosis was the following.

*This term is synonymous with the formerly used term dementia praecox. It represents a group of psychotic reactions characterized by fundamental disturbances in reality relationships and concept formations, with affective, behavioral, and intellectual disturbances in varying degrees and mixtures. The disorders are marked by a strong tendency to retreat from reality, by regressive behavior, and in some, by a tendency to deterioration. The predominant symptomatology will be the determining factor in classifying such patients into types (1952, p 26).*

DSM-II introduced in 1968 continued the narrative descriptive style of DSM-I with minor modifications.

### 1.5. Problems with Reliability

The US/UK Diagnostic Project conducted during the 1970s indicated that American psychiatrists diagnosed schizophrenia at a rate that was approximately fourfold the rate of their British counterparts, and that the difference in diagnostic rates was a function of differences in the definition of schizophrenia rather than national differences in the incidence of the disorder (Cooper et al. [13] and Kendell et al. [16]). Mounting evidence of substantial differences in diagnostic practice across locations and among practitioners became increasingly important as the success of pharmacological interventions in treating signs of acute disturbance and the related resurgence of biological models necessitated greater diagnostic reliability. Narrower and more specific criteria for the diagnosis of schizophrenia were adopted to improver the reliability of diagnosis.

By the mid 1970s several changes including the availability of more effective antipsychotic meds, access to improved brain imaging technology, and the related resurgence of biological psychiatry resulted in several important changes in diagnostic practice reflected in the introduction of DSM-III in 1980 and in 2004 DSM-IV-TR (2000). These changes heralded a return to an understanding of schizophrenia that is more in line with

Kraepelin's original concepts. The most obvious of these changes was the adoption of a requirement that symptoms must be present for 6 months continuously before a diagnosis of schizophrenia can be given. The introduction of this diagnostic rule implies that schizophrenia is a disorder from which few if any individuals ever return to premorbid levels of functioning.

Schizophrenia is included in the Diagnostic and Statistical Manual IV of the American Psychiatric Association under the group of Psychotic disorders. The term *psychotic* is a broad grouping that tells us something about the seriousness of the mental disturbance, in that psychotic disorders involve serious impairments, involving cognitive, behavioral, emotional and interpersonal processes. Psychotic symptoms are typically associated with serious *distortions of reality* that can result in behaviors and beliefs that can be experienced as frightening and bizarre by others. In the case of schizophrenia, these disturbances and distortions are evident in the presence of delusions, prominent hallucinations, disorganized speech or catatonic behavior.

### 1.6. DSM-IV-TR

The fourth edition of DSM published in 1994 and revised as DSM-IV-TR in 2000 introduced several changes in the diagnosis of schizophrenia. First it acknowledged that patients may evidence symptoms of more than one subtype by adopting a hierarchical approach to assigning subtype designations. Second, the diagnosis of schizoaffective disorder, previously discouraged in DSM-III, was given unequivocal subtypal status in DSM-IV-TR. DSM-IV also introduced the criterion of at least one month duration of some active symptoms rather than the one week duration as specified in DSM-III-R. The features of schizophrenia are described in DSM-IV-TR as a mixture of signs and symptoms (both positive and negative) that have been present for a significant portion of time during a 1-month period with some signs of the disorder persisting for at least 6 months (Criteria A and C). These symptoms are also associated with marked social or occupational dysfunction (Criterion B).

DSM-IV-TR criteria for the diagnosis of schizophrenia are the following.

*(A) Characteristic symptoms.*

Two or more of the following, each present for a significant portion of time during a 1-month period (or a shorter time if successfully treated):

(1) delusions
(2) hallucinations
(3) disorganized speech

(4) grossly disorganized or catatonic behavior

(5) negative symptoms (i.e., affective flattening, alogia, or avolition).

Note: Only one Criterion A symptom is required if delusions are bizarre or hallucinations consist of a voice keeping up a running commentary on the person's behavior or thoughts, or two or more voices conversing with each other.

*(B) Social/occupational dysfunction.*

For a significant proportion of the time since the onset of disturbance, one or more major areas of functioning such as work, interpersonal relations, or self-care are markedly below the level achieved prior to the onset (or when the onset is in childhood or adolescence, failure to achieve the expected level of interpersonal, academic or occupational achievement).

*(C) Duration.*

Continuous signs of disturbance for at least six months. This six-month period must include at least one month of symptoms (less if successfully treated) that meet Criterion A (i.e., active-phase symptoms) and may include periods of prodromal or residual symptoms. During these periods the signs of the disturbance may be manifested by only negative symptoms or two or more symptoms listed in Criterion A present in an attenuated form (e.g., odd beliefs, unusual perceptual experiences).

*(D) Schizoaffective and Mood Disorder exclusion.*

Schizoaffective disorder and Mood Disorder With Psychotic Features have been ruled out because either (1) no Major Depressive, Manic, or Mixed Episodes have occurred concurrently with the active-phase symptoms, or (2) if mood episodes have occurred during active-phase symptoms, their total duration has been brief relative to the duration of the active and residual phases.

*(E) Exclusion of toxic substances or a general medical condition.*

The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition.

*(F) Relationship to pervasive developmental disorder.*

If there is a history of Autistic Disorder or another Pervasive Developmental Disorder, the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations are also present for at least one month (or less if successfully treated).

The subtypes of schizophrenia are Paranoid type, Disorganized type, Catatonic type, Undifferentiated type, and Residual type.

### 1.7. ICD-10

The committee that developed the DSM-IV-TR definition of schizophrenia attempted to bring the definition of schizophrenia more into line with

international practice, as defined by the 10th edition of International Classification of Diseases (ICD-10) issued by the World Health Organization (2007). However, the specific criteria and decision rules that were adopted by the DSM committees differ from the narrative ICD-10 description of the disorder.

*The schizophrenic disorders are characterized in general by fundamental and characteristic distortions in thinking and perception, and affects that are inappropriate or blunted. Clear consciousness and intellectual capacity are usually maintained although certain cognitive deficits may evolve in the course of time. The most important psychopathological phenomena include thought echo, thought insertion or withdrawal, thought broadcasting, delusional perception and delusions of control, influence or passivity, hallucinatory voices commenting or discussing the patient in the third person, thought disorders, and negative symptoms.*

*The course of schizophrenic disorders can be either continuous or episodic with progressive or stable deficit, or there can be one or more episodes with complete or incomplete remission.*

Subtypes recognized in ICD-10 include paranoid, hebephrenic, catatonic, undifferentiated, postschizophrenic depression, residual, simple, other, and unspecified.

### 1.8. Demographics and Dual-Diagnoses

Symptoms of schizophrenia usually begin in men in their late teens and early 20s and in women in their mid 20s to early 30s. Onset rarely occurs after age 45, or before puberty. The symptoms of schizophrenia affect men and women at about the same rate, and occur in all ethnic groups and cultures around the world. The better the premorbid history in terms of educational and vocational attainment and relationship history in general, the later in life symptom onset will occur. People diagnosed with schizophrenia tend to abuse alcohol and/or drugs more often than the general population, however there is no evidence that substance abuse causes schizophrenia. Substance abuse can make matters worse however by creating additional life stressors that may trigger a recurrence of active symptoms, by reducing the effectiveness of medications, and by reducing the likelihood that patients will follow a consistent treatment plan.

### 1.9. Criticisms of the DSM-IV-TR and ICD-10 Definitions

Brockington [12] views are representative of criticisms of the official view of schizophrenia. Brockington argues that the richness and diversity of the

psychopathology encompassed under the diagnostic category schizophrenia is the source of the weakness of the construct. He notes that the symptoms of schizophrenia—verbal hallucinosis, passivity, delusional systems, defect symptoms, and deterioration—are not unique to schizophrenic patients but continuously distributed within the entire population of psychotic patients, including those with affective disorders. Brockington argues that the problems of patients are serious and real, but the diagnosis of such a wide range of problems as a single disorder-schizophrenia is a conceptual artifact, one which does not correspond to any natural cooccurrence or grouping of patients and their problems. Brockington concludes that given our human tendency to reify scientific terms no matter how tenuous their empirical foundations, it was inevitable that schizophrenia would be viewed as a natural disease entity with well defined causes, treatments, course and outcome (van Os and Tamminga [26]).

## 1.10. Summary

The DSM-IV-TR concept of schizophrenia is based on the assumption, beginning with Kraepelin, that this is a brain-based disorder that can be reliably identified and validly defined by the use of specific behavioral criteria. Critics argue in contrast that schizophrenia is a loose, descriptive grouping that has not been validated in terms of clinical findings, but is based on tradition and orthodoxy rather than scientific evidence (Brockington [12]). As of today the operationalized criteria of DSM-IV have not resolved validity issues in terms of reconciling diagnosis with research findings. There is no currently acceptable alternative to the concept of schizophrenia as defined by DSM-IV and ICD-10 however, it is important to bear in mind that many issues remain unresolved regarding the nature and causes of schizophrenia. It does appear however that a consensus is growing that (1) schizophrenia probably refers to a heterogenous group of disorders as Bleuler believed, (2) there are multiple etiological pathways to the disorder that interact over decades of human development, and (3) persons meeting diagnostic criteria have unique constellations of problems (Spaulding and Nolting [24]).

# 2 Symptoms and Subsyndromal Patterns

The diversity of individuals diagnosed with schizophrenia has motivated clinical researchers to search for reliable subtypes that can be validated against other measures and treatment outcomes. The subtypes listed in DSM-IV and ICD-10 are used in clinical settings, however these subtypes have not been found to be very useful in terms of temporal stability and prognostic value. Over the years alternative groupings that have been proposed and found wanting include reactive versus process, acute versus chronic, paranoid versus nonparanoid, and most recently positive and negative. The positive versus negative dichotomy generated the most interest although there is disagreement as to whether these symptoms should be conceptualized as independent subtypes or as cooccurring dimensions of the disorder (Crow [32]). Many individuals diagnosed with schizophrenia report experiencing hallucinations (false sensory perceptions) and/or delusions (culturally aberrant false convictions) and some degree of disorganization of thought and behavior, particularly during the active phase of the disorder. These symptoms are refereed to as "positive" symptoms because they seem to represent intensifications or exaggerations of normal processes. Other patients, particularly after the initial active phase, evidence reductions in behaviors and capacities; these are referred to as "negative" symptoms (e.g., alogia, anhedonia, asociality, anergia, amotivation, flat affect). When negative symptoms endure and do not appear to reflect the side effects of medications, they are labeled *deficit* symptoms (Carpenter et al. [31]).

Researchers have used multivariate analyses of positive and negative symptom ratings to determine subtypal patterns. These studies have consistently shown that negative symptoms are relatively stable but, positive symptoms form two separate factor groupings. Hallucinations and delusions (particularly well-organized delusions) form one factor, referred to

as positive symptoms or "reality distortion," and a separate disorganized factor (e.g., formal thought disorder in the form of tangentiality, derailment, and bizarre thought and behavior); Andreasen et al. [29], Brekke et al. [30], Kay [34], and Liddle [35]). This three-factor model of symptom patterns is listed as a provisional classification in the Appendix B of DSM-IV-TR. It is suggested that clinical heterogeneity of schizophrenia may be reduced by the use of these symptom dimensions, since each pattern may be associated with different risk factors and developmental pathways, social deficits, course, and likelihood of response to different treatments. Evidence indicates, for example, that negative and disorganized symptoms are significantly related to impaired social and community adjustment, including low levels of social competence and fewer days worked (Brekke et al. [30] and Liddle [35]), while positive symptoms are minimally or not at all related to social functioning ratings (Brekke et al. [30] and Liddle [35]). Studies have also found that the symptom dimensions are superior to diagnostic categories in predicting course, outcome, and treatment response (Dikeos et al. [33], Peralta et al. [36], and Rosenman et al. [37]).

Persons diagnosed with schizophrenia are obviously more than just a grouping of symptoms. They differ widely in terms of background, premorbid adjustment, comorbid disorders, intelligence, talents, and level of social functioning. The experience of a psychotic episode however, often has a profoundly negative impact on one's life, including the quality of relationships, life circumstances, and perceptions and future aspirations of both the person and those involved in his or her life. Symptoms expressed in the form of delusional thought illustrate only one facet of this disorder. Given the limitations of a one dimensional presentation of examples based solely in the form of delusional language, representative samples that illustrate important aspects of the three subsyndromal patterns are provided in the following paragraphs. For example, an individual with prominent delusions of persecution and grandeur may be diagnosed a with schizophrenia paranoid type associated with one of the three dimensions.

Schizophrenia, Paranoid Type, Episodic
Current:
With severe psychotic dimension
With absent disorganized dimension
With mild negative dimension
Schizophrenia, Paranoid Type, Chronic
Current:
With severe psychotic dimension
With mild disorganized dimension
With moderate negative dimension

The following monologues abstracted from actual interviews help illustrate the range of content associated with each of these dimensions.

### 2.1. Psychotic Symptoms (Psychoticism/Reality Distortion)

*1. Beverly. Well my half sister said that I had been acting a little funny. But she hadn't seen me before—she saw me at my Aunt's funeral and that was approximately eight months ago. Then she saw me in the store, she works in Titusville. I went by there one day that was about a week before I came in here. And I asked her if she had my computer part. Both she is in merchandising and I had been in merchandising. I asked her if she had my part, you know, computer part to my work, and she said that she had not. And I tanked her and left. So how she could possibly consider that funny behavior I do not know.*

*Well I've been debriefed. I think that's on the record here. I've been debriefed and computerized. And I had been in merchandizing so naturally one part of this debrief is merchandising part, and I wanted to go seek employment again so naturally the thing I was going to seek would be in my line of work, merchandising. I wanted to find out if she had that particular part of the computer.*

*That's correct, debriefed. You don't know what debriefed means? To divest one if his information is to debrief him. You've never heard of the word debrief? Well that's what I've gone through. Well see I was being treated for tuberculosis at the same time, deep in the brain, well see I had miliary tuberculosis and I was being treated for the tuberculosis and at the same time I was being treated for the tuberculosis I was also being debriefed of my information. You know anything about nuclear medicine?*

*I think I heard something on the TV one night here to the effect that a nuclear unit had been added here? Well it's part of the same thing. Nuclear medicine means treating medical problems from space. Atomically, by nuclear means, or space medicine it's all the same thing. You've done research so what I'm saying to you shouldn't sound at all far and uh, at this day and time when we already enter space medicine not only into space medicine we enter communications—laser, maser, you are aware of the laser, maser are you not? Radar sonar, all a part of the communication process. Well I was treated by a laser, by a laser. For the tuberculosis.*

*Well they took everything from me at the same time. Just treating by laser would not necessarily divest you of your info, I don't mean that. But both things happened almost simultaneously. While they were seating electrodes, you plant electrodes in order to treat by a laser. While they were putting the electrodes in the lungs, the brain, and in the vagina, all up and down the intestinal tract, everywhere. When you have miliary TB it means that your*

*body is more or less uh commonly infected. It's very rare to have military TB and not have the entire body infected. So while they were seating the electrodes and whatnot they began to debrief me. Well they divested me of a good portion of what I know. You cannot take all of the information because you know you have to have some relation to something in order to get every bit of it. The brain waves are working via transmit and receive. But you can take darn near every bit of it but you can not take all of it due to the fact that you have to have association with something that'll bring up something. You know as you associate with something else I can read an article over there and it would bring to mind something else that hasn't been divested. But in a general sort of the way I have been divested of my information.*

*Well it's been rather difficult you see because that's been a period of 3 years since I was debriefed. So since that time I've been debriefed I'm coming around a little bit you know. Of course I read and I do very well I've been doing research during the period. I have about three thousand books and I've been working in research. Three thousand books and magazines more than that now, I had about that when I started to add a few more. And I'm very interested in research especially in the since I enter a nuclear area of life, or era of life, it's a very interesting thing. Especially interesting that so few people know enough about it. How can we be up in the moon and people not know there's such a thing as nuclear medicine, or atomic medicine. I find that almost impossible to believe that they don't really know anything about it. Don't you find it rather unique?*

*Well no a piece of the computer acts with me at all times, otherwise I would be rather confused. A piece of it has to come forth otherwise I, how would I manage? I haven't been divested of everything that's almost impossible because it's a lifetime of information—fifty years of information. But in a general sort of way we covered areas of each, each area where I had worked. Each part of my life, my workday experiences as well as my employment experiences, what I liked in fashion world. What went on as far as I was concerned there, and what I personally liked in the way of types of clothing, this is what was very interesting in it. What I thought of different types of materials and what type of wardrobe is best for a working woman. It's endless but you don't grab every bit of it because in order to do that I'd have to have endless materials before me that would relate to that sort of situation.*

*TB researchers did it to me. Have you ever heard of TB research? Why did they do it to me, well they thought I was very interesting it seems that. No I don't think I could have done that to someone. At one point I thought it was interesting because the laser it's a strange thing about the laser. It can give you insight into things, insight and revelation. You can see deeply into people with it, the laser. Well I mean that various people who I thought were*

*one type of person more or less when the laser is in there you'd be surprised at how they open up and you can see other parts of them, facets of them that were not revealed before. It's difficult to explain. Electrodes were put all through my body, in the areas they were working heavily. Lungs, brain, uterus. Those were the main parts.*

*2. James. When I get excited I want to kill. I get full of highest level of rage. Mainly toward myself. I don't' know why, it's just always focused on myself. I never go out and seek anyone else. It's always me I want to kill. I feel like there's somebody else inside my body and I try to get to him. A person within me does things that activate me, make got to really violent. And I go there and I when I get there, going through the head is what I go for, because I know whoever it is, is speaking out of my mouth also so it's …*

*Not to anybody else. I don't present myself as violent to anybody else. The one I think of hurting the person that I feel is inside my body.*

*I think it's the Devil because he does try to damn me. He is trying to curse me. Get me in trouble, damnation wise. Damned, he wants me to be damned. I'm sitting here on wooden seats, and sitting on yellow seats, and pink seats, and doing it purposely, being led over when I look and get ready to sit. See that's his voice. That's him talking right there. I've always believed that yellow and pink are the Devil's colors. Like most men wearing pink shirts shows fag, gay. Shows you are gay, a person of the Devil.*

*I thought all the lines being painted yellow on the streets because the Devil wanted his color seen. And its just, like, I read the Bible a couple other days ago, and the devil showed me the word "cum" written in the Holy Bible. C-u-m, cum. I was reading through the Bible, and the Bible speaks to me when I read it. My eyes will catch phrases in the bible that'll say something to me. Like as though it's saying Hi Joe, how are you doing. It'll say Bless you, God is great, God hears you, God is listening, like that, God is here. And like the Bible's talking to me and all of a sudden Satan lives for the Devil, the beast, the dragon, fire and hell, the pit. I put it down. I closed it and put it down. As a matter of fact I threw the Bible that did that to me the garbage. It's in the trash now. It was the New Testament because all I had was the New Testament.*

*It's not just that, it's like my body being led to stand up against a building, and my thoughts telling me to stand here you're about to marked for the cross. You know actually go to a spot, a location, and stand there, and drop everything you're holding, ready to receive a cross to me. I feel like the person is trying to damn me, to go to Hell. And the only way you can damn somebody that's a Christian to go to hell is to get somebody to believe that he's Jesus Christ and that he's going to die on the cross and go to hell with all the sins of earth with him. And if you can get somebody to believe that, then yes, that*

*person is going to go to hell after dying very brutal death on crosses. And go to hell … accepted it because he did believe that he was Jesus Christ. And that's what my voices are trying to get me to believe, that I'm Jesus Christ. If I'm anybody at all, I'm God Almighty. I'm not Jesus Christ.*

*That's a trick of the Devil, what that does is, Let's say and I know that this is a fact, that the Devil would come down here right now and stand here if it was written and allowed for him to do that. Could come down here and sit here, right here and in front of you, while recording, say Joe, who are you? And if I say I am the Lord they God, Joe, he would tag me for the cross. Because my identification card says nothing about um Joe, the lord thy God, but it's the truth. I'm not Jesus Christ.*

*I'm from outer space. Another universe. Because I read in a magazine that the planets that Galileo discovered were planets that I had lived on. And the Galileo said that in the past … but it's the Galileo space module passed the planet Jupiter and it was sent into another dimension. It was science fact not science fiction.*

*3. Frank. I came here … specifically by the universe which is the highest thinking cell in my head. The universe is the highest thinking cell in my head. That's the highest thinking cell in my head. The first cell ever to think. There's only one of them. It's a two billion year old cell and it's in my brain it's in my subconscious. Two billion years, that's how long God has been around. For two billion years.*

*It announced itself that it's in there in my unconscious by a message from the God … brain. Then everything, around me disintegrated. It happened by radio waves, everything vanished except for myself and my speaking voice, that was the only thing left. I just escaped into my subconscious, into the universe which is my subconscious. It's a microscopic cell … it happened to show me that I was the universe. It didn't have to happen. The things didn't have to disintegrate, but that was what happened to everything to preserve.*

*There's another concept of the universe too that refers to all varied things. There are two concepts of the universe, one is the highest thinking cell and the other one is everything. They're on the map all over space. In the God family there would be six individuals and they would have the highest cell similar to the universe. It will have six individuals. It will have my father and my mother and myself and my wife and two children, a boy and a girl. They're just waiting above the Earth especially God waiting to come down when the time is right. To pick me up to take me back to heaven. It'll take many years to get him down.*

*I am here to kill off the people persecuting where I was and to protect all the good people in the world. For five years they persecuted me as an*

*individual … then they tried doing it as a life span captive … and I had to be born again. Good people who weren't deceived will be saved. The others will aspire … have abject pain. They will die because they've been bad seeds of the X family and they will suffer punishment because they were the first ones to punish me. The white people did because they thought it was necessary to kill God so that they could continue to exist as they want to … that's the second perversion of the whole concept, the whole concept why everyone went crazy … and they could get the Negroes to do anything they wanted them to do for money. They were paid to get rid of me, and I was dead for five days, perfectly dead … punishment … buried … and everyone could see what they did to punish me. That's why I'm here to get even with them.*

*Frank several years later. That depends on what you mean by what age is. If you mean by actually, I'm two billion years old. If you mean by date of birth then I think I'm one million years old born through my mother in heaven a million years ago. If you mean by arrival on earth I arrived on Earth 59 years ago. If you mean by resurrection on earth after 5 years of being murdered and tortured I was born again 54 years ago. So for legal purposes and the purposes of this hospital I'm 54 years old.*

*I was tortured and murdered because I tried to protect God's plan to judge and perfect the earth. I was murdered and tortured. I was bled to death followed by being shot with guns and knives and eventually cremated, burned up and my soul escaped from my body and made myself over again in the household for the family that murdered me. And I lived for 18 years until I graduated from high school. And at my graduation exercise it was revealed? My identity as well as my plan for the earth, as the Son of God.*

*Whether I'm married depends on whether you mean in this lifetime or not. If you mean this lifetime I've never been married … I have a wife waiting for me as infants and I'm an infant in heaven. I'm in multiple locations. I can be anywhere, anytime that I want to be. I am an infant now an infant Jesus in heaven dream … I believe I'm an infant now dreaming … to be anywhere I want to be at anytime. This is just one place I am. I'm many places at many different times. My imagination is real because my dreams are real.*

*This and heaven are the only places that I'm aware of right now. But during the 1990s I was president of every country in the world. And I am knowledgeable of every individual who had been judged.*

*I have no conscious memory that I exist in two channels. In one channel I'm an ordinary man. In my subconscious mind there are many channels in the God that I am the universe. The God is separate from the man, I am both, the man and the God. The God is infinite the man is just as ordinary as you*

*are for all intents and purposes except that it is the guide, the controller of my subconscious mind which is infinite.*

*I was in heaven for two billion years plus one million in the head of my father thinking what was to come to pass in the cosmos including what each individual would do on an individual basis … life span. It took me two seconds to plan a human life span and I was thinking a plan for each individual on an individual basis.*

*I was brought here by a conspiracy of people here at this hospital. The people at this hospital discovered that my by consuming my flesh. In the seed of my flesh is the messages that are the subconscious. They consumed my infancy and discovered that I would be born on earth and that brought me here as an infant first in elementary school, then in this mental institution, then in college. They thought they could acquire all my knowledge by consuming my flesh and they thought I was related to the Smith family because I was raised by that family. And they wanted me here to consume my unborn children to discover the truth of the universe then to destroy me and have my children enslaved in their heads forever, to make things the way God made the planets and the stars.*

*I'm safe here now only because my brain has God watching me. I was not safe in my community because they wanted to destroy me and steal the car that my father had made me. They stopped me on the road in my firebird which was a secret vehicle which can transform into my special car if I want it to, by putting it in my cell that had been projected out that way. Anyway they stopped me on the road and demanded that I get out of my car and commanded me to give them instructions to operate my car and then told me that I would build those things because I have a real artsy mind. And they thought they had destroyed me as well as taken the secret over and that they could use it to get to go to the cosmos. They thought that they could do that. These people from mental health and the hospital were all in conspiracy to destroy me and to stop me from telling God to give me a final judgment total destruction in hell which is the final act in creation.*

*I'm safe here now because God is watching me, God is, and I have capacity to use any mechanism that is to be imagined to protect my thoughts if I have to.*

*This my father announced to the world. My father announced, God announced that to the world. And I taught there for one year at vicariously from projections from my mind as well as in universities throughout the world vicariously by projections from my mind. But in three years I graduated with a BS degree. The doctors would say that I hear voices because I hear radio messages from God but they're not voices. They're telepathic messages that come through which can be modulated which can be turned on.*

*4. Edgar. I've heard voices for 10 years. I believe that they really are people speaking to me I believe I have extrasensory perception or something. I don't think they are hallucinations. It's all very realistic and things like that. I mean if I hear voices as hallucinations, I would know they are unrealistic. I hear people talking to me and I talk to other people. I hear two kinds of voices really. I have conferences with people about religion and things like that, and on the other hand I get beaten up by the voices by other people. I've always had this kind of balance between work and being beaten up, as if one would kind of counterbalance the other just to keep from overdoing anything.*

*Oh it's what they say they say horrible things. They ask questions, and interrogate. Interrogation is painful. They want to find out about my religious knowledge and things like that. I don't talk at all, in the religious conferences I don't talk at all about the bad behavior people. I talk about my latest discoveries in theosophy. I mean really theosophy not theology I hardly know the difference myself but I think that's true. Well I think those people are relatively sick. Don't you, don't you think they're probably sick?*

*I think they're sick and I think I am helping them with their problems. It's like undergoing torture or something it's just as bad as undergoing torture. But I've learned how to take it so that I don't suffer anymore. After ten years of suffering I've learned how to take it so that I don't suffer. I've been going through this for ten long years.*

*And only in this last month I've discovered that I mustn't do my behavior for conferences while I'm undergoing talks with these other people. I just change my behavior. And after all it's good for relaxation and whatnot. But the bad people don't know I'm having conferences because they don't listen to me. I don't think they ever find out about them. They interrupt them but then the conference ends. The conference ends as soon as those voices interrupt. It's very sudden the way those conferences end. It comes as a sudden interruption from interior people. It's all in my voices. I don't get visions of people it's all in my voices. I never discovered who it is. Nobody's every really told me whether they're true or not. So I can't really believe a single theory I hear. Some people that have voices I've heard pick them up and believe that they're true but I'm not one of those.*

*Well I just I think they are jealous of my wife and children, but I've never seen my wife and children. So I can't be sure that it's true. Because the voices might be hallucinations. I had the children by masturbation.*

*That will produce children I believe. I think that it gives a sexual reaction to the wife which fertilizes the egg. I do not believe in this theory that you have to shoot semen up into a woman's uterus and fertilize an egg by . . . I don't believe that. I think that you give her a sexual reaction by masturbating. I think it simply transpires on her too. She does it by talking to me. A kind of*

*sexy talk. It was in my voices. And then I masturbate to that and then she has the children.*

*I've seen her in visions but I really don't know who she is. I was always told to believe there was a woman that I was married to. But I never spoke to her about or anything like that. But I'm not married now.*

*I still have the children I'm bringing up the children. And I know all about bringing up children. It's just something I know from theosophy. I really don't do very much for them they're very independent. I've looked after their religious care and things like that. And they seem to be doing fine. There are eight boys and two girls. I can tell you their names . . . because in my we always felt that biblical names went well with the name X. It sounds good.*

*Edgar several years later. Well I don't know much about theosophy, I'm getting interested in criminology and police work and things like that. I think I'm doing a lot of police work, I think I can do it as well as anybody now. I hope that someday I might even go down to the FBI office and get signed for it. But the doctor said he couldn't assign me as yet. I do it over my voices. I guess that is pretty unorthodox, but police work is what I do in my voices That's mainly what my voices are about lately. I'm trying to major in police work now. Police work is really what I'm really trying to do now.*

*Well it works like this they come on with misbehavior. Misbehaviors for me to check out and report and things like that. I said the voices were misbehaving so. But it's boiled down to police work dealing with them. You asked me about my work, so I simply have to make it police work because that's what is interesting me right now. I do it in OT and everything. I'm always busy with my voices or something.*

*I don't know much about is since I've never been to a police school. I would have liked go but I didn't really go, and I'm here in the hospital so and I don't plan to go. I really don't know much about what it consists of in terms of formal technology and technical terms.*

*All I do is check out what the voices say and report it. That's basically what I do. I check out what the voices say or what the patients do on the ward for instance. And report it. I mean I do report it over my voices, and I report it to the police over my voices, and they know about me over the voices. It is secret though and one reason is that it has to be secret. I don't wear a uniform or anything like that because I don't want to be caught doing it no telling what would happen. It's dangerous and secret. I don't know what would happen it would be dangerous.*

*Misbehavior, the voices do bad behavior, they do crazy talk, when the voices start doing crazy talk it's the most horrible thing. They do oh spoonerisms and malapropisms and mispronunciations and they say the most awful*

*words. They think I talk like that ad so they think they can afford to do it. I think they're trying to pass as lunatics or mental patients or something like that and I don't quite know why. I think they're a little bit jealous of me being in mental hospital, I think that's why they're doing it. But it is really plagiarism, and that kind of thing that is a serious felony. I believe that's why they're doing this crazy talk. It's an awful thing to have to listen to. And anyway it is a serious felony. That's plagiarism. I think they can get ten years for plagiarism at least for doing it. Plagiarism and brutality and posing, posing as a mental patient, impersonating a mental patient. All those things are serious felonies.*

*I can't begin to say what will happen to them. One thing I tend to is I am very talented at getting confessions from people. But what I'm mainly interested in is cursing. What I'm really specialist in at the police is cursing. And when I say felony it is really a variety of cursing except there's an element of brutality in this. And the brutality is just about the worst thing in it. They are they are really committing brutality that I know about and there's a lot of brutality all around me. It's connected with cursing. I know more about cursing even than I do even about brutality. They are cursing a great deal and that's why I'm really in the police. I know about cursing. That's why I make it a kind of specialty of it in my work.*

*I'm not quite clear really on whether they're trying to upset me or not. They do upset me. It might be just that they want to do it and aren't aware of upsetting people. I don't know much about that. It's probably in someone else's work or something. But I know they do want me to hear it because I'm the person they're talking to. It might be as I said for their selfish ends or something without much concern about what I think or feel about it. If they knew that I was reporting it to a police department they'd probably be a little bit discouraged. But I don't want them to know that.*

*I make my reports to the police through my voices I believe that it's some sort of matrix designed to tap my memory banks. I think they get things from me that I just heard and remembered in my subconscious. I think they can get reports from that, because they have airtight technology for doing things like that. Police have very airtight technology I suppose you know that. I believe they do that because it has to be awfully secret. I really don't want anybody to catch me reporting things to the police. If they accuse me being a tattletale or something I'll be in serious trouble around here. Not many people know that I'm trying to do police work. But that is what I'm trying to do so that's mainly what I have to talk about.*

*I don't know much about theosophy. When I did that it was probably a long time ago. I was probably just learning it. I don't remember much about theosophy. I'm not even sure what it is, so I really don't know what theosophy*

*is, if you must know, I really don't know what it is. I probably thought I was doing it but I wasn't. I seem to remember that a few years ago I did have an idea of what I was doing in science and so forth. But I've never been clear about any of the sciences and what they consist of and I'm not doing anything very scientific in the police.*

*I do like to work, one thing I love to do is to work and to keep busy working. In fact it's important to my mental health because if I don't work I get disturbed. I have to work all the time or be disturbed, I found that out. Disturbance is terrible. I start yelling and screaming and dancing around and everything. I have seizures if I don't go on working. I must do that or I'll have seizures. I'm addicted to my work. And work is a nice habit I think. Everybody approves of work really. But so few people like to do it I find. Even people with jobs don't like to work as much as I do. Sometimes I think come kind of work mania is what I'm probably here for. At least that's the only ting I can think of, that I could have as a mental illness, some kind of work mania. A work maniac, is what I think I must be. But that's not what I'm here for because I could just get talk therapy for that. I don't keep disturbance any longer than I can help it. I yell and scream and I don't like to yell and scream because it's kind of frowned on in my building. But, sometimes though I just can't do anything but scream and it's horrible.*

*5. Judy. Yeah, my husband was leaving me, and I thought he didn't love me anymore. And I started hearing voices and I thought I was losing my mind. And instead it stopped right at my mind like I was going to have completely losing my mind completely. It stopped, it seemed to happen inside my head but my mind stayed intact. And my husband had left me and he left me with a child, and I couldn't pay the bills. They were coming in, bills were coming and I hadn't gotten my allotment check and I wasn't sure I was going to get it. All of a sudden everything came on me and I thought was my house breaking, my back hurt me bad, and everything. And then it just all came on me I started hearing a whole lot of voices all at one time.*

*They were just talking, just people living someplace else. Everyday people but it seemed like they were all talking and they were talking about me, you know. They were saying "Well she isn't doing the right thing, and she's going crazy," and all that, you know things like that. That is what they were saying to me. It came so fast and in the middle of the night one night I heard someone holler and I thought, well I've really lost my mind, And I got up and turned on the light and I saw that I still knew what I was doing, I could see myself in the mirror and everything you know. And I thought well something will have to be done so I waited until the next day and I got up and called my husband*

*and asked him if he would come back and he said no he isn't coming back, he would come by and bring my groceries to me but he wasn't coming back.*

*I heard voices for about a year, and I thought people were staring at me and everything. And for a while I thought the doctors were staring at me and I could go around trying to act—see I thought the world revolved around me and I'm going around trying to act like the way I thought I should, putting my best foot forward and I'd wear my best clothes around. I thought the doctors could see me you know, were staring at me, the nurses and all. I thought that everybody was interested in me. I did a whole lot of writing. I wrote a whole lot of essays when I first came in and I wrote some short stories. But I still thought in between those times I thought everybody was staring at me and watching everything I did, you know and not only that I thought they heard everything I said. And I was going around, constantly going around scared. I didn't sleep at nighttime you know. At nighttime I'd hear these awful voices and I think they were criminals hanging around me at nighttime. And sometimes I thought that hospital was being taken over by new people, all of a sudden new people would come in and take over the hospital and all the old people had gone away.*

*And I'd ask, I'd come out and ask "Has the hospital had changed hands?" And I finally caught on and got over that. I thought everyone's job was to watch me, yeah, was to watch me. I was the center of attention. I thought they watched me even when I smoked a cigarette. I still feel like people are paying attention to me and spying on me. And I can't get any privacy. I try to wear a head scarf or something in my hair all the time to protect me. I put a comb in my hair if it gets real bad. It drives them away, it drives these people away. It goes away for a little while and then it comes right back. They say "No we know you're homosexual." And I have to say, "No I'm not homosexual." And when I'm working in the building store surrounded by the walls I hear that. It comes out of the walls, it comes out, and I say "No I am not homosexual." And I see al those men sitting in that social room and wonder if they hear it. And nobody reacts, everybody goes on and minds their own business and nobody acts like they hear it. But I think they hear it, you know. But they don't show any emotion or they act like they hear it, but I'm so intense when I hear it. Then the next day the next morning comes and I'm calm in the morning, I'm calm in the mornings, after I've slept I'm real calm.*

*6. Florita. Well something about my case which is different from other cases. And it is that I started having revelations from God. And he dictated me a book. And it was a book on psychiatry and religion and I came out, that was dominating me and I came out with all these things you know to write in the book about psychiatry and religion. Actually they make sense, but I couldn't*

*find that they made sense … dictating the book. So at that time is when I realized that the book was useless. But he revealed to me that he was going to dictate a good one, for me. But it has been already two, two years since that happened. And nothing else has happened anymore.*

*That was before my daughter was dead. When she was sick. And that moved my emotions. And it was for about seventeen months, I think, I was with no emotions. It was kind of torment, you know. Torture on me. It was like an empty bottle but the difference is that the bottle was made of glass. And I'm made of flesh and bones, so. Well in the same book it said God had removed my emotions because I loved my daughter more than I loved him. That was one part of the book that he dictated.*

*He said that my husband did this because I loved the children more than I loved him. Well he explained that way. But I think he removed my emotions to put me in the position where I wouldn't be able to do anything against anybody. And I had to watch my husband and his mistress over my house, making love together. And actually the three of us too. And all this was directed by God to happen. To show me what mixed up people about sex can do, about sex when they are not sexually capable. And he also dictated me or inspired me how to educate my daughter, the one who was living with my husband, how to educate her sexually. And the child came very mature and she's fine. But God instructed me how to do it. And he instructed me how to clear her mind before the facts of life were told to her. So I have, having written that book, I appeared to my husband and other people as if I were, you know my mind was not right. And they wanted to make me see that I the book was no good but I couldn't see it. I couldn't see it at the time I was writing it. Only after he stopped the inspiration I could. And then as I said it lasted for seventeen months, the removal of my emotions, before he returned them to me. And so I think sometimes that maybe … the knowledge I used to have as a bilingual secretary. He revealed to me that he was going to make me a psychiatrist but nothing has happened, it is already two years. In two years nothing has happened. But I've been writing, letters with a different knowledge, the letters to my family, to my people. I got my emotions returning too, they are returning mature, very mature, and if before I felt so bad when I would be away from my children, now I don't feel bad. That means my emotions are stronger.*

*Stronger yes, too strong because I don't like to feel like I don't care about m y daughters, you know. But of course that must be a good idea according to him so as for me not to suffer for them. But I don't know why God allowed all these things to happen, when now he has me with nothing to do. I cannot work a job, I can not do anything, you know, like a normal person. I mean he taught me all those things, he made all those revelations to me and two years have gone by and nothing else has happened. And he even has revealed to me—a*

*live revelation about six times. They were live revelations of himself. As you know God is not a person, he's a spirit. And I had about six revelations of God as a glow always by shaped different ways. The first revelations was at home. I was lying down in one of the children's bed, and at the bottom of her bed I saw sort of like a flame to a match, you know, a flame? This big. That was the first one it's a glow. And another one in the backyard at home. My daughter saw it too. It was like a ray from here to, it uh um. It landed or whatever, in the middle of the yard. She said, "Mommy I saw God." And I said "I did too." But we made no more comments about it. Then we went to a party, and at that party my husband was dancing with someone else. And I was sitting in the chair, and God was between the two of us, making me feel my husband like thousands of miles away. I could see him there but he was not close to me, he was thousands of miles away.*

*7. Carol. I started feeling like I didn't want to eat or sleep. I feel like I am God. I know that I can't be God because I am a Christian. It is like being between heaven and hell, like after you have been judged it is either left or right. Right now I feel like I am on God's side. It is like a fight. Its weird, I just want to fight somebody. Its like I am fighting the Devil. I want to be in reality but it is hard. I think about the Devil all the time. So I get the Bible and read it, but then I can't stop. I am not going to hurt anybody but I hear this stuff in my head all the time, like kill him and attack him. I just want to be able to relax. And stuff is happening to my body (jumps up and begins making karate motions toward the interviewer) like this. What is this? Something just happens and takes over my body but it isn't me. I feel like somebody is manipulating and controlling me. I feel like I am fighting against an evil spirit I have a hard time finding reality, I look weird too. I've got big breasts look (pulls off shirt to show chest). Am I a man or a woman? I hear voices all the time asking me: Are you a man or a woman? People make fun of me. They don't know that Dracula is in my bloodline and I like to draw blood. I hear stuff telling me to draw blood, that I am Dracula, that I am Jesus, that I am God. I hear this in my head constantly. It is like I lived a long time ago. I shaved my head and my whole body. I don't like all this hair but I am not gay. I am not gay, but I hear these voices that call me gay. It is like I was supposed to be in heaven but I ended up in hell and I am in both places now. Sometimes I wake up in bed in the middle of the night and it feels like people have come into my room and gang raped me while I was sleeping. I think I am a transvestite or whatever. It is scary. I want to be like a marble statue. I think they make those statues by taking a dead body and making a mold from it. It is like none of the organs of my body works except my eyes and my heart.*

*8. Maggie. I've had spiritual experiences, and I'm interested in spiritual psychology, and it's interesting because I am sick and so to distinguish between spiritual experiences and sickness is um a very interesting experience. I also question the value of the experience … if there's a God, but that seems trite. Um so if I'm questioning the value of these experiences there's not much point in dedicating my life to it, is there? But on the other hand, when I started getting into this stuff, I said well if this stuff is true it probably is the most important thing I could do. And so I've been convinced that there is order in these experiences, that they do happen, and that they may mean something. I'm very pure, I have no sexual desire anymore. And I'm a really, I'm a really masturbator I know what sexual desire is like. So I know that these spiritual experiences have freed me from desire, or as John put it in the New Testament, I can perform no evil anymore. And it's not that sex is evil, it's just that I could identify immediately with what he was saying. It's not only sexual desire it's that you have no desire period. You don't you don't really know what's going on after this. Because desire really rules our intelligence. I hate to say it but I think that it's the penis. And I hate to take you on my personal trip but you're listening. I think the penis is the foundation of intelligence. And I don't even like the penis, you know. It doesn't do much for women.*

*But, what is the value of spiritual experiences? I'm not sure they have a value except to say that I think they must be God, you know. But on the other hand I'm impressed that God seems very limited in what he can do. Like I'm not sure about the miracles that he can perform. I'm very concerned that people are sick and I'm concerned about my own sickness. It seems so, I don't think I would have gotten in this condition if I hadn't had spiritual experiences. I think they opened me up. It's a double edged sword spirituality. I think Jesus said that somewhere but, it's a double edged sword. So I'm also convinced that Jesus made some mistakes based on my own spiritual experiences. So it's given me a good education, I mean my experiences have taught me what civilization is about, but um, you know people will always say Who is this psycho, what is she saying? Well I'm just not sure it's worth committing my life to. But on the other hand the beginning of psychology and I've got to find a book, and I'll probably go to the library and then they'll kick me out. My mother says they will; they won't like people wandering around. It's a public institution, so—yeah I hope not. But I'm not dressed as well as they are probably.*

*I used to hear voices, it's gotten to the point, I'm not sure what's happening, I've reached out to a spiritual master … maybe you've heard of him, this is psychology, I know they don't have you studying it but this is psychology. My spirituality is really a hobby. It takes time to read and to think through these things. You have to be really, you have to be a different person in order to go*

*through these experiences. You have to do no harm to anyone, you don't attack anyone. And that's why it's amazing that since I've been here I was involved in a physical brawl here. Oh, talking about the CIA, talking about drugs all the time, talking about sex. I think I've got a homosexual, I mean I know I've got a homosexual spirit. I, this is something, another controversy that I'd like to work out as a psychology student if I went this way. Is that I'm convinced that there is a spirit that's not myself. This guy taught me to be nefarious. I was so innocent. I did not know the word nefarious.*

*It was always the same guy who would pretend to be other people. It was always the same voice.*

*One of the reasons that I could be thrown into the hospital because it's seen as being dangerous to be hearing voices because they do command you. Well that's a bunch of horseradish. I mean, its … I think this voice this spirit may still influence me subconsciously. Give me dreams, things, like that. He is supposed to be merging, and I think this is a result of the spiritual master that I contacted. I asked her to help me with this spirit. And so maybe he's merging in me but it's not totally out. I'm very suspicious of the voice. He hates me, he wants to kill me. He's told me that finally, yeah. I had a car crash because of the voice. I think he could have blinded me. He'll burn through the skin of my, through my leg, and it's like—look you're supposed to be a fabric of my imagination. You're not supposed to exist, and I know that you do exist you stupid spirit. He made my heart feel, he activated, this was two weeks that he did this, there's a nerve around my heart that when you just touch it or whatever he did to it, it makes your heart feel really painful. He was trying to terrify me, this. Now he doesn't command but he does try to terrify. And if he can block my vision, and I think he may have even caused me to faint one time. But he doesn't command. So I don't think it should be terrifying because I think that just gives more potency. But it is kinda scary, what this thing can do. He told me he was going to make my eye go wandering around by loosening the muscles. That's when I couldn't go to sleep. So finally something lured him away. This usually happened when he's going his worst stuff to me. Something will just, finally lure him and he'll just disappear for a while. And it's like Thank God, finally God did something helpful for once.*

