

**CLASS 2: CLASS HANDOUT #1: WHAT ARE THE BASICS WE NEED  
TO KNOW ABOUT PSYCHOTIC ILLNESS, STARTING WITH  
SCHIZOPHRENIA?**

Schizophrenia is a devastating brain disease whose acute stage always involves a psychotic episode. The name "schizophrenia" means "to split the mind"—a term which vividly captures the idea of a complete rupture between reality and psychotic thinking.

Schizophrenia is a common neurobiological disease affecting about 1% of the world's population (about 20 million people). It is now evident that schizophrenic illness involves some fundamental alteration of the brain. A recent article concludes, (quote) "Schizophrenia is a disorder of brain circuitry, not some mysterious demon. Increasing evidence points to abnormalities that arise very early in life, probably before birth, which disrupt the normal development of the brain."

This modern biological explanation has not always held sway. Along with infantile autism and mental retardation (which are now known to involve specific brain dysfunctions), schizophrenia was attributed to maternal mistreatment—primarily neglect, disinterest, callousness, etc. Unfortunately, 50 years of clinical literature has blamed mothers, or families, for "causing" this severe brain disorder in their offspring.

The fact is, the characteristic "signs and symptoms" of schizophrenia have been observed for centuries. Moreover, they are universal as they are experienced by individuals suffering from schizophrenic illness. The World Health Organization sponsored an international study to determine if persons with schizophrenia from different countries were alike when diagnosed by a group of clinicians using the same interviewing techniques and trained to use the same decision rules. The findings: a person with schizophrenia, whether living in China, Colombia, the Czech Republic, Denmark, India, Nigeria, the United Kingdom, the USA or Russia exhibited lack of insight, suspiciousness, unwillingness to cooperate, false ideas, emotional dullness, poor rapport, and auditory hallucinations.

The general public tends to confuse schizophrenia with "split personality" (which it is not), or with rational thinking that goes in opposite directions (which it is not), or demonizes schizophrenia as psychopathic behavior (which it is not). Schizophrenia is a common brain disorder which affects 1 out of 100 people, typically striking them down in the prime of their early adult years. It is far more common than many other disorders which we hear much more about, like multiple sclerosis or muscular dystrophy ("Jerry's Kids").

**CLASS-2: CLASS HANDOUT #2: SYMPTOMS LEADING TO A DIAGNOSIS OF SCHIZOPHRENIA**

DESCRIPTIVE CATEGORIES	ONSET SYMPTOMS Prodromal Stage (NS: Negative Symptoms)	ACUTE SYMPTOMS Active Stage (A: Criteria A Symptoms)	LINGERING SYMPTOMS Residual Stage (NS: Negative Symptoms)
<b>MOOD "AFFECT"</b>	<input type="checkbox"/> Uncontrollable crying <input type="checkbox"/> Anxious <input type="checkbox"/> Irritable <input type="checkbox"/> Flat "blunted" emotional responses <span style="border: 1px solid black; padding: 2px;">NS</span>	<input type="checkbox"/> Anxiety, panic <input type="checkbox"/> Angry outbursts <input type="checkbox"/> Inappropriate emotional responses <input type="checkbox"/> Severe emotional blunting <span style="border: 1px solid black; padding: 2px;">NS</span>	<input type="checkbox"/> Depression, moodiness <input type="checkbox"/> Anxiety <input type="checkbox"/> Ambivalence <input type="checkbox"/> Flat, "blunted" emotional responses <span style="border: 1px solid black; padding: 2px;">NS</span>
<b>PHYSICAL (BODY) SYMPTOMS</b>	<input type="checkbox"/> Sleeplessness <input type="checkbox"/> Agitation <input type="checkbox"/> Weight loss	<input type="checkbox"/> Sleeplessness <input type="checkbox"/> A: <b>CATATONIC RIGIDITY</b> Bizarre body postures, mutism, negativism <input type="checkbox"/> A: <b>CATATONIC EXCITEMENT</b> Pacing, rocking, grimacing	<input type="checkbox"/> Unusual eating and sleeping patterns <input type="checkbox"/> Slowed movements <input type="checkbox"/> Odd posturing
<b>BEHAVIOR</b>	<input type="checkbox"/> Withdrawal <input type="checkbox"/> Decline in function <input type="checkbox"/> No attention to hygiene <input type="checkbox"/> Odd, peculiar behaviors <input type="checkbox"/> Lack of motivation (Avolition) <span style="border: 1px solid black; padding: 2px;">NS</span> <input type="checkbox"/> Inability to relate to others (Autism) <span style="border: 1px solid black; padding: 2px;">NS</span>	<input type="checkbox"/> A: <b>GROSSLY DISORGANIZED BEHAVIOR</b> Bizarre actions, follows rituals, swearing and shouting, mimics others	<input type="checkbox"/> Decline in function <input type="checkbox"/> No attention to hygiene <input type="checkbox"/> Lack of motivation: (Avolition) <span style="border: 1px solid black; padding: 2px;">NS</span> <input type="checkbox"/> Inability to relate to others (Autism) <span style="border: 1px solid black; padding: 2px;">NS</span>
<b>THINKING</b>	<input type="checkbox"/> Suspicious, superstitious <input type="checkbox"/> Illogical <input type="checkbox"/> Odd beliefs <input type="checkbox"/> Lack of insight <input type="checkbox"/> Poverty of speech (Alogia) <span style="border: 1px solid black; padding: 2px;">NS</span>	<input type="checkbox"/> A: <b>DELUSIONS</b> False beliefs <input type="checkbox"/> A: <b>DISORGANIZED SPEECH</b> incoherent, loose associations, "word salad"	<input type="checkbox"/> Lack of insight <input type="checkbox"/> Suspicious; superstitious <input type="checkbox"/> Odd "fixed" beliefs <input type="checkbox"/> Concentration/memory problems <input type="checkbox"/> Poverty of speech (Alogia) <span style="border: 1px solid black; padding: 2px;">NS</span>
<b>SENSES</b>	<input type="checkbox"/> Acute <input type="checkbox"/> Illusions, odd sensory experiences	<input type="checkbox"/> A: <b>HALLUCINATIONS</b> Voices, visual apparitions, Bizarre interpretations of taste, touch, smell	<input type="checkbox"/> Dulled <input type="checkbox"/> Illusions, odd sensory experiences
<b>CRITERIA FOR DIAGNOSIS</b>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     Negative Symptoms <span style="border: 1px solid black; padding: 2px;">NS</span>                      present in the prodromal stage: <b>(CRITERIA A)</b> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CRITERIA B: CONTINUING SOCIAL AND OCCUPATIONAL DYSFUNCTION</b> </div>	<div style="border: 1px solid black; padding: 10px;"> <b>2 OR MORE CRITERIA A SYMPTOMS</b>                      or  <b>BIZARRE DELUSIONS ALONE</b>                      or  <b>AUDITORY HALLUCINATIONS ALONE</b> </div>	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     Negative Symptoms <span style="border: 1px solid black; padding: 2px;">NS</span>                      present in the residual stage: <b>(CRITERIA A)</b> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>CRITERIA C: SYMPTOMS MUST PERSIST FOR 6 MONTHS OR MORE</b> </div>