*Disorganization.*

*1. Dotty. Because I was getting tired of being like … I'm getting an old woman. And they start treating me, and pulling my teeth and taking me to the X doctor and all that stuff like that. Pulling babies out of me and stuff like that. Pulling babies out of me. What is sex? What is intercourse? How?*

*I think these people just putting us on giving us those pills and liquid concentration. I think just putting us on. I think you could be my husband*

*sitting right there and they tell me you're not my husband. Yeah I think that's what it is. Got me all fooled up. Yeah the concentrators. And little they stick in my ears.*

*The general public they just does it that's all … just adds up, fights about it. They are carrying all kinds of stuff in here. They spray stuff make you X out … throw stuff all in the room make it sound like animals in there, like bees and snakes and wild animals and stuff. They don't keep the place clean. Spots all on the floor, over the tables and flies just swarming.*

*Everywhere I go they say the old girl got spots all over. I don't like her. She be coming around me I'll kill her. Every time they give me something they put poison it. The patients and the staff. They either give me urine or some kind of concentrated medication in my cup. And then they try to overdose me in pills. Come right out of my vagina, or of my rectum…. They know better. They were trying to get rid of me.*

*TV don't spot nothing to me. They can just sit there and look at it and pretend they're looking at it and just wait … open up a package from me, and they'll take it somewhere and hide it so they can distribute it to the girls out there. Its my money, my cigarettes, my food and stuff, my shoes and stuff. And they're carrying it, locking it up in that … and they even … I don't think it's right. They won't let me put out my own cigarette they put stuff all on my cigarette put fumes all over my cigarette and I have to smoke them. They … but her name was in the paper that she tried to stab the man and burn him up. And that … and I don't know how to deal with it. They told me pay it no mind but a girl she peeked at me and I saw her. I saw her that's all. I … what she'll do to you. She'll take everybody's name. I don't believe I'm no God, no.*

*Well I see, I see them. But what I see I let it be. I ain't going to worry about it. I'm going to keep it in my mind and forget about it in her mind or somebody else's mind. No I ain't gonna talk about it. And what she said to me, what she doing to do to me I'm going to forget about it I'm going to let her have her way. Because that don't hurt nobody. Never seen the girl before never heard her talk. But she is my daughter.*

*Its about hearing voices? It could because I've been on medication for years. They the same people.*

*Talk to me like a dog.*

*I could be dead … don't sleep at night. And stay there. Who's taking a bath, I take a bath every day, at least once a day at night or in the morning. And I'd like to have someone wake me up early so I can take a nice breakfast. Uh the food going out, my second smoke at nighttime. But when I get it out I'm not going to get conditioner or hair shampoo to bathe in, wash my hair and*

*my arms and titties and all around down there. I'm fine my body feel pretty good but I wonder why they keep sticking me with those needles.*

*My body feel all right … but those needles. I tell you they stick me once a month. Every month. It don't hurt that but I hate it. They thought I was choking but they trying to stop me from choking but I think they trying to get rid of me. I do a lot I'm not supposed to be doing for an old woman I think. I could be a little calmer. But these young girls that run around excite me that's all.*

*2. Cindy. Well God Almighty came down on this earth. He knew exactly what he was going to do. He is going to send one group of people right to Heaven, the other groups will remain here on Earth. One group will have heaven on earth. The third group is going to be sent into the abyss, let kingdom come, his will be done. All you have to do is to help save the earth in order to fulfill your potential. This year is going to be the year. If you don't love Jesus Christ and seek perfection then you will be put into the abyss. The resurrection is going to occur and the last shall be first and the first shall be last. My dad died in 1986 and if he came back for some tobacco or something he would say "What in the world is going on around here." God said the wicked shall be destroyed and put into the abyss. When I was a little girl I used to look at the trees and think "What is going on that the trees can live a hundred years and people don't." It seems like things are backward on this earth. It would seem like people would live that long not trees that can't talk or reason. Now I know better and I understand that demons can come into your house and take over.*

*3. Paul. I feel like I am God. I know that I can't be God because I am a Christian. It is like being between heaven and hell, like after you have been judged it is either left or right. Right now I feel like I am on God's side. It is like a fight. I want to fight all the time. I just want to fight somebody. It's like I am fighting the Devil. I want to be in reality but it is hard. I think about the Devil all the time. So I get the Bible and read it, but then I can't stop. I am ok, I am not going to hurt anybody but I hear this stuff in my head all the time, like kill him and attack him. I just want to be able to relax. And stuff is happening to my body (jumps up and begins karate motions) like this. What is this? Something just happens and takes over my body so it isn't me. I feel like somebody is manipulating and controlling me. I feel like I am fighting against an evil spirit. I just depend on God. I have a hard time finding reality, I look weird too. I've got big breasts look (pulls off shirt to show chest). Am I a man or a woman? I hear voices all the time asking me "Are you a man or a woman?" People make fun of me. They don't know that Dracula is in my bloodline and I like to draw blood. I hear stuff telling me to draw blood, that I am Dracula, that I am Jesus, that I am God. I hear this in my head constantly. Dracula*

*existed you know. It is like I lived a long time ago. I shave my head and my whole body. I don't like all this hair. I'm not gay, Peter used to go around with men together and he wasn't gay. I hear these voices that call me gay. I was supposed to be in heaven but I ended up in hell and I am in both places now. Sometimes I wake up in bed in the middle of the night and it feels like people have come into my room and gang raped me while I was sleeping. I want to walk around naked all the time, like a marble statue. I think they make those statues by taking a dead body and make a mold from it. It is like none of the organs of my body are alive except my eyes and my heart. My heart just pumps blood. But what does blood taste like?*

*4. Sasha. I put on a red dress and black shoes and leather to come here. Oh, I was so hot like this and that they let me come down here. I can do it in the bathtub (laughs). I don't know what I'm doing talking about these things at all. I must be talented or something (laughs). And you are beautiful yourself with your nice shirt and tie and your eyes. I can go from eye to eye, like there. But it is dangerous to get near it. What I'm getting now is a whole bunch of snakes. They might be eating you up you know. I got slits all over inside of me. You can mind God. I can't choose what to do anymore. They say we don't love our mother but we do. They say a lot of things. I say to God in front of me, you look so wonderful. I shouldn't love my brother too much, because he sent his wife into eternal life. Jesus, Jesus, savior and pretty girls. I'm going to become a virgin again and go out. But I am not a very nice person. I'm not supposed to be a very nice person. I look horrible, like a fiend.*

*I loved my aunt for eating me up. Honey, I am brazen just like her. Like a redbird and all the beautiful pictures sitting on the dresser. And it's not broken but it might break now. Once I wore a red suit. Now she is ready willing and able and available. I hate it but she is so mean, she is a witch. I'm trying to find out what I'm doing this for. I don't want you to be too nice because I could be dangerous to you. If I start messing with you or something. I don't want your money but I could be dangerous to you. I could be very dangerous to you. It sounds bad that I am dangerous but he got beat up way before me. It must have been the Devil that made me do that because I was trying to make him jealous. Who does the soul belong to anyway? I'm trying to be nice, nicer, and nicest and better, best and better best. I'll be a hands on girl and I'll be nice today. It's this place that is confusing. Honey you were meant for prettier places than this. If they put me in mean places I stay mean or go to jail or prison, or the doctor's office, and take the medicine. The personality is nothing. We'd all be safer at the drinking party than in here. My personality was good but then the rules went wrong. You have to live. That could blind you, you could be famous and I could be famous. Lord (shrieks), my eyes are on fire. I hated my*

*daddy. He took advantage of me is what he did. I was swamped by his damned tongue.*

*5. Javad. Well there was a murder of having married woman's name in the newspapers and all. She took the place of a Russian woman in Russia. And the Russia woman went to South America. She was a double. She was a spy. And then I was on a tape recording at the Pentagon, about a big military weapon I thought of the first stages of.*

*I had to leave the federal administration, where I was carrying money to the treasurer. I had to leave that day and go across to the river, what do you call it the Potomac River? Over to Virginia over to the Pentagon where it's just thousands of acres of land, big, just a big building, goes for blocks, I mean the buildings go for blocks and blocks. And I got lost in the building trying to find the generals. And the placement, the military placement which stopped me, I hadn't been locked up and then they had me sit down with the general to talk and it was on tape recorder. And they told me later on they were going to have me on tape recorder see.*

*She lived in a trailer near, about a block and a half, it'd be about three fourths of a block but if you go across where a church is right in the back of my house in a field in the back of my house. They were Jehova's Witnesses where they're communists, about 50% of them are communists. And they meet on Saturday. But the woman, she was a foreign woman, she looked like a Russian. And what I thought of what they would have is a woman take the place of the Russian woman while she's about 300 miles near Turkey I mean down near the southern part of Russia. She took the place of the Russian woman. And then moved to Moscow to find out things from the generals in the big offices and all about the way the communists are doing it.*

*It's something I thought of but they had claimed it was a murder. And then some times the President of the United States and I talk about the murders before they happen. You know it was 23 Germans had 12 Jews got kidnapped. They had 12 Jews kidnapped. It was a big apartment, you know, high building, and it wasn't but five floors. But they were trying to get the nerve gas, and something that the spies had told me about the atomic bomb and different things you know. And I had the government agent I could go to the building but I wouldn't go in with them. And they were eating cans of food and they would cut the wire. I had one thing he told me he cut the wire off to the building but that didn't help out much. And the watch, the in the back of the building, the alley. They could cut the way off to the building and maybe they would come out but they would come out but they were drinking drinks, eating out of cans, and getting water from foods and cans and things and having water with it. But right at the last, they shot up some tear gas. And I was looking through*

*that front door that front window there in that house in the FBI agents and the police department I mean and some of the military, it wasn't much of the military but some of the military were there and shooting tear gas up to them, and they come down and they were shooting … but it went in through the window back where I was. And I moved back into the second room and kept watching them you know the way they were doing. My father gave them was money and whiskey.*

*He helped catch the spies, you know. But I got shot. I went down in the government agency the day before, down in an air carrier, they came off of a small rubber submarine … and I had away of getting up in the airplane carrier and got down with where there's a section in the bottom … down in the bottom of it. But it was 32 feet in it. I walked down with the government, they had me walk down there and I saw with the tubes and needles. That's for where the spies are. The ones that they don't shoot, they electrocute them.*

*And so the next day, I went along the bottom of the carrier and looked at it, they had the guns and the tubes and they were sleeping. And I had a light just a little bit of light on in there. Of course you could see the light from when you come down the ladder and what do call that, the hole in the floor where you take the top off and you go down in there, you know what I mean, where you screw the screw on, I can't think of it, I heard it from federal governments and I can't think of it. But I tell you that's where I got shot. There was something else I was going to tell you. But the thing is I forgot.*

*6. Matt. People in my past have all caught up with me, you know, and. I had three illegitimate children. They've caught up with me they got the children in foster homes. Its in the bible. In the bible … it was a Christian for the red, white, and blue. I should have married them. Gotten straightened out, and God's kingdom could have come to Earth. That sounds far fetched doesn't it? I could marry colored, white, red, yellow, anybody. It was for the red, white, and blue for God. This is the part I can't explain. All I said was I should have married somebody to have love but with a world. But I'm staying single and the things aren't coming true.*

*I can have God but that's not enough. The Bible is now in jeopardy. Whosoever for the red, white and blue. Even if they were Indian I could have married them. If it saved God and have God's kingdom for the Earth. Indian, Polish, English, people … all anybody.*

*Well maybe it's not the Communists put me here maybe it's the devil and God. The devil and God. Chinese or well anybody could be on the Devil's side and they are. And I'm on the Lord's side. See you've got to have somebody to keep that sun down. You heard that song, Sunshine in my eyes makes me blue? Makes me cry? If I'd went with somebody we'd have, like when I was living*

*in Baltimore we had a lot of gloomy days without the sun and I should have chose somebody that the sun wouldn't be so hot. Do you understand me better now? All I want is now is to keep have God's kingdom on Earth. And it could have been possible. But see if all these people would have caught up with me before God had plans for all this to happen, if they had caught up with me and said "We have your children, would you like to marry me? " They waited until the last minute. I'm 47 years old now, it's too late. Life is passing my by. Why didn't they get in contact before now? But they put the blame on me. Well I put the blame on me. The whole thing is about God. Maybe somebody could help me, I don't know maybe it's the communists, or … the communists still represent the devil, right? I want to keep America free.*

*Negative Symptoms.*

*1. Mattie. I came to this building because they sent me here. They said you have to go to that building because I was raised in the country in a fish pond. And I played with those fish all the time and I was waiting for my driver's permit. I was waiting for somebody to show me the right track. There were men on top of buildings that were helping me walking in the air, shining lights, and going around with me. Some men I don't remember did it. And I cried and I prayed, but they kept right on shining their lights on me until I couldn't stand it any more.*

*2. Leon. I was involved in the war tactics. They were doing everything I told them step by step. Basically, they followed everything I said and then they said that it was a brilliantly fought war. I communicated over the television and they did what I told them. I remember when they shot the astronauts into space. They asked me questions about gravity and I answered them. They asked me about blood so they could get a clear concept of it, like what color it is in different parts of the body, things like that. I was worried about the Earth's resources. I know there is some kind of machine in the city hall that was causing my thoughts to be read by the federal government. I wanted them to take out whatever they had in there. I thought of the jet fighter, the aircraft carrier, cruise missiles, a lot of things. That's why the government is reading my thoughts. I told them how to build the internet. I go through a procedure where I come to a conclusion. It is just a process of thinking, so I can develop a new insight. Lately it is just simple things like the birds and the trees. One time I was thinking about what I created when some crows flew by. They indicated to me that I had created the Gatling gun, the tank, and advanced tactics.*

*3. Bruce. Jehovah tells me who I can talk to and who not to talk to. I love Jehovah. He tells me to be cautious and not say too much. Jehovah says that he is going to destroy this evil world soon and all the evil that is going on in it.*

*I don't worry because I know that he will do whatever is right and that he will take care of me as long as I do what is right. I used to see him everyday and could even feel him touch me like a boyfriend or a husband back a few months ago but now I can't see him any more. It is because they are poisoning me with the medicines that they give me. The staff is giving me medicines to give me Alzheimer's and schizophrenia. The medicines destroy my memory and I can't concentrate so I can't see Jehovah anymore.*

*4. Marque. I came here because of stiffness in my joints. I had a trial too and the judge sent me here because I hit someone and he bribed the judge to put me in here. He is bribing the nurses in here too. Sometimes I hear voices telling me how to answer questions, how to act and communicate with people. I have spirits inside my skull and stomach, like a burning bush is inside my chest. It's like God is controlling my mind like in a picture show. It's like I am in a new survival, like two sides of the country. So they had to say that I was dead for caring for him. The burning bush makes me feel like I got soul. I had it since I was single, by keeping God being near the voices helps to cool it off. It cools off with water too. It is sort of like a spirit, and it is green. People snap the grape from the vine you know when it is good and when you can taste it. But then people want to take the root from the vine. You know you dig a hole in the ground, you dig it and you put in the seeds like grapes, strawberries, bananas. Every time I start one I create another one. If I overlook one I go back and re do it.*

*5. Emma. I hear voices with it. Just people I don't know talking. People in different countries. Different states. Saying "I don't like that, I don't like that, always combing her hair, she's greedy? All sorts of things." Yeah all the time. Tell me to take my clothes off, men in the staff tell me to take my clothes off, especially at nighttime. And I'm always thinking about graveyards. I can see it on the TV and think about it the whole day. The only way I don't think about it if a TV show came on that seems interesting and I block it out. But I go on the front porch at here or at home, I be tore up, I be sick … again.*

*I feel like I'm going to stab myself with a knife and get if over with just like my uncle did. He killed himself but he is doing good now. I see the ghosts. They fly around. I see cats on the ground and dogs. I see a dog right there, right there a pit bull. He's right there. If I touch him he'd probably bit my finger. I don't like pit bulls. They dangerous. You got a pit bull?*

## 2.2. Summary

Persons diagnosed with schizophrenia come in all sizes, shapes, and colors. Some are brilliant individuals who accomplished a great deal prior to onset

of their disorder others evidence significant cognitive and social deficits early on. Onset of symptoms can range from adolescence thru the thirties. In general, later onset of symptoms, and higher the level of premorbid social, educational, and occupational accomplishments are associated with better prognosis and less likelihood of cognitive deterioration over time. The odds of any individual's recovery are very much a function of the quality and range of treatments and therapies that are available prior to, during, and after diagnosis. It is not possible to predict in any individual case what the prospects for recovery are, but it is likely that our attitudes toward prospects for recovery in general have been shaped by assumptions about etiology, as well as the quality and range of services that have been and are currently provided to individual diagnosed with schizophrenia. We don't know what is possible.

Efforts to identify reliable subsyndromal patterns, whether based on phenotypic features or neuropsychological markers, can facilitate research. Converging evidence from multivariate studies indicates that symptoms form continuous distributions or dimensions (Cuesta and Peralta [14]). Dimensional symptom models will probably not replace traditional categories in clinical diagnosis, but they can serve as useful complements for clinical research and treatment. Many observers now believe that schizophrenia is a heterogeneous disorder that is caused by a wide range of genetic, neurodevelopmental, and environmental factors that may differ considerably between individuals (Williamson [27]). The range of course, outcomes and patterns of recovery associated with this disorder suggests that this diversity is the result of complex interactions between individual characteristics, environmental, and cultural influences. These processes vary between individuals and these differences have implications for appropriate treatments and those processes likely to foster recovery.

# 3 Epidemiology, Course, and Outcome

Epidemiology is the study of the distribution and determinants of disorders. Distinguishing the characteristics and experiences of persons diagnosed with a disorder from those who do not helps researchers identify potential causal factors. The distribution of a disorder is generally described in terms of incidence and prevalence. The *incidence* of a disorder is the rate at which new cases occur in a given period of time. Data on *incidence* is typically gathered by community surveys or by identifying the number of referrals to treatment agencies. Estimates of incidence are influenced by several factors, including the reliability of diagnosis, criteria for caseness and the availability and social acceptability of treatment resources. The U.S. annual incidence rate for schizophrenia is estimated to be about. 5 per 1,000 of the general population. This figure is reasonably close to incidence rates reported for other industrialized countries (Jablensky [56]). A global study reported the annual incidence ranged from 16–40/100,000/year using broad criteria, and 7–14/100,000/year using narrow diagnostic criteria (Jablensky et al. [58]). McGrath et al. [60] conducted a meta-analysis of published studies reported a median incidence rate of 15.2/100,000/year, range 8–43 per 100,000 cases per year (McGrath et al. [60]). Rates of schizophrenia were not uniform across the world. In addition, higher risk for schizophrenia was associated with urban residence, migration, and male gender. The reasons for these differences in risk are not clear but they suggest that social factors must play a role in determining risk for schizophrenia. Risk factors associated with urban living, for example, may include difference in rates of substance use, prenatal health, poverty, nutritional deficiencies, exposure to environmental toxins and stress or infectious diseases (Tandon et al. [148]). Research on the sources of variations in incidence of schizophrenia may provide important information about the origins and prevention of the disorder.

*Prevalence* is the total number of cases of a disorder, new and old, known to exist. Point prevalence refers to the total number of cases known to exist in a given population at a particular time (e.g., on a given day, or during a given year, or lifetime). Lifetime prevalence is a measure of the proportion of individuals in a population who have manifested a disorder at any time during their life. Prevalence figures for schizophrenia vary widely, in part because they can be affected by differences in incidence rates, in migration, fertility, life span/death rates, and rates of recovery, as well as differences in economic opportunities, cultural practices, and political factors (Eaton [45]). Meta-analysis of studies of lifetime risk for developing schizophrenia indicated a median period prevalence (up to one year) of 3.3 per 1000, and a median lifetime prevalence estimate of 4.0 per 1000 cases (Saha et al. [63]). In contrast to reports of similar incidence rate across developed and less developed countries for narrowly defined schizophrenia, studies report higher lifetime prevalence for developed countries than less developed countries, as well as a higher prevalence of schizophrenia among lower versus upper socioeconomic classes within communities. Males have higher lifetime risk than females by a factor of 1.4. Interestingly, gender differences in incidence are not reported (Aleman et al. [38], McGrath et al. [60], and Saha et al. [63]). In addition, studies from developing countries and studies conducted prior to 1980 do not report gender differences. The reasons for these discrepancies are not well understood.

### 3.1. Syndrome, Symptoms, Course, and Outcome

A study by Hafner et al. [47] indicated that the *prodromal phase* of schizophrenia often begins with a wide variety of nonspecific signs, including mixtures of anxiety, tension, irritability, restlessness, aggression, depression, difficulty concentrating, sleep problems, low energy, withdrawal, odd behavior, religious preoccupation, deteriorating work performance, reduced communication, beliefs of being laughed at or talked about, and growing distrust of others. These problems may continue and gradually increase in intensity for as long as several years before clear symptoms become evident. Disorganized and undifferentiated symptoms of schizophrenia in particular are likely to have a gradual and early onset during adolescence or young adulthood, and are most likely to be associated with poor premorbid psychosocial adjustment and poor outcome (Fenton and McGlashan [46]). Paranoid patients with intact cognitive functions and systematized delusions in contrast tend to have later and more rapid

onset, a better outcome, and evidence less cognitive deterioration. This group of patients may not evidence symptoms until their late 20 and on into their early 30s.

During the *acute phase* of the disorder the most frequent positive symptoms are delusions and hallucinations, and the negative symptoms—avolition (lack of motivations) and anhedonia (pleasure deficit). Positive symptoms may dominate the clinical picture on hospital admission, but about 6 months after admission negative symptoms tend to become more prominent (Hafner et al. [47]). Symptoms of disorganization, formal thought disorder and bizarre behavior, are relatively infrequent in new admissions, occurring in extreme form in about 10 percent of admissions. Symptom severity decreases with treatment with antipsychotic medications and appropriate levels of psychosocial support but, at least 70% of patients suffer a relapse of acute symptoms within 5 years (Wiersma et al. [73]). Over time the severity of many positive and disorganized symptoms tends to decrease but, self-neglect, eccentric thinking and behavior, withdrawal, and anhedonia often increase, and continue well into the so-called *residual phase* of the disorder (Arndt et al. [39]). Risk for rehospitalization is high however, and this risk is uneven over time, with highest risk occurring during the period 2–4 years after onset of active symptoms (Hafner et al. [48]). Many factors can influence the course of symptoms, including age, gender, premorbid adjustment, symptom pattern, access to comprehensive services, and the social environment. Therefore, it is not possible to accurately predict course and outcome for any individual.

The clinical course and outcome of schizophrenia has been the subject of studies and reports throughout the twentieth century. Outcome statistics vary considerably as a function of how schizophrenia is defined (narrow or broad definitions) and access to treatments. Recall that Kraepelin argued that schizophrenia (dementia praecox) was a chronic illness, characterized by a progressive deteriorative course. He reported limited improvement at follow-up in only 17% of his cases. Hegarty et al. [52] conducted a meta-analysis of 320 studies in the schizophrenia outcome literature from the previous 100 years. Results indicated the proportion of patients rated as improved at long-term outcome increased significantly after the middle of the twentieth century (48.5% versus 35.4%). However, during the decade of the late 1980s to mid 1990s, the average rate of favorable outcome declined to 36.4%. The authors attribute the changes in outcome rates to several factors. First, during the 1950s changes in the conceptualization of schizophrenia introduced by Bleuler broadened inclusion criteria from the definition advocated by Kraepelin. The reintroduction of the duration of

illness requirement and a more narrow definition of the disorder in DSM-III reoperationalized Kraepelin's chronicity criterion, and likely accounts for the lower outcome figures. Outcome rates in other words, are better when patients are diagnosed with broad criteria (46.5%) and worse when and Neo-Kraepelinian criteria are used (27.3%), (Hegarty et al. [52]).

Studies of the long-term outcome of schizophrenia have been limited by methodological difficulties, not the least of which has been the lack of stable agreement about how to define the boundaries of schizophrenia (Hoffman [53]). The choice of appropriate outcome criteria presents another problem. For example, assessments of symptoms, rates of readmission, and duration of hospital stay can be contaminated by extraneous influences such as policy changes, and economic conditions. Strauss and Carpenter [68] suggested that long-term outcome studies should include at a minimum: ratings of symptoms, hospitalizations, quality of social relationships, and ability to work. These indicators are not highly correlated however, and may have separate determinants. McGlashan (1994) recommended that outcome evaluations should include (1) clinical signs and symptoms, including hospitalizations, medication and types and amount of aftercare utilization, (2) social functioning indicators such as frequency of interpersonal contacts, closeness of these contacts, and degree of involvement in a meaningful social network, (3) instrumental functioning including the ability to learn and work, amount of initiative, drive and frustration tolerance, and (4) humanitarian concerns such as adequate food, shelter, clothing, living situations appropriate to the level of functioning of the individual. Hospitalization rates decline during times of national emergencies and increase during economic recessions (Beck [40]).

Political, cultural and economic factors also play a role in the context and quality of the treatment that patients receive, which in turn affects outcome. During the first half of the twentieth century nearly two-thirds of all schizophrenic patients admitted to mental hospitals remained in the hospital for over two years (Strauss and Carpenter [68]), and more than one-third never left the hospital (Rennie [62]). By the late 1960s policy changes and access to more effective treatments resulted in only 9 percent of schizophrenics remaining in hospital more than five years.

Long-term follow-up research conducted in developed countries indicates that on average about 20–35% of schizophrenic patients improve rapidly with treatment with little deficit, a similar proportion evidence serious long-term social impairment, and about 50–60% evidence a fluctuating long-term course. Ciompi and Muller [44] traced the course of the disorder for 228 schizophrenics, all over 65 years of age, back to the time of their initial diagnosis. The lives of the patients were charted over

a minimum period of 37 years from first admission to reexamination; in some cases the histories extended back more than fifty years. The authors reported that onset of symptoms was acute (less than six months from first signs to clear psychosis) in about half the patients, and gradual in the other half. The course of schizophrenic symptoms was also observed to be episodic (acute episodes mixed with intervals of partial to complete recovery) in about one half of the cases. Signs of continuous impairment, but with a decrease in severity after several years, were observed in the other half of the sample. Ciompi [43] reported that about half of the patients in the study achieved a favorable outcome (complete remission or minor residual symptoms), 24 percent achieved an intermediate outcome and 22 percent continued to evidence severe symptoms. The remaining 9 percent were rated in the uncertain or unstable category.

Bleuler [41] followed-up on 208 schizophrenic patients that he had personally worked with for a period of over 20 years. Bleuler reported that about 25 percent of the patients recovered and remained recovered for good; about 65 percent alternated between phases of improvement and acute episodes; and about 10 percent remained psychotic and in need of continuous hospital care. Bleuler collected additional data from sites in Basel and New York altogether this sample comprised 1,158 patients and an additional 950 patients from three other teams of investigators. He arrived at several conclusions based on the data from these samples. (1) On average, after 5 years duration the psychosis does not progress any further, it rather tends to improve. (2) At least 25 percent of all schizophrenics recover entirely and remain recovered for good, even when the criteria for recovery include lack of psychotic signs, a normal social integration and the ability to work. On the other hand, Bleuler observed that many improved schizophrenics remain underactive, lack initiative, and have apathetic, colorless personalities. He compared this impoverishment in personality to the effects observed in total institutions that force an uneventful, unstimulating life on a person. (3) About 10 percent of schizophrenics remain permanently severe psychotics who require hospitalization. (4) The number of recovered patients at a given moment after the onset of the disorder is close to 50 percent, some however will have acute relapses. (5) Of the 25 percent of patients who had attained a long-lasting favorable outcome, not one was under long-term antipsychotic treatment. Of the patients admitted before 1950, Bleuler concluded that the factor that contributed most to improvement was progress in social and environmental therapies provided. Surprisingly, a lack of relationship between long term outcome and adherence to ongoing pharmacological treatment was reported by Bleuler.

A large scale longitudinal study conducted in Vermont reported outcome statistic similar to those reported by Bleuler (Harding et al. [49]). In the Vermont study chronic patients released from an early model rehab-deinstitutionalization program between 1955 and 1960 were followed up. On average these were medication refractory, lower-class, middle-aged patients, with an average of six consecutive years in hospital, and 16 years since their original admission. A retrospective assessment of these patients was completed 25 years later. Seventy percent of the original sample was alive and could be located at follow-up. Of that group 68 percent evidenced no schizophrenic symptoms, 60 percent scored in the normal range on the Global Assessment Scale, and 45 percent showed no psychiatric symptoms at all. Eighty four percent remained on antipsychotic medication, and 40 percent of those of working age had held a job during the previous year. Harding et al. included a recalibration of the original diagnosis of each patient using the DSM-III restrictive definition. Despite rediagnosis using a narrow definition 62 to 68% of the chronic patients showed few signs of schizophrenia at follow-up. The authors compared the Vermont outcome figures with a matched control group of patients from Maine who received traditional psychiatric treatment but had not received any psychosocial rehabilitation or systematic outpatient follow-up psychosocial involvement other than meds, maintenance and stabilization. The controls had a 48% recovery rate. These results indicate that comprehensive psychosocial aftercare interventions to improve self-sufficiency and social integration result in markedly improved long term outcome rates.

A meta-analysis, published by Harding et al. [50], of over 1,300 patients from 5 different studies that were followed for at least twenty years, indicated that fully one half to two thirds of the patients studied achieved recovery or significant improvement by the end of the observation interval. Hegarty et al. [52] conducted an analysis of worldwide long-term outcomes and concluded the social recovery rate they reported averaged 40.2% for the period 1895 through 1991.

In contrast to the results reported by Ciompi, Bleuler, and the Vermont Study Group, other researchers have reported less positive outcome figures. It is difficult to determine whether these differences are the result of truly different outcomes, differences in samples or type of care provided, or different approaches to measuring outcome. McGlashan (1984) completed a 15-year follow-up study of 163 upper middle class schizophrenic patients who were admitted to Chestnut Lodge, and received 3 to 4 years of psychotherapy there. Results indicated that two thirds remained chronically disturbed and only one third showed improvement. Carone et al., [42] followed 79 young schizophrenic patients for a period of 5 years. Only 15

percent of the outcomes were rated as positive at 5 year follow-up. Ram et al. [61] noted a relapse rate of 60 percent within two years for a group of first admission patients. It appears that the course of schizophrenia is varies considerably and that outcome statistics are strongly influenced by how outcome is defined and measured, as well as possible differences in access to appropriate pharmacological and psychosocial treatments.

In summary, since Kraepelin the course of schizophrenia has been thought to be a progressive downward course for nearly all correctly diagnosed patients. Evidence from long-term follow-up studies in developed countries indicates a different picture however, in which about 20–25% of patients achieve a good to fair recovery within less than a year leaving little deficit, although the short term course can be difficult. About the same percentage progress to serious and chronic disability and 50–60% evidence a fluctuating long-term course (Wing, 1987). Studies report a wide range of course, and social and occupational adjustment, with about 50–60% across several decades able to reclaim their lives. Many factors in addition to traditional predictors appear to play a role in determining symptom outcome and prospects for social recovery.

### 3.2. Culture, Course, and Outcome

The initial International Pilot Study of Schizophrenia (IPPS) sponsored by the World Health Organization (WHO) included 1,202 patients in nine countries—China, Columbia, Czechoslovakia, Denmark, India, Nigeria, the USSR, UK, and USA (Sartorius et al. [64]). Two and five-year follow-up studies were conducted to evaluate the long-term outcome of the patients (Sartorius et al. [67]). The same rating scales and diagnostic criteria were used in all countries. An unexpected finding of the WHO International Pilot Study of Schizophrenia (IPSS) at 2 and 5-year follow-up was that patients with an initial diagnosis of schizophrenia in developing countries (e.g., Nigeria, and India) had a markedly more favorable course and outcome than their counterparts in developed countries (e.g., Denmark, USSR, UK, US). These results held for all measures including percentage of time spent in psychotic episodes, course of the disorder, measures of social (self-care, occupational adjustment, sexual adjustment, interpersonal functioning in the community) and global rating of social functioning. Over one-quarter of the patients in developing countries had one single episode followed by full remission, compared with only 8 percent of patients in the developed countries. Fifty percent of patients in developing countries had full remission between episodes compared to 17 percent of the patients in developed countries. Fourteen percent of the patients in developing

countries and 24 percent in developed countries had a continuing episode of illness over the 5-year follow-up period. A similar pattern was observed in social functioning. Patients in developing countries evidenced no or mild impairment in social functioning in 65 percent of the cases, compared to 43 percent in developed countries. Taken together, of the patients followed up for five years in the three developing countries, 73 percent showed the best pattern or course, while 13 percent evidenced the worst pattern. Comparable figures for developed countries were 52 percent (best) and 24 percent (worst). Fully one half of the patients in the developing countries showed a pattern characterized by periods of complete remission punctuated by episodic relapses; only 17 percent of patients in developed countries evidenced this pattern. The most frequent pattern in the developed countries was a chronic residual state punctuated by recurring acute psychotic episodes. The most frequent course in developing countries was a full remission after the first episode with no further episodes during the 5 year follow-up period. These differences in outcome between developed and developing countries held even when other predictors, such as sex, marital status, premorbid personality and type of onset were included in the regression model. Expenditures were substantially higher and access to the latest antipsychotic drugs and case managers was far more available to patients in the developed countries.

A second series of studies was initialed by the WHO in ten countries and twelve locations around the world (Harrison et al. [51]). Once again results indicated that course and outcome for persons diagnosed with schizophrenia in developing countries was much better than for developed countries. About two-thirds of the patients in developing countries experienced a benign course leading to an outcome widely considered to be impossible, full remission, compared to slightly more than one-third of patients in developed countries. Only 16 percent of developing world patients was rated as impaired in social functioning at follow-up compared to 42 percent in developed countries. These differences were observed despite the fact that only 16 percent of developing world patients were taking antipsychotic medications throughout the follow-up period versus 61 percent of cases in the Developed world. A study of over 800 patients from earlier WHO studies followed up after 13 to 26 years concluded that people with diagnosed schizophrenia in developing countries were still doing considerably better than those in developed countries (Hopper and Wanderling [54]).

The WHO study of first-episode cohorts (N = 1379), was designed to avoid criticisms of possible selection bias in the earlier WHO study, was conducted at 12 research sites in a wide range of countries (Colombia,

Czechoslovakia, Denmark, India, Ireland, Japan, Nigeria, Russia, UK, and USA). Patients and key informants were interviewed at baseline and at 1-year and 2-year follow-up and a large proportion of the cohort was reassessed at 15-years follow-up in 8 of 12 field research centers (Jablensky et al. [58]). In contrast to earlier studies the results of the study indicated a diversity of outcomes. The outcome for patients in developing countries was not uniformly better than outcome in developed countries, although higher rates of complete clinical remission were significantly more common in developing countries (37%) than in developed countries (15.5%) but, the proportions of continuous symptoms (11.1% and 17.4%) did not significantly differ. Patients in developing countries did however experience longer periods of unimpaired functioning in the community even though only 16% were on continuous antipsychotic medication compared to 61% in developed countries. In this study the best predictors of outcome ($P < .001$) were type of onset (acute versus insidious) and type of setting (developed versus developing country). Jablensky et al. concluded that culture is a context in which gene-environment interactions influence the clinical picture of the disorder. Similar findings were reported by Harrison et al. [51] in their report of 15 and 25-year follow-up.

Jablensky et al. [58] did not argue that prognosis in developing countries is uniformly better than in developed countries, but that there appeared to be elements of the economic and or cultural practices of some developing countries that provide a more therapeutic context for recovery. Jabelnsky and Sartorius [59] recently reiterated the conclusions of the WHO studies, and pointed out that the erosion of social support systems in developing countries associated with globalization are a matter of concern with regard to their impact on the recovery process. The authors suggest that the findings of the WHO studies high rates of chronic disability and dependency associated with schizophrenia in developed countries indicates that something is missing in the social fabric of these countries, that seems to be provided in the cultural practices and economic structures of some developing world countries.

The WHO studies did not address the question of why the differences between developed and developing countries were observed, but several explanations have been suggested (Warner [70] and Waxler [72]). First, the nature of work differs in several ways between developed and some developing countries economies. For example, large segments of developing world economies are not based on a wage structure, where employment in developed countries is based on wages. Wages in capitalistic economies are based on the ability to function in an efficient, timely, and reliable manner. In this context there is little or no room for marginal performance,

absences, marginal productivity, or long learning curves. In contrast, people working in agricultural economies are often allowed considerable latitude in terms of performance and have a much greater likelihood of being allowed to perform tasks that match their knowledge, skills and capabilities. In many developing countries it is also more likely that employment related disabilities will be viewed as partial rather than absolute. In rural areas the nature of work is more likely to be collective and agricultural in developing countries. Agricultural work in developing countries also typically does not require extensive training or technical skills as prerequisites to participation. These differences help to explain the apparent anomaly that higher educational level is an indicator of poor outcome in developing countries, but the opposite relationship is observed in developed countries. A second factor that may influence differences in course and outcome between developed and developing countries relates to with social beliefs and practices that increase or decrease stigmatization. A contributor to good outcome for patients in developing countries is the relative lack of stigmatization and level of tolerance for the idiosyncrasies of individuals who have experienced psychosis by neighbors, relatives and friends. Access to helpful support from extended family members and sources of community involvement is associated with low levels of stigmatization and with patterns of social integration that minimize the likelihood of social isolation. Extended support systems also help reduce many of the stresses and burdens of care that are often placed on primary family members in developed countries. Access to supportive social networks and the absence of stigmatization can impact on recovery. For example, social isolation is one of the strongest predictors of poor outcome in both developed and developing countries (Warner [70]).

Stigmatization is related to negative self and social expectations. Non-western beliefs about causation of psychotic symptoms as typically outside the individual's control, including beliefs about possession or karma, function to increase tolerance and reduce the likelihood of condemnation, criticism, blame, and negative attributions. The healing ceremonies and rituals practiced in many developing countries also provide practices and set of beliefs that help to reintegrate former patients back into the group, and reaffirm a sense of community identity (Warner [70]).

### 3.3. Summary

Results of the World Health Organization IPSS studies indicate that cultural differences in the psychosocial aspects of the aftercare environment have a significant impact on prospects for recovery. Processes that facilitate

access to entry into meaningful social roles, foster positive social expectations of recovery, and provide access to graduated meaningful opportunities for reintegration back into the community are important to improving prospects for successful recovery. Questions have been raised about the methodology of the WHO studies, related to possible selection bias, over-inclusion of reactive psychoses in developing centers, high drop out rates in developing centers, and "black boxing" of the word culture. Most of these concerns have been addressed by strong inference analyses of the long-term results of the International Study of Schizophrenia (Hopper and Wanderling [54]). Nevertheless, there has been an undue emphasis on the explanatory value of the nonspecific term "culture" without specifying the specific values and practices that contribute to improved course and outcome within cultures. As Hopper [55] suggests, specific hypotheses about course and outcome need to be tested in future research, these include possible exculpatory beliefs, less-complex cognitive demands, extended family support, accommodating work regimens, and absent stigma. We do not adequately understand how the specific characteristics of a local culture might help to influence recovery, but evidence indicates that cultural difference can have a significant impact. Research is needed to improve our understanding of what aspects of cultures play a role in outcome, and to more clearly indentify the specific factors that influence those social processes that impact individual's lives for better or worse.

# Part 2

# Levels of Analysis

# 4 The Role of Vulnerability and Stress

A wide range of theoretical perspectives can be applied to understanding schizophrenia. Each perspective brings with it a different level of analysis for understanding the nature of the disorder. The biomedical model holds that schizophrenia is caused by a genetic defect that results in a "broken brain." This model assumes that the essence of the disorder and its eventual treatment is to be identified in molecular genetics, biochemistry and altered brain circuitry. Psychosocial theorists tend to view schizophrenia as a broad descriptive term that does not designate a single underlying disorder but, a final common pathway of symptoms that can result from the interactions of a wide range of experience based and genetic contributors. Today we do not understand how to integrate observations and concepts associated with different levels of analysis as varied as molecular genetics, biochemistry, brain imaging, information theory, cognitive-behavioral and psychodynamic psychology, sociology and anthropology. Most theorists acknowledge the value of adopting a broad biopsychosocial model for understanding and treating schizophrenia.

The usefulness of any model should be evaluated in terms of its ability to explain and solve problems and questions at the level of analysis for which it was developed. At present most emphasis is on genetic and brain-based causes. It would be a mistake to assume however that nothing that happens during a person's life is of relevance to understanding how or why people develop schizophrenia, or recover. Life experiences alter brain function just as brain function affects our experience. If experience did not alter brain function we would never learn from our experiences. Genetics and brain-based changes undoubtedly play an important role in contributing to risk for developing schizophrenia, and psychoactive drugs can be beneficial in controlling and reducing symptoms. However, in living systems causal processes are bidirectional so that the impact of various brain based

vulnerabilities and life events move in either direction. We know that life stresses such as early maternal separation results in an array of physical, affective and behavioral changes including altered neurotransmitter and hormonal levels, a reduced threshold for physiological arousal, social passivity, anxious response to novel situations, and depressive reactions to separation (Suomi [92]). Psychological and biological processes obviously reciprocally influence one another. Delusions, anxieties, hopes, fantasies, religious conversions, angry confrontations, romantic love, and political beliefs all have their biological correlates and underpinnings just as they influence brain processes. These experiences are brain based but they cannot be adequately described or explained by reducing them to physicochemical processes just as neurobiological processes cannot be adequately described or explained by reference only to psychological or social processes.

Diathesis-stress models attempt to integrate biological and psychosocial evidence into comprehensive biopsychosocial models. A *diathesis* is generally thought of as a biological predisposition to develop a disease or morbid condition but, life experiences can also result in a diathesis. Biological models generally assume that the diathesis for schizophrenia is a set of polygenetic defects, perhaps in combination with adverse events such as viral infections during prenatal development, birth complications and learning disabilities. These factors are thought to combine with genetic diathesis to alter brain development in ways that predispose the individual to respond in abnormal ways to ordinary life stresses. Polygenetic models postulate some form of additive model in which multiple genetic factors contribute additively to a liability threshold. Persons with a high polygenetic vulnerability loading may require little in the way of life stress to develop schizophrenia. Those with a genetic loading just below the threshold will likely develop the disorder under most circumstances, those moderately below threshold require greater levels of adversity and stress to develop the disorder, and those far below the threshold are unlikely to develop brief psychotic reactions even under conditions of extreme stress (Fowles [79]).

Vulnerability-stress models assume that vulnerability for development of the disorder is multidetermined, and exists as a potential that may be elicited only if sufficient stress occurs in the individual's life. This perspective emphasizes the importance of vulnerability markers as distinguished from episode markers (Zubin, 1987). Schizophrenia is understood as the expression of a pattern of permanent vulnerabilities that increase risk for episodes of the disorder under certain circumstances.

The evidence is substantial that risk for schizophrenia results from interactions between genetic vulnerability and environmental risk factors, although the patterns of these interactions are not well understood. Evidence indicates that at least some of the impact of genes on the occurrence of schizophrenia is mediated through increased sensitivity to stressors including dysfunctional family rearing environment, prenatal maternal viral infections, birth and pregnancy complications, cannibis use and factors associated with low socio-economic class, migration and urban birth (Van Os and Marcelis [95]).

### 4.1. A Diathesis-Stress Model

Meehl [84] introduced an influential vulnerability model in the form of a diathesis-stress formulation of schizophrenia. Meehl posited that a *schizogene* produces a diathesis for schizophrenia. Meehl's assumption of a single schizogene is controversial and contrasts with the views of most theorists who interpret risk figures from family aggregation and twin studies to be more consistent with a multilocus or polygenetic mode of transmission, in which susceptibility is the result of the joint action of multiple genes. Meehl's monogenetic diathesis-stress model is not critical to the rest of the model and does allow for the role of other polygenetic-based traits as sources of nonspecific potentiating or protective traits that function to either increase risk or contribute to resilience to the disorder. Meehl postulates that the genetic vulnerability factor is expressed as a form of broad neural integrative defect, he refers to as *hypokrisia*. This defect is postulated to trigger an array of impairments (*schizotaxia*) in the form of neurological dysfunctions that compromise or prevent the efficient integration of various brain modules and associated mental functions. These defects are in turn postulated to be associated with a set of phenotypic *schizotypic* characteristics no matter what the individual's life experiences. Prominent characteristics of *schizotypy* include tendencies toward interpersonal alienation, ambivalence, dereism, autism, anhedonia, cognitive slippage, social anxiety, and aversive drift (Meehl [85]). The presence of these traits increases risk for schizophrenia in two ways. First, they contribute to general vulnerability to life stress. Second, schizotypal features complicate interpersonal processes and trigger negative reciprocal influence processes that in turn result in increased stress and risk.

Meehl estimated that the majority of schizotypes (90% or more) do not go on to develop schizophrenia. Instead most evidence subclinical personality patterns that include varying degrees of unusual thought, eccentric thinking, social anxiety, and social ineptitude but, they do not develop

schizophrenia unless additional factors are present. These factors include (1) the inheritance of other polygenes associated with additional predisposing trait patterns, and (2) "bad luck" in the form of a variety of additional risk factors, handicapping conditions, and adverse life experiences that can include exposure to viruses during prenatal development and abuse.

Meehl [86] also expanded the list of polygenetic heritable traits that may serve as potentiators or protectors that influence the probability of occurrence of schizophrenia in a schizotype to include low capacity for pleasure, low energy level, low or high aggression and sex drive, and high introversion and general anxiety proneness. Protectors include high IQ, good looks and special talents. In somewhat similar fashion resilience studies indicate that children who experience chronic adversity are more likely to fare better or recover more successfully when they have areas of competence and perceived efficacy that are valued by self and society, are good learners and problem solvers, are engaging to other people, and have a lasting positive relationship with an adult (Masten et al. [83]).

Meehl [87] referred to the potentiating polygenetic traits as the SHAITU syndrome, an acronym formed from the initial letters of the terms: *submissive, hypohedonic, anxietous, introverted, traumatized,* and *unlucky.* The SHAI components of the acronym (submissive, hypohedonic, anxious, and introverted) are assumed to be polygenetically based personality traits that are potentiators, that is, increase risk for schizophrenia in interaction with schizotypal characterisitics. The TU components (frequent minor or major trauma and unlucky events in adult life) are environmental events that also increase risk for schizophrenia. Meehl [88] estimated that approximately 85–90% of all patients are cases of "true"schizophrenia, whereas about 10–15% do not carry the schizogene. He suggested that patients without the schizogene are more likely to evidence disturbances in the content (systematized delusions) rather than in the form of thought (derailment, tangentiality, disorganization). While Meehl's diathesis-stress model is largely speculative research has confirmed that schizotypal traits such as tendencies toward magical thinking and unusual perceptual experiences are associated with increased long term risk for psychosis (Chapman et al. [75], Kwapil [81], and Kwapil et al. [82]).

### 4.2. Vulnerability Stress

Zubin and Spring (1977) developed a somewhat different model which distinguishes between vulnerability (diathesis) to schizophrenia (conceptualized as a trait) and acute episodes (conceptualized as states). They

conceptualize schizophrenia as an episodic state rather than a permanent condition. Vulnerability is understood to be a consequence of traits that result from the interactions of various biological, psychological and psychosocial factors, and result in a predisposition to develop acute schizophrenic symptoms when the individual is confronted with problems and tensions that overwhelm coping resources. Vulnerability is a matter of degree, a form of susceptibility to various forms and sources of life stress or response potential that can oscillate over long periods of time. Acute schizophrenic episodes represent a breakdown of ego processes that occurs in response to stress, with the degree of vulnerability determining the level of stress required to trigger an acute episode or recurrence. Genetic liability, prenatal and perinatal injuries and psychological and social factors, and life experiences all contribute to vulnerability, as well as to long-term course and prospects for level of recovery.

### 4.3. The Role of Environmental Prenatal, Perinatal, and Psychosocial Factors in Risk

A number of studies have been published that support a gene-environment interaction model. One version of this model asserts that obstetric complications that occur in a genetically vulnerable individual will significantly increase the likelihood to that individual developing schizophrenia. These factors may interact or occur independently but additively increase risk. A large number of obstetric complications have been observed to have occurred more often in the histories of patients diagnosed with schizophrenia these include fetal hypoxia, and maternal viral infection during pregnancy (Ellman and Cannon [78]). The relationship between these environmental influences and increased risk for schizophrenia can be understood in the context of a neurodevelopmental model that posits that the synaptic pruning process that occurs during normal adolescence is somehow disrupted by the consequences of these pre- and perinatal complications. One model posits that an abnormally aggressive synaptic pruning process may occur, resulting in reduced connectivity and impaired connections between functional areas of the brain, that result in cognitive, emotional and perceptual difficulties (Rapoport et al. [90]).

A number of early events have been noted to have occurred with unusually high frequency during the developmental years of individuals later diagnosed with schizophrenia. These early events include various experiences of victimization, including abuse and bullying. Additional factors associated with increased risk include social withdrawal and isolation, immigration to seemingly alien and strange cultures, and adolescent

substance use (Bebbington and Kuipers [74]). These events are also reported with increased frequency in cases of PTSD, depression and other anxiety disorders. Certain experiences and events increase risk in general but the elevated risk is not specific to a particular disorder. Bebbington and Kuipers suggest that one route that may link stressful life events and contexts to the development of schizophrenia could involve cognition. In that adverse experiences often change the way people view themselves, others and the world in general. It is possible that these cognitive changes interact with a genetically based propensity for anomalous experiences, similar to the model proposed by Meehl, such that traumatic experiences can exaggerate this propensity and increase the likelihood of perceptual distortions and delusional thinking. The authors point out that not everyone diagnosed with schizophrenia has a history of having experienced traumatic victimization, just as not everyone with this diagnosis has a family history of serious mental disorder. Schizophrenia is likely a heterogeneous disorder that is the result of a range of influences, none of which are necessary or sufficient in any single case.

Finally, there is the ongoing Finnish adoptee research conducted by Tienari and colleagues that indicates that disturbances in family communication may interact with genetic vulnerabilities to significantly increase risk for schizophrenia (Tienari et al. [94]). This research is described in detail in Chapter 5. It is remarkable to this writer how often this impressive body of research is overlooked by writers on the topic of environmental sources of risk for schizophrenia. One cannot help but wonder if this oversight whether intentional or unintentional has to do with commitment to a particular paradigmatic point of view rather than methodological considerations.

### 4.4. Neurodevelopmental Models

Neurodevelopmental models build on a diathesis-stress framework and assume that the underlying biological problems that increase risk for schizophrenia occur during development and are manifested in markers that complicate development and adjustment, and result in clinical symptoms during adolescence or early adulthood when triggered by a combination of normal physiological and life stress related changes. The starting points are varying genetic vulnerabilities along with environmental insults that contribute to brain based susceptibilities to schizophrenia (Cornblatt et al. [77]). The assumption of the neurodevelopmental approach is that although many factors that increase susceptibility occur relatively early in development, most behaviors are not dramatically altered until triggered by

some later developmental event, at which time clinical symptoms emerge. Susceptibility may be expressed in a variety of brain based abnormalities such as abnormal dopamine levels, decreased dorsolateral precortical functions (Weinberger and Berman [98]), and hippocampal damage that increases stress sensitivity (Szuran et al. [93]). These abnormalities may be associated with several neurocognitive markers, such as "soft" neurological signs, impaired eye tracking, and a range of information processing deficits. Stressors, both biological (birth complications, intrauterine viral exposure) and psychosocial (abuse, interpersonal conflict, communication disturbances) may augment neurocognitive risk factors and increase vulnerability. The neurodevelopmental model implies that it is likely that many if not most persons predisposed to schizophrenia may develop the disorder because they are not protected from normal levels of stress, rather than because they were exposed to excessive life stressors (Keefe and Harvey [80]).

Symptoms typically do not occur until later in life according to the neurodevelopmental model because risk factors such as heightened sensitivity to dopamine may interact with normative adolescent increases in hypothalamic-pituitary-adrenal activity that in turn triggers the augmenting effects of increased cortisol levels on dopamine activity, thus heightening stress responsivity (Cocoran et al. [76] and Walker and Diforio [96]). Because of the impact of the interactions of a number or risk factors biological diatheses an have a wide range of expressions, ranging from severe early onset symptoms of schizophrenia to a range of less severe disorders, and relatively normal functioning; perhaps also contributing to enhanced creativity. Researchers have focused on identifying characteristics that may identify biobehavioral and personality based risk and prodromal factors that can be used in preventive interventions. Researchers have focused primarily on schizotypal personality characteristics such as thought abnormalities and social withdrawal (Walker et al. [97]), neurocognitive deficits (Silverstein et al. [91]), and "soft" neurological signs (Neumann and Walker [89]) as potential markers. The goal is to identify factors that allow for reasonably accurate prediction of those individuals that might benefit from preventive treatment efforts.

### 4.5. Summary

Diathesis stress and vulnerability-stress models of schizophrenia attempt to integrate genetic and brain based structural and neurochemical sources of vulnerability with additional factors, including exposure to a variety of risk factors and psychosocial stressors, into comprehensive biopsychosocial

models of the origins of the disorder. However, these approaches are essentially linear in their characterization of how contributing factors impact on vulnerability in an additive fashion. More complex systems models appear to be more appropriate ways to integrate information from different.

# 5 The Role of Genetics

There are several ways to conceptualize the role of genetic factors in schizophrenia. First, schizophrenia can be viewed as a single brain based disorder that is the result of a schizogene that causes brain based deficits. Schizophrenia can also be understood as a heterogenous grouping. In this case it makes more sense to assume that many combinations of genetic factors and premorbid traits increase individual risk for the disorder. Researchers such as Kringlen [126], for example, maintain that the potential genetic diathesis for schizophrenia is not specific but, a weakly inherited or additive group of traits (e.g., anxiety proneness, introversion, irritability, and negative affect) that may be enhanced by psychological and socio-environmental stressors to increase risk for schizophrenia. In addition to the assumption of genetic risk for the disorder, writers have speculated there may be a genetic basis for what is referred to as the "schizophrenia credit." Claridge (1997) pointed out that many clinicians who have daily contact with people diagnosed as "schizophrenic" often note that some patients seem to have remarkable abilities as well as deficits. These abilities are difficult to measure but include descriptors such as "uncanny sensitivity" and frightening empathy." Claridge has suggested that the reason the genetic predisposing factors for schizophrenia have survived for so long despite a consistently lower birth rate and higher death rate for this populaiton, may be because some genetic predisposing factors are associated with personality characteristics (affective, cognitive, interpersonal, and spiritual) that also foster creativity and exceptional interpersonal sensitivity. Interestingly, this raises the question of what might be lost if in the near future we develop the technology to neutralize the effects of "schizogenes." In any case there is a large body of evidence available that indicates genetic factors play a role in vulnerability for schizophrenia,

no matter how one conceptualizes the disorder. It is well known that schizophrenia tends to aggregate in families. Family consanguinity studies have consistently indicated that the closer the individual is genetically to the index case the higher the prevalence of the disorder. Although more than two-thirds of diagnosed cases do not have an identified family member with the diagnosis, evidence indicates that the magnitude of risk varies with the amount of gene sharing, so that averaged figures indicate that identical twins and offspring of dual schizophrenic matings have higher risks (about 45%) than first degree relatives (parents 6%, dyzogotic twins 17%, children 9%, siblings 9%), who have higher risks that second-degree relatives (uncles-aunts 2%, nephews/nieces 4%, half-siblings 6%) and third-degree relative (first- cousins 2%; Gottesman [112]). At the same time it is important to remember that about 89 percent of all schizophrenic patients do not have a schizophrenic parent, and 81percent do not have a schizophrenic parent, sister or brother (Gottesman [112]).

### 5.1. Twin Research

Twin research is based on the assumption that monozygotic (MZ) and dizygotic (DZ) twins of the same gender experience the same set of family circumstances therefore any differences in concordance rates between these groups are likely to be the result of genetic influence. This assumption can be challenged for several reasons however. First, MZ twins are peculiar in several ways, that is, they are at increased risk for a number of disorders. This increased idiopathic general susceptibility may impact on vulnerability so that comparisons between MZ and DZ twins may not be the best design. Second, an equal environment assumption is the foundation of twin studies (Gottesman [112] and Kendler et al. [121]). That is, it is assumed that MZ twins and DZ twins of the same gender experience the same set of family circumstances, therefore any differences in concordance rates between these groups must be the result of genetic influence. This assumption is controversial since children raised in the same family can have quite different experiences. Another issue related to twin research, particularly studies done during the first half of the twentieth century, relates to with questionable reliability of determination of whether the twin pair is MZ or DZ. Despite these limitations studies indicate substantial differences in consanguity rates for MZ (about 50%) and DZ (about 15–20%) DZ twin pairs (Gottesman [112]). Overall twin studies provide evidence that both genetic and environmental factors play an important role in determining risk for schizophrenic symptoms.

### 5.2. Adoption Studies

There are several variations of adoption research strategies. The first approach begins with the identification of grown-up adoptees that have been diagnosed as schizophrenic, and studies the past and present psychiatric status of their biological and adoptive relatives. This is referred to as the *Adoptee as Proband Method*. A large scale study conducted in Denmark using this method reported that 6.4 percent of the biological relatives of schizophrenic adoptees were diagnosed as having a schizophrenia spectrum disorder compared to 1.4 percent for the controls (Kety [123]), indicating that biological relatives are at increased risk in comparison to adoptive relatives. A second approach, the *Parent as Proband Method*, compares the grown up, adopted away children of birth parents who were diagnosed as having a schizophrenia spectrum disorder. The Danish-American research team adopted a broad definition called schizophrenia spectrum disorders in their study of adopted away children. Using this broad definition 13 of 39 index cases were diagnosed with spectrum disorders versus 7 of 47 controls (Kety [123]).

A more comprehensive prospective adoption study design has been underway for over twenty years involving a team of American and Finnish researchers (Tienari et al. [149, 150]). This research is unique in that it prospectively assessed the roles of genetic contributions and the adoptive family rearing environment in the etiology of schizophrenia. The authors initially identified 19,447 women who had been diagnosed schizophrenic in Finland between 1960 and 1979. From this sample a total of 184 adopted-away offspring of 171 schizophrenic mothers were identified and accessible. Genetic liability of adoptees was deduced from DSM-III-R diagnoses of the adopting-away biological mothers. Adoptees at genetic high risk had mothers with a diagnosis of either narrowly defined "typical" schizophrenia or a disorder in the "schizophrenia spectrum." Adoptees at low genetic risk had mothers with a nonspectrum diagnosis or no psychiatric diagnosis. The maximum time that any of the adoptees lived with the biological parent was 4 years and 11 months, most were adopted away when much younger. A control group was identified by independent researchers and matched with probands on the basis of gender, age of placement, age of adoptive parents (within 10 years) and social status. Taped interviews were completed with all families together and with the adoptive couples only. A battery of psychological tests was also administered to all parents and adoptees. Interviewers and testers were blind to the status of the families. The functioning of the families in the study was assessed prospectively, well before the onset of schizophrenia in the offspring. The researchers, as is

customary in adoption studies, incorporated the concept of the schizophrenia spectrum grouping when comparing index and control groups. In this study the spectrum grouping included delusional disorders, schizophreniform psychosis, schizoaffective disorder, psychosis NOS, and schizotypal personality disorder. Results indicate that of 112 index cases (offspring of a mother diagnosed schizophrenic for which follow-up data were available, 8 individuals (7 percent) were diagnosed as psychotic, 10 individuals (9 percent) were diagnosed as borderline, and 16 (14 percent) were diagnosed as evidencing severe personality disorder, yielding an overall schizophrenia spectrum rate of 30 percent among index cases. Among controls (offspring of a mother who had never been diagnosed schizophrenic) 2 individuals (1.5 percent) were diagnosed psychotic, 8 (6 percent) as borderline, and 10 (7.4) percent as having a personality disorder, yielding an overall schizophrenia spectrum rate of 15 percent among control cases. Of the 43 offspring reared in adoptive families rated as seriously disturbed based on previous interviews, 16 percent ($n = 7$) were rated as psychotic, 37 percent were rated as either psychotic or borderline ($n = 16$), and 65 percent ($n = 28$) were rated with at least one diagnosis. In contrast there were no psychotic or borderline diagnoses, and only three offspring (6 percent) with personality disorders among the adoptees raised in the 49 healthy or mildly disturbed families. In other words 37 percent of the 43 offspring of schizophrenic mothers who were reared in a severely disturbed adoptive family developed either schizophrenic or borderline disorders, while none of the offspring of schizophrenic mothers that were raised in a healthy adoptive family environment were diagnosed as either schizophrenic or borderline (Wynne et al. 2006).

Wahlberg et al. [153] reported that thought disorder occurred at a higher rate in the offspring of parents with schizophrenia adopted into families where the mother evidenced communication difficulties. There was no increased risk for thought disorder however in children with genetic risk raised in families where the mother showed low levels of communication disturbance or in children with no genetic risk raised in families with relatively high levels of communication problems. These results indicate that the joint effect of genetic liability and dysfunctional rearing family environment is highly significant. When either genetic risk or family rearing environment is healthy, the adoptees do not develop significant levels of spectrum disorders. The authors concluded that results indicate either low genetic risk from the biological mothers or healthy rearing family relationships has a protective effect even when the other variable is highly disordered. This evidence supports an epigenetic formulation in which psychosocial factors add to genotype expression. Genetic liability

was more strongly predictive in the case of broadly defined schizophrenia spectrum diagnoses of biological mothers than based on narrowly defined, "typically" schizophrenic mothers. The authors noted that this finding is most consistent with a hypothesis of polygenic, multifactorial genetics, and suggests that the diversity of forms of dysfunction of the adoptive rearing families indicates that the nature of these environmental variables remains to be more fully explicated. In addition to family adoption studies, evidence that family dysfunction, in the form of communication deviance, precedes the onset of schizophrenia spectrum disorders by several years was reported by Goldstein [111]. These studies provide evidence that family environment during childhood can have lasting effects on development that, in the presence of a preexisting vulnerabilities, can be of importance in understanding the development of schizophrenia. Twin and adoption studies have taken us about as far as this methodology can. Future progress in our understanding is likely to result from studies of the specific nature of the genetic factor or factors that increase risk for schizophrenia.

Genes and environment can operate to have an impact on risk in a number of ways. They might simply add to one another's effects, or genetic risks may be multiplied by some factor by different environmental influences, or alternatively they may have synergistic effects, where both are necessary to result in the disorder. Since schizophrenia is a relatively rare disorder even among individuals with known genetic risk, and risk is probably polygenetic, the task of finding the contributing genes and alleles is difficult. Additional potential methodological complications to research design include epigenetic mechanisms such as DNA methylation, in which environment affects gene expression (Meaney [131]), and increased probability of mutations inherited from older fathers (Zammit et al. [156]). Current heritability estimates for schizophrenia based on genetic studies run as high as 80% (Owen et al. [137]) but these heritability estimates are likely to be inflated since they include estimates of gene-environment interactions, including environmental-gene induction (Meaney [131]).

Meaney [131] research indicates that the environmental-gene induction process may be social as well as physical. Research indicates for example that variations in mouse maternal competency can affect the offsprings' later responses to stress. This change, apparently mediated by epigenetic changes in histone regulation of DNA expression, is maintained and in turn affects the offsprings' own parenting behavior (Fish et al. [108] and Weaver et al. [154]), so that causality may run from the social environment to the physical as well as the other way around. Evidence also indicates that environmental factors such as maternal viral infections during critical periods of pregnancy, birth complications, low birth weight, and

developmental experiences associated with family dysfunction that overtax the coping capacity of the child can contribute to risk for schizophrenia spectrum disorders. These environmental risk factors may interact with and compound genotypic risk factors (Tandon et al. [148]).

### 5.3. Molecular Studies

Human genetic material is housed in double helix strands of DNA assembled into 23 chromosomes. Each DNA strand is composed of about 3 billion nucleotide base pairs. Genes are locations on the DNA strands that are formed of sequences of base pairs. Genes take different forms, called alleles, and each of us has about 100,000 genes. Gene variations or alleles contain codes that alter the way certain proteins are produced that are critical for cellular growth, function, and health. Gene expression is the process by which genomic DNA sequence is converted into RNA and from this into specific proteins. Early in life the genes expressed in each cell are coordinated through complex and poorly understood processes to help determine cell specialization. Later in life environmental influences on neural gene expression become important. These influences are associated with the long term impacts of experiences on behavior. Research on the genetics of schizophrenia involves attempts to identify the relevant genes and alleles associated with risk for schizophrenia. Since schizophrenia is a multifaceted disorder, most likely involving multiple, interacting genes of small effect, as well as an array of environmental influences, genetic studies must include very large, well-characterized samples in order to establish a valid association with any given gene (Bray [103]). There are three basic strategies used in molecular genetic research on schizophrenia: linkage studies, cytogenetic approaches, and association studies.

Linkage analysis attempts to identify chromosomal regions containing susceptibility loci by studying the segregation of a given disorder with alleles of polymorphic genetic markers in multiply-affected families (Bray and Owen [102]). Linkage studies attempt to identify regions of the genome linked to the disorder, that is, which chromosomal segments are shared among affected relatives but not among unaffected relatives. Linkage studies are based on the expectation that it is possible to detect mutiply affected families in which schizophrenia results from highly penetrant mutations. The logic is that if a marker allele is observed in affected members and nonaffected members of families that have a high incidence of the disorder, then the schizophrenia relevant genetic marker alleles must be present in the affected family members and not in nonaffected members. Mapping of the entire human genome has allowed for detailed assessment of the linkage

of specific chromosomal segments to differences in liability for different disorders. Linkage studies search for a region of the DNA strands in which there is a reasonable likelihood of knowing where on a chromosome to look for an allele. Linkage studies are most likely to be successful if there are a small number of genes involved in a disorder and genetic heterogeneity is minimal. Although several regions of DNA in chromosomes have been linked to schizophrenia, early optimism about the promise of linkage studies has abated as several widely publicized reports of positive findings have not been replicated, and early results appear to be specific to small subpopulations (Pulver [139]).

Linkage studies are ideally suited to detect genes of large effect in genetically simple disorders however their power to detect genes of moderate to small effect is very limited (Owen and O'Donovan [138]). A second problem with linkage studies is that marker alleles found in affected members may have nothing to do with schizophrenia. Even when localization of a disorder related gene is obtained by linkage, relatively large chromosomal regions are likely to be implicated, and these findings must be followed up by many association studies to identify the risk gene responsible for the linkage (Owen and O'Donovan [138]). A number of linkage studies have identified areas on chromosomes where there is a reasonable likelihood of finding marker alleles. Linkage analysis does not however identify the particular susceptibility genes themselves, and to date the total number of genes and genes in chromosomal regions linked to schizophrenia as suggested by meta-analyses is very large (about 4000 genes), or about one-quarter of all known genes (Badner and Gershon [99]). Interest in linkage studies as a methodology for locating schizophrenia susceptibility genes has decreased as the lack of precision of this approach, and difficulties finding sufficiently large samples of multiplex families necessary for analyses with sufficient power to detect genes of relatively small effect have become apparent (Fanous and Kendler [107]). The likelihood of genetic heterogeneity also reduces the sensitivity of linkage analysis.

Association studies complement linkage analysis in that studies can be conducted on samples of related or unrelated individuals. Genetic association studies begin with a particular suspect gene in mind, one that is considered relevant to the disorder perhaps because it is known to be related to a protein used in synthesizing a specific substance or neurotransmitter suspected of being involved in schizophrenia. Groups of unrelated individuals with the diagnosis are then compared to controls in order to identify a DNA marker that is in or close to the hypothesized genetic susceptibility locus. The aim is to detect alleles that are more or less common in patients than in the general population. Gene variants are evaluated on the basis of their

relative distribution within groups of affected and nonaffected individuals. Association studies are typically guided by neurochemical models, focusing on genetic influences on specific neurotransmitter receptors and metabolizing enzymes. Association studies are more suitable than linkage analysis for detecting genes of relatively small effect because they are more powerful for this purpose but, require careful attention to the possibility of false positive and false negative findings due to the large number of gene variants that can be evaluated (Hunter and Kraft [118]). Associations may represent false positive or false negative results due to the large number of gene variants that can be evaluated, and the potential effects of numerous artifacts. In populations with no significant inbreeding approximately 500,000 markers are required to screen the entire genome by association (Owen and O'Donovan [138]). The challenge faced by association researchers is substantial because there are likely to be multiple genes that are involved in the production of any neurotransmitter and its receptor sites, and we are not certain at present precisely which neurotransmitters and receptor types are actually relevant to the etiology of schizophrenia. Thousands of functional candidate gene studies have been reported, but no strongly replicated findings have emerged (Bray and Owen [102]). This problem has prompted the adoption of positional approaches based on analysis of genomic regions implicated by linkage studies, and these have been more successful in identifying a number of susceptibility genes that have been implicated in studies (Kirov et al. [125] and Ross et al. [141]).

Meta-analyses of linkage and association studies of the molecular genetics of schizophrenia indicate that the genes encoding dysbindin (DTNBP1) and neuroregulin (NRG1) are the strongest contenders for susceptibility loci (O'Donovan et al. [134]). Animal models of downregulation of these genes have also provided some interesting insights into their functional consequences. For example, downregulation of DTNBP1 expression using RNA interference results in lower presynaptic protein expression and a decrease in glutamate release in neuronal culture (Numakawa et al. [133]), as well as increased cell surface dopamine (D2) receptor expression. NRG1 gene knockout in mice is associated with behavioral abnormalities, and altered hippocampal plasticity (O'Tuathaigh et al. [136] and Bjarnadottir et al. [101]). Other promising susceptibility genes for schizophrenia have been identified in meta-analyses, including possible loci at 8p and 22q, as well as at 2, 3p, 5q, 6p, 11q, 13q, and 20p (Harrison and Owen [117]). More loci are likely to be found in the future, as genetically less complex endophenotypes (e.g., measurable, subclinical aspects of brain function indicated by neuropsychological, neuroanatomical, behavioral or biochemical indicators) may be identified. Neurobiological data

plausibly links some of these genes to pathophysiologial processes that are widely considered relevant to schizophrenia (Talkowski et al. [147]). It is also possible that messenger RNA of these genes is expressed in the brain in ways that may be differentially expressed in individuals with the disorder. However, in no case to date have specific risk alleles been unambiguously implicated as causal, and the strength and consistency of the genetic evidence at this time does not match that for genes known to be involved in other common disorders (Owen and O'Donovan [138]). One study using an endophenotype approach does stand out. Hallmeyer et al. [116] dichotomized schizophrenic patients into "cognitively spared" and "cognitive deficit" groups using several neuropsychological tests and latent variable analysis. They performed a genome-wide scan comparing the two groups, and found an association between "cognitive deficit" schizophrenia (generally impaired on several measures) with a marker on chromosome 6 that has previously been associated with schizophrenia (Straub et al. [144]), close to the dysbindin gene.

Cytogenic studies search for chromosomal abnormalities such as translocations and eletions in affected individuals as potential clues to the location of susceptibility genes. These abnormalities implicate a gene or region by disruption of the function of a gene directly, by having a positional effect on gene expression, or by showing linking with a susceptibility variant (Bray and Owen [102]). If chromosomal abnormalities are identified in a large proportion of individuals with the same diagnosis, it is likely that the abnormality is related to increased risk for the disorder. To warrant follow-up, abnormalities should be demonstrated to exist in greater frequencies in individuals diagnosed with schizophrenia, disrupt a region already implicated by genetic analyses, or show cosegregation with the condition in affected families (Owen and O'Donovan [138]). New techniques have enabled researchers to undertake genome-wide screening for submicroscopic deletions and duplications, referred to as copy number variations (CNVs). These techniques have demonstrated that CNVs are common in the general population, and the approach has been applied to the study of neurodevelopmental disorders such as autism (Sebat [143]). There is growing interest in the possibility that submicroscopic CNVs may be found to play a role in schizophrenia. Cytogenic studies of the genetic basis for schizophrenia provide a promising approach but to date have not resulted in interpretable results.

Molecular research has identified a proportion of the genetic risk factors that may be relevant to schizophrenia but caution against premature conclusions should be the byword. Tandon et al. [148] point out that even for the most "promising genes" there has been a general failure to

replicate markers and haplotypes across studies, and lack of consistency in implicating particular alleles in risk for schizophrenia (Sanders et al. [142] and Sullivan [145]). Tandon et al. [148] identified four issues that should be considered in evaluating current evidence for the genetic basis of schizophrenia. First, the implications of the failure to replicate findings implicating a particular gene variant as a risk factor are a topic of considerable disagreement. Some researchers maintain that replication problems are to be expected since schizophrenia is most likely a heterogeneous disorder that results from multiple genes of relatively small effect that may vary across populations (Owen et al. 2005). More consistent findings have been reported in other complex genetic disorders however, and there is no reason why genetic research on schizophrenia should not adhere to similar standards of replication in order to avoid type 1 errors (DeLisis and Faraone, 2006). A second issue that should be addressed has to do with the evolutionary paradox, that schizophrenia has persisted around the world at a relatively stable rate for at least the past 200 years, despite decreased reproduction and higher mortality (Svensson et al. [146]). An argument set forth to explain this paradox is that the genes for schizophrenia may also confer certain evolutionary advantages to unaffected family members thereby compensating for lower reproduction and higher mortality in affected members (Crespi et al. 2007). A third issue has to do with the proper genetic model of schizophrenia. The predominant model is that schizophrenia is a heterogeneous, polygenetic/multifactorial disorder that involves multiple genetic polymorphisms, each contributing a small effect to risk (Lichtermann et al. [128]). Alternative models suggest that schizophrenia may be the result of a highly heterogeneous group of genetic factors that can result from the effects of multiple, highly penetrant mutations that are specific to individual cases and families rather than the entire population of diagnosed individuals (McClellan et al. [129]). This model suggests emphasis should be placed on intensive study of individuals and single families. A third genetic model suggests that heritable changes in gene expression alter DNA methlylation and histone remodeling of chromatin structure (Crow [106]). Finally, it has been suggested that given the heterogeneity of the phenotype genetic factors do not code for schizophrenia *per se*, but for a broad clinical construct such as risk for psychosis (Craddock and Owen, 2007) or neurocognitive deficits that are not unique to schizophrenia (Toulopoulou et al. [151]). This suggests that inclusion of endophenotypes based on measures of neurocognitive deficits (Gottesman and Gold [113]) or symptom dimensions (Jablensky [119]) would improve etiological homogeneity and improve the likelihood of replication in genetic studies, since individual endophenotypes would

presumably be determined by fewer genes than the more complex phenotype schizophrenia. The ideal neurophysiolgical endophenotype would be measured by a stable deficit that occurs in both patients and family members and shows strong evidence of heritability and cosegregation with illness within pedigrees. It should also be relatively easily measured with minimal subject demands for motivation and cooperation, have excellent test-retest and cross-site reliability, and reflect a discrete mechanism that is infomraitve of the likely phyiologcy of the disorder and regulated by a limited number of genes (Turetsky et al. [152]). There is no such measure available at this time however, potential markers include sensorimotor gating deficits including failure of prepulse inhibition of the startle reflex, P50 auditory evoked potential suppression, impairments in attention indicated by the P300 event-related potential antisaccade eye movements, and other event related potentials measured by EEG recordings (Freedman et al. [110] and Turetsky et al. [152]). There are obstacles to use of these measures however (Walters and Owen [257]). First, there is not sufficient evidence available that the genetics of the endophenotypes is simpler than that of schizophrenia, or that any of these measures cosegregate with the disorder within individual pedigrees (Flint and Munafo [109] and Turetsky et al. [152]). The special methods required to identify endophenotypes also make it difficult to collect samples large enough for genetic research (Owen and O'Donovan [138]), and several measures are subject to state dependent nongenetic noise, such as the effects of antipsychotic medications. Other measures that are relatively stable trait measures require motivation and cooperation on the part of participants for reliable assessment. Finally, these measures do not appear to correlate (Turetsky et al. [152]), there has been considerable interlaboratory variation in the measures used, as well as lack of consistency of findings, and there is little consensus as to the measures that should be used. The majority view appears to be that use of endophenotypes would be better confined to studies aiming to determine the brain mechanisms linking specific gene actions and products to psychopathology once more robust genetic associations are determined (Owen and O'Donovan [138]), and that studies should assess multiple endophenotypic measures in the same individuals and families in order to better address questions of underlying etiological mechanisms of the disorder (Turetsky et al. [152]).

### 5.4. Summary

Although it is widely accepted that susceptibility to schizophrenia involves a genetic component, one cannot assert conclusively that any particular

gene variant increases risk for schizophrenia (Tandon et al. [148]). Two types of genetic transmission are commonly hypothesized. The single gene or single major locus model is based on the assumption of incomplete penetrance, so that the causal gene may be present but not everyone who has the gene develops the disorder. The alternative polygenetic/multifactorial threshold model suggests that schizophrenia is a complex disorder that results from the interaction of polygenes as well as other environmental factors, each having various levels of effect on overall risk (Gottesman and Shields [114]). This model suggests that risk for schizophrenia can be understood as a single continuum, contributed to by the additive effects of many genes at different loci, as well as a wide range of environmental influences (McGuffin and Sturt [130]). Individuals inherit varying degrees of predisposition for developing the disorder, not the disorder itself. Whether or not the disorder will be expressed depends on the degree of inherited genetic risk as well as other factors, including biological and prenatal, perinatal and postnatal environmental influences.

Efforts to identify genetic loci that contribute to risk for schizophrenia may have been hampered by factors such as incomplete penetrance, genetic heterogeneity, and the likely presence of phenocopies (Ott [135]). When positive results are reported they often are only weakly positive, and remain to be independently replicated. The issue of replication is complex, since there may be a large degree of individual variation in the specific position that gives maximum evidence for linkage (Roberts et al. [140]). This variation may represent chance variation around a single genetic signal, the presence of multiple genetic signals, or one or more false-positive signals. Nevertheless, meta-analyses and genome-wide scans have pinpointed chromosomal regions 8p21-22 and 22q11-12 as harboring schizophrenia risk genes, and a number of additional chromosomal regions have been identified in other genome wide scans (Badner and Gershon [99] Lewis et al. [127]). If these findings hold up it is likely in most cases that each gene has a partial effect and is unlikely to singly be responsible by itself for causing schizophrenia.

The challenges for the future require the identification of genetically less complex endophenotypal subgroups within the population of schizophrenic patients, to isolate the susceptibility variants or halotypes and determine their relationships with the endophenotypal subgroups, to examine possible genetic and functional interactions between established and other putative loci, and to study the normal and abnormal biology of the gene products (O'Donovan et al. [134]). Interactions between genetically based neurodevelopmental risk factors and environmental factors, including prenatal viral exposure (Mednick et al. [132]), birth

complications (Byrne et al. [104]), childhood trauma (Morgan and Fisher [514]), disturbed family communication patterns (Tienari et al. [150]) and stressful environments experienced by the mother during the first trimester of pregnancy (Keshavan et al. [122] and Khashan et al. [124]), may contribute to risk for the disorder, complicating the interpretation of results of genetic studies. The issue of heterogeneity further complicates the picture, as the range of characteristics within the population of clinically diagnosed schizophrenic patients suggests that may be a complex and varied pattern of potential genetic and life history factors that can contribute to increased risk for the disorder. Given these limitations it seems reasonable to conclude the following about the role of genetics in schizophrenia. (1) Genetic factors play an important role in liability for schizophrenia in many cases. (2) A large number of candidate susceptibility genes may contribute to risk for the disorder. (3) No gene is likely to be either necessary or sufficient for development of schizophrenia. (4) Although there are many "findings" of genetic variations linked to differential risk, lack of consistent replication does not allow for definite identification of any single allelic variant as a gene for schizophrenia at this time (Tandon et al. [148]).

# 6 Brain, Neurotransmitters, and Symptoms

Schizophrenia typically begins in late adolescence or young adulthood, and may progress to profound levels of cognitive and social impairment. Given the level of dysfunction and deterioration observed in many patients it is not surprising that clinicians and the lay public assume that some genetically caused brain based dysfunction is the cause of schizophrenia. Given that all behavior is associated with changes in brain activity, the diversity of schizophrenic symptoms suggests the involvement of multiple interacting systems or modules rather than a single localized lesion. The relationship between behavioral symptoms and brain activity is not direct however, and no alterations of the morphology of particular anatomical structures or brain based systems have been reliably associated with any group of schizophrenic symptoms. There are no measures or specific tests of brain function that can be used to diagnose schizophrenia because (1) no one brain region has been exclusively implicated in all or even most schizophrenic patients or subtypes; (2) many schizophrenic patients do not show any detectable indications of structural brain abnormality, and (3) many of the symptoms of schizophrenia are not diagnostically conclusive, do not occur in all patients, and are not specific to schizophrenia (Levy [181]).

Buchanan and Carpenter [164] have suggested that the failure to identify neuroanatomical substrates is the result of a failure to address the heterogeneity of schizophrenia. Others have pointed out that when separate symptom domains (e.g., negative versus disorganized symptoms) are used to group patients questions arise as to whether the symptoms are *primary* (a direct manifestation of the pathophysiology) or *secondary* (e.g., the result of some comorbid disorder, lifestyle, or treatment induced). In order to separate cause from effect, information that allows for accurate distinctions

between primary and secondary symptoms (e.g., negative versus deficit symptoms) must be included to supplement symptom-based groupings yet, this distinction is difficult to assess and rarely addressed in research (Kirkpatrick et al. [180]). Anatomical studies of brain pathology are based on the assumption that symptoms of schizophrenia are permanent trait like differences, consequently researchers use cross-sectional assessments of symptoms to classify patients, and ignore the historical course of the expression of the symptom. If for example, research focuses on the study of abnormalities in the temporal lobe that are associated with auditory hallucinations, the study should not simply study individuals reporting auditory hallucinations but, contrast closely matched schizophrenic patients with and without a history of auditory hallucinations, including those currently in remission, in order to reduce state dependent artifacts. Brain imaging studies typically compare groups of schizophrenic patients and controls but, rarely are the controls "true" controls, and patients are often not grouped according to additional parameters that are likely to be important in studying the relationship between diagnosis and brain function and structure (e.g., symptom dimensions, longitudinal course, or neurocognitive deficits). Controls often do not approximate experimental subjects on key variables. These problems have contributed to a confusing literature that describes a bewildering array of anatomical differences between patients diagnosed with schizophrenia and controls but, has not resulted in well validated coherent and definitive neuroanatomical models of the disorder.

In summary, problems in conducting research on the defining etiological characteristics of schizophrenic patients include heterogeneity within the population of individuals diagnosed with schizophrenia, and difficulties separating cause from the effects of prolonged stress, poor diet, institutionalization, antipsychotic drug treatment and life style differences. It is also very difficult to identify valid control groups that differ from the schizophrenic patient group only in that they have not been diagnosed as schizophrenic. There are problems with the diagnostic construct itself, since patients vary widely in types of symptoms, background, and many other factors and there is not agreement on the kind of patient that is a "true" schizophrenic. Several designs have been implemented to avoid some of these issues including studies of unaffected first-degree relatives, longitudinal studies of patients over long intervals, extended studies of premorbid populations, and studies of medication naïve patient and at-risk individuals. These approaches may eventually generate sufficient findings to support well-validated neuroanatomical models.

### 6.1. Brain Abnormalities

The human brain is a structure in which more recent and sophisticated structures evolved on top of older and more primitive brain structures that are characteristic of the brains of lower species. At the top of the structure are the most elaborate, nimble, and in many ways vulnerable structures, which allow us to process, cogitate, project into the future, and ask ourselves "why" questions. The prefrontal cortex is the most important and evolved brain structure. Older areas of the brain are stacked below the cortex, these areas function to help process and relay sensory and perceptual experiences, drives, emotions, fight or flight arousal systems and so on. Near the bottom of the structure is the "reptilian brain" or basal ganglia that help regulate to basic physiological functions and actions needed for physical survival. The interconnections between this complex array of structures that are essential to the initiation and control functions are critical to purposeful, organized, goal oriented, culturally appropriate thoughts, and behaviors. It is not too far fetched to imagine that the interplay between the components of this extraordinarily complex evolutionary structure can be disrupted in many ways that can result in disturbances of affect, thought, motivation, and behavior. Brain imaging studies focus on finding abnormalities in the activity of brain structures.

Initially, brain imaging technologies were used to look for deficits in specific areas of the brains of diagnosed patients. Computerized tomography (CT scan) and magnetic resonance imaging (MRI) studies have consistently demonstrated abnormalities in the ventricular system in about 25 percent of chronic schizophrenic patients. Enlarged ventricles reflect one or more brain abnormalities, since ventricle size increases with brain tissue atrophy. Additional structural abnormalities have been reported for patient samples in areas such as the temporal lobe, the amygdala, nucleus accumbens, and hippocampus (DeLisi et al. [171], Pakkenberg [187] and Suddath et al. [191]). The nucleus accumbens is a brain structure that may play an important role in schizophrenia, since the accumbens is an area in which cortical regions implicated in schizophrenia interact with dopaminergic pathways (O'Donnell and Grace 1998). The authors point out that the nucleus accumbens has unique afferent connections from nearly every brain area that has been implicated in schizophrenia, including the hippocampus, amygdala, and prefrontal cortex, and has one of the densest dopaminergic innervations in the brain (Dopamine has long been thought to be the neurotransmitter most directly implicated in schizophrenia.). In addition, the activity of the accumbens is controlled by several limbic inputs that provide contextual and spatial information from

the hippocampus and emotion relevant information from the amygdala. Information coming from these sources interacts with afferents from the prefrontal cortex. Thus, the activity of nucleus accumbens neurons influences the level of thalamic-prefrontal cortical activity. Tracts also radiate from the accumbens core to aspects of the reticular thalamic nucleus that contributes to the filtering of sensory activity. The medial prefrontal cortex is both a primary source of input to the accumbens and strongly influenced by circuits connected to the nucleus accumbens. The role of dopamine in accumbens activity is not well understood but, this neurotransmitter appears to be involved in the timing and coordination of neural ensembles in the accumbens, ensembles that influence the activity of prefrontal cortical neurons.

Dysregulation of the dorsolateral prefrontal cortex (DLPFC) is thought to be the neurophysiological basis for disrupted working memory in schizophrenia (Goldman-Rakic [176]). It is thought that working memory disturbances disrupt guidance of ongoing thought and behavior and lead to a form of cognitive fractionation that results in the symptoms of schizophrenia. Meta-analyses of functional neuroimaging studies (Glahn et al. [175]) indicate that reduced DLPFC activation and increased activity in the anterior cingulate suggest that schizophrenia is associated with disruption of the normal pattern of functional connectivity between prefrontal and limbic structures, so that at least some cases of schizophrenia may represent a form of disconnection syndrome (Andreasen et al. [161]). Deficits in executive and memory functions in schizophrenia involve not only impairments in specific neuroanatomical regions, but also impairments in the ability to engage functional networks subserving specific cognitive functions and challenges (Friston and Frith [173]).

Csernansky and Bardgett (1998) emphasize the etiological importance of the anatomical circuit linking the functioning of the nucleus accumbens with the hippocampus and other limbic-cortical structures. Animal research indicates that lesions of limbic-cortical neurons cause decreases in glutamatergic input to the nucleus accumbens that are associated with decreases in presynaptic dopamine release and increases in the density of dopamine like receptors. The authors suggest that schizophrenic symptoms may result from an abnormal dopaminergic state (Recall that antipsychotic medications all affect the dopamine system.) that develops secondary to a primary limbic-cortical lesion and deficits in glutamatergic input to the nucleus accumbens. The authors speculate that negative symptoms may result from the abnormal functioning of frontal lobe structures that receive extensive connections from limbic structures. Sudden reversals of negative symptoms, in the form of episodes of excitement and increased sensitivity

to stimulation occur with stress induced increased dopamine release that is combined with increased sensitivity of postsynaptic dopamine receptors. Studies have demonstrated an association between negative symptoms and decreased blood flow and metabolic activity in the prefrontal cortex (Liddle et al. [183] and Wolkin et al. [192]), as well as abnormalities in dorsolateral prefrontal cortical circuitry (Buchanan et al. [163]). Twin studies indicate that brain abnormalities may also be the result of environmental factors, with a history of pre and perinatal problems associated with ventricular enlargement in particular (Lewis and Murray [182] Casanova et al. [168]). In most cases however, the authors believe that the brain abnormality associated with risk for schizophrenia is genetic in origin and becomes manifest clinically during the normal course of maturation of the brain.

The concept of schizophrenia as a neurodevelopmental disorder is supported by studies that indicate that most schizophrenic patients do not show evidence of brain degeneration as indicated by gliosis (Roberts and Bruton [188]). The lack of evidence of glosis suggests that associated impairments are probably not the consequence of environmentally induced degenerative processes.

### 6.2. Neurobiological Modular Systems

Andreasen et al. [160] describe the study of the neural mechanisms of schizophrenia as having passed through three stages. During the first phase, efforts were focused on using computerized tomography (CT) to demonstrate that schizophrenic patients had diffuse nonspecific abnormalities in the brain. The second phase attempted to localize anatomical abnormalities and relate them to specific manifestations and symptoms using the enhanced resolution of magnetic resonance (MR) imaging between prefrontal cortical dysfunction and negative symptoms. The third and most recent phase does not focus on the relationship between symptoms and regions, but attempts to understand schizophrenia as the result of abnormalities in basic cognitive processes and related neural circuits. Rather than studying brain abnormalities related to specific symptoms of schizophrenia researchers are presently attempting to determine those neurocognitive disturbances that are common to patients, and to identify the abnormalities in neural circuits that explain these disturbances. This suggests that the functional relevance of a specific brain region may depend on the patterns of interactions that take place between that region and other areas within a complex network that may aggregate to serve a particular set of functions.

Cleghorn and Albert [169] developed a model of brain dysfunction in schizophrenia based on the results of neuropsychological studies of

schizophrenic patients that reveal a number of functional deficits including impaired attention, reduced self-awareness and self-monitoring, incomplete recall of spatial and verbal information, impaired planning and goal-directed behaviors, reduced emotional responsiveness, altered continuity in time, and impaired self-other distinctions. Patients also often have difficulty maintaining a shared focus of attention, respond in socially inappropriate ways, and have difficulties screening out distracting information. These functions require the complex integration of multiple brain-based modules. Normally brain messages are sent to modular parts of the brain that are specialized for the required functions and other parts of the brain are coordinated and in turn inactivated or activated appropriately. The authors postulate that normal patterns of modular coordination do not occur in schizophrenic patients. M*odular dysjunction* is the term they use to describe the underlying brain dysfunction that is the basis for the neurocogntive deficits that are postulated to be the basis for many schizophrenic symptoms. Cleghorn and Albert suggest that it is the pattern of brain modular dysjunction rather than specific abnormalities that cause the various symptom subtypes of schizophrenia. Abnormalities emerge when the individual is required to integrate basic functions into more complex expressions.

Cleghorn and Albert believe that individual modular activities and outputs may be inappropriately mixed or relayed to parts of the brain not adequately specialized for the information. As a result the neural networks that form the substrates for cognitive and emotional modules are activated and inactivated in disorganized or inappropriate temporal sequences. The symptoms of schizophrenia reflect asynchronous activation and dysjunction of functional units in the brain. This asynchronous activation is manifested in symptoms such as incongruities between thought and affect, odd and incoherent communications, and faulty attributions of meaning. In the case of delusions, for example, dysjunctions associated with strong emotions early in the psychotic process may trigger delusional perceptions experienced as sudden insights that are interpreted as having special significance. These "insights" that often form the basis for delusions are in effect the result of a mismatch of the sense of significance of an event that has not been correctly checked with expectancies based on personal memory. In the case of thought insertion there is an experience of part of oneself or one's thoughts and perceptions as alien. This is a form of dysjunction of the sense of ownership of the thought. In the case of auditory hallucinations the patient attributes part of the self to nonself because of the dysjunction of functional brain activities.

The authors cite several sources to support the concept of modular dysjunction. First the various brain structures implicated in brain imaging studies of schizophrenia involve widely distributed anatomical systems, for example, prefrontal, temporolimbic, parietal, thalamic and striatal. Second, pharmacological studies indicate that tuning mechanisms in animal brains are regulated by norepinephrine and switching mechanisms are subserved by dopamine, both neurotransmitters have been implicated in schizophrenia. The assumption is that schizophrenic symptoms result from disturbances in the selection, activation, sequencing, and switching of compartmentalized motor and cognitive programs that produce errors in communication between modules.

Andreasen et al. [161] adopted a unitary model of schizophrenia that resembles Bleuler's assumption that the symptoms typically used to diagnose schizophrenia are not primary but rather, are secondary to a fundamental deficit described as a "loosening of associations." The unitary model posited by Andreasen et al. assumes that a number of neural misconnections that result from aberrant brain development can lead to a fundamental cognitive deficit in an underlying process that shapes all aspects of cognition, emotion and behavior. This model assumes that schizophrenia is a single disorder expressed as a single phenotype. The phenotype however is not defined on the basis of symptoms as current diagnostic practice assumes. Instead, the phenotype is defined by a fundmental cognitive abnormality that in turn causes the diversity of symptoms. This "neo-Bleulerian" model attempts of understand schizophrenia as a neurodevelopmental and cognitive disorder. Andreasen et al., posit that cumulative gene-environment interactions are involved as the etiology of abnormalities in the form of "misconnections" during brain development. These "misconnections" are expressed as abnormalities in cognitive processes and ultimately, as symptoms such as hallucinations, delusions, disorganization, alogia, anhedonia, or avolition. The diversity of schizophrenic symptoms, course and outcome suggests that these misconnections must involve multiple interacting systems of the brain. Andreasen et al. [161] propose that a form of *cognitive dysmetria* to be the underlying or fundamental deficit in schizophrenia. Dysmetria in neurology refers to a disruption in the fluid coordination of motor activity leading to abnormalities such as the inability to perform tandem gait. Cognitive dysmetria is the mental equivalent of motor dysmetria: a disruption of the fluid coordination of mental activity. Since multiple locations are involved in the coordination of mental activities the concept of cognitive dysmetria implies that the underlying neurobiological deficits associated with schizophrenia must be widely distributed throughout the brain rather than localized. This suggests

that the symptoms of schizophrenia reflect abnormalities in connectivity in the circuitry of several functional brain modules. Variations in the degree of disruption in connectivity at different levels of brain structure are invoked to explain the diversity of symptoms and outcomes observed in schizophrenia.

The term cognitive dysmetria refers to evidence that many individuals diagnosed with schizophrenia evidence fundamental deficits in taking measure of time and space, in making inferences about interrelationships between self and others, and among past, present, and future. Additional signs of cognitive dysmetria include difficulties in accurately timing input and output, coordinating perceptions, prioritizing, retrieving information, and expressing experiences and ideas (Andreasen [159]). Support for the concept of a form of cognitive dysmetria as involving abnormalities in the circuitry of functional brain modules comes from studies of brain imaging. PET studies have consistently revealed abnormalities neural connectivity, especially in the frontal-thalamic-cerebellar circuitry of schizophrenic patients across a broad range of cognitive tasks (Andreasen et al. [158]). Abnormalities in this circuit are consistent with hypotheses about disturbances in neurotransmitter systems, since these systems are concentrated in midline regions.

Andreasen [159] believes that the common thread that ties diverse observations of brain dysfunction in schizophrenia together into a single model is that the disorder reflects a disruption in a fundamental cognitive process that is normally based on the integrity of several specific brain circuits. These circuits involve connections between brain nodes. Node 1 the *prefrontal cortex* is essential for higher executive functions and long been thought to play a key role in the origins of schizophrenic symptoms. The prefrontal cortex is associated with functions such as language and speech, it is diffusely connected to other areas of the brain and has been demonstrated to play a key role in complex executive, planning and decision making functions. Varying levels of hypofrontality (decreased prefrontal lobe function) are observed in many schizophrenic patients. Node 2 the *thalamus* is a nucleus of relay junctions that are thought to have both gating and generating functions. Thalamic relay nuclei project to sensory and motor cortical regions and receive projections from these areas that allow the thalamus to modulate sensory and motor inputs. Diffuse projections from the thalamus throughout the brain play a role in governing arousal of other systems. MRI and PET studies indicate that thalamic abnormalities are common in schizophrenic patients. These abnormalities are associated with deficits in the sensory filtering role of the thalamus (Andreasen et al. [157]). Node 3 the *cerebellum* is of interest because like the cerebral cortex

it is one-third larger in human beings than in nonhuman primates and has substantial connections with the prefrontal cortex. This anatomical evidence suggests that the cerebellum plays an important role in cognitive as well as motor functions. Schizophrenic patients show a lack of normal activation of the fronto-thalamic-cerebellar circuit during performance of a cognitive task (Andreasen et al. [158]). Andreasen et al. [158] hypothesize that neuroanatomic disruption of the fronto-thalamic-cerebellar circuit results in poor mental coordination that is the basic underlying brain based deficit that is associated with schizophrenia.

The underlying mechanisms involved in cognitive dysmetria are thought to reflect an abnormality in a basic process that regulates the synchrony of mental processes involved in thought and action. The consequence will be that the individual receives mistimed information transfers, and is more likely to incorrectly connect perceptions and associations, and misinterpret both external and internal processes, leading to the formation of delusions and hallucinations. In similar fashion defects in coordinating language production may lead to "thought disorder." Finally, information flow through the systems may become inhibited, leading to "negative symptoms" such as social withdrawal, affective blunting, and alogia.

In summary, the cognitive dysmetria model of schizophrenia as a unitary disorder, posits that the underlying disease process is characterized by poor coordination, or dysmetria, in all domains of functioning. The role of the cortico-cerebellar-thalamic-cortical circuit is to facilitate the smooth planning and execution of both motor and cognitive activities, when there activities become dysmetric, the many symptoms that characterize schizophrenia may result.

### 6.3. Symptom Dimensions and Neurocognitive Deficits

Frith [174] proposed a neurocognitive model to explain symptom heterogeneity. He postulated that the three symptom dimensions of schizophrenia are special cases of a more general underlying disorder of consciousness or self-awareness that impairs the ability to think with meta-representations or higher order abstract concepts that are representations of mental states. Frith accepts the division of symptoms of schizophrenia into three broad groups but with a cognitive emphasis. The first grouping is referred to as *disorders of willed action* (as evidenced in negative symptoms of alogia and avolition). The second grouping includes *disorders of self-monitoring*, evidenced in positive symptoms such as auditory hallucinations and delusions of control. The third grouping is called *disorders in monitoring the intentions of others* that lead to formal thought

disorder and delusions of persecution, described as disorganization. Frith maintains that each symptom pattern is associated with a specific set of cognitive deficits, although all patterns share the underlying characteristic of an impairment of self-awareness that in turn impairs the ability to think effectively with meta-representations. Disorders of willed action are attributed to relative decreases in frontal lobe activity and increases in temporal regions in comparison to normals. Research on blood flow in frontal and temporal regions generally supports the notion that the relationship between these areas is impaired in many negative symptom patients (McGuire and Frith [186]). Symptoms such as hallucinations are thought to result from erroneous attributions of inner speech to other persons, due to a defect in self-monitoring. Evidence for this hypothesis comes from comparisons of hallucinators to non-hallucinators indicating that hallucinators have decreased blood flow in areas associated with monitoring of speech, such as the left, middle temporal gyrus and supplementary motor area (McGuire and Frith [186]). Recordings made while patients were experiencing hallucinations indicated activations in subcortical (thalamus and striatum), limbic and paralimbic regions (anterior cingulate and parahippocampal gyrus), and the cerebellum (McGuire et al. [185]). The authors speculate that subcortical activity may moderate hallucinations, with the content (auditory, visual, olfactory or tactile) determined by the neocortical regions that are activated. Defects in monitoring the intentions of others are associated with increased blood flow to the left medial frontal gyrus and posterior cingulate.

## 6.4. Neurochemistry

A considerable body of evidence is available that relates the efficacy of "typical" antipsychotic medications or "neuroleptics" to the ability to blockade of dopamine (DA) receptors, particularly those receptors ($D^2$) that inhibit the enzyme adenylate cyclase. Dopaminergic neurons play an important modulatory role in a number of mental, motor, endocrine, and autonomic functions, are characterized by complex intrinsic control mechanisms, and are involved in the integration of the activities of neocortical and older subcortical systems. Neuroleptic medications (e.g., haloperidol—Haldol, chlorpromazine—Thorazine, perphenazine—Etrafon, and fluphenazine—Prolixin) have been used to treat schizophrenia over the past 50 years, and have proven to be effective in reducing many psychotic symptoms. Growing awareness of the problem of *tardive dyskinesia* however prompted the search for new "atypical" agents that can block dopamine receptors in

the limbic and mesocortical areas without the same level of risk of affecting the neurotransmitters and brain areas associated with tardive dyskinesia and other adverse effects. The first of these new "atypical" antipsychotic drugs (clozapine) was introduced in the late 1980s. Clozapine was thought to be more effective in the treatment of neuroleptic refractory patients, and negative symptoms (Jibson and Tandon [178]). Eventually concerns grew about increased risk for infrequent but serious side effects, (e.g., agranulocytosis or loss of white blood cells and heart disease) associated with clozapine. Alternative atypicals have been developed since clozpine this list includes risperidone-Risperdal, olanzepine-Zyprexa, quetiapine-Seroquel, sertindole-Serdolect, and ziprasidone-Geodon. Atypical medications are not associated with increased risk for tardive dyskinesia or agranulocytosis but, these medications are not problem free since they often result in weight gain, and metabolic changes that are associated with high cholesterol, cardiovascular disease, hyperglycemia, and increased risk for diabetes. Long-term studies are mixed as to whether or not these medications are any more effective than neuroleptics in reducing positive symptoms, but they may be superior to typical agents in reducing relapse rates and some negative symptoms (Csernansky et al. [170]).

There are similarities as well as differences in the pharmacological profiles of the "atypical" antipsychotic drugs. First, the "atypicals" retain the property of $D^2$ antagonism to varying degrees. Risperidone and olanzapine, for example, are potent $D^2$ antagonists, while clozapine is a weak antagonist. All of the atypical antipsychotics are also potent selective serotonin ($5HT^{2a}$) antagonists. The atypical antipsychotics are all mixed antagonists of at least three receptors (dopamine, serotonin, and noradrenalin), and display fewer extrapyramidal side effects than typical neuroleptics (A. Carlsson and M. Carlsson 2006). These medications have proven to be somewhat slower to affect acute psychotic disturbances but, overall they are as effective as conventional antipsychotic agents in treating psychotic symptoms (Beasley et al. [162]). It is important to note however that people respond individually to psychoactive medications. In most cases symptoms such as agitation and hallucinations improve a few days after atypical antipsychotic medications are started, and the degree of preoccupation with delusional ideas usually decreases within a few weeks. Unfortunately, some individuals diagnosed with schizophrenia, perhaps as many as 25%, continue to experience positive symptoms (delusions and hallucinations) even when they take adequate doses of antipsychotic medications (Kane and Marder [179]). The newer atypical medications appear to be more effective in reducing negative symptoms than neuroleptic medications. Because of individual differences however it is not possible to predict

beforehand how an individual will respond to a particular medication and it is not unusual for several medications to be tried before optimal effect is achieved.

How do the atypical medications work to selectively block $D^2$ receptors without increasing risk of tardive dyskinesia and other adverse effects associated with the neuroleptics? The mesolimbic dopamine pathway has a limited number of presynaptic 5-HT receptors. The atypicals block serotonin ($5\text{-}HT^{2a}$) receptors in all pathways. Serotonin normally acts to inhibit dopamine release in the mesolimbic pathway. When 5-HT is blocked it increases dopamine release in the mesocortical, tuberofundibular, and nigrostriatial pathways. This enhanced dopamine release offsets the effects of medication induced dopamine blockade. The result is antipsychotic effects without the severe cognitive slowing, extrapyramidal, or prolactin-related side effects commonly associated with unilateral dopamine blockade.

### 6.5. The Effects of Altered Neurochemistry on Brain Mechanisms

The cerebral cortex controls sensory input and arousal levels by means of a negative feedback loop involving the striatal complexes, the thalamus, and the mesencephalic reticular formation. This feedback loop is composed of several parallel components representing motor, cognitive, and emotional functions. These systems provide a means for the cerebral cortex to control sensory input by adjusting a thalamic filter, as well as by controlling the activity of subcortical arousal systems. Antipsychotic medications appear to exert their therapeutic effects in part by enhancing the potential for cortical control over sensory and subcortical arousal systems. Carlsson and Carlsson [166] maintain that the mesostriatal dopamine pathways play a modulatory role on brain activity, by exerting an inhibitory influence on the striatum, which in turn acts to inhibit thalamic/mesencephalic reticular formation activity. On the other hand stimulation of dopaminergic mechanisms functions to counteract this inhibition. The corticostriatal glutamate system acts in the opposite direction of dopaminergic pathways by stimulating the inhibitory function of the striatum. In this manner a deficient corticostriatal glutamatergic function can lead to functional disturbances similar to those caused by dopamine agonists such as amphetamines that are known to cause psychotic symptoms. Other psychosis inducing drugs such as phencyclidine (PCP or angel dust) act as glutamate antagonists (Lodge et al. [184]). High levels of glutaminergic activity induced by NMDA antagonists have been demonstrated to have an excitotoxic effect on cerebrocortical neurons without significant gliotic reactions, due to a

shutdown of inhibitory GABA input to posterior cingulate and retrosplenial neurons (Farber [172]). The fact that this phenomenon only occurs in animals during the young adult stage is consistent with the age of onset of schizophrenia.

Cell destruction results in hypoactive NMDA activity and drugs such as PCP that can trigger psychotic reactions also result in reduced NMDA activity. Dopamine over activity is incorporated into the explanatory model, since DA over activity can inhibit glutamate input to GABA interneurons, which control excitatory input to GABA interneurons involved in control of excitatory input to the posterior cingulated neurons (Henn [177]). This evidence fits with a neurochemical model that hypothesizes a toxic reaction during early adulthood is the trigger for the schizophrenic process, and with anatomical evidence since glutamate from cortical afference is known to act on GABA interneurons in the striato-pallido-thalamic-cortical loop that is implicated in schizophrenia (Henn [177]).

Carlsson and Carlsson [166] suggest that at least some schizophrenic symptoms are caused by a dopamine-glutamate imbalance. They argue that understanding of the role of dopamine as an essential stimulant for a variety of brain functions (mental and motor) must be revised, since it now appears that the lack of activity that occurs when dopamine activity is reduced is due to an active glutamate-based inhibition exerted by the corticostriatal glutaminergic pathway via the striatum on the thalamus and mesencephalic reticular formation. If this inhibition is removed by blocking glutamate receptors, psychomotor activity occurs in the absence of dopaminergic stimulation. Thus, the corticostriatal glutaminergic pathway is a strong suppressant of a number of arousal mechanisms. The inhibitory action of the corticostriatal glutaminergic pathway on brain activity is also selective, in that it fosters targeted and purposeful responses to external stimuli. This suggests that the selection of purposeful programs, as well as the switch from one program to another, is an important function that is based on normal operations of the corticostriatal glutamate system. Thus, just as a psychotic condition can be induced, aggravated, or alleviated by manipulation of the dopaminergic system, manipulation of the corticostriatal glutamate pathway can have similar consequences. Carlsson and Carlsson conclude that in at least some cases schizophrenia may be induced by deficiencies of the corticostriatal glutamate pathway. These researchers suggest that the connectivity of several basic neuronal circuits may be causally related to the generation of symptoms of schizophrenia. This circuitry involves D2 receptors in the striatal complex that the antipsychotic drugs act on. Dopaminergic neurons from the substantia nigra and the ventral tegmental area also project to the striatal complex and seem to play an

important role in schizophrenia (Carlsson [165]). The striatal complex has inhibiting effects on the thalamus via GABAergic neurons, in this manner the thalamus can act as a filter of sensory information. Dopamine receptors in striatal neurons also function to inhibit output projecting to the thalamus. In this way hyperactivity of the dopamine system can inhibit the striatal inhibitory influence on the thalamus. If this occurs the thalamus may exhibit hyperactivity that can over stimulate the cortex. The striatum also receives excitatory input from the cortex via a glutaminergic projection. In this manner the striatal complex is controlled via inhibition by the brain stem and activation from the cortex (Carlsson [165]). The inhibitory GABA neurons can be inhibited by hyperactivity of D2 receptors and/or reduction of glutaminergic input to the striatal neurons that reduce inhibition of the thalamus. The balance between glutamate (hypoglutaminergia) and dopamine activity (hyperdopminergia) alters the balance between inhibition and stimulation in the striatal complex, and can result in disturbed information processing that is associated with many psychotic symptoms. If however schizophrenia is a heterogenous disorder, as Carlsson and Carlsson [166] suspect, multiple neurotransmitter imbalances may prove to be relevant for understanding and treating different psychotic symptoms.

## 6.6. Summary

Significant advances have and continue to occur in research and theory about the nature of the genetic diathesis, as well as our understanding of the underlying neuroanatomical, neurocognitive, and neurochemical factors that play a role in the etiology of the symptoms of schizophrenia. Imaging researchers have developed models that integrate findings of abnormalities in multiple brain areas. These models focus the coordination of functions between multiple brain locations rather than specific lesions. Enhanced understanding of the relationships between the effects of antipsychotic medications, neurotransmitters, and brain modules and functions will contribute to the formation of more sophisticated models and medications with fewer side-effects. Biological research on schizophrenia is an area of rapid development and will undoubtedly lead to more powerful models of the etiology and treatment of the disorder. Antipsychotic medications are effective in treating acute psychotic symptoms and are an important component of the long-term treatment of schizophrenia. These medications also reduce the likelihood of relapse and increase tolerance for life stress, so that successful participation in psychosocial rehabilitation programs is more likely (Rossler and Riechler-Rossler [189]). Although antipsychotic

medications are effective in controlling many symptoms, they are limited in their effects in that drugs cannot alone improve functional skills, improve interpersonal relationships, or help people seek, gain, and hold a job (Sergi et al. [190]). Truly comprehensive treatment programs must include both access to pharmacotherapy and a wide array of psychosocial treatments that can be tailored to suit the particular needs and competencies of individuals diagnosed with schizophrenia.

# 7 The Role of Neurocognition and Neurodevelopment

Adaptive cognitive functioning from an information processing perspective depends on the ability to prioritize and allocate appropriate resources for processing significant input. This ability requires the coordination and integration of new inputs within existing cognitive frameworks developed on the basis of past experiences. These match-mismatch evaluation processing functions involve complex and only partly understood interactions between the hippocampus, several subcortical and cortical regions that include hippocampal-amygdaloid circuits, and integration of the dorsolateral prefrontal cortex with the striatal-thalamic circuit on the one hand and the mesolimbic system on the other (Eggers [201], Oades 1995 and Weinberger et al. 1992). A significant proportion of adolescent and adult patients and children at genetic risk for developing schizophrenia show deficits in their ability to control and strategically allocate information processing resources and appropriately process task-relevant information in order to respond adaptively (Servan-Schreiber et al. [222]). Schizophrenic patients have difficulties with selecting relevant stimuli, sustaining attention, and shifting focus appropriately, in recognizing and identifying more from less important details in a situation, and in storing, recalling, and using inputs appropriately (Eggers [200] and Nuechterlein and Dawson [216]). As the level of cognitive processing involved in a task becomes more complex the performance of many patients becomes more impaired (Calev et al. [196]). These impairments often do not change significantly whether the individual is in an active or residual symptom phase of the disorder, or when medications decrease active symptoms (Nuechterlein [217]).

Dysfunctions in the mesolimbic, striatal, and hypothalamic-thalamic areas are thought to be involved in perceptual and cognitive processing problems (Eggers [201]). The connections between these CNS structures and the heteromodal association areas of the neocortex are involved in

a range of executive functions, including working memory storage. The impact of disruptions in limbic processes on neocortically controlled executive processes also appears to be related to difficulties with affect regulation and perception (Eggers [201]). Reduced capacity to process information impedes molar cognitive functions involved in executive and social functions. Difficulties with executive functions such as planning, problem solving, and the ability to alternate attention between tasks are indicated by performance on neuropsychological measures such as the Wisconsin Card Sort Test (WCST). When asked to match cards that go together on the WCST and given feedback indicating whether a match is right or wrong but not told specifically which characteristics on which to match (e.g., color, shape, size, or number), schizophrenic patients typically give a high number of perseverative responses. This pattern of response perserveration continues in spite of trial by trial performance feedback, and indicates that many patients suffer from deficits in executive functions associated with decreased activation of the prefrontal cortex (Weinberger et al. [231]). Information processing dysfunctions have also been reported to occur at a higher rate among first degree family members of patients than matched controls, particularly their children (Nuechterlein and Dawson [216]).

Neurocognitive deficits are reported to be better predictors of posthospital social and occupational functioning than clinical symptoms (Green et al. [203]). About 90 percent of diagnosed schizophrenic outpatients evidence impairment in at least one neurocognitive domain (e.g., attention, memory, motor functioning), and nearly 75 percent show deficits on two domains (Palmer et al. [219]). Additional neurocognitive deficits that occur at higher rates in remitted as well as symptomatic patients, and in at risk populations and first-degree relatives of patients than in controls include impairments in performance on the continuous performance and span of apprehension tests (Asaranow et al. [193] and Mirsky et al. [213]).

The potential usefulness of neurocognitive deficits as predictors of outcome, as targets for direct therapeutic interventions, and as indicators of the therapeutic impact of atypical medications has been under exploited. Neurocognitive deficits can also be fruitful targets of treatment interventions, since these features may be the basis for deficits that increase risk for the disorder (Green [204]). Neurocognitive deficits are related to impairments in social cognitive functioning, including interpersonal effectiveness, the ability to accurately recognize emotions in others, the ability to correctly infer what others are thinking, and the ability to understand social roles and the implicit rules that govern most social interactions (Mueser et al. [214] and Penn et al. [220]). Neurocognitive measures,

including indicators of executive functions, verbal declarative memory, and vigilance, are potentially useful endophenotypic markers that also predict community functioning among severely ill patients (Schutt et al. [223]). An additional marker, eye tracking deficits, in the form of saccadic intrusions into smooth pursuit eye tracking movements have been reported in around 65% of schizophrenic patients, 40% of first-degree relatives, 30% to 50% of bipolar patients, and 8% of controls (Holzman and Matthysse 1990 and Siever [224]). Impaired eye tracking is related to poor premorbid personality adjustment, severity of thought disorder and symptom deterioration but, is not related to other positive symptoms such as delusions (Siever [224]). Eye tracking deficits on antisaccade tasks are thought to be signs of an endophenotype that are both stable over time, and expressed in many schizophrenic patients and their first-degree relatives. These deficits may be signs of a latent trait that is variably expressed in the form of risk for negative symptoms of schizophrenia (Holzman et al. [208] and Radant et al. [221]). Factor analytic studies indicate there are seven cognitive performance dimensions in schizophrenia that occur across studies and probably represent fundamental dimensions of cognitive deficit in schizophrenia: Speed of Processing, Attention/Vigilance, Working Memory, Verbal Learning and Memory, Visual Learning and Memory, Reasoning and Problem Solving, and Verbal Comprehension (Nuechterlein et al. [218]). Social Cognition is a likely eigth domain. These measures are potentially useful indicators that can be used in clinical trials designed to evaluate the impact of attempts to enhance cognitive performance and functional recovery (Nuechterlein et al. [218]).

### 7.1. Neurodevelopment

Neurodevelopmental models are based on the assumption that schizophrenia is a consequence of early (most likely genetically based and/or from prenatal sources) abnormalities in neural development (Green [204]). These abnormalities occur early in development but may remain unnoticed or relatively dormant until the affected areas of the brain mature (Weinberger [229]). Neurodevelopmental researchers maintain that risk for schizophrenia is related to problems that begin as early as the second trimester, and involve misinformed communication within regions of the brain due to problems in neural migration. Several sources of evidence support the assumption that schizophrenia can be understood as a neurodevelopmental disorder. First, the typical onset of the disorder is during adolescence, a time when many important changes are occurring in the brain and hormonally. Second, the structural abnormalities associated with

onset of schizophrenia do not appear to progress with time (Weinberger [230]). Third, a large number of schizophrenic patients evidence signs of neuromotor and cognitive dysfunctions during childhood (Walker et al. [228]). Those developmental antecedents that occur with increased frequency in schizophrenic patients include behavior problems at school, low IQ and achievement test scores, and motor skills deficits (Walker et al. [227]). Follow-back studies also indicate that preschizophrenic children evidence significantly more behavior problems than their healthy siblings, and the severity of these problems increases with age (Baum and Walker [194] and Neumann and Walker [215]). Many researchers believe the neurodevelopmental brain abnormalities that predispose someone to schizophrenia occur early in development, intra- or perinatally, most likely during the second half of gestation (Weinberger [229]). This assumption is supported by evidence from postmortem studies indicating the presence of abnormal cortical cytoarchitecture suggestive of early errors in developmental neurogenesis or migration (Weinberger [230]). Other theorists postulate that schizophrenia can result from later neurodevelopmental errors such as an abnormality in periadolescent synaptic pruning in the central nervous system or a defect in the myelination of key corticolimbic connections (Feinberg [202]).

Attempts to understand the neural circuitry of the predisposition to schizophrenia have focused on multiple functional circuits involving cortico-subcortical loops. Several loops, involving the dorsolateral circuit (thought to mediate executive functions such as planning and working memory), the anterior cingulate (thought to mediate motivation), and the lateral orbitofrontal circuit (thought to mediate context appropriate behavioral responses) appear to be involved in risk for schizophrenia. Walker et al. [228] maintain that neurodevelopmental deficits in these circuits are congenital, and are the reasons why many schizophrenic patients in the premorbid phase manifest motoric, cognitive, and socioemotional deficits that escalate with age. The authors suggest that there may be two premorbid behavioral subtypes of schizophrenia, one characterized by early onset of behavioral dysfunctions that increase in severity through adolescence and another that shows an unremarkable behavioral course until adolescence. Walker et al. point out that development of the human cerebral cortex extends into late adolescence/early adulthood, with different circuits activated at different developmental periods. The motor circuit is dominant during the first two years of life, while frontal and limbic circuits do not reach maturity until late adolescence/early adulthood. Hyperkinetic movement abnormalities, observed to occur with high frequency in preschizophrenic children, may represent abnormalities

in the motor circuit associated with over activity of striatal dopamine pathways involved in the striatal-thalamic-cortical motor circuit. Hyperdopamine activity in the limbic circuit that results from striatal dopamine receptor abnormalities can contribute to the cooccurrence of movement and thought abnormalities. Because these circuits develop at different rates, the expression of the underlying striatal pathology changes with age. Thus, the clinical syndrome schizophrenia may be one of several developmentally linked manifestations of a common diathesis; the initial expressions of which coincide with maturation of the limbic and frontal circuits.

Walker et al. [228] hypothesize that cases of schizophrenia spectrum disorders involve an underlying neuropathology that results in heightened sensitivity to dopamine because of unspecified abnormalities in dopamine receptors. As a result these individuals are more sensitive to increased dopamine activity, and also more sensitive to stress. This sensitivity is assumed to be the expression of an organic diathesis, but as development proceeds early and repeated exposure to stressful experiences render a person more vulnerable to subsequent stressors and more reactive to dopamine activity, so that the biological and behavioral effects of stress interact and escalate with each stressful experience. The cumulative effects of stress are thought to be the source of individual differences in the extent of childhood behavioral dysfunction among schizophrenic patients, as well as differences in the course and onset of the symptoms.

The role of neurodevelopmental factors in the etiology of schizophrenia is supported by evidence from epidemiological and neurohistological studies that indicate that neural migration during the second trimester of pregnancy is adversely affected by genetic or environmental factors, such as exposure to influenza virus (Mednick et al. [212]). These abnormalities in neural migration are in many cases reflected in subtle but measurable physical characteristics and abnormalities in motor development. Many schizophrenic patients, for example, evidence an unusual frequency of minor physical abnormalities that may be related to these risk factors such as mixed laterality, and neuromotor functioning deficits compared to controls (Green et al. [203] Walker et al. [227]). These neurodevelopmental characteristics may represent signs of underlying genetic vulnerability.

Several questions remain to be adequately addressed by neurodevelopmental researchers. (1) Are there brain abnormalities, unique to schizophrenic patients that unambiguously point to derailment in one or more neurodevelopmental processes? (2) Can these pathologies be reliably demonstrated in individuals at the time periods when the brain is undergoing the proposed abnormal developmental changes? (3) Can it be demonstrated that putative etiological factors predictably cause the

observed developmental neuropathology? If reliable neurocognitive and social cognitive deficits can be identified in some or most schizophrenic patients and their normal relatives and not in carefully matched controls, the next step would be to identify the neural mechanisms that are the basis for each of the deficits. Sampling problems that complicate the interpretation of studies include inadequate neurological evaluation and diagnosis, failure to control for chronicity of illness, lack of comparability between patients and controls on such basis measures as age and education, failure to report or control for past and concurrent somatic therapies, inappropriately matching patients and controls on IQ, and failure to include substance abuse as a potential confound (Heaton and Crowley [207] and Gur et al. [205]).

In summary, neurodevelopmental researchers maintain that the emergence of schizophrenia in adolescence can be explained by an interaction of early brain lesions and a disruption of later postnatal brain maturational processes; in which genetic factors and environmental variables play a role (Keshavan [211]). The net result of the complex interplay of these causative factors may be a multimodal network based form of dysplasia in certain critical cortical-subcortical systems or modules, with clinical expression of symptoms varying with the particular networks involved. The preschizophrenic process disrupts the neuronal winnowing process that naturally occurs during adolescence. This disruption leads to a deficit in the organization of cortical and lower limbic and mid-brain centers that have to do with the coordination of higher order cognitive processing with emotions, memory storage, and other functions. The result is a brain based developmental deficit that increases risk for schizophrenia.

### 7.2. A Neurocognitive-Attachment-Based Model

Eggers [200] proposed that the functional consequence of normal interactions between the neocortices and the mesolimbic structures may be the development of a capacity called "sensory protection." He speculates that early childhood experiences, especially those based on interactions with primary care-givers, may be crucial to balanced development of normal cortico-limbic connections. Anatomical studies have demonstrated that there are phases in various cortical regions where synapse density increases and later decreases (Braun 1996). Eggers suggests that these phases in synaptic reorganization may account for several critical phases in learning processes, as well as the stability and long-term effects of certain childhood experiences over time. Appropriate levels of cognitive stimulation and certain parent-child related experiences are affected by

and depend on the precise and efficient processing of environmental events and experiences and can only occur normally if the process of synaptic selection (pruning) proceeds in a fashion that results in a functional substrate. Attachment research indicates that "adequate stimulus input" is based on the presence of parenting that consistently provides "an adequate stimulus barrier." Parents ideally function as this stimulus barrier and regulate input from the environment in a manner that is in synch with the infant's momentary state, including its attentiveness, receptiveness, coping abilities, and needs. Establishment of a secure attachment depends in large part on the quality of the parental stimulus barrier function. Ideally, the parental response should be appropriately sensitive to the infant or child's stage of development and abilities regarding self-control, perception, and integration of sensory information into symbolic and interpersonal capabilities. Ainsworth et al. (1978) described the essential qualities of the parents' responses during early childhood. (1) She/he must take in the signals coming from the neonate and her/his attention threshold must be appropriate and not too high. (2) She/he must be able to accurately interpret signals from the baby's point of view and not project from her/his own state. (3) She/he must react promptly so the neonate can develop a relationship between its behavior and her/his tension relieving behaviors. In this manner, the neonate experiences its effectiveness and ability not to feel helpless. (4) Reactions to the signals of the neonate must be appropriate. Parents in other words should give no more and no less than is necessary to respond appropriately to the infant's stage of development; he or she should not over- nor understimulate, indulge, or deny. Psychodynamic studies indicate that the development of the child's self-system depends to a large degree on the differentiated coordination of the parents' ability to correctly identify and respond appropriately to the mental state of the child. If the infant or child does not experience this form of "good enough" parenting it is likely to shift attention inward, to comfort itself, fantasize, become less expressive, withdrawn, and develop difficulties focusing. These qualities are similar to the premorbid features of children who later develop schizophrenia (Jones et al. [210]). Thus the quality of parenting may have a significant impact on emotional and cognitive functioning at both behavioral and neurodevelopmental levels. Eggers [201] suggests that early childhood experiences, especially those based on interactions with primary care-givers, have lasting effects that are essential to the development of cortico-limbic connections that are crucial for normal functioning, and when disrupted may be implicated in development of increased risk for schizophrenia.

### 7.3. Summary

Vulnerability-stress models of schizophrenia stimulated the search for neurocognitive indicators of vulnerability that are independent of the current symptom picture. Neurocognitive and neurodevelopmental indicators can be used to identify functional deficits that may be help identify endophenotypes that are quantitative, heritable, trait-based deficits that can be assessed by laboratory methods (Braff et al. [195]). These indicators hold considerable promise both as measurable indicators of vulnerability and as targets for therapeutic interventions.

There is good evidence for cognitive heterogeneity among individuals diagnosed with schizophrenia, however it is not clear whether this heterogeneity is best accounted for by a general loss of function that varies in degree between individuals, or reflects impairment in specific cognitive functions. The measures that are considered to be most promising include impaired performance on measures of attention, impaired processing of complex information, deficits in maintaining a steady attentional focus, problems distinguishing relevant from irrelevant stimuli, and in forming consistent abstractions, deficits in sensory inhibition and autonomic responsivity, eye tracking deficits, and impairments in processing interpersonal information, and coping skills deficits (Cornblatt and Erlenmeyer-Kimling [197], David and Cutting [198] and Nuechterlein and Dawson [216]). A large proportion of patients and a significant number of their apparently healthy biological relatives evidence information processing and perceptual deficits (Green [204] and Toomey et al. [226]), suggesting that these impairments in neurocognition and social cognition may predate the onset of symptoms. Neurocognitive abnormalities may also provide useful markers of the boundaries between subpopulations of schizophrenic patients, and are hold promise as targets of direct therapeutic intervention.

# 8 General Systems Thinking and Schizophrenia

The levels of focus and analysis that have been applied to understanding schizophrenia often seem to present irreconcilable viewpoints. Genetics, neuroanatomy, neurochemistry, physiology, neurocognition, neurodevelopment, behavioral psychology, psychodynamic psychology, family systems, anthropologcy and sociology all focus on different aspects of the disorder. Each discipline provides a unique perspective that represents an organized way of viewing and attempting to understand schizophrenia, and each generates observations that focus on different levels of analysis. These disciplines also tend to rely upon different methods for obtaining and evaluating evidence. This fragmentation of science is necessary and has many benefits but, it also leads to the generation of information and concepts that seem to be incompatible. Nearly all contemporary clinical researchers espouse the value of biopsychosocial explanations of schizophrenia but, one is hard pressed to find examples that approximate this ideal. The dominant model of science and the tendency in technologically advanced cultures to attribute greater credibility to reductionistic explanations has contributed to a bias in the field toward biological explanations.

The biologist von Bertanlanffy [232] was among the first to outline a framework and rationale for an integrative scientific model for understanding living organisms. General systems theory posits that the processes of reorganization to hierarchically higher levels characteristic of living systems cannot be accounted for by simply summing the parts. Systems theory holds that progress in understanding living organisms is most likely to occur when scientific disciplines are understood to be complementary and interrelated, rather than contradictory and separate. This approach encourages focus on the study and identification of patterns, relationships, and the dynamics of coacting influences on the person from a holistic rather

than a linear perspective (Ropohl [235]). Systems thinking emphasizes that influence processes often occur at multiple levels, and can be multicausal, synergistic and reciprocal rather than additive and linear. The goal of systems thinking is to understand human beings as complex, open, and purposeful living systems that are composed of multilevel processes and mechanisms that perform different but interrelated functions that operate together to attempt to maintain homeostasis at all levels. Thus, people are not viewed only as receptors of environmental inputs or bundles of genetic and biochemical processes, brain structures, and conditioned responses; recognition is also granted that people are members of interpersonal networks, and are able to interpret, organize, and search out experiences in a purposeful manner.

Von Betanlanffy proposed a hierarchical model in order to foster enhanced understanding of how the different levels of organization of living systems function. Causality is not conceptualized as unidirectional; instead causality is conceptualized as involving multiple reciprocal influence processes, synergistic effects, and feedback loops. General systems theory suggests that schizophrenia comprises a complex form of reorganization at multiple levels within the person, and this reorganization no matter how socially dysfunctional represents attempts at adaptation. From this perspective molar explanations of symptomatic behaviors should be consistent with but, are unlikely to be adequately understood in terms of concepts developed at molecular levels, just as molecular levels cannot be adequately synthesized or understood in terms of more molar constructs. Adoption of a hierarchical systems perspective implies that the diverse behaviors and experiences that we diagnose as schizophrenia cannot be adequately explained at any single level of analysis. Schizophrenia is viewed as a polyvalent outcome of the reciprocal contributions of many potential influences and idiosyncratic factors that influence systemic regulation and occur at multiple levels. Of course observations across levels may eventually be validated and weighted in terms of their relevance to etiological theories if clear causal relationships can be established between observations and dysfunctions.

General systems thinking is based on the assumption that schizophrenia is best understood as the outcome of any number of patterns of complex, individual failures in systemic regulation, potentially involving biological, psychological, and socioenvironmental factors over the life course of the individual. This approach is "biopsychosocial" in that it assumes that contributory factors at one level interact with contributory factors at other levels in complex ways to increase risk, long before symptoms of psychopathology are observed. Genetic vulnerabilities, prenatal changes

and stressors, birth complications, and stressful life experiences interact synergistically to alter genetics, neurochemistry, brain functioning, affect, cognition and relationships in ways that in turn alter coping capacities. Children who inherit various risk factors must learn to cope and successfully complete the same developmental tasks and manage as many if not more interpersonal and social challenges as the rest of us. The inborn potentials and resources available to each of us must interact with a range of factors to determine the impact of experiences. Prenatal or delivery-related risk factors and differences in quality of parenting and family functioning, as well as differences in cultural practices may activate, compound, protect, or fail to compensate for inborn and other environmentally caused vulnerabilities.

General systems theory fosters potentially useful alternative ways of thinking about causality. The concept of *equipotentiality* suggests that there can be many pathways to a similar outcome, that is, many different contributing factors may interact in complex ways that contribute to risk for schizophrenia. The concept of *multifinality* suggests that similar circumstances can result in very different outcomes, depending on the characteristics and vulnerabilities of the individual. Each individual brings his or her own unique set of coping strategies, vulnerabilities, traits, resources, and supports into situations, so that it is unlikely that any single set of events will have a common impact across individuals. Finally, the principle of *reciprocal causality* suggests that contributing factors are not additive, but interact in highly complex and unpredictable ways that can compound or reduce the impact of one another.

Grinker [234] suggested that the study of schizophrenia can be represented in the form of a systems model represented as three transactional cylinders. The height of each cylinder represents levels of analysis with one cylinder representing somatic variables such as biochemical, enzymatic, cardiovascular, central nervous system, drive, physiology, and various regulatory systems and modular control systems. Another cylinder represents a psychological column, with systems such as attention, memory, perception, social cognition, self-beliefs, ego and super-ego functions, and related regulatory and control systems. The third column represents socioenvironmental influences, including the various sources of and kinds of life situational stressors, conflicts, and social factors that affect the individual. Reciprocal relationships are assumed to exist between the three columns therefore one cannot ascribe a specific cause to any particular column. Contributing factors are understood as transactions between the factors represented by the cylinders, since causation can occur in all directions and between processes at all levels of organization.

Scheflen [236] was an early advocate for the application of systems thinking to understanding schizophrenia. He described how each level of analysis, from the cellular level of the brain to society, as cybernetically related to every other level. So that disturbance at one level (e.g., brain cells) interacts with others (e.g., parent-child relationships, marital function, peer relationships, and socialization) in ways that result in disturbances being either compensated for or worsened. Thus no single level of analysis or deficit is likely to be sufficient in itself or prior to another in terms of explanatory power, since they interact in complex and cybernetic patterns. Ciompi [233] also emphasized the interactional nature of the relationships between different levels and provided important steps in the gradual progression to adoption of a systems perspective for understanding schizophrenia. He developed a Multiconditional, 3-Phase Model of Schizophrenia that articulated the development of susceptibility to a pattern of premorbid vulnerability, and conceptualized acute psychotic symptoms as reactions to overwhelming stresses which the vulnerable individual is unable to appropriately cope with. Vulnerability (Phase 1) is the result of the interaction of genetic influences (e.g., reaction sensitivity, cognitive slippage) and psychosocial influences (e.g., disturbance experienced in family communication and structure, atypical reference systems, poor coping mechanisms, low self-efficacy). Phase 2 refers to the resultant premorbid level of vulnerability possibly manifested in various disturbances in cognitive functions and information processing, that in combination with an accumulation of nonspecific stressful life events results in acute psychotic decompensation. The manner and form of the postacute treatment and recovery environment in turn influences the Phase 3, the course of the disorder in terms of chances for remission and recovery, residual impairments and vulnerability, and chronic residual traits. Ciompi [233] suggests that problems such as deficient information processing in schizophrenia are caused by an underlying affective-cognitive reference system that has been disturbed by the interaction of various sources and causes of vulnerability, including genetic vulnerabilities and a broad array of potential life stressors and psychosocial factors.

## 8.1. Summary

General systems theory provides a heuristic framework in which to integrate the observations and concepts of a wide range of scientific disciplines. This approach provides a useful framework in which to evaluate and guide theory development. Systems thinking can help avoid the parochialism and assertions of opinions as knowledge that currently plague the field.

# 9 Psychological and Environmental Factors

## 9.1. Environmental Risk Factors

The fact that 50% of monozygotic twins of schizophrenic patients do not develop schizophrenia indicates that genetic factors alone do not account for development of the disorder. A number of environmental factors have been implicated in risk for schizophrenia, although no single factor has been found to be a necessary or sufficient cause of the disorder. Maternal infections, nutritional deficiencies, and severe adverse life events during the first and early trimesters of pregnancy have been associated with increased risk for schizophrenia (Khashan et al. [246] Penner and Brown [250]). Obstetric and perinatal complications double the risk for schizophrenia in affected offspring with fetal hypoxia are among the most frequently identified risk factor (Byrne et al. [104]). The effects of environmental factors may be mediated by a process of "stress sensitization" that increases vulnerability to later stressful life events in some cumulative or multiplicative fashion (Koenig et al. [247]). Birth in late winter or early spring is associated with a 5–10% increased risk probably due to the increased incidence of viral infections during this period (Davies et al. [242]). Older paternal age at conception is linked to a near doubling of risk for developing schizophrenia, although the basis for increased risk is not well understood (Byrne et al. [239] and Wohl and Gorwood [258]). Childhood experiences of trauma including head injury (David and Prince [241]), parental separation or death (Morgan et al. [248]), infection (Dalman et al. [240]), and abuse (Read et al. [251]), as well as the presence of "soft neurological signs," developmental delays, poor social adjustment, academic underachievement (Walker and Lewine 1990 and Keshavan et al. [245]) urbanicity and migration (Talman et al. 2008), and cannabis use during adolescence are additional factors reported to be associated with increased risk for

schizophrenia. Research studies indicate that patterns of family dysfunction and disturbed communication interact with genetic risk to increase risk for schizophrenia and spectrum disorders (Rolf and Knight [253], Goldstein [244] and Tienari et al. [256]). The range of environmental factors linked to risk to develop schizophrenia is impressive but, the exact role or the nature of the interaction of any factor with genetic risk is not well understood.

In summary, a substantial body of evidence indicates that both genetic and environmental factors are important contributors to risk for schizophrenia. However, the impact of various combinations of environmental and genetic factors (e.g., whether additive, interactive or synergistic) in any individual case is poorly understood. It is also not clear whether specific influences are risk factors, or mediators, and if mediators which risk factor effects are mediated. General systems theory can provide a conceptual framework for integrating information obtained from different levels of analysis so that we move from disconnected "findings" to integrative models. We must also be open to the possibility that schizophrenia is not a single disorder, but many, perhaps even hundreds of different disorders that share one or more common clinical symptoms.

## 9.2. Psychodynamic Concepts

Psychodynamic psychology developed largely as an interpretive discipline rather than as an observational science. As a consequence this approach has fallen from favor since it does not lend itself to standard experimentation and empirical analysis. Psychodynamic therapists concern themselves with beliefs and subjective experiences and their significance and meaning in the context of an individual life rather than development of objective quantifiable measures and and implementation of experimental controls. Psychodynamic theories emphasize the formative role of early experience in the development of personality, and how these experiences interact with constitutional factors in the context of an individual life. Therapists are most concerned with what is unique and idiosyncratic about the individual, and the information that can account for the development and organization of specific psychological characteristics. Theorists interpret evidence typically provided by patients in the context of therapy to formulate interpretations and explanations for the reality-distorting experiences of patients. Individual cases and their histories provide data for psychodynamic constructs and formulations rather than laboratory research, consequently concepts are often loosely defined by scientific standards and often cannot be operationalized.

Psychodynamic theorists assume that the experiences of childhood interact with phenotypic expressions of genetic predispositions to determine how later events are cognized, why specific emotions are triggered or arise spontaneously, and how relations with others are experienced (Arieti [237]). This point of view assumes that individuals with a schizophrenic genotype or diathesis must negotiate the same developmental tasks and milestones, and respond to the same cultural and interpersonal stresses as others but, their meanings and their mode of resolution may differ as constitutional differences interact with experiences with primary caretakers (Robbins [252]). A central assumption of the psychodynamic approach is that vulnerability for psychopathology may, but does not necessarily, emerge in the context of primary parenting that does not compensate for, or that contributes to the emerging mental manifestations of constitutional predispositions. Psychodynamic theorists view the diverse symptoms of schizophrenia as both deficits and indicators of attempts to compensate for underlying deficiencies in psychological functions. They contend that many constitutionally vulnerable children may grow up to be either dysfunctional or normal, or even exceptional, depending on how they are raised. Genetic risk for schizophrenia represents a continuum, so that the role of parenting in determining risk is a function of the degree of genetic vulnerability. Since the 1970s the application of psychodynamic theory to schizophrenia has been rejected by the majority of contemporary theorists and practitioners for several reasons: (1) the theory appears to blame parents as causing schizophrenia; (2) the theory seems to ignore evidence for the role of genetic and brain based mechanisms in the disorder; (3) the theory is not based on observations and concepts that adhere to standard scientific practice; (4) psychodynamic therapy is impractical and inappropriate for most individuals diagnosed with schizophrenia, and some believe may increase symptoms in many patients. Psychodynamic theorists respond to these criticisms that this approach is not meant to apply to all or even most cases of schizophrenia, that the significant role of constitutional factors is accepted but not specified because this is not the level of focus of the approach, and that research is supportive of the mutual influence of genetic and family-based factors (Tienari [256]).

Freud had limited experience with psychotic patients, and published only one speculative paper on paranoid schizophrenia based entirely on his reading of the autobiographical memoirs of a single person (Dr. Schreber). In this essay Freud concluded that schizophrenia involved primary narcissism or a conversion of libido (the drive toward pleasure) away from other people or objects and toward oneself. He observed that psychosis appears to involve two stages: (1) an initial acute or chaotic phase in which the ego can

no longer cope with object relations and is overwhelmed with experiences and sensations that originate in unconscious processes and, (2) a stage in which symptoms such as social withdrawal and delusions are formed to reestablish some level of ego control over experience and function as alternatives to lost object relations, alternatives that are egocentric and that increase cut off from meaningful object relations (Object relations generally refer to intrapsychic representations of interpersonal relations.). Freud (1924) interpreted the early stages of the positive symptoms of psychosis, sometimes characterized by euphoria, a sense of heightened sensory and perceptual awareness and religious or mystical experiences as signs that established ego functions are failing or have failed and the individual is regressing back to earlier narcissistic levels of functioning. In his view the nucleus of psychosis is the break with reality that signals ego regression (withdrawal of object related cathexes) back to a level of early narcissistic functioning in which the boundaries between experiences from within and without, thought and external reality, or the distinction between self and other are seriously compromised. In schizophrenic regression Freud believed the individual withdraws from external reality and creates a reality based on fantasy and primary process thinking. The processes that occur during an acute psychotic experience are often biphasic and cooccurring rather than sequential. Phase one, referred to as "symptoms of regression," signal a gradual or sudden collapse of ego functions that result from an overall inability to cope with the demands of life. These symptoms include a growing sense of the "uncanny" about experiences, regressive behaviors, fragmented visions and fantasies, alterations of body sensations and sensory experiences, emotional turmoil, behavioral agitation, intense anxiety, feelings of depersonalization and derealization, and grandious ideation. At the same time that symptoms of regression are occurring phase two "restitutional symptoms" are also experienced. These symptoms represent attempts to shore up and restore some semblance of ego control and organization to experience. Delusions are understood as attempts to restructure reality and construct beliefs and explanations that make partial sense of chaotic psychotic experiences, and restore a semblance of executive ego control. Auditory hallucinations in the form of accusatory and derogatory voices, or commands are projections of split-off or dissociated aspects of unconscious functions and emotions, and superego processes. Freud maintained that the distortions of reality and cognition apparent in delusions help to create a new reality, one that insulates and protects the individual from increased vulnerability associated with engagement with object relations, as they also debilitate and impair. The schizophrenic adaptation is achieved in other words a great cost in terms of overall level of

functioning and future adaptive potential. Given the level of regression to narcissistic functioning Freud did not believe that individuals diagnosed with schizophrenia were capable of forming the level of transference relationships with therapists that would allow for psychodynamic therapy.

Wilfred Bion [238], a British psychodynamic theorist, was struck by the level of fragmentation in acute schizophrenic thought and assumed a connection must exist between this fragmentation and failures of *linking*. These failures can result from any number of physical and environmental causes, but are generally attributed to complex interactions and synergistic effects of genetic and constitutional vulnerabilities with life experiences. Bion used the concept of *projective identification* to explain this fragmentation. Projective identification refers to mental activity characteristic of the infant in which some segment of the Self is experienced as located in another person, with whom some segment of the Self is identified and struggles to control. Bion assumed that the fragmentation of schizophrenic thought and language may originate in the young child's experience of disturbing sensations that he or she cannot organize or control. Through the mechanism of projective identification the infant projects this disturbing and disorganized content onto others. In similar fashion in the case of psychosis the intensity of painful experiences and fears is such that they are externalized. Thus, it becomes impossible for the patient to recognize and integrate emotion charged memories and tendencies into his or her own being. Instead they are experienced in the form of hallucinated voices and delusional ideas. Vulnerability to psychosis increases when the boundaries of the Self are not adequately formed or are broken so that feelings cannot be integrated and experienced as belonging to the Self. The psychotic Self experiences affects as external to the Self, as omnipotent, secret, and sinister forces. In schizophrenic delusions for example, it is no longer that "I am filled with angry feelings" but, "others have malevolent designs on me, the world is a dangerous and evil place." Split off psychotic parts of the Self are externalized as the other, and expressed in the form of symptoms such as delusional beliefs such as thought insertion, made feelings and thoughts, persecution, and auditory hallucinations. The Self in schizophrenia is no longer able to maintain links to others in the form of intimate and empathic relationships and therefore no longer has any true object relationships. In schizophrenia the Self becomes its own omnipotent/grandiose object.

Bion believed that in schizophrenia the Self regresses back to a form of narcissistic isolation from the other and to a narcissistic identification with omnipotence. The ego ideal is projected in the form of identification with absolute power in a form of narcissistic fusion, expressed as grandeur, self as God-man, or the Universe. Bion viewed psychosis as a universal human

potential, rather than a relatively rare genetically based brain disorder. This potential is variously expressed in both individual and group expressions of alienation, narcissism, grandiosity, prejudices, and destructiveness; all ways of severing connections with the linking objects in the Self. For Bion the potential for psychosis is often related to the quality of our early linking experiences of holding of being held, of containing and being contained, as well as in our genes. Both factors interact with later life experiences and risk factors to culminate in degrees of risk in the particular context of a person's life. Most of us manage to keep our psychotic potential in check because of the qualitative balance of our early experiences and through our ongoing linking experiences with others, empathic identifications, and the quality of our social processes throughout life but, this balance can be disrupted.

Psychodynamic theory does not lend itself to scientific research it does however provide a descriptive and conceptual framework that many practitioners find informative and helpful in understanding some individuals. Contemporary psychodynamic theorists acknowledge that evidence from genetic research and neuroscience indicates that biological factors play a major role in risk for schizophrenia, as they attempt to describe the intrapsychic processes and the impact of developmental experiences. Psychodynamic theorists must strive to do more to validate and integrate their concepts with contemporary scientific evidence if this approach is to continue to have any lasting impact.

### 9.3. A Systems-Dynamic Model

Robbins [252] developed a systems-dynamic model of schizophrenia that incorporates assumptions about the role of developmental and family influences with inborn vulnerabilities. Robbin's model is speculative and does not integrate information from neurochemistry, neuroanatomy, or molecular genetics into a truly coherent systems model. Nevertheless, this model represents an interesting attempt to integrate concepts from different levels of analysis. Robbins identified four stages in the development of schizophrenia. (1) Patterns of characterological vulnerabilities that emerge as combinations of deficits and abnormalities. (2) In some cases family members may inadvertently compound these vulnerabilities, perhaps because their own issues, problems, and limitations of adult members have not been adequately processed. (3) At some point during the extended period in industrialized societies the young adult is expected to separate from dependency on the family, to establish intimacy with others, marry, become financially independent and assume other adult responsibilities, he or she undergoes serious adjustment difficulties in the form of an

"adaptive disequilibration." This disequilibration is often associated with a variety of interpersonal stressors in combination with loss or threat of loss of the cushion of the family. (4) The vulnerable individual's social and psychological skills prove inadequate to this period of transition and crisis, and attempts at adaptive responses lead to further maladaptation.

Robbins described two constitutionally based areas of neurpsychological vulnerability he believes are involved in risk for schizophrenia. The first is referred to as a deficit in *organization-affinity,* a concept that refers to several more specific subcharacteristics including *aversive drift* (a tendency toward negative thoughts and feelings), *hypohedonia* (a deficit in the ability to experience normal levels of interpersonal sources of enjoyment and pleasure), and *cognitive slippage* (a tendency to illogicality, and fuzzy logic). Robbins suggests that impairments in organization-affinity are largely biological in origin. These deficits in organization-affinity contribute to a general sense of uneasiness and awkwardness about close emotional contact, a tendency toward emotional flatness and/or negative mood states, and deficiencies in the potential for age appropriate psychological differentiation and integration of experiences. Vulnerabilities in organization-affinity are evidenced in characteristics such as difficulties in forming attachments and maintaining intimate relationships, difficulties with self-differentiation, and deficits in the ability to integrate experiences into adaptive meaning structures and coping patterns. These tendencies are likely to increase as the developing child encounters ongoing difficulties in maintaining age appropriate, social adjustments, self-object boundaries and self differentiation, and contribute to increased risk for difficult and painful interactions that increase in frequency as problems accelerate. In addition, Robbins postulates that a genetically disordered sensory-perceptual system contributes to lack of integration of experiences and functions, impaired executive functions, and difficulties with attention, memory, and perceptual processes. Symptoms such as hallucinations and delusions are understood to represent the outcomes of life long difficulties with integration and differentiation that are reflected in the inability to recognize components of the Self, and to discriminate and make adequate emotional and sensorimotor contact with others. Schizophrenic symptoms are viewed as the developmental consequences of the interaction of inborn deficits in organization affinity and genetically based neurocognitive deficits, with life experiences, internalized thoughts and reaction tendencies, and the interpersonal environment throughout development.

A second area of biological vulnerability (*Impaired Affect Regulation)* involves difficulties coping with the intensity and regulation of stimulation, both external (sensations and perception) and internal (drives and

affect). Impaired affect regulation contributes to problems with unsymbolized, poorly controlled emotions, and a failure to develop adequate and age levels of appropriate emotionality and self-control. Robbins maintains that difficulties in managing feelings of anger are an important example of the vulnerability to stimulus intensity that is associated with impaired affective regulation. Angry feelings can be inferred from the content of many delusions, and the threatening and destructive acts that often precipitate hospitalization. In other cases angry feelings may be more difficult to recognize because the feelings are unsymbolized; and instead are enacted against the patient's own self-organization and those aspects of the Self that constitute his/her uniqueness, aliveness, and self-expression. This internalization process is most clearly evidenced in some negative symptoms. In such cases patients appear to be severely lacking in energy, motivation, range of interests, and assertiveness in their daily lives. The two core constitutional vulnerabilities combine to produce a third vulnerability, *nihilism,* or an aversion to the basic effort involved in feeling, forming lasting relationships, and being responsible for the content of one's thoughts and experience. Nihilistic vulnerability is related to the aversion to object relations (close relations with others), and experiencing and owning one's feelings and thoughts, observed in many schizophrenic patients.

These *Stage 1 vulnerabilities* (deficits in organization affinity, impaired affect regulation and nihilism) are associated with increased risk for difficulties and problems in early dyadic relationships. The primary parental caretaker(s) may function to confront and ameliorate the infant's constitutionally determined vulnerabilities and foster more mature ways of coping, or inadvertently compound these vulnerabilities and contribute to the potentiation of Stage 1 vulnerabilities. It is through the countless daily interactions that take place between the infant and parent(s) that the child develops an awareness and internal representation of others, as well as his or her own identity, thoughts, and feelings. The combination of constitutional vulnerabilities and part-child interactions provides the foundation for later mental functions that lead to the development or failure to develop a cohesive self-system. Interactions that compound Stage 1 vulnerabilities occur when parents initiate interactions, no matter how well intended, in which they attribute to their child their own unconscious affects, meanings, needs, and agendas, and thus ignore, exacerbate, or distort the child's unique vulnerabilities and potentials. The processes of cognitive and emotional development can also be complicated by any number of factors that are likely to have synergistic effects, including by not limited to prenatal exposure to viral agents, birth complications, peer rejection, abuse, parental substance abuse, and family dysfunction. Some

children may be born with such strong genetic loadings for vulnerabilities that virtually any child-rearing regimen will result in an adverse outcome. Others may require the interaction of inborn vulnerabilities with fairly severe life adversities in order to eventuate in schizophrenic episodes.

Psychodynamic writers such as Robbins suggest that in schizophrenia the mental representations of the Self are often not adequately differentiated from the characteristics of parent(s) and other persons in an age appropriate manner. This outcome can occur for a variety of reasons but the result is the same, the integration of mental functions into a cohesive and stable sense of self is impaired. Symptoms such as incapacity to self reflect, aversion to emotional closeness, delusional thinking, auditory hallucinations, and difficulties with affect regulation are both signs and the long-term consequences of the failure of the developmental processes of integration-differentiation. Risk for schizophrenia is increased when young children do not develop an internalized, coherent template of early "good enough" symbiotic relationships. This experience deficit, particularly in a constitutionally vulnerable child, can result in failure to differentiate and develop and to own and integrate a cohesive attachment-based self structure that culminates in the eventual repudiation of the possibility of a facilitating intimate relationship with another person. Delusions and auditory hallucinations are viewed as signs of lack of clear differentiation of self from object, and a lack of integration of important components of aspects of one's own emotional and mental content into a cohesive self structure.

An additional characteristic of the mental activity of many schizophrenic patients is expressed in the form of *global passivity*. This form of passivity may be obscured during episodes of acute disturbance, but otherwise is considered to be a pervasive aspect of schizophrenic thought and behavior. Global passivity is expressed in lack of initiative and assertiveness expressed as indifference, withdrawal, and difficulty adaptively processing and expressing aggressive feelings. Angry feelings are often diffusely represented and directed inward or inappropriately toward other persons, including those who provide attentions that might stimulate increased interpersonal involvement and self-awareness. The inability to appropriately recognize process and express angry, aggressive feelings also undermines self-cohesion. Experiences of closeness and self-awareness may trigger assaults on and/or rejection of others because of the anxiety these experiences are likely to engender.

A fourth facet of schizophrenic patients is a severely *impaired capacity for social and interpersonal adaptation*. Robbins relates this characteristic to a lack of development of rudimentary forms of sensorimotor-affective

thinking. Sensorimotor-affective thinking is the basis for the infant's gradual development of stable internal representations of which objects relationships will safely foster continued mental development and which will not. The difficulties that result from the effects of inborn vulnerabilities and the challenges of parenting a vulnerable child often contribute to the intensification of psychological vulnerabilities that increase risk for later onset of schizophrenia. Robbins maintains that schizophrenia only appears to develop unexpectedly in early adulthood in a hitherto relatively normal person. Signs of vulnerability are already present early in life. In cases where these vulnerabilities are increased the result will be a developing child, adolescent or adult who functions in an increasingly fragile state of equilibrium. This precarious level of adjustment persists until serious attempts to separate, cope with adult responsibilities, and make one's way in the outside world are undertaken and the stresses of separation/independence, intimacy, and adult responsibilities increase. At this point typically in late adolescence or early to mid-adulthood, depending on circumstances and the overall coping resources of the individual, processes indicating the impending failure of psychological coping mechanisms become increasingly evident.

Given the at-risk infant's constitutional propensities and deficiencies of control mechanisms, constitutional risk factors can be compounded by well-intentioned but detrimental parental projections and distorting attributions. Robbins suggests that what is may be amiss in many cases is the ability to provide appropriate and timely kinds of validation and growth promoting interactions that match the idiosyncratic emotional and developmental needs of the child. The challenges and stresses of rearing a child who may be anxious, irritable, impulsive, inconsolable, explosive, passive, learning disabled, poorly organized, or hyperactive, or who does not respond favorably to closeness or stimulation is bound to trigger inconsistencies, ambivalence, over-reactions, and personal vulnerabilities in anyone. Problems in child-parent interactions are also more likely when other aspects of the lives of parents are difficult and/or the parental coalition is impaired. In situations where parents are unable to consistently provide adequate ministrations tailored to the needs and vulnerabilities of the child for whatever reasons, the child's vulnerability will be increased. Infants with constitutional difficulties present major challenges for parents in the best of circumstances. Such an infant is likely to frequently overtax parental coping capacities to appropriately mirror and contain the infant, and to manage one's ability to set aside personal anxieties, frustrations, disappointments, memories, and feelings of being overwhelmed. Even the most mature adults will be provoked to respond inconstantly, and have difficulty

responding appropriately and consistently to the vulnerable infant's real needs. At the same time, it is possible that vulnerabilities and missing elements of the capacity for age appropriate self care and social maturation may be compensated for by positive responses. Parents limited in their capacity to respond, unsupported in their relationships, and/or overtaxed by the demands of raising other children and the demands of economic survival are more likely to misidentify needs and feelings, and substitute meanings, needs, and feelings of their own, rather than respond to and validate the unique attributes of the child. The consequent developmental failures and dysfunctions are often subtle and cumulative, and may not clearly emerge until efforts to leave home, or much later when one must cope with the ongoing demands of assuming adult roles. Once the young adult loses the protective family cushion and gradually enters into the adult world of forming and maintaining intimate relationships, sexuality, raising children, or coping with demanding studies and jobs, he or she is at increased risk to experience an *adaptive disequilibration,* compounded by regression. This process coincides with the onset of prodromal and/or acute symptoms.

At a societal level Robbins believes that the image promoted by much of the clinical scientific literature is that the schizophrenic is not a whole person. Patients are discussed as a collection of symptoms and brain dysfunctions that are assumed to be etiologically unconnected to personality traits, life experiences, culture, and family situations. As a consequence symptoms are often described out of context, and explained entirely in terms of inborn malfunctions at the level of neuronal circuits and neurotransmitters. In Robbins' view this serves to reflect the circumstances that contributed to risk for the disorder in the first place, and compounds the problems of the patient in ways that decrease the likelihood or recovery.

## 9.4. Summary

Systems models conceptualize schizophrenia as the polyvalent outcome of the contributions of interacting and multidirectional influences. From this perspective symptoms of schizophrenia comprise a complex attempts at reorganization and adaptation. Robbins' model represents an informed and potentially valuable attempt to integrate concepts from a range of disciplines into a coherent systems model for understanding schizophrenia. He focused on building a plausible etiological mode and did not address the issue of whether or not dynamic therapy based on his model is recommended, and if so with individuals with what characteristics. Psychodynamic theory and therapy has fallen from grace in academic

and medical circles in part because the approach is largely post-hoc and interpretive, concepts are rarely operationalized and empiically validated, and the approach does not lend itself to manualized, controlled outcome studies. A review of research indicated that psychodynamic treatment was associated with worse outcomes than other approaches for many individuals diagnosed with schizophrenia (Mueser and Berenbaum [249]). The initial 1998 PORT committee recommended against psychodynamic and interpretive therapies for schizophrenia, because these therapies might actually do harm. This conclusion was challenged as not consistent with a number of controlled outcome studies (Grinspoon [263], Karon and VandenBos [266] and Rogers et al. [273]), as well as prominent autobiographical reports (Saks [532]). Consequently, the PORT committee did not specifically recommend against psychodynamic therapy in the updated and revised recommendations. However, existing evidence suggests that psychodynamic therapy is not appropriate for many if not most individuals diagnosed with schizophrenia. Perhaps, as some dynamic therapists have suggested interpretive therapy should be limited to a select group of individuals diagnosed with schizophrenia, those who are young, intelligent, with good premorbid functioning, a history of achievement at work and study, and some degree of success in building and maintaining interpersonal relationships (Gunderson [264]).

# Part 3

# Treatment, Rehabilitation, and Recovery

# 10 Deinstitutionalization, Recovery, and Evidence-Based Practices

Several events occurred during the latter half of the 20th century that resulted in dramatic changes in the manner in which psychotic disorders are treated in most industrialized countries. In the U.S. the impacts of the Community Mental Health Centers Act of 1963, the availability of antipsychotic medications, the extension of Social Security disability benefits to the mentally ill during the 1970s, and growing awareness of the debilitating effects of long stays in mental hospitals gave impetus to the deinstitutionalization movement. In response to the mandate of the 1963 Community Mental Health legislation sponsored by President Kennedy, a variety of programs were implemented including comprehensive community mental health centers, day and night hospital units, clinical case management models, and psychosocial rehabilitation groups and centers (Test and Stein [356]). Deinstitutionalization markedly reduced the number of long-term patients residing in large mental hospitals within a relatively short period of time but, this reduction was often accomplished by transferring patients from large institutions to over burdened families, homeless shelters, poorly regulated nursing homes, and unsupervised apartments. Many communities and government agencies did not adequately plan for, fund, or follow through with provision of needed services. The result was an substantial increase in the mentally ill homeless and incarcerated populations and a marked increase in the so-called "revolving door" of recurring short-term rehospitalizations, crisis stabilization and release.

Symptoms can be reduced by medications so that they may no longer totally disrupt an individual's ability to perform the routine chores of daily living but many behaviors, including those that create conflict and misunderstandings in social relationships and work related environments, are not likely to be significantly altered by medications alone. Patients diagnosed with schizophrenia are too often discharged from hospital to live lonely,

isolated lives, and are too confused to cope with the demands of life in the community. Their efforts to assume meaningful and productive social roles, if undertaken at all, are associated with failure, rejection and disappointment. Failure to establish any form of meaningful socially acceptable social role participation pushes the discharged patient further in the direction of withdrawal into a delusional fantasy life that functions as a source of refuge. The combination of low status, negative self and social image, marginal social roles, isolation and paternalistic treatment of discharged patients, contributes to a process of demoralization that reduces the possibility of establishing a productive and meaningful social life. The public image of the seriously mentally ill as an unpredictable and potentially violent individual suffering from a chronic brain disease also contributes to the negative transformation of a patient's sense of identity, and reinforces feelings of inferiority, alienation, and separateness (Phelan et al. [270]). There are no easy solutions to the problem of how to foster opportunities for recovery from schizophrenia, especially those who may not initially be motivated, cooperative or treatment compliant but, evidence that indicates that access to comprehensive psychosocial therapies in combination with medications can significantly improve prospects for good symptom outcome and improved social recovery for many patients. International studies indicate, for example, that a large proportion of individuals diagnosed with schizophrenia can establish meaningful lives in their communities and achieve good outcome (Jablensky et al. [265] and Sartorius et al. [274]). Despite evidence of better recovery rates in some less developed countries much of the clinical literature is lacking in any expression of belief that some form of shared public life that involves productive activity and social participation is possible for most schizophrenic patients. This literature focuses on what is wrong with people diagnosed with schizophrenia, and generally fails to address key issues related to enhancing opportunities for recovery. An alternative is to focus on how to best provide a comprehensive array of adequate and appropriate services, how to best provide opportunities for experiences that foster a viable sense of individuality and self-integrity, and how to foster productive contact with and involvement in society.

Access to meaningful forms of public participation provides opportunities to develop aspects of an identity that lie outside the focus of the traditional model of schizophrenia as a chronic disorder. It is not possible to state to what degree any individual patient may benefit from access to community-based psychosocial programs that provide a synthesis of caring treatments that accommodate the vulnerability of patients and an environment that gradually defuses the impact of psychosis and the role

of patient that pulls toward further withdrawal but, studies indicate that access to medication and suitable psychosocial programs are quite effective in fostering recovery.

### 10.1. Recovery

Workers in the mental health care system have traditionally taken a parental view of schizophrenic patients, treating them as passive recipients of treatment and, expecting compliance rather than collaboration. The concept of "recovery" conveys an alternative philosophy of hope and optimism that many persons diagnosed with schizophrenia are capable of establishing productive, fulfilling lives as members of society. Beginning in the 1980s an expanded definition of the meaning of recovery from schizophrenia began to gain acceptance; one that views recovery as a process representing the belief that all individuals can develop hope for the future, participate in meaningful activities, exercise self-determination, and live in society without discrimination (Resnick et al. [272]). Recovery oriented programs focus on implementing strategies to promote individual choice and responsibility, as well as fostering improved social adaptation by providing opportunities and interventions to improve coping and life functioning. This emphasis supplements and adds to the biomedical model by focusing on the reduction of interpersonal and social deficits, as well as strategies to promote improved social adaptation by providing opportunities and interventions to improve coping and life functioning (Spaulding et al. [275]). The goal of recovery oriented treatment programs is to develop and provide access to services that help patients reestablish a meaningful self identity and life in the community, and to overcome the limitations implicit in formation of a self identity, that is, largely centered on one's diagnosis. Resnick et al. [272] identified four domains of the recovery orientation: empowerment, hope and optimism, knowledge, and life satisfaction, in addition to provision of adequate biomedical care. The key components of recovery oriented psychosocial programs include (1) providing appropriate opportunities for work, increased social contacts, and a context to foster an enhanced sense of purpose, and self-esteem; (2) encouraging access to experiences that foster a positive outlook and set of expectations and understanding of symptoms and their control, and (3) providing opportunities to form and maintain a range of satisfying social relationships (Bellack et al. [261]).

Recovery oriented services are guided by the following values and practices. (1) Treat the person as a competent equal with equal capacity to learn, change and make life decisions, and take action to create life change, no

matter how severe the symptoms. (2) Avoid scolding, patronizing, judging or condescending to the person, while being honest about how you feel when that person threatens or condescends to you. (3) Focus on how the person feels, what the person is experiencing, and what the person wants rather than on diagnosis, labeling, and predictions about the course of one's life. (4) Share simple, safe, practical, noninvasive self-help skills that people can use on their own or with the help of their supporters. (5) When necessary, break tasks down into the smallest steps to insure success. (6) Limit the sharing of ideas and advice, to one piece of advice a day. Avoid nagging and overwhelming the person with feedback. (7) Pay close attention to individual needs and preferences, accepting individual differences. (8) Assure that planning and treatment is a truly collaborative process with personal choice as the bottom line. (9) Recognize strengths and even the smallest bit of progress without being paternalistic. (10). Accept that a person's life path is up to them. (11) As a first step to recovery listen to the person, let them talk, hear what they say and what they want, make sure their goals are theirs and not yours, understanding that what you might see as good for them may not be what they really want. (12) Ask if there is something going on in the person's such as "learned helplessness" that is getting in the way of change. (13) Encourage support and connection with others who experience symptoms. (14) Ask "would this person benefit from being in a group led by others who have experienced similar symptoms?" (Mead and Copeland [269]).

Recovery can be thought of as a multifaceted "open system" in which the domains of symptoms, social performance, and community functioning are relatively autonomous, and require individually targeted treatments and interventions (Spaulding et al. [275] and Bellack [260]). As a process, recovery includes those experiences and processes that foster healing both physically and emotionally, these include experiences that engender positive changes in attitudes, feelings, perceptions, beliefs, goals and roles in life; and that are associated with increased involvement in a process of self-renewal, independence, and responsibility (Liberman and Kopelowicz [326] and Watson and Corrigan [550]). The process of recovery is favorably influenced by access to comprehensive and continuous evidence-based practices, as well as personal and social factors (Liberman and Kopelowicz [326]). Access to individualized treatments that are effective in reducing symptoms, improving social skills and relationships with family and others, and that help people become engaged in work and community life, are needed to foster the processes of recovery (Harding et al. [49] Jenkins 2005 and Wilken, 2007). As outcome, recovery can be defined as evidence of symptom remission, involvement in work or school, independent living

without close supervision by caregivers, no full dependence on financial support from disability insurance; and having friends with whom activities are shared on a regular basis for at least two continuous years (Anthony [259], Liberman and Kopelowicz [326]). Recovery is distinct from "cure" in that it means that individuals diagnosed with schizophrenia can live reasonably normal lives even though they may be vulnerable to relapse and continue indefinitely to participate in comprehensive but flexible levels of services (Liberman and Kopelowicz [326]).

## 10.2. Evidence-Based Practices

The report of The President's New Freedom Commission on mental health and mental illness published in 2004, stressed the values of the recovery movement and the importance of identifying evidence-based practices (EBPs) in their statement of basic principles "We envision a future when everyone with a mental illness will recover, a future when mental illnesses can be prevented or cured … and a future when everyone with a mental illness at any stage of life has access to effective treatment and supports-essential for living, working, learning, and participating fully in the community." The Commission statement continued, "First, services and treatments must be consumer and family centered, geared to give consumers real and meaningful choices about treatment options and providers—not oriented to the requirements of bureaucracies." " Second, care must focus on increasing consumers' ability to successfully cope with life's challenges, on facilitating recovery, and on building resilience, not just on managing symptoms." Recovery is defined in the Commission report as "the process in which people are able to live, work, learn, and participate fully in their communities. For some individuals, recovery is the ability to live a fulfilling and productive life despite a disability. For others, recovery implies the reduction or complete remission of symptoms. Science has shown that having hope plays an integral role in an individual's recovery." The Commission statement also drew attention to the disparity that exists between research and practice and called for a transformation of the mental health system to one that provides access to empirically based treatments and includes clients and their families as partners in treatment. The Commission emphasized that the Nation must have a more effective system to identify, disseminate, and apply proven treatments or evidence-based practices (EBPs) to mental health care (The President's New Freedom Commission on Mental Health [271] Executive summary page 1).

Consonant with the recommendations of the President's Commission, the 2004 Schizophrenia Patient Outcomes Research Team (PORT)

published an updated consensus list of twenty EBPs, fourteen of the PORT recommendations deal with pharmacotherapy, and six recommendations describe psychosocial EBPs for schizophrenia (Lehman et al. [268]). The PORT committee recommendations emphasize the benefits and importance of combining pharmacological treatments with psychosocial therapies. These recommendations provide a blueprint for the organization of community-based programs that, if implemented competently, will go a long way toward significantly improving the prospects for recovery for many patients. A growing body of evidence indicates that many individuals diagnosed with schizophrenia are capable of establishing meaningful lives and achieving good outcome (Harding et al. [49], Hopper, Harrison, & Wanderling 2007 and Siegel, Wanderling, Lin, & Baker 2007). This evidence suggests that practitioners must rebalance the traditional clinical focus on symptoms and deficits with increased emphasis on the provision of comprehensive evidence based services that enhance opportunities for recovery. This rebalancing should include provision of services that help build competencies, as well as opportunities for experiences that foster a viable sense of individuality, self-integrity, and productive involvement in society. When treatment with psychotropic medications is combined with access to adequately funded and administered evidence-based psychosocial programs there are solid reasons to expect improved rates of recovery (DeSisto, Harding, and McCormick 1995).

# 11 The Schizophrenia Patient Outcomes Research Team Recommendations

In 1992, the Agency for Health Care Policy and Research and the National Institute of Mental Health funded the Schizophrenia Patient Outcomes Research Team (PORT) to develop and disseminate recommendations for the treatment of schizophrenia based on existing scientific evidence. After exhaustive reviews of the literature, treatment recommendations were published in 1998. The PORT recommendations provided a basis for moving toward evidence-based practice for schizophrenia and identified the strengths and limitations of the current knowledge base. Follow-up surveys indicate that few patients diagnosed with schizophrenia were receiving even a modicum of these EBPs (Lehman and Steinwachs [508]). In 2004 the PORT published an updated consensus list of twenty EBPs, fourteen EBPs refer to pharmacotherapy and six describe psychosocial EBPs (Lehman et al. [280]).

In order to complete the 2004 Schizophrenia PORT update a search process identified 248 eligible studies published since the last PORT reviews that met criteria (e.g., sample limited primarily to schizophrenia spectrum diagnoses, design limited to comparative clinical trials with well-specified treatment alternatives and standardized outcomes, and double-blind randomized trials of pharmacotherapies). An expert panel of 20 leading clinicians and researchers reviewed the articles and submitted its assessments and recommendations (Lehman et al. [280]). The Schizophrenia PORT recommendations emphasize the value of treatment approaches that combine medications with psychosocial treatments, including family interventions, psychological interventions, supported employment, assertive community treatment, and skills training. The PORT concluded that currently available treatments when appropriately applied and accessible should provide most patients with significant relief from psychotic symptoms and improved opportunities to lead more fulfilling lives in the community

(Lehman et al. [280]). The PORT committee also emphasized however, that major challenges remain, including the need for (1) improved knowledge about the underlying causes of the neurocognitive impairments and deficit symptoms that appear to account for much of the disability associated with schizophrenia; (2) treatments and rehabilitation programs that more directly address functional impairments and that promote recovery; and (3) approaches that facilitate access to scientifically based treatments for patients, the vast majority of whom currently do not have such access.

*A. PORT Committee Psychopharmacologic Treatment Recommendations.*

*Treatment of Acute Positive Symptoms in Treatment Responsive Patients.*

*Recommendation 1: Acute Antipsychotic Treatment.* Antipsychotic medications other than clozapine should be used as the first line treatment to reduce positive psychotic symptoms for persons with multiepisode schizophrenia who are experiencing an acute exacerbation of their illness.

*Recommendation 2: Acute Antipsychotic Medication Dose.* The daily dose of first generation antipsychotic medications for an acute symptom episode should be in the range 300 to 1,000 chlorpromazine or 5 to 20 haloperidol equivalents. The daily dosage of second generation antipsychotic medications for an acute symptom episode should be within the recommended dosage ranges, and reasons for dosages outside of this range should be documented. Treatment trials should be 4 to 6 weeks.

*Recommendation 3: Acute Antipsychotic Medication Dose in First Episode Patients.* Persons experiencing their first acute positive symptom episode should be treated with an antipsychotic medication other than clozapine, but dosages should be started on the lower end of the recommended range. There is no empirical evidence to suggest that first and second generation antipsychotic medications differ in their efficacy for reducing positive psychotic symptoms in first episodes of schizophrenia.

*B. Maintenance Pharmacotherapy in Treatment Responsive Patients.*

*Recommendation 4: Maintenance Antipsychotic Medication Treatment.* Persons who experience acute and sustained symptom relief with antipsychotic medication should continue to receive antipsychotic medication in order to reduce the risk of relapse or worsening of positive symptoms. Maintenance therapy with a first or second generation antipsychotic medication after an initial positive response during an acute symptom episode significantly reduces the risk of symptom relapse (20 to 25 percent versus 55 percent) during the first year following the acute symptom episode.

*Recommendation 5: Maintenance Antipsychotic Medication Dose.* The maintenance dosage for second generation antipsychotic medications should be the dose found to be effective for reducing positive psychotic symptoms in the acute phase of treatment. The maintenance dosage for first generation antipsychotic medications should be in the range of 300 to 600 chlorpromazine equivalents or 2 to 12 haloperidol equivalents (oral or depot) per day.

*Recommendation 6: Long-Acting Antipsychotic Medication Maintenance Treatment.* Long-acting injectable antipsychotic medication maintenance treatment should be available and considered for persons who have a history of frequent relapse on oral medication, or a history of problems with adherence on oral medication, or who prefer the long-acting injectable depot regimen.

*Recommendation 7: Targeted, Intermittent Antipsychotic Medication Maintenance Strategies.* Targeted, intermittent antipsychotic medication dosage maintenance strategies should not be used routinely in lieu of continuous dosage regimens because of the increased risk of symptom worsening or relapse. These strategies may be considered for patients who refuse continuous maintenance treatment or for whom some other contradictions to continuous maintenance treatment exist.

*C. Treatment of Positive Psychotic Symptoms in Treatment-Resistant Schizophrenia.*

*Recommendation 8: Clozapine in Treatment Resistant Schizophrenia.* Clozapine should be used in patients with schizophrenia who experience persistent and clinically significant positive symptoms in spite of adequate treatment with other antipsychotic agents. Lack of response to previous antipsychotic trials is defined by persistent positive symptoms after at least tow adequate trials of antipsychotic agents, including at least one second generation agent.

*D. Pharmacotherapy for Other Symptom and Functional Domains.*

*Recommendation 9: Clozapine for Hostility.* Clozapine should be used in patients with treatment-resistant schizophrenia who present with persistent symptoms of hostility and/or display persistent violent behaviors.

*Recommendation 10: Clozapine for Suicidality.* A trial of clozapine should be considered for patients with schizophrenia who exhibit marked and persistent suicidal thoughts or behaviors.

*Recommendation 11: Clozapine for Neuroleptic Malignant Syndrome, Tardive Dystonia, and Tardive Dyskinesia.* A trial of clozapine should be offered to patients who require antipsychotic therapy but who experience neuroleptic malignant syndrome, persistent dystonia, or severe or very distressing tardive dyskinesia when prescribed other antipsychotic agents.

*E. General Pharmacological Treatment Recommendations.*

*Recommendation 12: Monitoring Antipsychotic Medication Plasma Levels.* Monitoring antipsychotic medication plasma levels is indicated in the following circumstances. (1) When patients fail to respond to what is usually an adequate dose; (2) in the very young, the elderly, and the medically compromised, in who drug pharmacokinetics may be significantly altered; (3) when antipsychotic drugs are combined with other drugs that may affect their pharmacokinetics; (4) when medication nonadherence is suspected or to monitor adherence; and (5) when it is difficult for the clinician to discriminate drug side effects—particularly akathisia or akinesia—from symptoms of schizophrenia such as agitation or negative symptoms.

*Recommendation 13: Prophylactic Antiparkinsonian Medications.* In patients treated with first generation antipsychotic agents, prophylactic use of antiparkinsonain agents to reduce the incidence of extrapyramidal side effects should be determined on a case by case basis, taking into account patient and physician preferences, prior individual history of extrapyramidal side effects, characteristics of the antipsychotic medication prescribed, and other risk factors for both extrapyramidal side effects and anticholinergic side effects. The use of prophylactic antiparkinsonian agents in patients treated with second generation antipsychotic medications is not warranted.

*F. Adjunctive Pharmacotherapies.*

*Recommendation 14: Antidepressants.* Persons with schizophrenia who experience an episode of depression, despite an adequate reduction in positive psychotic symptoms with antipsychotic therapy, should receive a trial of an antidepressant.

*The Role of Combined Psychoactive Medications and Psychosocial Therapies.* Pharmacotherapy is considered essential to the treatment of schizophrenia by the majority of clinical practitioners, but combining psychosocial rehabilitation efforts with pharmacotherapy is more effective than medication alone. The effects of these treatments also interact so that certain medications and dosages can impair cognitive functions essential to rehabilitation efforts (Corrigan and Penn 1995). While pharmacotherapy will likely continue to be the cornerstone of treatment efforts aimed at management of

psychotic symptoms, for reasons of convenience as well as effectiveness, there is a need for quality research on how medications and dosage ranges interact with different psychosocial treatment regimens in order to optimize treatment. The effectiveness of combining these approaches requires that the persons prescribing the medication, the entire treatment team, and the person taking the medications must communicate and work together on an ongoing basis to reach decisions related to the balance between symptoms and side effects, in order to maximize likelihood of success at establishing and maintaining functioning.

# 12 PORT Recommended Psychosocial Therapies

The majority of individuals diagnosed with schizophrenia experience several relapses in which acute symptoms reemerge after a period of remission. Each relapse is associated with decreases in cognitive functioning and quality of life, loss of self esteem, increased social stigma, and significant social disruption. Relapse prevention therefore must be an important part of treatment services designed to help people reestablish and maintain previous levels of functioning. Antipsychotic medications are effective in treating acute psychotic symptoms and in reducing the likelihood of relapse. These medications do not however, help patients gain self awareness or insight into their problems, acquire adaptive coping and social skills, expand their repertory of stress coping strategies or help them deal with real life situations. Programs that combine antipsychotic medications with an array of psychosocial therapies tailored to the specific needs and interests of the individual have been demonstrated to be more effective than medication alone (Lehman et al. [321]). The PORT committee identified six psychosocial evidence-based practices (EBPs) to be utilized during any phase of the disorder, but noted that it would be unusual for all six practices to be administered at the same time since individuals have different clinical and psychosocial needs at different points, and some psychosocial interventions share treatment components.

*Recommendation 15: Family Intervention (FI).* Persons with schizophrenia and their families who have ongoing contact with each other should be offered a family intervention, the key elements of which include a duration of at least 9 months, illness education, crisis intervention, emotional support, and training in how to cope with illness symptoms and related problems.

*Rationale.* Randomized clinical trials have consistently demonstrated that family interventions, in combination with adequate pharmacotherapy, significantly reduce 1-year relapse rates. Other beneficial outcomes of family interventions include reduced rates of hospital admission, reduced family burden, and improved patient-family relationships. Effective family intervention programs integrate treatment with medication within a multidisciplinary team approach to the patient and family.

By the late 1970s high relapse rates among discharged schizophrenic patients were apparent even when patients were medication compliant. At about the same time research indicated that highly stimulating forms of psychosocial interventions and family interactions involving high levels of expressed emotion (EE) could evoke psychotic symptoms in vulnerable patients (Leff and Vaughan [317]). The key components of EE have been identified as high levels of critical comments, hostility, over involvement and low levels of warmth directed by family members and other caregivers toward the patient. Each of the negative components of EE was found to be correlated with higher rates of relapse of schizophrenic symptoms. Patients discharged to high EE families have a nine-month relapse rate of about 50% compared to 15% for low EE families (Vaughan et al. [359]). Family members that fail to understand the disorder, often become frustrated, angry and accusatory with the former patient, and react in ways that increase the likelihood of relapse. Family psychoeducational interventions (FI) are designed to counteract the problems associated with high levels of family EE. Research has demonstrated that the course of schizophrenia for individuals, who are in close contact with family members, depends to a significant extent on how family members interact and deal with the patient during and after an initial episode of psychosis. Because the family is often an important part of the patient's natural support system, it makes sense that improving family attitudes and coping skills regarding schizophrenia can result in benefits in terms of patient outcome and family adjustment.

FI refers to a psychoeducational approach to working with families, other caregivers and friends who are supportive of persons diagnosed with schizophrenia. The goals are to markedly improve outcomes and quality of life, as well as to reduce family stress, and improve communication and problem-solving skills that are the basis for recovery. FI is conceptualized as a treatment for a disorder, not as a method of treating family pathology. Additional goals of FI are to reduce feelings of isolation, stress, and burden on family members, and to develop a collaborative relationship between family and clinicians. The core elements of FI include illness education, access to crisis intervention, emotional support, and training in how to cope with illness symptoms and related problems with the help of support

and ongoing services. Family sessions may involve role-plays of various situations that are likely to cause stress for the consumer and family members. The family is also encouraged and assisted in rebuilding its own network of family and friends. Sessions are typically conducted on a once or twice—monthly basis, with more frequent sessions scheduled during particularly stressful times.

FI programs typically incorporate several additional features. First, they provide information and problem solving strategies designed to reduce the degree to which the patient is criticized by family members and other care providers, and held personally responsible for her or his illness. Second, therapists strive to increase understanding of the disorder and the patient's actions and needs in a manner that does not increase stigmatization, and to enhance the active social networks of family members. Sessions are directed toward supporting efforts to encourage calibrated resumption of responsibility by the diagnosed member, and to strengthen the marital/parental coalition while increasing family tolerance for low-level dysfunctional behaviors. Multifamily groups may also be initiated, especially following the first episode of psychosis, to increase the size of the social support network, provide more opportunities for families to connect with others who share similar experiences, and solutions. It is generally recommended that FI should be offered as early in the course of the disorder as possible, because it can help prevent relapse and increased disability, while preserving and enhancing family relationships and supports for recovery.

FI therapy has been demonstrated to significantly reduce rates of hospital readmission by 40–70% over two years, reduce feelings of family burden, interpersonal conflict and resentment, and improve patient-family relationships (Bebbington et al. [283] Dyck et al. [303], and Magliano et al. [328]). Additional benefits of FI include improved adherence to medication and reductions in caregiver distress, burden, and expressed emotion. The positive effects of FI including reductions in relapse and the number and duration of rehospitalizations have been confirmed by meta-analyses of multiple outcome studies (Pfammatter et al. [342] and Piling et al. [343]). FI also significantly improves medication treatment adherence (Piling et al. [343]), and improves social functioning (Chien et al. [295], Li and Arthur [327] and Magliano et al. [328]). Access to FI as part of an integrated recovery program is particularly important for first and second-episode participants, and may improve long-term outcome. Outcome is partly a function of the time over which services are offered, with 9 months minimum to see any clinical effect according to the research literature, and 24 to 36 months recommended for optimal employment and recovery outcomes. Combining psychoeducational FI and supported employment has proven

effective with employment rates of 35–56% for people diagnosed with schizophrenia (Magliano et al. [328]).

The FI program developed by Leff and colleagues ([318, 319]) employs three main techniques: an educational component, a relatives group, and family therapy sessions conducted in the patient's home. Research conducted at different centers have confirmed the effectiveness of FI and indicates that patients maintained on antipsychotic medication and provided with psychoeducational family interventions do better than controls or those provided with individual therapy over a one year follow-up (Anderson et al. [282]). Differences between FI therapy and control groups are evidenced most notably in length of time between hospitalizations (Leff et al. [318]).

The phase-related goals of the FI program developed by Anderson et al. [282] are also representative of the FI approach. *Phase 1*. The goal is to connect with the family and to enlist their cooperation, to decrease guilt, emotionality, and negative reactions to the illness and to reduce family stress. *Phase 2*. The goal is to increase understanding of illness and patient's needs by family and enhance social networks. *Phase 3*. Efforts focus on maintaining the patient in the community and supporting calibrated resumption of responsibility by the patient. Additional goals are to strengthen the marital/parental coalition and increase family tolerance for low level dysfunctional behaviors on the part of the patient. *Phase 4*. Efforts focus on providing support for gradual reintegration of the patient into normal social roles in community systems (work, school) and continuing to maintain and improve effectiveness of family problem solving. An additional component of FI programs involves *social skills* training. Skills training components emphasize problem behaviors that are likely to be manifested in the family and, later, in the context of resocialization in social and vocational settings beyond the family. A goal of skills training is to improve the social competence of patients by focusing on behaviors that are likely to elicit high levels of expressed emotion, particularly anger and criticism.

The interactive model of FI developed by Kavanaugh [120], assumes that the patient's biological and life history-based vulnerabilities predisposes to psychotic symptoms that are triggered by life stressors. The effects of events are moderated by the interpretations placed on them, and by the skills available to deal with the life stresses that are experienced. This approach includes use of antipsychotic medications to decrease arousa-based vulnerabilities and psychoeducational training in cognitive-behavioral strategies and coping skills, for both patients and others that are likely to contribute to an environment that is less likely to over tax

the adaptive capacities of patients (Faloon et al. 1985). Although there are distinctive features to each of the FI treatment programs described in the preceeding paragraphs there are several underlying similarities. FI programs include educational components and management strategies designed to lower the emotional climate of the home to which the patient is likely to be discharged, while maintaining graduated expectations for the patient's performance. Emphasis is placed on helping families to avoid overstimulation that tends to elicit positive symptoms and at the same time to avoid under stimulation that might result in increased negative symptoms.

Detailed treatment manuals for family interventions based on the vulnerability-stress model have been published by the various research groups. The U.S. Substance Abuse Mental Health Services Administration (SAMHSA [534]) has produced a package on Family Psychoeducation for public dissemination available on the internet that provides basic instructional materials for general family education and support programs.

The PORT recommends that FI should be a component of a broad array of psychosocial services that comprise a comprehensive community support program. FI may be particularly important for first and second-episode participants. However, research is needed to determine how different elements of FI result in reduced recidivism. It is not clear, for example, to what degree evidence of lower relapse rates with FI are the result of enhanced medication adherence, changes in the relatives' knowledge, lowered expectations and levels of expressed emotion, improved social support, reduced feelings of burden, or all of the above. A second issue to be addressed is the high attrition rates of key relatives reported in some studies of FI (Jeppesen et al. [309]). Finally, positive effects of FI on relapse and rehospitalization rates last 18 months after termination (Xiong et al. [364]), however these effects begin to dissipate after 2 years (Montero et al. [332]). This evidence suggests that strategies should be developed and tested to foster higher levels of ongoing participation in FI sessions, and to provide and assess review and booster sessions over extended intervals.

*Recommendation 16: Supported Employment (SE).* The PORT committee recommends that persons with schizophrenia who have the goal of employment should be offered supported employment, the key elements of which include individualized job development, rapid placement emphasizing competitive employment, ongoing job support, and integration of vocational and mental health services.

*Rationale.* Randomized controlled trials have consistently demonstrated the effectiveness of supported employment in helping persons with

schizophrenia to achieve competitive employment (Drake et al. [301] and Lehman et al. [320]). Individuals receiving integrated SE and psychiatric services are significantly more likely to obtain employment than controls, and 50 percent or more on average obtain competitive employment. Outcomes related to hours worked and wages earned are also superior among individuals receiving supported employment in comparison with those receiving traditional vocational services (Lehman et al. [320]).

Unemployment for people with all mental disorders is high, with rates of up to 95% for individuals diagnosed with severe mental disorders (Mueser et al. [337]). Many factors, both intrinsic and extrinsic, make it difficult for patients diagnosed with schizophrenia to find and maintain suitable employment. Intrinsic factors include increased vulnerability to stress, neurocognitive deficits, idiosyncratic behaviors and beliefs, social anxieties, low self-efficacy beliefs, inconsistent employment histories, and lack of vocational and social skills. Extrinsic factors include prejudice on the part of potential employers, hiring practices that eliminate applicants with spotty employment histories, government disability programs that discourage employment, and lack of access to effective rehabilitation services. Fewer than 15 percent of the seriously mentally ill in the U.S. work in either full-time of part-time employment, yet it is estimated that at least 50–60 percent of the population of seriously mentally ill are capable competitive employment (Bond [288]). This means that more than one-half million people in the U.S. diagnosed with schizophrenia are unemployed and probably receiving disability payments, but could become contributing members of society (Warner [361]). Traditional vocational rehabilitation, referred to as the train and place approach, is the most prevalent model but has had little success beyond placing patients in sheltered workshops (Lehman et al. [321]). Supported employment emphasizes job searches based on patient preference, and access to continuing support to patient and employer from an employment specialist working as an integral member of the mental health service treatment and planning team.

In order to be successful SE services must include (1) integration of clinical and employment services; (2) provision of ongoing job support; with gradual withdrawal of services after successful employment, (3) development of job opportunities consonant with participants' abilities and preferences, and (4) opportunities for an array of placements into permanent competitive employment (Mueser and Bond [338]). A key element of SE is integration of the job coach with the mental health team responsible for providing comprehensive and continuing care, to assure that specialized services are available to sustain the individual on the job. Ongoing coordination and consultation with the supervisor at the work site as well

as the client and mental health team are important components of the performance standards for job coaches. SE services are most effective when combined with additional services including access to medication and an array of psychosocial therapies (Lehman et al. [321]). Several programs have employed motivational strategies to help engage participants in the early stages of commitment to seeking employment, social skills training (Larson et al. [315]), and cognitive rehabilitation (CR) services for those with cognitive impairments (McGurk et al. [329]). Studies indicate that SE participants receiving combined CR and SE services had better employment outcomes over long-term follow-up than those receiving SE services alone (Bell et al. [285] and McGurk et al. [329]).

Results from randomized clinical trials indicate that rates for competitive employment on the open job market for patients using SE services more than doubled, and that well designed and administered SE programs are highly effective and cost effective in helping persons diagnosed with schizophrenia find competitive employment (Lehman et al. [320], Cook et al. [296] and Bond et al. [290]). A randomized controlled trial conducted in six European centers reported similar results, with the rate of obtaining competitive employment for people with severe mental illness who were motivated to work double that of those provided with the usual high quality vocational rehabilitation (Burns et al. [291]). SE programs have proven effective in reducing hospital admissions, improving medication management, decreasing alcohol abuse, improving self-esteem, increasing family role performance and social activity, and helping people find competitive employment (Cook et al. [296]). Some practitioners, consumers, and family members are concerned that competitive work may be too stressful and increase the chances of relapse and rehospitalization. However, research on SE indicates that working is correlated with fewer hospital admissions, reduced health care costs, and modest benefits in terms of fewer positive and negative symptoms, enhanced self-esteem, social functioning, and improved quality of life (Bond et al. [290]). Significant long-term cost savings can also result from SE programs since treatment costs are markedly reduced for former patients who are placed in jobs.

The Substance Abuse and Mental Health Services Administration (SAMHSA) has identified a number of principles of supported employment practices. (1) Eligibility is based on consumer choice. No one is excluded who wants to participate. (2) Supported employment should be fully integrated with treatment, so that employment specialists coordinate plans with the treatment team. (3) Competitive employment is the goal. The focus is on finding community jobs that anyone can apply for and that pay at least minimum wage. (4) Job searches should begin

shortly after a consumer expresses interest in working. There should be no requirements for completing extensive preemployment assessment and training, or intermediate work experiences such as sheltered workshops, or prevocational work units. (5) Follow-on supports should be continuous, and individualized to help maintain employment as long as consumers want/need them. (6) Jobs are viewed as transitions. People may try several jobs before finding a job they want to keep. Employment specialists are available to help consumers find further jobs when they leave jobs. (7) Consumers' preferences, choices, and input into decisions about work and support should be important, along with consideration of the person's strengths and experiences. SAMSA has produced and placed in the public domain an exemplar package for public dissemination of SE practices.

*Recommendation 17: Assertive Community Treatment.* The PORT committee recommends that systems of care serving persons with schizophrenia should include a program of assertive community treatment (ACT). This intervention is recommended for individuals who have any of the following characteristics: high risk for repeated hospitalizations, difficulty remaining in traditional services, or recent homelessness. The key elements of ACT include a multidisciplinary team (including a psychiatrist), a shared caseload among team members, direct service provision by all team members, a high frequency of patient contact, low patient-to-staff ratios, and outreach to patients in the community.

*Rationale.* ACT is designed to actively follow people released from hospital into the community, and to provide them with proactive support at every step in the transition and adjustment process. This intervention is designed to provide multidisciplinary psychosocial treatment in a community-based setting to individuals who have a severe and persistent mental disorder. When appropriately implemented with this population ACT markedly reduces inpatient service utilization (Bond et al. [289] and Rosenheck et al. [345]).

ACT is not a specific clinical intervention rather it is a way or organizing services to provide the help that is essential to effectively integrate certain individuals with severe mental illness into life in the community. ACT programs are based on the assumption that work can play an important role in providing meaning and structure in an individual's life. ACT arose from the realization that many community treatment programs do not effectively address certain factors required for the successful community adjustment of long-term patients (Stein and Test [349]). ACT programs may not be appropriate for everyone they are generally most effective with

individuals at high risk for repeated hospitalizations, including medication resistant and previously homeless individuals.

ACT is designed so that program staff initiate contacts with patients as soon as they are released from hospital, and arrange for or provide services whenever and wherever needed; visiting patients in their homes, providing services around the clock, helping with basic living skills, settling disputes, finding and keeping jobs, expanding social lives, and providing support to patients' families. ACT staff is organized to work as an egalitarian team and are trained to provide supportive counseling, crisis intervention, home visits, outreach, psychoeducation of patients and family members, and *in situ* rehabilitation.

The requirements of ACT programs are (1) ACT programs must assume responsibility where necessary for helping individuals access basic material resources such as food, shelter, clothing medical care. (2) Staff must provide teaching in vivo the coping skills needed to meet the demands of community life, including using public transportation, preparing simple but nutritious meals, and budgeting money. (3) Provision of a readily available system of support to help the individual solve real-life problems, help motivate and remain involved in life, feel that he or she is not alone, and that others are genuinely concerned. (4) Help break the cycle of dependency and revolving door syndrome by providing sufficient support to keep the client involved in community life and to encourage growth toward greater autonomy. (5) Provide support and education to community members involved in participants' lives, the help them relate in a manner that is beneficial to and acceptable to both. (6) Many chronically disabled individuals are passive, anxious and prone to develop severe symptoms and "drop out" under stress. Hence, ACT programs are assertive, actively involving participants in their planning and treatment, and must be prepared to "go to" the client whenever necessary, to insure continuity of care. The ACT core team provides clients with medication, supportive and problem-solving therapy, assistance in finding appropriate housing, occupational rehabilitation and placement, crisis intervention around the clock and whatever else is needed in terms of biopsycho-social services. The team serves as a fixed point of responsibility in order to avoid the fragmentation that so often exists in community services, and allows for continuity across functional areas across time as well as continuity of care givers. A second characteristic is that the ACT team must be mobile. Team members use assertive outreach to provide most services where the client is rather than in offices. Staff must be willing and able to meet with clients in residences, neighborhoods, or work sites, as necessary. Assertive outreach is effective in reducing the number of drop outs and allows for

effective provision of services when and where the client needs them. A third aspect of ACT programs is that services are individualized to address the diversity of persons diagnosed with severe mental illness, and the fact that the person with the disorder is constantly changing. ACT services and interventions are provided to meet the current needs and preferences of each client, based on a thorough clinical and functional assessment and an individualized treatment plan. The core team also provides medication which is often delivered to the clients in their homes. One on one contacts frequently focus on problem solving and providing emotional support. Staff members work to educate clients about their illness, to help them develop ways to manage symptoms, and provide individualized psychoeducational sessions to family and relevant community members such as landlords and supervisors. Team members are on call 24 hours a day to provide crisis intervention, or brief hospital admissions when needed. Staff members help clients locate living arrangements in the community and spend a great deal of time doing outreach. Problems of daily living, including money management, grocery planning and shopping, laundry, housekeeping, and learning about transportation are all concerns of the core services staff. Staff act as coaches, both teaching clients how to manage these things and providing them with support when new or difficult moments occur.

ACT programs may also incorporate a "supported employment" model in which each interested client is assisted in securing a paying job in the community that matches the client's current interests, skills, and abilities. In addition to assistance in locating jobs core team members may work with the client and the employer at the site. Work with clients and employers involve helping to structure the job environment so that clients work in spite of continuing psychotic symptoms. The goals of ACT programs are to provide interventions that decrease vulnerability and help build protective factors such as social skills and supports, meaningful and appropriate work opportunities, and resources to weaken the effects of environmental stressors. The emphasis is on helping clients find environments in which they can function, as well as on decreasing the severity of their symptoms. Staffing of ACT core teams typically includes various mental health professions, with at least 75 percent holding bachelor's or master's degrees in mental health related fields and no more than 25 percent trained at the paraprofessional level. All team members work with all clients. Team members also share responsibilities for treatment plans so that no single person is responsible for a specific caseload of clients.

Evaluation of the initial ACT program in Wisconsin indicated that clients experienced less time in hospital if rehospitalized in psychiatric

hospitals, evidenced fewer symptoms in the community, and lived more independently than controls (Stein and Test [349]). ACT clients also spent more time in sheltered employment and belonged to more social groups. Nearly all individuals referred to the program could be successfully treated in the community, and had a markedly lower rate of hospital readmission, higher levels of functioning and greater overall life satisfaction. The ACT program accomplished these results at no increased overall long-term cost to either families or the community (Stein and Test [349] and Test and Stein [354]). Similar findings have been reported in other settings where the ACT model has been adopted (Bond et al. [289], Morse et al. [333] and Rosenheck et al. [345]). Overall costs and benefits of the ACT program indicate that costs are similar to traditional care while benefits are greater. A study of young adult schizophrenic patients (Test et al. [355]) also indicated that ACT clients spent significantly less time in psychiatric hospitals or nursing homes than controls, and this advantage continued long-term as long as services were provided. A randomized trial of ACT for homeless persons with severe and persistent mental illness also indicated that participants in the ACT program used significantly fewer emergency department visits, and more outpatient visits than controls. Participants also spent significantly more days in stable community housing and experienced greater improvements in symptoms, life satisfaction, and perceived health status (Lehman et al. 1997). Additional studies in the U.S., Australia and Sweden have demonstrated the effectiveness of ACT in reducing length of hospitalizations, reducing bed usage, decreasing capitated costs, and improving living conditions of patients (Latimer [316], Rosenheck and Dennis [346] and Chandler and Spicer [294]). It is important to note however that 5%–20% of seriously mentally ill patients (at least half of whom have been diagnosed with schizophrenia) do not function well in ACT, for reasons that are not clear. In addition, ACT may not afford a significant benefit for dual disorders (cooccurring psychosis and substance abuse) when compared with usual integrated services for both disorders (Drake et al. [301], Essock et al. [304] and Morse et al. [334]). Follow-up studies also indicate that ACT program participation should be considered long-term since once clients are discharged from the program many lose the advantages relative to controls (Morse et al. [333]). There are wide variations in how ACT programs have been implemented which may have been a factor in some outcome studies (Deci et al. [298]). The effectiveness of ACT can be influenced by factors such as the amount of skill training included, consumer characteristics, access to focused skill training to facilitate the transition from institution to community, and the treatment team's degree of control over hospitalization (MacKain et al. 1998).

The ACT model appears to be most effective with people diagnosed with psychosis who are at high risk for relapse or have difficulty remaining in traditional services. This group includes individuals who continue to have severe psychotic symptoms, are noncompliant with treatment, have difficulty taking care of basic living functions. Many of these individuals can live successfully outside of the hospital for long intervals when ACT services are provided, even though they may continue to be disturbed. ACT services are most effective when integrated with other psychosocial treatments such as SE (Jeppesen et al. [309]), multifamily FI groups (McFarlane and Deakins [330]), and skills training (Kurtz and Mueser [314]) to provide broad based community services to foster the process of recovery. Successful ACT programs promote client choice, a recovery perspective, and meaningful community integration (DeLuca et al. [299]). Consumer groups have expressed concerns about issues related to outpatient commitment and the potential for coercive practices within the ACT framework. Staff must be particularly sensitive to the promotion of the processes of recovery given the intensive, assertive nature of many ACT services.

In summary, ACT is an effective therapy for individuals who are at high risk for repeated hospitalizations have difficulty remaining in traditional services, or a recent pattern of homelessness. The key elements of ACT include a multidisciplinary team, a shared caseload among team members, direct service provision by all team members, a high frequency of patient contact, low patient-to-staff ratios, and outreach to patients in the community. A description of ACT implementation guidelines and practices is available for public dissemination by SAMHSA [534] via the agency website.

*Recommendation 18: Skills Training.* Persons with schizophrenia who have deficits in social skills or activities of daily living should be offered social skills training. The key elements of social skills training include behaviorally based instruction, modeling, corrective feedback, and contingent social reinforcement. Clinic-based skills training should be supplemented with practice and training in the individual's day-to-day environment.

*Rationale.* Individuals with schizophrenia can learn a wide variety of social and independent living skills when provided with structured behavioral training. Controlled trials indicate the benefit of skills training in improving social and independent living skills when training is offered in conjunction with adequate pharmacotherapy (Hayes et al. 1995 and Glynn et al. [305]). Follow-up evaluations report that participants show good retention of skills (Mueser et al. [336] Liberman et al. [324]).

Skills are behaviors that promote problem-solving, engagement with others in successful affiliative and instrumental relationships, and that mobilize supportive networks and engagement in work. In order to live successfully in the community people must have the self-care, interpersonal, and life skills necessary to manage the demands of daily living. Skills training utilizes a variety of strategies to build these skills, including behaviorally based instruction, modeling, corrective feedback, homework assignments, and contingent social reinforcement. Skill training modules include sessions on topics such as: (1) problem identification in terms of perceived obstacles to achieving personal goals, (2) goal setting, in terms of incremental goals, (3) role plays and behavioral rehearsal, (4) positive and corrective feedback, (5) social modeling provided by a therapist or peer, (6) behavioral practice and repetition to criterion, (7) positive social reinforcement contingent on skill improvement, (8) homework assignments to practice skills in real life situations, and (9) follow-up positive reinforcement and problem solving based on experiences using skills (Kopelowicz et al. [312]). Topics may include one or more of the following: (a) basic conversation and communication skills and expressiveness, (b) symptom management, (c) assertiveness: (d) disorder management skills such as medication adherence and negotiation skills with service providers, (e) developing friendships, intimate relationships, (f) job finding and communication, (e) and problem solving with peers, coworkers and roommates. Skills training can be conducted in either individual or group settings.

Randomized controlled studies indicate that social skills training can result in positive benefits to participants (Piling et al. [343] and Liberman and Kopelowicz [326]). Studies of psychiatric inpatients and outpatients indicate that the benefits of skills training generalize from hospital or clinic-based training settings to the everyday lives of patients living in the community (Liberman et al. [325]). Newly learned skills are maintained for 6–12 months, and generalization to real life environments is fostered by homework assignments. Social skills training can add a needed dimension to prevocational rehabilitation efforts by targeting behaviors and skills that improve the individual's functional capacity for work. Meta-analyses of studies of skills training indicate that skills training sessions have a significant positive impact on social and community outcomes (Kurtz and Mueser [314] and Pfamatter et al. 2006), although participants in social skills training may not all respond equally well (Bellack [286]). Social skills training should ideally be delivered in the context of a multielement treatment program that includes access to timely medication management, intensive case management, crisis services, access to appropriate housing, family psychoeducation, and SE services including job coaching

and training. In addition to social skills training, specialized training programs have been developed to provide training related to specific illness/wellness management concerns such as diabetes, drug side effects, relapse warning signs, medication review assertiveness skills, and stress management (Liberman et al. [325] and Velligan et al. [360]). Given these promising results there is a need for research to help practioners better understand who needs social skills training, who can profit from it, and when patients will be receptive to it.

A peer-based self-help skills program the Wellness Recovery action Plan (WRAP) (Copeland [470]) has been developed by a group of individuals who were working to recover from their own mental health problems. WRAP is designed so that each participant develops their own plan to maintain wellness, including identification of personal triggers, early warning signs, signs that things are getting worse while there is still time to do something about it, and a personal crisis plan with advance directives. At least one controlled trial of a peer support group program for persons with severe affective disorders showed significant benefits (Lake et al. 1994).

In summary, skills training can be an effective psychosocial intervention to improve functional living skills, especially when delivered in the context of a multielement treatment program. In addition to packages developed by leading skills researchers (Kopelowicz et al. [312]), the SAMHSA [534] has developed two packages for public dissemination (Illness Management and Recovery, and Medication Management Approaches in Psychiatry).

*Recommendation 19: Cognitive Behaviorally Oriented Psychotherapy.* Persons diagnosed with schizophrenia that have residual psychotic symptoms while receiving adequate pharmacotherapy should be offered adjunctive cognitive behaviorally oriented psychotherapy. The key elements of this intervention include a shared understanding of the illness between the patient and therapist, the identification of target symptoms, and the development of specific cognitive and behavioral strategies to cope with these symptoms.

*Rationale.* Controlled studies of cognitive behavioral therapy (CBT) with persons diagnosed with schizophrenia report benefits in reducing delusions and hallucinations (Wykes et al. [362, 363]), positive symptoms (Tarrier et al. [351]), negative symptoms (Sensky et al. [347]), and depression (Turkington et al. [357]).

CBT focuses on symptoms, particularly delusions and hallucinations and encourages the individual to weigh evidence, which might contradict

these beliefs and perceptual experiences. Patients can be helped to recognize delusional thoughts, early signs of relapse, and are taught stress reduction tools and coping strategies (Bellack [287]). The elements of CBT include: development of rapport and a shared understanding of the illness between patient and therapist, mutual identification of target symptoms, and implementation of specific cognitive and behavioral strategies to cope with these symptoms. CBT encourages individuals to reappraise delusional beliefs in order to reduce distress, reduce negative schemas, more effectively manage stressful environments, change reasoning biases by the application of therapy assisted disconfirmation strategies, and fosters detailed consideration of the full range of evidence to reduce high conviction delusional beliefs. CBT sessions are conducted weekly or biweekly typically over a period of about nine months.

The praxis of cognitive therapy is based on the notion of collaborative empiricism which involves specific requirements for planning, motivation, and methods that should be discussed and clarified with the patient on an ongoing basis. The goals of broad-based cognitive therapy are to bring about a restructuring of patients (core understandings of themselves and their relationship to the environment. This process involves strategies to bring about alterations of prevailing dysfunctional meaning structures and their replacement with more adaptive alternatives. During the initial phase of treatment the therapist attempts to identify each delusion and to assess the degree of conviction with which the belief is held. The therapist next targets the least firmly held beliefs for intervention. Two strategies are used to gently challenge the patients' delusional beliefs and to introduce alternative interpretations (Chadwick and Lowe [293]). The initial strategy involves verbal challenge in which the therapist questions the evidence for the delusional belief and points out discrepancies in the patient's account. Once seeds of doubt about the accuracy of these beliefs are introduced, the therapist begins to offer alternative explanations to account for the evidence and experiences that are the basis for the beliefs and to encourage the patient to consider alternative ways of looking at the evidence. The second strategy involves encouraging the patient to engage in small behavioral experiments to test the evidence for the beliefs. These tests are carefully planned and negotiated with the patient to assure their relevance and acceptance, and to increase the likelihood that they have the potential to invalidate the delusion. Next the patient is asked to carry out the tests and the results are discussed in subsequent sessions. Dialogues and small homework assignments are structured to gradually introduce alternative interpretations to the experiences that form the apparent foundation for the delusional beliefs. The desired outcome is to guide the patient so that

delusional beliefs are eventually let go of and replaced by more adaptive explanations.

A second cognitive-behavioral approach involves a normalizing approach on the assumption that delusional beliefs represent extremes on a continuum of degrees of conviction of belief that ranges from normal to psychotic. The goal is to gradually move delusional beliefs and extreme behaviors toward the normal range. This process is accomplished through a process of first identifying, then attempting to understand, explain, and normalize previous and current confusing and frightening experiences (Kingdon and Turkington [311]). Techniques such as verbal challenge, behavioral assignments, and teaching of coping strategies are incorporated as the therapy progresses and additional aspect of delusional ideation are identified. The etiological importance of the concept of a delusional mood that is associated with increased suggestibility that is experienced during stressful times is emphasized by this approach. The authors maintain that increased anxiety, confusion, and other disturbing feelings associated with a delusional mood increases suggestibility and contribute to the misperceptions and misattributions that culminate in delusional beliefs. Delusions are understood as serving to alleviate confusion and unpleasant feelings by providing an explanation and reasons for these experiences, no matter how unusual the beliefs may seem to others. By identifying and better understanding the origins of the confusing and frightening experiences associated with onset of the delusional mood, it is assumed the patient will become more open to alternative interpretations of memories of experiences associated with the acute disturbed affective state or delusional mood. Kingdon and Turkington [311] reported the results of the application of this approach to a cohort of 64 patients over a 5-year period. Participants in the cognitive-behavioral therapy program, designed in accordance with their model, evidenced lower readmission rates and more symptomatic improvement than controls.

Fowler et al. (1995) developed another approach to cognitive therapy with schizophrenic patients based on six steps: (a) engagement and assessment, (b) teaching self-management coping strategies, (c) collaborative development of new ways of understanding symptoms based on a vulnerability-stress model, (d) using cognitive strategies to challenge delusional beliefs, (e) using cognitive therapy techniques to challenge dysfunctional assumptions, and (f) teaching relapse prevention and disability management strategies. Support for the effectiveness of this approach has been reported by Fowler (1992). The author noted that ability to benefit from the therapy was symptom related. Patients with predominantly

negative symptoms generally had difficulty participating in the therapy and did not show improvement; patients with predominant positive symptoms participated in an average of 22 sessions and evidenced significant benefit. Another approach to CBT developed by Chadwick and colleagues utilizes techniques of verbal challenge to gradually structure discussions of the feasibility of delusional beliefs (Chadwick and Birchwood [292] Chadwick et al. 1996 and Drury et al. [302]). Gradually alternative possibilities and interpretations for the patient's experiences are introduced in sessions in order to provide alternatives interpretations to the events associated with the delusions. Behavioral assignments are planned to help provide evidence of the accuracy or error of delusional beliefs. Hallucinations are approached in a similar fashion. First the important dimensions of hallucinated voices are identified, including the identities, power, source, and meaning of the voices. Then verbal challenge and planned reality testing strategies are introduced to offer alternative explanations of the hallucinations and to develop plans for how the patient might deal with the voices differently. Sessions increasingly include efforts to incorporate strategies to address issues related to threats to the self system that contribute to symptom expression (Chadwick et al. 1996). Work with acute patients includes both individual and group sessions in which participants are encouraged to discuss the adaptive and dysfunctional aspects of one another's beliefs, to consider alternative interpretations of these beliefs and to learn new coping strategies. Negative attitudes toward psychosis, such as expectations of permanent disabilities and dependency, are also challenged. The discussion of the functional and dysfunctional beliefs in group context is considered to be especially important since many schizophrenic patients tend to live in their own worlds of fantasy and rarely voluntarily subject their beliefs to interpersonal consideration and discussion, in a supportive and understanding context. Additional components include family sessions that focus on stress and symptom management, and a structured ward program that emphasizes interpersonal skill development. Studies of the effects of this approach on samples using behavioral baseline measures indicate that delusions and auditory hallucinations can be significantly changed toward the normal range thru verbal challenge and planned reality testing strategies (Chadwick and Birchwood [292] and Chadwick and Lowe [293]). A controlled trial of acute inpatients indicated that cognitive therapy was significantly more effective than supportive (control) therapy in reducing positive symptoms and delusional convictions by week 7 (Drury et al. [302]). Results at nine month follow-up indicated 95% of the cognitive therapy participants showed significant reductions in symptoms versus 44% of controls. These differences were

observed for positive but not for negative or disorganization symptom patients.

Additional studies indicate that CBT can reduce positive symptoms and overall symptom ratings for acute patients (Gumley et al. [306] and Lewis et al. [322], Rector et al. [344], Turkington et al. [357] and Wykes et al. [363]). The symptoms that are reduced by CBT include delusions, distress related to auditory hallucinations, and negative symptoms (Beck and Rector 2005). CBT for early schizophrenia has been found to result in transient but faster improvements in positive and negative symptoms and delusional beliefs (Bechdolf et al. [284], Gumley et al. [307], Haddock and Lewis [308] Lewis et al. [322]). Modest benefits have also been reported for long-term patients (Turkington et al. [357]). Additional randomized controlled trials indicated that CBT is effective in reducing both positive and negative symptoms when compared to supportive therapy (Dickerson et al. [300], Rector and Beck 2001 and Wykes et al. [363]). A meta-analysis of meta-analyses concluded that CBT resulted in declines in ratings of general psychopathology and positive symptoms (Pfammatter et al. [342]).

Multielement psychosocial intervention programs for early psychosis that include CBT reportedly improve social function, increase insight, lower rates of readmission, decrease substance abuse, decrease self-harm behaviors, less time spent in hospital, and higher levels of satisfaction with treatment (Kemp et al. [310] and Spaulding and Poland [431]). The effects of CBT on ratings of social and occupational functioning (Bechdolf et al. [284] and Temple and Ho [353]), as well as relapse and rehospitalization (Gumley et al. [307], Startup et al. [348] and Tarrier et al. [352]) are equivocal. CBT therapy appears to be most effective during acute psychotic episodes (Zimmerman et al. [366] and McIntosh et al. [331]).

In summary, broad-based CBT attempts to bring about a restructuring of the patients' understanding of themselves and their relationship (past, present, and future) to the environment. This process involves strategies to bring about alterations of prevailing dysfunctional meaning structures and their replacement with more adaptive alternatives. Programmatic attempts to extend cognitive therapy techniques, developed originally for treatment of symptoms of anxiety and depression, to the treatment of schizophrenic patients have proven to be effective in bringing about reductions in symptoms such as delusions and auditory hallucinations (Bechdolf et al. [284] and Temple and Ho [353]). Evidence suggests that CBT therapy is most effective during acute psychotic episodes (Zimmerman et al. [366]). There is a need to develop and evaluate modifications in CBT that can increase its effectiveness with patients evidencing different levels of chronicity and diverse phenotypic symptom patterns.

*Recommendation 20: Token Economy Interventions.* Aftercare and inpatient programs that deliver long-term care should provide a behavioral intervention based on social learning principles. The key elements of this intervention are contingent positive reinforcement for clearly defined target behaviors, an individualized treatment approach, and the avoidance of punishing consequences. These programs, often called points programs or token economies, should be delivered in the context of an environment that provides adequate pharmacotherapy, as well as access to the full range of other recommended psychosocial interventions, and access to basic amenities.

*Rationale.* The token economy constitutes the most extensively research type of social learning program. Token economy programs are based on the principles of contingent positive reinforcement for target behaviors. In these programs tokens or points are used to provide immediate reinforcement for the performance of specified desirable target behaviors. Tokens may be exchanged at a later time for individually selected reinforcers, such as snacks, beverages, and privileges. Tokens permit rapid reinforcement of behaviors, are less likely to be subject to satiation effects, and can be distributed in a flexible manner.

Applications of reinforcement theory to bring about therapeutic change in schizophrenic patients led to the development of *token economy* programs. In these programs tokens are used as a medium of exchange much as money is used in the outside world. Tokens gain value as generalized reinforcers because they can be exchanged for primary and secondary reinforcers and privileges. In a token economy most behaviors of patients can either gain or costs tokens. Adaptive behaviors are rewarded with tokens and nonadaptive behaviors result in either withholding of tokens or token costs. In this manner patients are reinforced for approximating behaviors that approximate those necessary for successful functioning in the community outside the hospital. Three steps are involved in setting up a token economy (Corrigan et al. [297]). First, the target prosocial and self-care behaviors to be changed must be clearly identified. Second, contingencies between target behaviors and rewards/tokens must be defined, so that less frequent and more difficult behaviors earn more tokens. Third, exchange rules must be established so that the relationship between tokens and desirable consumables are clear. These rules involve basic supply and demand economic principles. Finally, all stakeholders should have meaningful input into each step of the process of establishing targets, contingencies and exchange rules (Corrigan et al. [297]).

Paul and Lentz [340] published the results of a long-term study of the comparative effects of a token economy program, milieu therapy and

traditional medication oriented treatment on the outcome and community adjustment of schizophrenic patients. Long-term patients were randomly assigned to the different treatment conditions and additional patients were sequentially assigned as patients were discharged. The major findings were as follows. (1) Both psychosocial treatment programs (token economy and milieu) resulted in significantly more improvement and better ward adjustment ratings than the traditional medication alone group, and these effects were maintained over time. (2) The token economy treatment was more effective in changing patient ratings in a positive direction in the long run than either milieu or medication treatments. (3) The token economy program resulted in significantly more hospital releases (95 percent) than either the milieu (67 percent) or medication control patients (45 percent). When discharges were taken into account the percase operational cost savings of the token social-learning program was 33 percent.

Reinforcement programs can be effective in increasing in-hospital adaptive behaviors of patients in hospital and residential treatment environments, particularly in cases where residents are socially withdrawn, unmotivated, and have difficulty performing routine activities of daily living (Dickerson et al. [300]). Token reinforcement programs can help to highlight the "value" of certain behaviors, and foster explicit mapping of outcomes that can compensate for deficits in the ability to use internal representations. The effectiveness of token reinforcement programs indicates that the reward systems of many withdrawn "institutionalized" patients can be reactivated with consistent external cueing and opportunities for contingent reinforcement (Velligan et al. [360]). Caution must be exercised regarding possible misconceptions of the principles of social learning on which the programs are based (e.g., using tokens as a form of punishment rather than positive reinforcement). When applied appropriately as a systematic behavioral reinforcement program however token reinforcement programs can help to highlight the "value" of certain behaviors, and foster explicit mapping of outcomes that can compensate for deficits in the ability to use internal representations. This is especially relevant to the recovery of many long-term patients since the issues of withdrawal and lack of motivation is often central to rehabilitation (Koren, et al. [313]). In well-designed programs, individualized goals and objectives of participants are collaboratively identified and updated, along with the activities and skills building efforts that will help them achieve these objectives. Reinforcement programs need not necessarily involve tokens and should not be applied in a uniform or "one size fits all" manner. In programs that involve tokens or points for reinforcement plans should incorporate indicators for gradual withdrawal of tokens or points in order to foster generalization of skills

and coping behaviors to real life in the community. At this time it is not entirely clear to what extent and duration patient gains in token economy programs transfer to other contexts outside of the hospital environment unless these programs also include a systematic program to foster generalization. Despite evidence to support the effectiveness of token programs, the frequency of application of the approach has decreased in recent years. The reasons for this decline most likely relate to the fact that successful application requires dedicated and well-trained nursing staff, and to ethical concerns about requiring patients to "earn" tokens in order to gain access to rewards and privileges that have come to be viewed as rights.

## 12.1. Summary

Antipsychotic pharmacoptherapy is considered to be the standard of care for schizophrenia however, residual symptoms remain largely unchanged, medication adherence is often poor, many patients experience psychotic symptoms that do not respond to medication (Lindenmayer 2000 and Nasrallah and Lasser [339]), and psychosocial functioning and functional outcomes generally do not improve (Swartz et al. [350]). Relapse and rehospitalization rates for patients with schizophrenia treated with medication alone are as high as 30% after one year, and 80% after five years (Dossenbach et al. 2005 and Gumley et al. [307]). Combining psychosocial treatments with pharmacotherapy improves functional outcome and decreases the average cost of treatment per disability adjusted life year by 40% or more (Guiterrez-Recacha et al. [115]). The PORT committee identified a number of evidence-based pharmacological and psychosocial practices that can significantly increase the prospects of positive outcome and social recovery for many individuals. Evidence indicates that successful community based programs include timely access to psychoactive medication combined with a spectrum of individually tailored and well integrated EPB based psychosocial therapies, effective health care, and meaningful assistance in meeting basic needs such as access to decent housing, food, and social support. A number of questions and treatment issues remain to be addressed, these include (1) the need for development and evaluation of multielement programs that integrate psychosocial therapies into individually tailored packages that can be offered to the recovering patient in goal setting and rehabilitation planning sessions; (2) studies to determine the interaction of psychosocial therapies with individual differences in participant characteristics; (3) long-term follow-up studies on the effects of psychosocial therapies, and evaluation of the value of continued support

and periodic booster sessions; (4) research to improve understanding of the contributions of social context, and employment on functional outcome; and (5) development and use of more ecologically valid measures of interpersonal and social functioning to evaluate the effects of therapies at various follow-up intervals (Silverstein et al. [91]).

The value of indentifying empirically based treatments is unquestioned. Nevertheless, a combination of uncritical enthusiasm for empirical findings without due consideration of design limitations and economic and political factors can result in an unjustified narrowing of what we consider to be acceptable. The problems associated with identifying empirically validated psychosocial therapies are pronounced. Increased funding for long-term studies of psychosocial therapies is sorely needed. Relatively few true double-blind studies of psychosocial therapies have been published. It is premature to reach exclusionary conclusions about appropriate therapies at this time for any given case given the heterogeneity of individuals diagnosed with schizophrenia.

# 13 Promising Psychosocial Treatments

A number of promising approaches to providing psychosocial therapies have been developed and validated in outcome research however, there were not sufficient randomized control studies completed to include them in the 2004 PORT committee recommendations. Several of these treatments are currently under review for inclusion in the next round of PORT recommendations.

## 13.1. Cognitive Remediation

Cognitive impairments are frequently observed among individuals diagnosed with schizophrenia. These impairments are reasonably good predictors of functional outcome (Green [390]). Impairments are evident in deficits on measures of attention, learning and memory, problem solving, language, social cue recognition, executive functions, and theory of mind tasks (Heinrichs and Zakanis [394] Green et al. [391]). These deficits are resistant to the effects of medication, are persistent, and are strong predictors of functional behaviors (Green et al. [391], Milev et al. [415], Rempfer et al. [426], Wagner et al. [440] and White et al. [446]). Disturbances in cognitive control, (i.e., the ability to guide and adjust cognitive processes and behaviors flexibly in accordance with one's intentions and goals) are associated with these impairments. Although, the PORT recommendations did not include cognitive remediation (CR) as an EBP, a growing body of research indicates that CR programs can have beneficial effects on cognitive performance (Heyebrand 2007, Kurtz and Nichols [404] and McGurk et al. [411]). Additional evidence indicates that the effects of CR programs interact with the impact of other psychiatric rehabilitation services to foster recovery (Kurtz et al. [403], Kurtz and Nichols [404] and McGurk et al. [411]). When combined with supported employment programs, CR is associated with superior employment outcomes compared

to SE services offered singly (Heyebrand 2007). Many CR programs seek to improve and/or restore cognitive functions using a range of pencil and paper and computerized tasks designed to develop cognitive skills such as attention, problem-solving, planning, and memory functions. The strategies used in CR are based on theories of cognitive development, and represent adaptations of treatments developed for brain injured patients. These include graded, repetitive exercises, positive reinforcement, and breaking tasks down into manageable components so that training proceeds from simple components to more complex to promote errorless learning. CR programs may be included as components of comprehensive rehabilitation programs where training exercises are included with other psychosocial treatments.

Cognitive remediation programs involve repetitive exercises that focus on specific aspects of cognitive functioning, based on the assumption that the cognitive systems are organized hierarchically so that remediation must focus on basic deficits first (Sturm et al. [432]). Additional adaptive change strategies incorporated into CR programs include reinforcement and shaping strategies, training in problem-solving, and strategies to foster "positive behavioral momentum" (Heydebrand 2007). Procedures such as errorless learning, graded levels of task difficulty, high levels of redundancy, and personal control are incorporated into training sessions in order to foster more positive task related attitudes, enhance motivation, and improve self perceptions of competence to perform the tasks. CR programs often include computerized training, individualized or group training sessions, along with integration with other rehabilitation efforts such as SE and social skills learning (Heydebrand 2007). Computer-based programs designed to train participants in specific cognitive tasks and to increase intrinsic motivation have been developed to contextualize the learning in real world type situations, and to provide multisensory stimulation and personal control over the pace of the learning activity. CR programs have resulted in significant gains in cognitive functioning, problem-solving ability, and impression management skills (Medalia et al. [413]).

A group-based approach to CR is referred to as Integrated Psychological Therapy (IPT, Brenner et al. [370]). IPT proceeds in a stepwise fashion beginning with structured group activities requiring various combinations of molecular cognitive abilities and operations. Sessions begin with efforts to improve basic vigilance and learning-based processes of information acquisition and short-term memory storage and retrieval processes, and gradually progress to units covering molar processes such as social skills and social competence. The molecular cognitive differentiation subprogram of IPT for example, includes activities designed to develop concept

manipulation abilities. In this program a sorting task is introduced and the group is encouraged to develop strategies for sorting objects of different color, size, and shape. The more general Social Perception subprogram in contrast, includes activities designed to develop skills for processing social information (e.g., detailed examination and description of pictures of people involved in different social contexts). Activities included in IPT subprograms are typically graduated in complexity and amount of required social interaction. IPT has been demonstrated in controlled trials to have significant effects on measures of symptom functioning, neurocognitive measures, and interpersonal problem solving skills (Spaulding et al. [430] and Spaulding and Poland [431]).

Hogarty and Flescher [397] developed another CR program called Cognitive Enhancement Therapy (CET). CET conceptualizes the deficits of patients in terms of their failures to develop appropriate cognitive and social cognitive skills. CET is based on the assumption that a fundamental problem of many individuals diagnosed with schizophrenia is impaired apprehension of the gist of social problems and situations. CET does not assume that the molar components of social cognition are necessarily a compilation of molecular processes rather the ability to perceive and respond to the gist of social situations is viewed as a rapid form of conceptual apprehension. CET assumes that the gist of social situations is normally inferred from a relatively small amount of information, when that information correlates with implicit social schemata stored in memory about declarative relationships, social roles, cues, and procedural scripts. Normally this information is learned in the course of development. In the case of schizophrenia however normal elements of social cognition are often not fully developed. It is assumed that impairments in the social cognitive processes required for the identifying and acting on the "gist" of social situations and interactions is a fundamental deficit that limits the social performance of individuals diagnosed with schizophrenia. Controlled outcome studies of CET indicate that this approach is effective in enhancing social competence and performance (Hogarty and Flesher [398]).

The Neurocognitive Enhancement Therapy (NET) program developed by Wexler and Bell [445] focuses on the use of computerized software programs targeting attention, memory, and executive functions. Training begins with simple functions and progresses to more complex exercises, to foster mastery at increasingly difficult material. NET is administered in the context of a work rehabilitation program, so participants also attend a weekly social-processing group where they are given feedback on work performance and suggestions for improvement are discussed. Medalia et

al. [414] developed a CR program-based on teaching techniques developed by educational psychologists. These techniques are designed to promote levels o intrinsic motivation and task engagement. This approach emphasizes higher-order strategy-based approaches to learning over drill exercises that focus on gradual development of basic skills. Training involves participation in computer-based exercises such as games designed to be engaging, enjoyable, and motivating (e.g., "Where in the World is Carmen San Diego?"), and require use of a range of cognitive strategies, and skills in a contextualized format.

In summary, a growing body of evidence from controlled clinical trials indicates that cognitive deficits in schizophrenia can be modified through methods that employ strategies to engage patients in a graduated series of cognitive exercises and training programs (Heydebrand [395] and Kurtz and Nichols [404]). Research indicates that CR programs generally can have a positive impact on multiple domains of cognitive functioning that extend beyond those specifically trained. These programs are also reported to improve functional outcomes, including independent living skills, employment and job tenure, social adjustment, and social problem solving (Bell et al. [368], Hogarty et al. [399] and Wykes et al. [449]). The impact of CR on functional outcome is also greater when augmented with supported employment and vocational services (Greig et al. [392] and McGurk et al. [411]). Additional research is needed to determine the degree to which improvements on cognitive measures that result from CR lead to corresponding improvements in overall functioning, the degree to which the effectiveness of these approaches is affected by individual differences (e.g., premorbid history, chronicity, educational level, functional intelligence, and symptom dimensions), and the degree to which CR can be effectively integrated with a range of other psychosocial therapies to foster prospects for recovery (Heydebrand [395], Kurtz and Nichols [404] and McGurk et al. [411]).

### 13.2. Cognitive Adaptation Training

Approaches to the treatment of cognitive impairments and their consequences can be categorized into those that focus on restoration of function (CR) and those that are compensatory. Cognitive adaptation training (CAT) is a compensatory approach that utilizes strategies and supports designed to bypass deficits by establishing supports in the environment that help to cue and sequence adaptive behaviors (Velligan et al. [438]). These aids may include strategies and prompts such as providing alarms to prompt an individual to take medications, dose specific pill containers,

and activity checklists to prompt and sequence adaptive strategies as well as strategies to improve the organization of belongings in the home environment (Velligan et al. [437, 439]). CAT is composed of a series of manualized compensatory strategies and environmental supports targeted to address and compensate for specific cognitive impairments, and to foster individualized behavioral approaches to goal directed activities. The first step in the implmentation of CAT involves tailoring the application of CAT strategies candidates receive. This step involves a comprehensive assessment of neurocognitve function, behavior, adaptive functioning, and the residential context. Interventions are applied to each area of functional deficit based on 2 dimensions, (1) level of impairment in executive functions (based on neurocognitive tests) and (2) overt behavioral manifestations of apathy, disinhibition, or a combinations of these styles based on observations of the individual during performance of goal-directed activities (based on scores from the Frontal Systems Behavior Scale; Grace et al. [386]).

The CAT model is based on the assumption that individuals with poor executive functioning require structure and obvious environmental cues, while those with relatively better executive functioning require less structure and more subtle cues. For example, individuals with high apathy scores benefit from numerous environmental supports that cue and help sequence behavior, those evidencing disinhibition will benefit from strategies to cue improved organization and minimization of distracting stimuli, and those with mixed patterns benefit from a combination of these strategies. CAT assessments are designed to identify functional needs and to complete environmental assessments in the home, including neighborhood safety, availability of transportation, and family member involvement. Plans are based on the individual's level of executive functioning and behavioral type as adapted for individual strengths and limitations. CAT assessments yield six classifications for targeted interventions (i.e., apathy/poor executive function, apathy/fair executive function, disinhibited/poor executive function, disinhibited/ fair executive function, mixed poor executive function, mixed/fair executive function). After completion of the assessment CAT therapists work with the client to determine identify acceptable goals and those possibilities likely to be most effective in improving a specific functional problem. Strategies for specific functional problems are manualized (e.g., grooming, dressing, laundry, leisure activity, medication adherence). CAT interventions are established, trained, and maintained in the residence during weekly visits from a CAT trainer that extend over a nine-month period.

CAT is likely to benefit individuals who are willing to work with a caseworker and are experiencing difficulties in a range of functional areas,

including involvement in productive activity during the day, leisure interests, friendships, money management, making and keeping appointments, maintaining hygiene and basic health behaviors, following medication regimens, or traveling in the community. CAT therapists typically hold bachelor's or master's degrees in psychology or related fields, and are trained in a combination of didactic and in vivo strategies. Fidelity of adherence to the model can be checked using a CAT fidelity scale developed by Velligan et al. [439]. Randomized trials have demonstrated that the systematic application of individually tailored supports in CAT decreased relapse rates, decreased levels of symptomatology, and improved social and occupational functioning for individuals diagnosed with schizophrenia (Velligan et al. [437] and Velligan et al. [438]). Studies of the CAT model have been conducted with relatively long-term individuals (e.g., diagnosed on average more than a decade). Six-month follow-up comparisons of CAT with treatment as usual indicate that impairments in functional outcome decreased following cessation of home visits, although survival time to relapse was maintained (Velligan et al. [439]). This evidence suggests that maintenance of functional gains may require periodic booster sessions. The degree to which CAT techniques would be helpful to individuals with more recent onset has not been examined at this time. Barriers to implementation of CAT programs include costs to already underfunded and overburdened mental health agencies, restrictions related to reimbursement policies for home visits and travel, and the amount of training and supervision required to prepare clinic staff to conduct CAT.

### 13.3. Pharm-CAT

Pharm-CAT is a subset of the Full-CAT program. It is a manual driven treatment that utilizes environmental supports such as checklists, signs, and electronic cuing devices to improve medication adherence. Interventions in Pharm-CAT are individualized to target adherence, and may include issues such as transportation if they relate to medication or keeping clinic appointments. Velligan et al. [439] suggest that individuals who are ambivalent toward medication may benefit from CAT treatment to help them connect medication adherence to improvements in functional outcomes (2008). Pharm-CAT is best suited therefore for individuals who are willing to take medication but who may miss doses due to memory problems, poor planning, chaotic environments, or apathy. Individuals

who refuse medication may be more suitable for cognitive behavior therapy interventions (Turkington et al. [436]) or compliance therapy (Kemp et al. [401]) as precursors to Pharm-CAT. The combination of attitude change and the use of environmental supports to change behavior would likely foster improved adherence for more individuals. Research indicates that Full-CAT has benefits for functional outcomes beyond Pharm-CAT alone, and that more individuals are likely to drop out of Pharm-CAT programs if offered singly (Velligan et al. [439]).

### 13.4. Illness Self-Management

Mental health service consumers can play an important role in the treatment of their problems. The teaching of self-management skills can help consumers to become more self-reliant, lessen the impact of relapse and symptoms, and become more capable of handling their own lives (Corrigan et al. [376]). Illness self-management programs are designed to help consumers learn to better manage their disabilities in collaboration with others. The goals of illness self-management are to help consumers develop strategies to minimize the impact of symptoms on their lives, and achieve increased sense of wellness and control over their lives. Individuals diagnosed with schizophrenia can benefit from improved understanding of the disorder and the determinants of outcome, so that they can learn how to better monitor and manage their problems, self-administer medications, and implement lifestyle changes that can promote improved health and functioning. Active collaboration and shared decision making between consumer/patient and treatment provider, and where appropriate family members, is a cornerstone of this approach. Self-management sessions provide information about the disorder and its treatment to help the consumer make informed decisions. These programs are similar to those developed for family psychoeducation programs and include lectures, discussions, videos, and review sessions that impart information about what is known about schizophrenia and its treatment. Randomized controlled trials of educational interventions indicate that education is effective in teaching participants information about their disorder and treatments, but does not improve symptom severity or frequency of relapses (Mueser et al. [518]).

A second component of self-management training focuses on processes such as behavioral tailoring to improve medication adherence. A problem for continued treatment is maintenance of adherence to prescribed antipsychotic medications. For many individuals medications form a foundation upon which processes that foster functional recovery can continue. The importance of antipsychotic medications in preventing symptom relapse

and rehospitalization is well established (Davis et al. [378] and Lehman et al. [407]), but studies indicate that over 50% of all individuals diagnosed with schizophrenia and living in the community do not take medications as prescribed (Dolder et al. [381]). Relapse rates run about five times higher in people diagnosed with schizophrenia who are nonadherent to medication compared to those who are adherent, resulting in an enormous social and economic burden for everyone concerned (Gilmer et al. [387]). Nonadherence is associated with increased delusions of grandeur (Bartko et al. [367]), poor insight (Donohoe et al. [382]), cognitive deficits (Macpherson et al. [410]), poor therapeutic alliance, inadequate aftercare, and lack of availability of social supports (Larco et al. [406] and O'Donnell et al. [424]). Several strategies have been developed to enhance medication adherence rates, including psychoeducational approaches to increase health beliefs so that people come to perceive some aspect of their experience as unhealthy, and to see that certain treatments can improve their well-being (Zygmunt et al. [450]).

Interviews with patients, care givers, and professionals identified five clinically relevant themes that affect adherence: medication efficacy, external factors such as therapeutic alliance and social supports, insight, side effects, and attitudes toward medication (Kikkert et al. [402]). This research indicates that adherence is most likely to be positively influenced if professionals focus on the positive aspects of medication, on enhancing insight, and on fostering a positive therapeutic relationship with both patients and caregivers. Psychoeducational approaches that provide information about the benefits and side effects of medication and correct misconceptions, along with motivational interviewing to increase the likelihood that participants will see how medication and other changes are to their benefit are often combined with targeted skills training and family psychoeducation (Miller and Rollnick [513]). One straightforward approach to improving medication adherence involves behavioral tailoring designed to help people develop strategies (e.g., the use of daily pillboxes) to foster the likelihood of remembering to take prescribed medications. Additional strategies to improve self-management include relapse prevention training and cognitive behavioral therapy for reducing distress and the severity of persistent symptoms. Gray et al. [388] reviewed the relevant literature and concluded that efforts aimed at enhancing adherence should include (1) a collaborative approach to working with participants, (2) providing information about the illness and treatments, (3) tailoring medication regimes to suit the characteristics and needs of the patient, and (4) utilization of strategies such as exploring reasons for ambivalence and testing beliefs about medication.

Psychoeducational approaches to improving medication adherence are based on the assumption that lack of adherence to prescribed medications is often an issue of poor communication between therapist and patient. Consequently, these approaches emphasize efforts directed at providing education on the rationale for pharmacological treatment, the mechanisms of action of medications, information about possible side-effects, and specific instructions for the correct administration of medications. Educational sessions take place in a wide range of contexts and range from four to 20 sessions. A recent review of 39 studies of psychoeducational adherence programs indicated that 13 studies resulted in significant improvements in medication adherence (Zygmunt et al. [450]). The basis for the differences in reported effectiveness is not clear at this time, but more research is needed to determine how individual characteristics interact with program components to determine outcome.

The Illness Management and Recovery (IMR) program is a curriculum-based intervention that was developed to help individuals diagnosed with schizophrenia learn to manage their disorder more effectively in the context of pursuing their personal goals (Mueser et al. 2006). The program was developed based on a review of the literature on teaching illness self-management strategies to individuals with severe mental illness. Five empirically supported strategies were identified and incorporated into the program: (1) psychoeducation about mental illness and its treatment, (2) cognitive-behavioral approaches to medication adherence, (3) developing a relapse prevention plan, (4) strengthening social support by social skills training; and (5) coping skills training to manage persistent symptoms. The five self-management strategies are incorporated into an IMR curriculum that is organized into 9 topic areas. The nine topic areas include recovery strategies, practical facts about schizophrenia, stress-vulnerability and treatment strategies, building social support, using medications effectively, reducing relapses, coping with stress, coping with problems and persistent symptoms, and getting your needs met in the mental health system.

IMR begins with sessions to explore the meaning of recovery to the client and discussion of personal recovery goals to work toward in the program. Topic areas are taught using a combination of educational, motivational, and cognitive-behavioral teaching strategies, during weekly individual or group sessions. With the participant's consent family members, friends, and significant others may be encouraged to become involved in helping participants learn self-management strategies and pursue their goals. IMR is based on a combination of two theoretical models: the transtheoretical model and the stress-vulnerability model. The transtheoretical model posits that motivation to change develops over several stages

(precontemplation, contemplation, preparation, action, maintenance) and that change facilitation requires specific interventions that are tied to each stage (Prochaska 1984). During the first stage (precontemplation) participants are not committed to change, so intervention focuses on building interest and motivation for change. IMR uses motivational interviewing throughout the entire program to help participants develop their own understanding of recovery, to identify and pursue personal goals, and to explore how illness management strategies can help them achieve those goals. IMR strategies are designed to interrupt the cycle of stress-vulnerability (Zubin and Spring 1977) that contributes to relapse and problems in functioning. The short-term goal is to teach participants the basics of illness self-management based on the stress-vulnerability model; these strategies include medication adherence, reduced substance use, increased social support, improved coping, and involvement in meaningful activities. The combination of identifying and pursuing personal goals and developing more effective strategies to manage the illness is designed to help participants progress toward recovery. Guidelines for self-management outlined by (Mueser and Gingerich [421]) include the following. (1) Establish motivation. (2) Provide psychoeducation. (3) Improve medication adherence. (4) Reduce drug and alcohol use. (5) Develop a relapse prevention program. (6) Teach stress management techniques. (7) Teach coping strategies for persistent symptoms. (8) Increase social support.

IMR has gained in popularity and a standardized implementation manual is accessible through the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) site: http://www.mentalhealth.samhsa.gov/cmhs/communitysupport/toolkits). Randomized controlled trials of IMR have provided support for the effectiveness of the program (Hasson-Ohayon et al. [393], Levitt et al. [408] and Mueser et al. 2006), and several instruments have been developed to foster reliable psychometric evaluation of the effectiveness of the IMR program (Bond et al. [290]).

Compliance therapy (CT) is another approach to self-management based on an adaption of the techniques of motivational interviewing for substance abusers (Rollnick and Miller [428]). Motivational interviewing strategies are intended to involve the individual in exploring his or her own rationale and, at the same time create dissonance that may lead the individual to reappraise their own behavior and address potential ambivalence related to initiating more adaptive behaviors (Kemp et al. [400]). Compliance therapy combines motivational interviewing with cognitive therapy techniques that focus on three areas: (1) eliciting the participant's views about treatment, (2) exploring sources of ambivalence toward medication, and (3) maintaining treatment adherence. Focus is on

developing a collaborative approach to understanding the disorder and rationale for treatment, exploring attitudes by strategies such as Socratic dialogue, predicting ambivalence, and identifying and weighing the pros and cons of treatment. As treatment progresses issues such as perceived stigma associated with taking medication, and reinforcing a normalizing rationale for treatment become the focus of many sessions. Kemp et al. [401] summarized the results of a series of randomized controlled studies that indicated significant benefits at 18-month follow-up, including improved insight, positive drug attitudes, and longer rates of survival in the community. Other studies of CT have failed to replicate the findings of Kemp et al., (O'Donnell et al. [424]), and a European multicenter randomized controlled trial did not find any benefits of adherence therapy over a health education control group (Gray et al. [389]). At this time compliance therapy should be considered to be a work in progress.

In summary, illness self management strategies are based on the view that individuals diagnosed with schizophrenia can play an active and positive role in the management and treatment of their own symptoms to avoid relapses, and that the benefits of this approach may include improved ability to cope with many other aspects of life. Several components of different evidence-based practices have been incorporated into comprehensive illness self management programs, along with family psychoeducational efforts, however the long-term effectiveness of these integrated programs are not well established (Corrigan et al. [376]).

## 13.5. Task-Groups

It is clear that the level and quality of support provided are important factors that affect the quality and success of life in the community. Strategies for fostering the building new networks of social relationships and programs that present graded opportunities for participative status and employment can enhance the likelihood of successful community adjustment. The Task Group/Community Lodge program, developed during the 1960s by George Fairweather and colleagues, is an example of an approach to providing these opportunities based on principles of social reinforcement and graded levels of shared responsibilities (Fairweather et al. [383]). Task groups can be initiated in-hospital and transferred *en toto* to the community or they can be used as transitional in-patient programs that are linked to community efforts. In-patient task group programs are small-group treatment programs in which patients are tasked to make decisions about solving member's problems (Fairweather et al. [383]).

Reinforcement contingencies are applied on a group basis to foster interpersonal interactions and increased willingness to assume responsibility among members. Once an active task group is formed the group can be transferred to a residence/lodge in the community. In Community Lodge programs group members are responsible for developing employment opportunities to generate income and to gradually assume increased financial responsibility for the operation of the lodge. Members in the original lodge program, with minimal staff assistance, established their own group janitorial and landscaping service businesses that eventually generated sufficient income to cover most expenses. Residents obtained contracts to provide services and organized work teams to meet contract requirements. The Lodge program demonstrated that many long-term patients diagnosed with schizophrenia are capable of becoming more fully functioning and independent members of society. Community lodge members were significantly less likely to be rehospitalized during the 40-month follow-up evaluation period than controls, and were more likely to be employed full-time during their time in residence in the Lodge.

Fairweather et al. [383] noted several operating principles for psychosocial programs designed to provide opportunities for more responsible and rewarding lives in the community for long-term patients. (1) Participants must have a stake in the program so that they feel what they do is important and develop a sense of pride in the program. (2) The program should give as much autonomy to its members as is possible, consistent with their performance. (3) The program should have a vertical organization so that a division of labor is possible and meaningful roles, with opportunities for vertical advancement can be found. (4) The program must be compatible with the context in which it is located, so that it is compatible with the geographic location and broader society. (5) The internal norms of the program must be tolerant of deviant behaviors, and leaders should differentiate between internal norms and those that are representative of society in general. (6) Communication systems should be devised for each subsystem or group within the Lodge community so that feedback to members about job and Lodge performance is timely. (7) Ease of entry and exit from the program should be possible without penalty. (8) Members should perform as groups whenever possible. (9) The size of community residential programs should remain limited to relatively small numbers. (10) Community programs should be implanted in the community is such a way that they are not directly dependent on the immediate locality for financial support. Participants need time to adjust and become self-sufficient and community pressures can undermine embryonic social

organization processes. (11) Work groups should be arranged so individuals can substitute for one another when necessary, in order to maintain continuity of services among work teams. (12) Programs should emphasize both work and rehabilitative norms. (13) Programs for chronic mental patients must establish mechanisms for handling medication.

There has been little follow-up investigation of this promising program designed to foster successful transition to life in the community, perhaps because of the effects of deinstitutionalzation in reducing numbers of long-term inpatients since the 1960s but, the group reinforcement processes and shared employment opportunities incorporated into the task-group model can obviously be adapted to a range of psychosocial therapy models.

### 13.6. Social Firms

Worker co-operatives that employ formed patients diagnosed with serious mental illnesses have operated successfully in Italy, Germany, Ireland, Japan, Spain, Switzerland, and the U.S. (Mosher and Burti [416], Fairweather et al. [383] and Warner [443]). The businesses operated by co-operatives often employ a mixed workforce of disabled and healthy workers in a wide range of manufacturing and service jobs. Successful enterprises include hotels, cafes, building renovation, furniture repair, cleaning, nursery and landscaping, printing, meals on wheels deliveries, and nurses-aide services to nursing homes. In Boulder, Colorado the mental health agency started a property repair business employing a nondisabled lead contractor and part-time consumer assistants. The business provides janitorial services and property maintenance saving the agency substantial dollars, and has recently trained clients to work as research interviewers, residential staff, and case managers. Unfortunately, this approach has been relatively under-utilized in the U.S. There are several reasons why the social firm approach has been under utilized in the U.S. One reason has to do with economic disincentives to gainful employment built into SSI and SSDI disability payment programs. Individuals on disability who earn income are subject to disability payment reductions and eventual termination of their benefits. Given that many former patients are unlikely to earn substantially more than their benefits even working full time, there is little incentive to seek and maintain employment. Warner [443] suggested several policy changes that could potentially address the problem of work disincentives: (1) raise the earnings disregard amount allowed before the disability pension is reduced, and (2) provide a wage subsidy to supplement part-time or marginal salaries, perhaps by transferring funds from nonvocational day treatment programs.

### 13.7. Soteria House

Soteria House was designed to provide a protective, supportive, normalizing environment as an alternative to medication and hospitalization for individuals diagnosed with acute schizophrenia. The project was designed as a research study and involved random assignment of persons newly diagnosed as having schizophrenia and deemed in need of hospitalization. Participants were limited to newly diagnosed (less than 30 days previous hospitalization), young adult, unmarried patients that were reliably diagnosed by three independent raters. Newly diagnosed schizophrenic individuals were alternately given a choice of standard psychiatric treatment and hospitalization or Soteria House. The theoretical base for the day to day operation of Soteria House is based on an interpersonal phenomenological approach that focuses on understanding and sharing the psychotic person's experience, and one's reactions to it, without judging, diagnosing, derogating, or attempting to invalidate it.

The Soteria approach involves around the clock application of interpersonal phenomenologic interventions by nonprofessional staff, usually without neuroleptic drug treatment, in the context of a small, homelike, supportive environment. Staff focuses on development of a nonintrusive, noncontrolling but empathetic relationship with the individual. There are no formal therapeutic sessions at Soteria but a great deal of helpful relating takes place as staff gently attempt to build bridges that help the individual connect his or her emotional turmoil and the life events that seem to have precipitated psychological disintegration. The original Soteria House opened in 1971, a second facility opened in 1974. Soteria housed 12 residents, with one or two new residents admitted each month. Two specially trained nonprofessional staff, a man and a woman were always on duty at any one time. In addition one volunteer was usually present in the evening. Overall there were six paid nonprofessional staff, a house director, and a quarter-time psychiatrist at each facility. Staff generally worked 36–48 hour shifts to enable them to interact with residents continually over a relatively long period. Staff and residents shared responsibility for household maintenance, meal preparation, and cleanup. Residents who were "not together" were not expected to do an equal share of work, or complete all tasks to which they had agreed. Soteria house staff considered all facets of the psychotic experience to be "real." Staff tried to provide an atmosphere that would facilitate integration of the psychotic experience into the continuity of the individual(s) life, rather than to invalidate or treat these experiences as symptoms of a diseased brain. Limits were set if the resident was clearly a danger to himself, others, or the program as a whole.

Antipsychotic drugs were ordinarily not used for at least the first 6 weeks of residence. If the resident showed no change by that time, drugs were prescribed. A comparison group was composed of participants who chose the more traditional community mental health clinic (CMHC) comparison ward consisted of two locked units of 30 beds each. The staff to patient ration was excellent (1.5:1). Antipsychotic medications in high doses were typically administered on admission. Staff was well trained, enthusiastic, and believed they were doing a good job. Patients were quickly evaluated and placed in other sections of the treatment network when stabilized. Six-week and two-year outcome data from the participants admitted between 1971 and 1976 was collected.

Results indicated that Soteria and control participants were comparable at intake and that both groups improved significantly and comparably in terms of reduced symptoms of psychopathology at six-week follow-up. All control participants were given neuroleptic medications compared to three percent of Soteria patients. At 2 years evaluation the 1971–1976 Soteria cohort was significantly more likely to be living independently, to work at high levels of occupational functioning, and to have fewer readmissions than controls. The cost for care for the first 6 months was about the same for both groups, since Soteria participants stayed about 5 months versus and average of 1 month of hospitalization for controls. These results were replicated in a second cohort study (1976–1982) conducted at Emanon House (Mosher et al. [417]). The authors concluded the following. (1) Interpersonal therapeutic milieus are as effective as neuroleptic drugs in reducing the acute symptoms of psychosis in the short term, in newly diagnosed schizophrenic patients. (2) Therapeutic community personnel did not require advanced degrees or extensive training and experience in order to be effective. They did however need to be sure this is something they wanted to do, and to be tolerant, flexible, positive, enthusiastic, and psychologically strong. (3) Two year outcomes were as good as or better than those of hospital treated controls. (4) Positive longer-term outcomes achieved were at least partially a result of the spontaneous growth of social networks around the facilities.

Ciompi initiated the opening of a Soteria House in Bern, Switzerland in 1984. The success of this program, in which about two-thirds of newly diagnosed persons with schizophrenia recover from symptoms in 2 to 12 weeks with little or no drug treatment prompted the beginning of additional projects in other European countries (Ciompi et al. [372]). Mosher [419] identified the therapeutic ingredients of Soteria type programs as follows. (1) The residential setting allows for interactions with the community. (2) The facility is small and home-like, with space for about 10 persons to

sleep, (6 to 8 clients and 2 staff). (3) The primary task of the staff is to understand the immediate circumstances and relevant background that precipitated the crisis necessitating admission. (4) Within the relationship between staff and client, staff will carry out the roles of companion, advocate, case worker, and helper. (5) Staff if trained to prevent unnecessary dependency and as much as possible support autonomous decision making on the part of clients. (6) Access and departure are made as easy as possible, and clients are free to maintain their connection to the program any way they choose; phone calls, drop-in, advice, time with staff or clients. The format of Soteria House allows for provision of alternative approaches that are particularly suited for young, first-admission individuals who are resistant to taking antipsychotic medications.

### 13.8. Fountain House and the Clubhouse Model

Fountain House is a successful clubhouse program located in New York City in which former patients or "members" are actively engaged with staff in running all operations of the clubhouse. The clubhouse provides opportunities to socialize, to develop job related skills, and serves as a refuge and source of support. This approach is designed to provide a supportive social environment with a full continuum of services. Two key elements appear to be essential aspects of the success of the New York Fountain House program (Richardson [427]). First, the program philosophy strongly emphasizes and puts into practice belief in the potential usefulness and productivity of all participants. This belief means that members take responsibility for the bulk of the day to day running of the clubhouse. The Fountain House prevocational day program is organized into six work units: the kitchen, reception, clerical, education/research, and snack bar. Each new member is asked to select a unit and a key staff liason worker, and to participate in the activities of these units as well as twice daily unit meetings. The goal of the program is to foster opportunities for interacting and relating to other members and staff in the context of a meaningful work environment. Prevocational day program members are encouraged to participate in their assignments and to develop basic work habits such as punctuality, improved concentration, and acceptance of supervision. They are not criticized for lack of performance but encouraged and given opportunities to develop and become involved. The assumption at Fountain House is that everyone has a need to become involved with others and to engage in meaningful, productive activities and will do so if they feel safe in that context and have a reasonable expectation of success. The New York Fountain House program attracts a daily attendance of well over 350

members. A clubhouse program of this size requires a complex organization in which many responsibilities must be assumed by members. A second key component is that the staff to member ratio is kept low to assure this. Members and staff work alongside of one another in the day-to-day operation of the program, with an emphasis on egalitarian relationships. Member involvement in running the program and maintaining the facility fosters a sense of personal investment and of having meaningful responsibilities and expectations. Staff members focus on providing opportunities for growth and on encouraging and promoting member's strengths rather than diagnosing or developing treatment plans. When a member feels ready and has participated successfully in the day program adequately for a sufficient amount of time (usually around six months), he or she may be eligible to enter into the transitional employment program. This program offers opportunities for part-time work in entry level jobs in various industries and business organizations where members receive regular wages. About 100 members in the New York program go out to work on a part-time basis the remainder of their day is spent at the clubhouse. In many cases two members fill one job placement. Some placements involve teams or groups of six to ten members working together. Over 40 different employers in New York City employ Fountain House members. Staff members negotiate with employers for new positions and work units of staff and members are responsible for the management of and supervising the placements. This means that staff must spend time on the jobs to familiarize themselves with the work demands since they may at times have to fill in for a member and work the job. Members work in their part-time jobs for six months or more before helping train another member who may be about to replace them. Many Fountain House members move on to full time work.

The Fountain House transitional employment program is organized so that if a member is unable to attend work there is always another member or staff worker available to take their place. In this way businesses are assured of continuity of workers. In turn employers are more willing to hire those members who may have a long record of hospitalizations, little formal education, or a poor work record. Most members find the transition from working in the club house environment to working in a transitional employment position an intimidating prospect. Many members have never held a job before and are afraid of failure and uncertainty. Members are not pressured to take jobs however long they have been participating in the club house program, and are assured that whenever a placement does not work out they can return to full-time participation in the day program without criticism or censure. It is not unusual for members to try several placements before completing one successfully. There is no time limit on how long it

may take for members to move into the transitional employment program, or on how long they may stay in the program and work on a part time basis. These decisions are left to individual members to decide.

Weekly dinners are held at Fountain House for all members on transitional employment placements. Members sit down to a meal prepared and served by fellow members and staff, and each member is asked to stand up to describe their achievements and problems for the week. These presentations in front of an audience of fifty or more people are often followed by informal problem solving and social conversations with fellow members and staff after dinner. Mutual support and help between members is a fundamental component of the program. Fountain House attempts to build on the universal human need to have a sense of belonging and purpose that comes from meaningful relationships and involvement in productive activities. When the goals and philosophy of the Fountain House program are effectively implemented this approach can do much to counteract the tendencies to withdrawal, dependency, and lack of initiative that characterize many schizophrenic patients. Establishing an effective club house program and adequate opportunities for transitional employment however, require great effort, commitment, perseverance, and effective community outreach. Staff must also have a clear understanding of and commitment to their role as enablers, that is, people who encourage, involve, support, and guide rather than instruct or do for. If staff and members together are not able to create a genuine climate of belief in each member's potential to become involved and gradually assume responsibilities in the club house and a work placement in the community, it will not happen.

The goal of the clubhouse program is to achieve a community of cooperation and support with staff and members sharing and interchanging roles. Members are expected to share in the operations and maintenance of the clubhouse as possible, as part of their recovery process. Staff members offer assistance, but the focus is on self-help. At some point in the recovery process members often express an interest in obtaining employment. The focus of the clubhouse model is on working with the individual potential of each member and developing vocational skills and job opportunities for members, as they are ready to assume greater responsibilities. The New York Fountain House program has been successful in identifying employers who are willing to hire former patients. These employers are willing to take chances on hiring a former patient because individuals are trained and supervised on site by a job coach for several months prior to placement in the job. If the member cannot work at any time the job coach will provide another person to do the job or fill in his or her self. The New York Fountain House TE program also provides opportunities for a work

adaptation process that includes time-limited part-time placements where individuals can adjust and gain confidence in a competitive setting with the assistance of a job coach. This process allows workers to miss work if necessary and to return to the position when they are able, thus addressing the episodic nature of symptoms. There are several potential limitations of the TE model however, these include lack of ownership of the job by the worker due to a policy of time limited placements (typically no more than six-months), and the fact that many of contract positions do not lead to opportunities for career development.

### 13.9. Generic Factors in Psychosocial Therapies

The Conclusions and Recommendations of the Division 29 task force of the American Psychological Association regarding Empirically Supported Therapy Relationships addressed issues of outpatient treatment of nonpsychotic populations that are relevant to treating individuals diagnosed with schizophrenia (Ackerman et al. [451]). Among the recommendations of the task force was the conclusion that the therapy relationship makes substantial and consistent contributions to psychotherapy outcome independent of the specific type of treatment. The role of the therapy relationship was not mentioned in the original PORT Committee EBP recommendations, but it seems evident that this conclusion also applies to most if not all of the psychosocial EBPs described in the PORT recommendations. Additional Task Force recommendations that are relevant include emphasis on the importance of adapting or tailoring the therapy relationship to specific patient needs and characteristics in addition to diagnosis, and the importance of examining the complex associations among patient qualities, clinician behaviors, and therapy outcome. The importance of participants feeling positively toward their treatment providers (Hall et al. [494]), and about the quality of the therapeutic relationship (Saunders and Lueger 2005) was also emphasized in the APA Task Force Report. These conclusions about the importance of the relationship with the therapist are consistent with case descriptions of the importance of individual therapy for some individuals diagnosed with schizophrenia (Saks [532]). Support is part of "just listening" and contributes to the effectiveness of most if not all approaches to psychotherapy. The provision of reassurance, clarification, and exploration of alternatives in the context of a caring, supportive relationship can facilitate changes in behavior and ways of thinking. The relevance of "generic factors" in psychotherapy was described by Strauss, "in a day when being with a person with schizophrenia in the sense of "just" listening, of talking with him/her, of trying to understand "Who

is this person?" is less and less frequently the experience of clinicians in practice or in training, we are losing another source of information (and of treatment) which as crucial as a PET scan (1997, page 259)."

In summary, a wide range of established and innovative approaches to psychosocial interventions for individuals diagnosed with schizophrenia have been developed that were not included in the 2004 PORT recommendations. These programs offer therapeutic services that may be fruitfully combined with one another and with previous PORT recommended psychosocial programs and medications to enhance the recovery process. A number of these practices will undoubtedly be included in the forthcoming PORT recommendations.

# 14 Issues and Practices that Impact Risk and the Recovery Process

The deinstitutionalization policies implemented in the U.S. and other countries during the 1960s and 70s ended the abuses associated with indefinite wharehousing of patients with serious mental disorders, but these policies contributed to a new and more complex set of problems. Deinstitutionalization was accomplished in the U.S. largely by transferring people from large institutions to communities, often without access to adequate pharmacological and psychosocial therapies, housing or other support services. Lack of provision of adequate community services and access to decent housing alternatives, in conjunction with deinstitutionalization policies, contributed to the "revolving door" phenomenon of hospital admission-release-readmission, increased rates of mentally ill homeless individuals and prisoners, and reinforced stereotypes and negative expectations about prospects for recovery. Providers have been fairly successful in managing some of the active symptoms of schizophrenia with medication. We have not accomplished nearly enough in the way of implementing the kinds of programs and services that are needed to increase the likelihood that patients will not only remain out of the hospital for longer intervals, and will also be able to engage in productive activities and develop an improved sense of self esteem and improved quality of life. Given their vulnerabilities and problems with daily living combined with the lack of access to appropriate services, it is not surprising that many individuals diagnosed with schizophrenia become increasingly dependent, and experience difficulty maintaining even marginal functioning in the community. The consequences of these failed social policies and inadequate funding are not inconsequential. Schizophrenia accounts for 10% of all disabled persons, 40% of Medicaid reimbursements, and about 75% of all mental health expenditures in the United States (Martin and Miller [22] and Rupp and Keith [528]). These figures are conservative

since costs to organizations in the public sector outside of mental health (e.g., social service agencies, housing programs, and the criminal justice system) are often overlooked in published estimates, as are services costs to charities and other nongovernmental organizations. Suicide and mortality rates are also high for individuals diagnosed with schizophrenia, and the rate of unemployment is over 80% (Heila and Lonnqvist [15]). In addition, the "costs" of schizophrenia in terms of distress, pain, and impoverished quality of life experienced by patients and their families cannot be measured in monetary units.

Models of treatment that focus only on managing symptoms, and minimize the importance of efforts to help clients establish a meaningful identity, quality of life, and a place in the social matrix predictably result in lowered prospects for recovery. A large body of evidence convincingly indicates that access to programs and services that foster increased opportunities and access to participation in those processes and services that facilitate entry into meaningful social roles, foster positive social expectations, and provide meaningful opportunities for community reintegration significantly improves chances for recovery (Harrison et al. [496], Jablensky et al. [498] and Warner [564]). Studies report percentages of first episode patients in good remission of 85–91%, when access to effective psychosocial interventions is combined with proper treatment with antipsychotic medications (Edwards et al. [480]). Rates of long-term remission for more chronic individuals average 68% (Harding et al. [495]).

Recovery focused programs also provide access to processes that encourage empowerment and social participation, access to peer support, and opportunities to develop a sense of control and competence (Bellack [454]). Questions remain about how to improve prospects for recovery, but it is clear that access to adequately funded, and competently staffed and implemented evidence-based programs that provide individualized pharmacological and psychosocial therapies is critical to success. The diversity of individuals diagnosed with schizophrenia also suggests that a differentiated view of the role of psychosocial therapies in fostering prospects for social recovery is necessary (Spaulding et al. [275]).

### 14.1. Treatment of First Episode Psychosis

The critical period hypothesis postulates that deterioration occurs most aggressively during the early years of psychosis (Birchwood et al. [458] and Crumlish et al. [474]). This suggests that treatment delay early in the process will have a negative long-terms impact on chances for clinical outcome and recovery (Wunderlink, Sytema, Nienhuis et al. 2008). This

hypothesis suggests that therapeutic intervenentions administered as early as possible after symptom onset or during the prodrome are most likely to have a lasting positive impact on recovery and clinical outcome. Effective early-intervention treatments for first-episode psychosis include psychoeducational family treatment, social skills training, and assertive community treatment, in addition to pharmacological interventions (Buckley and Evans [463], Cocchi et al. [468], Harvey et al. [497] and Verhaegh et al. [547]). Enhanced social and family support in achieving acceptance and adherence to medications very early in the course of treatment is an important part of achieving good results (Gleeson et al. [491] and Rabinovitch et al. [524]). Randomized controlled trials of a multimodal individual and family cognitive-behavioral therapy program indicate that likelihood of relapse is significantly reduced in early psychosis when compared to standard case management (Craig et al. [473], de Haan and Gosira 1998 and Gleeson et al. [492]). In addition, results of long-term follow-up studies of an internsive early-intervention program indicated that participants evidenced improved clinical outcome at 2 years, and increased likelihood of living in supported housing and decrease days in hospital at 5 year followup (Bertelsen et al. [457] and Lenior et al. [510]).

## 14.2. Physical Health Problems

About three-fourths of persons diagnosed with schizophrenia have a cooccurring medical disorder (Rystedt and Bartels [531]). People diagnosed with schizophrenia have a relative mortality risk that is 2-3 times that of the general population, and die approximately 10 years earlier than the general population average. Meta-analysis indicates that 40% of this elevated mortality is due to unnatural causes (suicide, accidents) and 60% is due to natural causes (Brown [462]). The largest contributor to natural deaths is cardiovascular disease (Osby et al. [521]). Individuals diagnosed with schizophrenia are also more vulnerable to a number of chronic diseases such as diabetes, hypertension, and emphysema (Brown [462]). Lack of access to quality medical services is one factor that contributes to increase mortality for persons with serious mental illness (Druss et al. [479]). Secondary factors such as lifestyle, smoking, substance abuse, unsafe sexual practices, poor diet, the side effects of pharmacological treatments (e.g., weight gain, dyslipidaemia), and lack of exercise all contribute to increase likelihood of physical health problems. The cognitive and motivational problems associated with schizophrenia also decrease capacity to recognize that a problem merits medical attention, and motivational problems can compromise efforts to follow through with treatment and lifestyle change

recommendations. Practical problems such as lack of access to transportation, financial limitations, lack of health insurance, and the demands of dealing with medical providers also contribute to lack of adequate care. Physical health problems have an important impact on recovery prospects since these problems are often associated with lower capacity to participate in important life activities such as work, socializing, leisure, and essential daily activities. Disorders such as diabetes require self-management activities that can be especially problematic for persons diagnosed with schizophrenia. Monitoring blood sugar level, self-administering medication, understanding and maintaining dietary and exercise recommendations to mange the illness, and keeping up with regular visits to a medical care provider may be beyond the capability of many individuals. It is critical for mental health providers to coordinate with medical providers and to provide skills training, education, and assistance in helping clients cope with these requirements. In similar fashion managing hypertension may require significant lifestyle changes, such as diet, exercise, smoking cessation, self-monitoring and adherence to prescribed medication for a disorder with few if any noticeable symptoms. Ongoing close communication and consultation between case managers, mental health professionals, and medical providers are often critical to successful disease management.

Antipsychotic medications are associated with a number of potential physical side effects and health risks. The metabolic syndrome is a potential side effect that refers to a set of features associated with risk for cardiovascular disease, and consists of at least three of the following: abdominal obesity, elevated triglyceride levels, low levels of high density lipoprotein, high blood pressure and elevated fasting blood glucose levels. The metabolic syndrome occurs at a rate of about 17% in untreated patients, and between 39% and 48% for individuals treated with neuroleptics or atypical antipsychotic medications. Careful monitoring of the components of the metabolic syndrome, along with access to appropriate medical care is necessary to avoid the adverse metabolic and cardiovascular consequences of this syndrome. Lifestyle factors such as lack of exercise, smoking, social isolation, and poor diet all increase risk, and can be addressed in targeted interventions with reasonable likelihood of success (von Hausswolff et al. 2009). Guidelines for physical monitoring for individuals with schizophrenia include regular physical health check-ups for weight, blood glucose, cardiovascular function, blood pressure, lipid profiles, and drug-related adverse events (Marder et al. [511]). In addition lifestyle counseling and therapies aimed at smoking, poor diet, lack of exercise, and alcohol use have been demonstrated to be effective (Citrome and Yeomans [466]). Four issue areas must be addressed to reduce morbidity and improve the physical

health of individuals diagnosed with serious mental disorders: (1) healthy behaviors must be encouraged and supported, such as healthy diet and exercise, quitting smoking, and providing access to preventive health care; (2) education and encouragement of participant monitoring and management of the side effects of antipsychotic medications must be provided; (3) routine general medical care must be made available and recommendations followed; and (4) suicide risks should be routinely assessed and reduced (Corrigan et al. [472]).

## 14.3. Homelessness

People diagnosed with schizophrenia are overrepresented among those individuals living in shelters and on the streets in the U.S. (Ridgway [526]). A review of studies of the prevalence of schizophrenia in homeless persons in the U.S. and elsewhere indicates an average prevalence of about 11 percent (Folsom and Jeste [485]). A diagnosis of schizophrenia is more common in younger homeless persons, among single homeless women, and among the chronically homeless. The homeless mentally ill are likely to experience a range of physical health problems (e.g., HIV, diabetes, hypertension), as well as experiences of victimization, poor quality of life, and to have a great number of basic subsistence needs that are unmet. Homelessness is associated with higher risk for arrest and incarceration, and incarceration is in turn associated with higher risk for homelessness (Felix et al. [484]). Individual characteristics associated with the diagnosis of schizophrenia, such as delusional ideation, poor social judgment, lack of basic skills, social isolation, and the episodic nature of the disorder, as well as the incidence of cooccurring substance abuse also contribute to increased risk for homelessness. Policies that result in lack of allocations of adequate resources to adequately fund and develop community-based programs play a large role in homelessness. Mental health and social service programs also remain fragmented, and assistance eligibility criteria are often difficult to understand and negotiate, making it more likely that the seriously mentally ill do not receive needed services. A related problem has to do with entitlement funding policies. The income of most individuals diagnosed with schizophrenia in the U.S. is limited to Supplemental Security Income (SSI)—a Federal entitlement program for individuals determined to be permanently disabled. There is no major housing market in the U.S. where someone living on SSI can afford to pay rent even for an efficiency apartment, using Federal Income-housing cost standards (Ridgway [526]). Housing discrimination also contributes to a lack of access to decent housing. Lack of continuity of care during

transitions, between hospitals, shelters jails, and prisons, as well as lack of appropriate coordination and training of case managers are additional problems in the service delivery system that contribute to homelessness among the seriously mentally ill (Felix et al. [484]). The ACT model has been adapted for use with homeless individuals to help compensate for some of these limitations nevertheless the problem of homelessness among the mentally ill has not been adequately addressed, and there has been little research published on the topic. Access to a decent place to live that allows for individual choice along with access to subsidies and support services for as long as needed is a critical but often missing component of the recovery process. The evaluation of treatment programs for the mentally ill homeless population must be expanded to include outreach programs that provide support in obtainng entitlements, access to decent housing, and individualized treatment services.

### 14.4. Supported Housing

Subsequent to the deinstitutionalization movement of the 1960s and 1970s, there were few housing alternatives available for patients discharged to the community. Housing placements were often in poorly supervised boarding homes, nursing facilities or transitional facilities. This situation contributed to increased feelings of displacement and dependency, served to further isolate former patients, and contributed to the problem of homelessness. Lack of access to decent housing is often a precipitant of additional crises and contributes to deterioration. At this time access to supported housing programs is very limited so that only a small fraction of community residential programs serving adult individuals diagnosed with schizophrenia actually provide these services. Surveys of clients and family members indicate that lack of access to housing and social isolation are significant problems for those who live independently, and both groups expressed preferences for access to a wide array of choices in housing ranging from 24-hour staffed group settings to independent living (Friedrich et al. [486] and Tanzman [543]).

The recovery concept is consistent with the values of supported housing programs which emphasize the importance of providing nonfacility based, permanent housing options and support services as determined by the individual's functional abilities and preferences. The failure of mental health systems to provide access to decent and permanent housing contributes to longer psychiatric hospital stays, increased emergency room visits, increased family burden, and further declines in functioning (Geller [488]). Best practices guidelines for effective supportive housing include

access to rental subsidies, honoring of individual housing preferences in placement decisions, provision of direct assistance in obtaining housing, and provision of ongoing support to the client (Ridgway [526]). Unfortunately, Department of Housing and Urban Development (HUD) sponsored Section 8 rent subsidies in the U.S. are difficult to obtain, and SSI and SSDI payments are so low that the cost of basic apartments in most areas is well beyond what is affordable to an individual living on these benefits. Section 8 certificates from HUD are the best way to secure affordable housing for individuals below the poverty level, but the waiting lists for these vouchers is 5 years or longer in many communities (Corrigan et al. [472]). Many individuals diagnosed with schizophrenia and or dual diagnoses of substance abuse are capable of successfully living in the community if they have access to decent supported housing of their preference, along with individualized supportive services linked to programs such as ACT. Access to decent supported housing services reduces the likelihood of rehospitalization, reduces homelessness and jail stays, increases life satisfaction, and can contribute to symptom reduction (Ridgway [526]).

The Pathways to Housing program is an example of an effort designed to provide housing and services for dual-diagnosis individuals. The Pathways program houses participants in their own apartments often directly from the street or shelters, with no preconditions of abstinence from drugs or alcohol (Tsemberis and Eisenberg [545]). The Pathways program includes a modified assertive community treatment case management model to provide supportive services with a low client to staff ratio. Outcome statistics indicate that 88% of participants remain in the program and continue to be stably housed at 5-year follow-up.

In summary, supported housing programs vary but most are organized around three basic principles: (1) consumer choice about their own living situations is an important value; (2) consumers should live in integrated, stable independent housing; and (3) consumers should also have access to the individualized services and supports necessary to help them maximize opportunities for recovery over time (Carling [465]). Supports that are required include housing search assistance, help in moving, money management, crisis supports, limit setting, and access to empathic staff who value their role as client advocates (Brown and Wheeeler [460]). Additional helpful organizational supports include provision of access to transportation, flexible resources, telephone support, low case loads, and a culture of allowing staff to make independent decisions and with minimal paperwork requirements. Research on supported housing has been largely descriptive rather than based on controlled clinical trials, despite the critical role of access to supported housing in the recovery process. More remains to be

learned about how to best organize services to improve results with individuals with the most severe problems, how choice versus placement affects long term success, how best to foster supportive communities that foster interaction and relatedness, and how to organize and train staff to most effectively provide assistance when needed as they continue to promote the recovery process.

### 14.5. Schizophrenia and the Criminal Justice System

About 16% of state prison inmates, 7% of federal inmates, and 16% of jail prisoners in the U.S. have or reported some form of mental disorder (Ditton [380]). A survey of male prisoners in jails indicated that 10% met lifetime criteria for schizophrenia or mood disorder (Fisher et al. [384]). The problems associated with coping with the needs of the mentally ill in the criminal justice system are evidenced in a survey that indicates that prison personnel rate psychological problems among prisoners as second only to overcrowding as among their most significant concerns (Gibbs [385]). Consider that the Los Angeles County jail provided mental health treatment to 3,300 of the 21,000 inmates housed in the facility on an average day (Torrey [434]). With the closure of so many state mental hospitals jails have become the only alternative secure environment in many communities for the control of difficult to manage and noncompliant individuals. In this manner jails have taken over the social custodial role once filled by state mental hospitals, more often than not on a revolving door basis (Morrissey and Cuddeback [515]). Many jail detainees with serious mental illness also have cooccurring substance abuse problems, as well as histories of repeated incarcerations and hospitalizations. The nature and intensity of services provided to these individuals must vary in accordance with the degree of their needs if the downward cycle of offense, incarceration, relapse, reoffense, and deterioration is to be broken.

One approach to this problem is to provide opportunities for diversion to community-based treatment programs in cases of less serious offenses during the pretrial detention period in the jail. In addition, prison programs, for the mentally ill convicted of more serious offenses, could provide prerelease assistance in making arrangements for housing, entitlements, and links to appropriate treatment agencies to ease reentry back into the community. Jail and prison programs for the mentally ill should include screening and evaluation, crisis services, and short-term treatments including case management, access to psychoactive medications, counseling, suicide prevention, and discharge planning and assistance with transition to continued care after release (Watson et al. [444]). Jail diversion programs

for defendants with severe mental illness can be implemented prior to or postbooking. Prebooking approaches involve collaboration between police and mental-health clinicians, often in the form of crisis intervention teams whose members are officers trained to act as liaisons to the mental health system. Postbooking diversion can occur at arraignment, during pretrial detention in jail, at adjudication, or after conviction and sentencing. Postbooking diversion efforts involve negotiations between mental health clinicians and criminal justice personnel to secure alternative sentencing, conditional release, or dropped charges given agreement that the person will enter into adequately supervised mental health treatment programs.

A number of diversion programs have been designed to decrease the flow of persons with schizophrenia into the criminal justice system. Among these programs mental health courts represent a promising if underutilized possibility. These courts vary in terms of eligibility criteria, but all require voluntary participation and are designed to divert individuals away from the criminal justice system to mental health treatment programs (Boothroyd et al. [369]). Research on the effectiveness of mental health courts is limited, but one quasi-experimental study indicated that participation in mental health courts decreased lengths of jail stay, improved functioning and prevented deterioration (Trupin and Richards [435]).

One prominent approach to diversion is the APIC model (Assess, Plan, Identify, and Coordinate) a best practice approach for managing early release and reentry of detainees (Osher et al. [522]). The APIC model is based on implementation of a set of elements in postbook jail diversion programs that, if implemented effectively, are likely to improve outcomes for the seriously mentally ill. Step one of the APIC model is to assess the inmates' clinical and social needs, and public safety risks. Step two is to plan for identifying and accessing the treatment services required to address the inmate's needs. Step three is to identify the appropriate community and correctional programs that will be responsible for postrelease services. Step four is to coordinate the transition plan to insure proper implementation and to avoid gaps in access to or follow-up with care provided by community-based services. Results of a large scale cross state quasi-experimental study of the effectiveness of diversion programs indicated that diversion reduces time spent in jail and does not increase public safety risks, but does not significantly reduce symptoms or improve quality of life (Steadman and Naples [536]).

Whether diversion to community programs based on evidence-based practices would improve both mental health and criminal justice outcomes has not been adequately answered at this time. However, the results of one study of a diversion program that integrates dual-diagnosis participants

into assertive community treatment (ACT) and intensive case management to provide services indicate that program reduced days hospitalized and incarcerated, number of arrests, and improved community adjustment (Lamberti et al. [405]). There is a great need for improved coordination between correctional and mental-health clinicians in many communities, as well as for continued research on the effectiveness and costs of diversion programs based on the implementation of evidence-based practices.

### 14.6. Substance Abuse and Schizophrenia

The rate of alcohol, cocaine, and marijuana use among individuals diagnosed with schizophrenia is estimated to be above 50% (Zedonis et al. 2000). Even these estimates of the prevalence of cooccurring substance use may be conservative since substance abuse problems often go unrecognized. Substance abuse is one of the greatest obstacles to the effective treatment of schizophrenia, and is associated with increased incidence of physical disorders such as HIV, sexual disorders, and hepatitis. Younger persons, especially men are more likely than older persons and women to abuse drugs and/or alcohol (Mueser et al. [517]). Substance use is also associated with increased risk for more severe psychotic symptoms, a range of impulsive behaviors including violence, self-harm, and risky sexual behaviors, as well as treatment noncompliance. The adverse impact of substance abuse in individuals diagnosed with schizophrenia, their families and friends, and health, and social services is enormous. Financial costs include more frequent hospitalizations and use of more expensive, crisis-oriented care, in addition to increased medical costs (Dickey and Azeni [475] and Shaner et al. [538]). Heavy use of inpatient and emergency room services by Medicaid beneficiaries with cooccurring substance use disorders has also been identified as a serious cross-state problem (Clark et al. [467]).

Co-occurring psychoses and substance-use disorders decrease the likelihood of participation in community-based treatment, suggesting that policies that focus on these settings may miss a significant proportion of the population in need of services (Clark et al. [467]). Many dually diagnosed individuals have little else going on in their lives other than experiences associated with drug induced states, and report that drugs help them self medicate for negative feelings, to get high, and to share experiences with others. To complicate matters, individuals diagnosed with schizophrenia are especially vulnerable to the negative impacts of small quantities of drugs, compounding the adverse effects of abuse. Some substances may help ameliorate some of the side-effects of antipsychotic medications. Abused substances can stimulate brain reward systems, and

temporarily increase activation of the prefrontal cortex (Ziedonis et al. [555]). When dual-diagnoses are confirmed is important that these individuals are included as active participants in planning. This population is often unmotivated therefore the initial phases of treatment should focus on identifying mutually agreed upon small but attainable and meaningful goals, and implementation of interventions that are designed to tailored to the individual's readiness for change (Ziedonis et al. [557]). There is a substantial literature available on the treatment of dually-diagnosed disorders to help guide the design of treatment programs however, organizational barriers to the implementation of these practices are often present. These barriers include fragmented services and funding sources, and lack of cross-training of treatment providers. The role of medication in treating substance abuse among dual-diagnosis patients includes managing symptoms of schizophrenia, substance withdrawal, and the early abstinence phase of recovery. A variety of medications are also used for detoxification, reduction of craving, relief of protracted abstinence syndromes, and as agonist maintenance agents.

Psychosocial therapies for dually-diagnosed individuals are designed to integrate evidence based mental health treatments for schizophrenia. These programs include ACT outreach, illness education, cognitive-behavior therapy, family interventions, and social skills training with psychosocial treatments for substance dependence, motivational enhancement therapy (MET), cognitive behavioral strategies to prevent relapse, 12-step programs, and addiction recovery concepts (Ziedonis et al. [557]). The basic principles of psychosocial treatment include the following. (1) Development of a positive therapeutic alliance and focus on motivational enhancement during the engagement phases of treatment. (2) Integration of several evidence-based treatments for addictions, including MET, relapse prevention, and the 12-step model with mental health EBPs. (3) Focus on helping the client attain abstinence and develop recovery skills. (4) Emphasis on fostering and encouraging when appropriate positive social supports, including attendance at 12-step meetings. (5) The application of short-term case management approaches during vulnerable periods to promote and maintain treatment adherence and retention (Ziedonis, et al. [557]). Since individuals vary in terms of severity and type of substance use, as well as their motivation to stop using substances, treatment strategies should be blended and modified to meet the needs of the individual. In addition, two treatment implications of the effects of dual-diagnosis of substance abuse and schizophrenia for treatment should be borne in mind (Kavanagh [502]). First, involvement of families and friends in helping the individual cope may be of significant benefit. Second, treatment providers

must ensure that their reactions to substance abusing individuals do not worsen their prognosis, or lead to further exclusion.

One approach to treatment referred to as modified motivational enhancement therapy (MET) is designed to target individuals with low motivation for change (Ziedonis and Stern [556]). MET is an expansion of motivational interviewing that has added personal feedback from a baseline assessment as a strategy to further enhance motivation to change. This approach includes an empathic, client-centered approach that respects ambivalence, and uses strategies such as balancing pros and cons, and developing change plans with the participant's input. MET also directly encourages seeking an environment and lifestyle that are supportive of abstinence as well as teaching skills for crisis management and relapse prevention. Ziedonis and Fisher [554] developed a dual diagnosis recovery therapy program, which integrates behavioral therapies such as social skills training, with motivation enhancement therapy (MET), and 12-step approaches with group and individual sessions. MET techniques are applied to enhance motivation include empathy, eliciting self-motivational statements, managing resistance, as well as collaboration with family and significant others, and summarizing in the context of ongoing therapy. Additional strategies to increase motivation include exerting external leverage both through family, legal, therapeutic, and financial contingencies when appropriate, as well as by using MET and case management strategies. MET allows the clinician to acknowledge the individual's ambivalence about giving up use, and establishes short-term goals that are achievable without seeming overwhelming. As ambivalence is reduced, the clinician can become more active is encouraging a plan for abstinence. Social skills components including modules that focus on topics such as medication management, leisure time management, problem solving, and communication, are combined with modeling and coaching strategies to teach and provide opportunities to practice the skills in group sessions. When participants reach the stage where they are motivated to actively attempt to stop using substances, and have maintained abstinence for a period of time, they may be encouraged to attend 12-step meetings (Alcoholics Anonymous), if they are interested and willing. Many individuals benefit from the messages and support system provided by 12-step groups, as well as their emphasis on the importance of spirituality in the recovery process. A second approach, cognitive-behavioral therapy includes MET and relapse prevention strategies, as well as social skills training and problem-solving strategies. Participants are educated about the nature of cravings and triggers of drug use, and the special difficulties associated with substance abuse by people diagnosed with schizophrenia. Skill building

exercises can be practiced in small groups twice a week on average for about 6 months. Therapy sessions focus on a limited number of specific skills to accommodate the limitations of individuals with serious mental illness,and abstinence may be reinforced by procedures such as providing rewards, such as small amounts of money for drug-free urine screens (Bellack and DiClemente [455]).

Several case management approaches have also been developed to treat the dual-diagnosis population. Most of these programs are based on the ACT model (Johnson and Montgomery [500]). The components that are most characteristic of these approaches: (1) completion of a thorough needs assessment, (2) development of a comprehensive service plan, (3) proactive outreach and ongoing coordination of services, (4) monitoring and assessment of service delivery, and (5) evaluation and follow-up contacts (Ziedonis and Stern [556]). Integrated treatment programs that address both psychotic symptoms and substance abuse have shown good results in terms of increased retention and treatment participation, reducing symptoms and homelessness, and reducing substance use (Dixon [476]). Successful integrated programs include careful assessment, assertive case management, motivational interventions for participants who do not recognize the need for substance abuse treatment, behavioral interventions for those who are trying to attain or maintain abstinence, family interventions, access to housing, rehabilitation services, and psychopharmacology (Drake and Mueser [477]). Several literature reviews (Drake et al. [478] and Kavanaugh and Mueser [501]), and treatment manuals have been published (Bellack et al. [456] and Mueser et al. [519]) on the topic of substance abuse and schizophrenia. Research is currently needed to determine which elements of these integrated treatments are most effective, what the optimal duration and pattern of treatment should be based on patterns of abuse, and what role pharmacological treatments should play (Dixon [476]).

## 14.7. Psychosocial Factors That Impact on Risk and Recovery

There is substantial evidence of a link between stressful events and the onset of episodes of schizophrenia (Brown and Birley [459]), including first onset of symptoms (Bebbington and Kuipers [453]). Studies of inpatients and outpatients diagnosed with schizophrenia indicate that the prevalence of childhood trauma in this population is very high (Morgan and Fisher [514]). Read et al. [525] reviewed the literature on the relationship between childhood trauma and psychosis and concluded that the evidence strongly suggests a causal link between childhood trauma and schizophrenia, with

a dose effect. Population-based studies have also reported a link between childhood trauma and adult psychosis (Bebbington et al. [452], Janssen et al. [499], Spataro et al. [542]). One mechanism to explain this link may relate to evidence that exposure to early severe stress and maltreatment can produce a cascade of events that causes lasting changes in brain development at multiple levels (Teicher et al. [433]). These changes include neurohumoral (especially in the hypothalamic-pituitary-adrenal [HPA] axis) as well as structural and functional changes. Studies also indicate that prolonged exposure to early stress can result in structural changes in the brain that include reduced size of the mid-portions of the corpus callosum, and attenuated development of the left neocortex, hippocampus, and amygdale as well as functional changes in limbic structures, and reduced functional activity in the cerebellar vermis (Teicher et al. [433]). These neurobiolgical sequelae of prolonged and early stress may interact with later life difficulties to play an important role in the emergence of risk for a variety of mental disorders, including schizophrenia. Exposure to prolonged stress during childhood also produces dopaminergic hyperactivity in the mesocorticolimbic system that results in long-term sensitization, and susceptibility to psychotic symptoms (Morgan and Fisher [514]). These findings indicate that life stress can be an important contributing factor in risk for schizophrenia however questions remain however about the specificity of the link between schizophrenia and stressful life events. Correlational evidence, for example, indicates a link between exposure to chronic childhood stress and schizophrenia, but similar links are reported for other disorders such as depression, dissociation, and PTSD (Kilcommons et al. [504] and Morgan and Fisher [514]). Shevlin et al. [539] addressed several methodological concerns about the reliability of assessments of stress used in the review published by Read et al. [525], as well as the specificity of the disorder-stress relationship in an analysis of data from a National Comorbidity Survey. Shevlin et al. assessed childhood victimization was assessed along with a number of background variables (e.g., gender, age, depression lifetime, family history, urbanicity). Results indicated that childhood physical abuse was the only significant predictor of psychosis, once self and family history of depression was controlled for. The authors noted however that although physical abuse was the only significant predictor of psychosis, there was significant homogeneity among the effects for all trauma variables, and the common odds ratios for all traumas was significant.

In conclusion, while there is more to be learned about the early childhood stress-susceptibility to psychosis relationship, the evidence suggests however that a least some individuals are more vulnerable to develop psychotic symptoms at some point after prolonged childhood trauma. This

increased vulnerability result from a synergistic interaction with underlying genetically based susceptibilities, as suggested by the findings of the Finnish adoption studies (Tienari et al. [256]). It is also possible that the characteristics of specific types of stressful life events play a role in the link to schizophrenic symptoms. Long-term stress responsiveness has been demonstrated to be related to experiential influences on gene expression, thus exposure to stressful life circumstances during childhood may alter how genetic factors are expressed (Meaney et al. [412]). Events that occur earlier in a person's life such as child abuse, or excessive intrusiveness might also sensitize an individual in ways that make him or her more vulnerable to additional forms of stressful events that occur later in life. It seems likely that the confluence of several factors, including physical condition, genetic makeup, prior experience, and developmental history play a role in determining how an individual may react to stressful events (Chichetti and Walker [371] and Sapolsky [429]). At this time the evidence for the specificity of a link between childhood trauma and psychotic symptoms merits more research, in the interim clinicians are advised to follow the suggestions of Shevlin et al. [539] that interpersonal victimization experiences should be routinely evaluated to ensure comprehensive understanding of an individual's difficulties and appropriate treatment planning.

## 14.8. Consumer Movements

During the 1970s movements composed of relatives of consumers, such as the National Alliance for the Mentally Ill (NAMI), began to advocate for better funding for services for the seriously mentally ill. Consumers also began to organize and advocate for increased access to self-help programs, and the services necessary to successfully foster recovery (Chamberlin, et al., 1996). Today consumer initiatives are associated with groups such as Mind Freedom and the Support Coalition International. The focus of consumer-generated programs is empowerment through provision of opportunities to socialize, educational programs, peer counseling, antistigma programs, and advocacy. Consumer run programs provide democratically run centers that offer opportunities to socialize, educational programs, peer counseling, and advocacy. Peer services have benefits for service providers as well as recipients, and to the mental health service delivery system (Salzer and Shear [533] and Solomon [541]).

The Wellness Recovery Action Plan (WRAP, Copeland [470]) is an example of a program developed by former patients to provide guidelines to help people working to recover from mental illness. WRAP sessions provide structured training so each participant can develop his or her own

plan to achieve and maintain wellness. Peer-to-peer psychoeducation programs have also been demonstrated to have positive effects on knowledge of illness, trust in medication, and decreased negative expectations (Rummel et al. [527] and Yanos et al. [365]). Properly run peer-to-peer programs can also help foster a recovery-oriented self-narrative, so that changes in self-efficacy beliefs can be sustained by interactions with both peers and recovery oriented professionals (Rummel et al. [527]). Despite the potential for conflict and dual-relationships, peer services can be a successful and integral part of a comprehensive mental health service delivery system, and can function as a highly useful alternative or supplement to existing services.

SAMHSAs Community Mental Health Section supports participation of mental health consumers in all aspects of the mental health system, including planning, design, implementation, policy formulation, and evaluation of mental health services. A SAMHSA funded multisite study compared nearly two thousand participants in consumer-operated services (drop-in centers, mutual support groups, and educational/advocacy groups) with similar participants in traditional services (Campbell [464]). Results indicated significant improvement in ratings of well-being in two of the drop-in centers, and no overall improvement in participants in consumer operated programs compared to participants in traditional programs. Despite lack of strong empirical evidence for the effectiveness of consumer operated programs, due in part because the format of randomized clinical trials are not consistent with the values of these programs, consumer and family advocate organizations are convinced that these programs are of significant benefit to participants. Research is needed to identify the characteristics of consumer run programs that are most helpful, the characteristics of participants most likely to benefit from these programs, and how to maximize the benefits of participation.

In addition to the consumer run programs the National Alliance on Mental Illness (NAMI) is a self-help group composed of both consumers and family members. NAMI sponsors support groups for consumers and family members, and has been very effective in advocating for improved treatments and services, as well as implementing programs to combat stigma and discrimination. Many NAMI affiliates hold weekly or monthly self-help, and care-and-share groups in which consumers and family members are involved in group support activities.

## 14.9. Stigma

Despite evidence of increased public acceptance of less serious mental disorders, individuals diagnosed with schizophrenia often fall victim to

stigma. In fact evidence indicates the image of schizophrenia is more strongly associated with the stereotype of potentially dangerous individuals suffering from a chronic, incurable disease today than it was 50 years ago (Phelan et al.[270]). Perceptions of dangerousness associated with schizophrenia in particular, can have a substantial impact on the personal, social, and economic opportunities, and contribute to a negative transformation of self-identity, as well as a sense of alienation and social indifference (Phelan et al. [270]). The image of the person diagnosed with schizophrenia as unpredictable, potentially violent, and suffering from a chronic, incurable brain disease contributes to the negative transformation of a patient's sense of identity, and reinforces feelings of inferiority, alienation, and separateness. Since perceptions of threat account for a substantial amount of what is viewed as "disturbing" about individuals diagnosed with schizophrenia there is a need to design programs targeted specifically to counter this perception.

The media is a major source of negative portrayals that have contributed to the increase in perceptions of dangerousness associated and increased public social distance from people previously diagnosed with psychosis (Wahl 1995). These portrayals of mental patients as violent and unpredictable are important targets for interventions. The National Alliance for the Mentally Ill (NAMI) established media watch programs to inform people in the media and entertainment industries and to encourage entertainment leaders to include positive portrays of characters with schizophrenia. NAMI has also initiated a program called Stigma Busters that focuses on identifying disrespectful and inaccurate images of mental illness in the popular media and coordinates letter-writing campaigns to stop these images from being publicized. NAMI also developed a program called *In Our Own Voice: Living with Mental Illness* that combines information and exercises to help consumers teach groups about the experience of mental illness. The World Psychiatric Association has initiated an international program called "Schizophrenia: Open the Doors" to combat the social stigma associated with the diagnosis of schizophrenia that involves 20 countries (Sartorius [535]). The program has been initiated on three continents: Asia, Europe, and South America.

An interesting approach to combating stigmatization and increasing community acceptance of former patients was initiated by mental health professionals in Trieste, Italy, following the closing of regional public mental hospitals. When mental health reform was enacted there emptying mental hospitals professionals initiated a program of newspaper interviews, radio programs, television interviews, public discussions, debates, film festivals, art exhibits and advertising brochures, designed to stimulate

interest and sympathy among the public, and allay public fears. These efforts proved successful in gaining increased acceptance and opportunities for many individuals released to live and work in the community.

The inability of many individuals diagnosed with schizophrenia to obtain jobs and access to decent housing is partly the result of the problems that people with serious mental disorders experience; these problems are exacerbated by prejudice that potential employers and landlords hold. Self-stigma decreases the likelihood of participation in rehabilitation services. Persons living in cultures that stigmatize mental illness are likely to accept and internalize these images, so that they may experience diminished self-esteem, lowered self-efficacy, and withdraw from opportunities for increased participation once diagnosed. Internalized stigma fosters withdrawal, dependency and a sense of futility. Intervention programs that target specific power groups that are in position to make important decisions about the resources and opportunities made available are critical to change (Watson and Corrigan [550]). Discriminatory behaviors and attitudes can be identified for each group, such as employers, landlords, police officers, legislators, or media executives, and appropriate strategies developed and tested. Self-stigma can be addressed through programs directed to combat these internalized images through (1) cognitive reframing of negative self-beliefs, (2) self-disclosure to individuals who seem open-minded in order to overcome feelings of embarrassment and shame, (3) programs that foster a sense of involvement, self-worth and empowerment (Corrigan and Larson, 2008). Collaborative exchanges in which individuals work together as partners and peers in a variety of contexts are excellent ways to foster empowerment.

## 14.10. Implementation

The original PORT treatment recommendations (Lehman et al. [508, 509]) identified empirically based treatments for schizophrenia and estimated how often people actually received these treatments. Results indicate that individuals diagnosed with schizophrenia rarely received treatments known to be effective. Individuals receiving no treatment of any type make up about one-third of the homeless population and at least 10 percent of individuals in jails (Fuller-Torrey [487]). The National Comorbidity Survey conducted during the 1990s reported that 54 percent of individuals with severe mental illnesses received no treatment of any type during a 1-year period (Kessler et al. [503]). In addition to problems of access to treatments the effectiveness of any therapy can be undermined by uncontrolled variables related to integrity of program implementation

and the adequacy of resources. There are wide variations in the quality and fidelity of implementation of psychosocial programs that are given the same name. These variations can have a significant impact on program effectiveness (Fuller-Torrey [487]). Simply designating of a program as providing certain services and recording that such a service was provided, does not indicate the level of competency or integrity of implementation of basic program principles and practices. The degree to which the services listed are competently provided, and truly accessible and available as needed varies widely between programs with the same name (Essock et al. [481]). Mental health agencies may or may not adequately staff, provide ongoing opportunities for training and supervision, or evaluate and monitor the quality of implementation of programs. Many community mental health agencies hire untrained entry-level providers, at minimal pay, with high turnover rates to work as case managers for the long-term mentally ill. These practices undermine the integrity of efforts to implement meaningful EPB psychosocial programs, and impair continuity of care, an essential component of psychosocial therapies. The need for ongoing staff training, and competent supervision and evaluation, along with feedback and program adaptation is also often overlooked. Implementation issues have been documented in the results of a study of factors influencing implementation of EBPs. Results indicate the most frequently observed barriers to success are lack of effective program leadership, inadequate staffing, agency policies, and lack of adequate mastery of the therapeutic principles and practices (Moser et al. [516]). It is relatively easy to monitor pharmacological treatments, but the challenges are far greater for psychosocial interventions. Documentation of implementation of psychosocial therapies and rehabilitation practices must be valid yet relatively straight forward and capable of being integrated into routine practice in ways that allow for efficient use of resources. Documentation of evidence-based treatments is both a way to improve clinical outcomes, and a necessary part of getting funding for interventions that are not part of traditional medical model services (Essock et al. [481]). The Clinical Strategies Implementation Scale (CSI; Falloon et al. [483]) provides one potentially useful tool to assess the degree to which EBPs have been competently implemented, and to assist in planning ongoing improvement programs.

The psychosocial therapy programs recognized as empirically based practices by the PORT committee can be effective only if adequately staffed and funded, and competently run and administered. The assumption that the sign on the door tells us what is actually taking place may be a false and expensive assumption. Advocates will be in a much stronger position

to argue for funding and reimbursement if they can document that their mental health systems are delivering measurable medical and psychosocial treatments supported by and empirically validated evidence base (Essock et al. [481]).

### 14.11. Individual Rights versus Treatment

To complicate matters the majority of individuals receiving no treatment report that they do not believe they have an emotional problem requiring treatment (Kessler et al. [503]). These statitics present an unresolved issue and challenge for the recovery movement with its emphasis on the importance of individual choice. It may be that in practice the value of choice applies once an individual has agreed to seek treatment but may not always be appropriate when denial, dysfunction and disorganization seriously impair the individual's ability to make choices that are in their own best interests and foster safety and survival. "Choice" in terms of rational informed decisions may be inappropriate during certain intervals of a person's life, if the right to choose means people are left to eat from garbage cans, sleep under cardboard boxes in the winter, and progressively deteriorate, and "liberty" means a jail cell instead of treatment (Treffert 1996). The ethical, legal and clinical issues and seemingly conflicting values involved in establishing and informed and reasonably balanced guidelines that allow for respect for basic individual rights, as well as informed recognition of the limitations on judgment and competency associated with psychotic symptoms and the need for and right to effective treatments have yet to be satisfactorily resolved.

### 14.12. Public Policies

Work, and involvement in a useful social role, is as important to the self esteem and long-term adjustment of individuals diagnosed with schizophrenia as it is for anyone else. Despite evidence that work has beneficial effects on long-term outcome, there are many obstacles to finding employment. The difficulties are reflected in the U.S. statistic that fewer than 15% of individuals diagnosed with schizophrenia, and living in the community are employed in any capacity (Consumer Health Sciences [469]). The low employment rate in the U.S. contrasts with other industrialized countries that have adopted policies designed to eliminate obstacles to ex-patients finding work. In Bologna, Italy, for example, nearly half of all ex-patients were employed continuously and more than one fifth were working full time. In Verona, Italy nearly 60 percent of schizophrenic patients living in

the community were employed, one quarter full time (Warner [70]). There are several reasons for these differences in rates of employment. First, in the US and UK disability pension regulations regarding allowable earned-income levels are limiting so there may be little economic incentive to work. Rather than applying regulations that are perceived to be disincentives, many individuals would benefit from partial wage subsidies that encourage them to work. In Italy where disability payments are less generous and there are fewer disincentives to work, business consortiums have been formed and successfully employed a mixed workforce of mentally disabled and nondisabled workers to run businesses as varied as a hotels, cafés, renovation companies, transport businesses, furniture workshops, cleaning businesses, plant nurseries, and work as nursing home aides (Warner [70]).

Supplemental Security Income (SSI) and Social Security Disability Income (SSDI) are federal programs in the U.S. that provide income support to individuals who are determined to be eligible due to a disability that prevents them from engaging in substantial gainful activity (Burt and Aron [461]). SSI is a means-tested program determined by income and resources, in addition to evidence that the disability is severe enough to render the person unable to work for at least 12 months. SSI does not require a work history and previous employment related contributions to the Social Security fund. SSDI eligibility involves the accumulation of a minimum amount of previous paycheck deductions to the Social Security fund, and the amount of payments depends on the length of time worked and amount contributed. SSDI payments are not adjusted each month for earnings, unlike SSI payments, but earnings must not exceed a certain maximum amount ($590 a month in 2005). SSDI recipients are also eligible for medical coverage through the Medicare system, after a 24-month waiting period. If they improve or earn above the maximum allowed amount during any 9 months over a 5-year period they are subject to review and possible loss of benefits. Each year the government establishes a maximum dollar amount allowable for substantial gainful activity ($900 per month in 2007). SSI recipients can work for pay without losing eligibility, but the amount of SSI payments is reduced by both unearned and earned income, in the amount of $1 for every $2 of income. Unearned income such as provision of housing by family members can also affect eligibility. A second disincentive to work is in the form of lost subsidies such as food stamps, subsidized housing assistance, utilities and transportation. SSI recipients are eligible for medical coverage through the jointly funded federal and state sponsored Medicaid programs for low income individuals. If an SSI recipient exceeds a certain income level, SSI benefits and Medicaid eligibility may be cancelled. Section 1619B of the

most recent Social Security act was adopted to mitigate the disincentive to employment for SSI recipients, by allowing individuals who have SSI benefits to continue receiving medical coverage up to threshold earnings, the amount which varies between states. This allowance has not had much impact on employment of mentally disabled SSI recipients however, and is not familiar to most mental health professionals (Corrigan et al. [376]).

Social Security policies have a great impact on the field of mental health rehabilitation since individuals with psychiatric disorders form the largest diagnostic group on the disability rolls (Kouzis and Eaton [505]), and fewer than 1% leave the disability rolls each year because of earned income (Rupp and Scott [530]). Individuals with mental disorders also tend to enter the disability rolls at a younger age and remain on the rolls for much longer than other disabilities (Rupp and Scott [529]). Research is needed on how variations in government policies impact on employment rates of former patients, and how employment rates of former patients can be improved by changes in policies. Additional policy barriers are present in the manner in the model used to authorize funding for services, and the manner in which the administration and planning of services to the seriously mentally ill are administered. For example, Medicaid has become the primary source of funding for mental health services among those with serious mental disorders. This structure presents a problem for many mental health rehabilitation programs, since most outreach programs such as ACT, supported employment, and family psychoeducation are not reimbursable under the current fee-for-service system. In addition vocational services are funded and administered separately from mental health in most communities. Only a small fraction of vocational rehabilitation (VR) expenditures are allocated to supported employment services. Critics have pointed out that the bulk of VR funding is devoted to administration, pre-employment evaluations, and sheltered workshops rather than supported employment services (Wehman et al. [551]).

Government policies and the manner in which they have been implemented have directly or indirectly supported practices that foster institutional care, incarceration, day treatment, sheltered workshops, and periodic clinic-based symptom management, rather than support for comprehensive programs of empirically based practices. Political philosophies play a large role in the manner and degree to which programs to provide access to health care, housing and psychosocial rehabilitation services to individuals with serious mental disorders are funded and available. The WHO international schizophrenia course and outcome studies indicate that access to opportunities for meaningful participation in productive work is an important component of those processes that contribute to

recovery. Research is needed on the effectiveness of innovative policies and pilot programs that provide temporary or permanent wage subsidies, as well as innovations that increase the amount persons on disability pensions can earn without penalty and provide start-up funding for consumer run businesses. Surveys indicate that about 60% percent of people diagnosed with serious mental illnesses are capable of employment, and about 70% say they would like to be working, but fewer than 15% are employed even temporarily, and less than 25% receive any form of vocational assistance (Leff and Warner [506]). More effort must be directed toward developing and evaluating programs that are effective in creating the conditions that foster positive aspirations for the future, as well as increased incentives to seek and maintain employment.

## 14.13. Leadership

One of the most important factors contributing to inadequacies in community-based programs is the fragmentation and confusion of administration and responsibility that exists among the various levels of government agencies that have responsibility for planning, organizing, implementing and evaluating mental health programs. The U.S. does not have a coordinated national public health structure, nor has there been strong leadership and support for psychosocial program development at the Federal level since 1979. The U.S. mental health system is so fragmented and inadequately funded at present that there is little likelihood of significantly increasing access to comprehensive programs based on evidence-based practices. The situation was examined in a U.S. Government Accounting Office (GAO) report more than 30 years ago. The GAO report noted that the National Institute of Mental Health: (1) provides only a small portion of the funds needed and used for development of community support services, (2) exerts only a limited influence and no authority over other agencies, and (3) does not have authority or responsibility for monitoring, evaluating, and enforcing standards and requirements under other programs serving the mentally disabled" (GAO Report 1977, page 36). Similar patterns of fragmentation and poor coordination and planning also exist at state and local levels (Turner and TenHoor [358]). Policy changes are needed at all levels to support the implementation of evidence practices and make them broadly available. Local mental health agencies and states cannot develop integrated systems of mental health care without greater emphasis on coordination and quality control in the policies and practices of Medicaid, Medicare, Social Security, managed care companies, and other private and government organizations (Merrens and Drake [512]). Consumers,

family members, researchers and clinicians must also become more active in advocating for evidence and values based systems of care if change is going to occur.

There is much more to be learned about the development and implementation of therapeutic programs, but the following guidelines summarize what we know about programs that are most effective in improving prospects for recovery incorporate the following characteristics: (1) treatment of the acute phase of the disorder in small, domestic, noncoercive settings that reflect the humane principles of moral treatment, (2) provide access to adequate psychological and clinical support in the community, including a full range of independent and supervised, noninstitutional accommodations, (3) provide psychoeducational programs and support for the care offered by the families of persons with schizophrenia, (4) strive to provide access to a variety of work opportunities—work that is neither too demeaning or too stressful, (5) provide economic incentives to work by increasing the earnings disregard in disability pensions or by providing wage subsidies for the severely handicapped, (6) encourage economic and social advancement through consumer cooperative businesses, housing and services, (7) implement efforts to protect the rights of people with schizophrenia and their families to participate as fully integrated members of society, through local action and coordinated efforts to counter the misrepresentations generated by the news and entertainment media and, (8) use antipsychotic drugs as a supplement to these measures, not as a substitute for them (Warner [70]).

# 15 Recovery from Schizophrenia: The Present and Future

The role of mental patient defines an individual in the language of mental disorders and patienthood. Being hospitalized provides containment, protection, and a place to receive assistance. Symptoms can often be controlled by medications if patients are treatment compliant but, many behaviors and vulnerabilities including those that create anxiety, conflict and misunderstandings in social relationships and work-related social environments are not significantly altered. Too often discharged patients are discharged to live alone, isolated, and too confused to cope with the demands of life in the community. Efforts to assume meaningful and productive social roles, if undertaken at all, are often associated with failure, rejection and disappointment. Lack of meaningful socially acceptable role participation pushes the individual further in the direction of isolation. In these circumstances withdrawal into an inner fantasy life functions more and more as an alternative reality and source of refuge and solace. The low status, marginal social role, and paternalistic treatment of persons diagnosed with schizophrenia, also contribute to a process of demoralization that further reduces opportunities for a productive and meaningful social life. There are no easy answers to these problems and not everyone diagnosed with schizophrenia is cooperative or compliant with treatment efforts, but we can do a much better job than what we have been doing. More is understood about the processes associated with risk for schizophrenia than twenty years ago but no one can state with any certainty which genetic and environmental factors cause schizophrenia. Different research groups emphasize different causal factors and work in relative isolation, often ignoring or misinterpreting areas of published research outside of their specialized realm. There is a need for meaningful integration of existing knowledge across levels, along with a need for more studies in which hypotheses are clearly stated based on solid evidence, and findings are

presented and interpreted in the context of existing knowledge (Tandon et al. [148]). Too often etiological and treatment focused research is presented in the form of isolated findings with little or no attempt to relate these findings to existing research or theory.

We do not know whether or how particular risk factors are linked in any specific manner to schizophrenia, or their effects mediated. It is also not clear whether these factors modify risk, or modify or moderate the effects of other factors (Fanous and Kendler [107], Jibson and Tandon [178] and Tandon et al. [148]). Perhaps it is time to reevaluate and seriously consider the implications of the possibility that there is no "one" schizophrenia (Tandon et al. [148]). The PORT committee recommendations suggest that recovery can be a realistic goal for many individuals diagnosed with schizophrenia but factors such as poverty, lack of availability of affordable housing, fragmented health care systems, and a continued focus of mental health resources on institutional programs result in only a small proportion of individuals receiving access to these programs and therapies. As a consequence, the potential benefits of supported employment, job training, rent subsidies, earning set asides, jail diversion efforts, combined treatments for cooccurring disorders, and peer support organizations are unrecognized, unattained, and service remain under resourced.

## 15.1. Treatment

Schizophrenia is diagnostic term that refers to a broad clinical syndrome that incorporates a heterogenous group of symptoms, differences in background, response to treatment, course, and outcome and prospects for recovery. The grouping may eventually be replaced by multiple categories or some version of a "domains of dysfunction" where symptoms are grouped into variations in patterns and the concepts of remission and recovery are considered in the context of each functional domain (Fischer and Carpenter [561]). For now it is essential for both family and professionals to bear in mind that the diagnosed individual evidences the symptoms of schizophrenia, but he or she is not the disorder. In addition to access to an array of combined pharmacological and psychosocial treatments the community support and rehabilitation literature indicates that important ingredients for recovery and community participation include respect for consumer goals and preferences, access to a flexible individualized rehabilitation process, and access to job training, placement and support services, decent housing, and social supports (Blanch et al. 1988). Adoption of a recovery perspective implies a conceptual transition from an emphasis on symptom control and maintenance, to a service

approach which includes provision of functional supports, opportunities for networking, and the importance of self determination, choice and provision of supports based on reciprocal, and respectful relationships (Carling [465]). Efforts to improve prospects for recovery raise a broad array of social and political issues related to the proper and just allocation of resources, as well as the level of societal responsibility for those who are disabled, how to balance individual rights with the public good, and the necessity of implementation of evidence-based best practices (Lehman [507]). The desire to provide good care can be an incentive to support the implementation of evidence-based practices, but additional changes and incentives are necessary if the situation is going to change. Substantial administrative and fiscal incentives are needed if evidence-based practices are going to be implemented as more than special demonstration projects. The PORT guidelines can be used to determine the extent to which evidence-based practices are being implemented; and some have suggested this may be their greatest value (Essock et al. [481]), but more than guidelines are needed.

## 15.2. The Future

It would be productive to think of schizophrenia not only in the language and paradigm of illness and hospitalization, but also in terms of social, economic and political concepts. What is lacking in much of the clinical literature is a belief that some form of shared public life that involves both productive activity and participation is possible for most schizophrenic patients (Glass [490]). Clinical theories focus on what is wrong with the patient, conceptualized in terms of brain or chemical dysfunctions, cognitive processing errors, or skills deficits, and can lead one to overlook or ignore the importance of access to decent housing, opportunities for productive social roles and work, meaningful interpersonal relations, and the politics of persons, institutions and bureaucracies as factors that are related to recovery. Despite current access to an impressive clinical treatment research literature there is much more to be learned about the design of adequate and appropriate services to former patients, and how to best provide opportunities for experiences that will help to foster a viable sense of individuality and self-integrity along with manageable productive contact with and involvement in society. Many individuals diagnosed with schizophrenia have significant cognitive and social impairments but, these impairments do not necessarily rule out the capacity to act on appropriately designed economic and social opportunities. Meaningful public participation allows for opportunities to develop aspects of an identity that

lie outside the focus of the role of patient. To be effective recovery oriented programs must provide access to services that represent a synthesis of caring treatments that accommodate the vulnerability of patients and provide access to pharmacological and psychosocial treatments, as well as access to environments that counteract and defuse the impact of psychosis. Opportunities must be provided that facilitate feelings of self-efficacy, interest, and community. Incentives must also be provided to develop and explore ways of developing coproduction models and innovative organizational approaches in both rural and urban environments, as well as rehabilitation models designed to encourage and support enterprises that harness the productive potential of chronic patients. Provision of opportunities to develop a sense of place, understood as involving both productivity and community, can do much to reduce the problems of alienation, homelessness and recidivism among the mentally ill (Warner and Polak [71]). Service providers must strive to identify and build upon each individual's strengths and areas of competence in order to help him or her develop an increased sense of mastery and achievement including increased control over symptoms, while assisting in any way possible activities and efforts to regain meaningful and constructive participation in community life. In addition to attempting to help control symptoms and compensate for impairments, clinicians must also attend to and value individual narratives. There is much more to be accomplished, studied, and learned.

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