**CLASS 2: CLASS HANDOUT #3: WHY DO PEOPLE CHANGE SO DRASTICALLY WHEN THEY BECOME PSYCHOTIC? WHAT ARE THEY ACTUALLY EXPERIENCING?**

Psychosis is a bizarre state of profoundly altered thinking and behavior, described by many families as "a living nightmare". The victims of psychosis withdraw into the delusional realm of their illness, leaving behind, stranded on the shores of reality, all the familiar people in their world. Many people speak of this experience in metaphors of "leave-taking"; the victims feel they are becoming unmoored, drifting away, while the family watches the person they love slipping from their grasp.

In this process, their personality alters in ways you could never have imagined. They will no longer be inhabiting a world that is remotely familiar to you. When psychosis strikes, you will find that you can no longer reason with your relative or persuade your relative on the basis of shared understanding. This will frustrate many of your efforts to aid and assist the one you love. It is critically important for families to grasp and understand this point.

For many years psychosis was thought to be the one primary symptom that distinguished schizophrenia from depression and bipolar disorder. Today we know that psychotic features are not exclusive to schizophrenic illness: People in acute stages of mania and depression appear severely ill and grossly impaired. Their symptoms of psychosis are equally florid (this is particularly true of the adolescent onset of bipolar illness). In all of these illnesses, thought disorders are strikingly apparent and affect the ability to think, formulate ideas, reason, remember, or concentrate.

So, let's take time to go over the Criteria A symptoms in more detail, so you can see what people actually experience when they are in a psychotic state.

**CLASS 2: CLASS HANDOUT #4: CRITERIA A SYMPTOMS OF SCHIZOPHRENIA  
ALSO CHARACTERISTIC OF PSYCHOSES IN DEPRESSION AND MANIA**

**CRITERION A1: DELUSIONS:** These are disturbances in thought involving the misinterpretation of perceptions or experience. These beliefs usually have a theme of persecution (being tricked, spied upon, subjected to ridicule). They can also involve religious themes and feelings of being cosmically important. Delusional thinking represents a "gross impairment in reality testing, which grossly interferes with the capacity to meet the ordinary demands of life". Some of the more common examples of delusional thinking are:

<u>Thought broadcasting:</u>	My thoughts are being transmitted out into the world.
<u>Thought insertion:</u>	People are putting bad ideas into my head.
<u>Delusions of reference:</u>	Everything I see and hear has some special meaning or reference particularly to <u>me</u> .
<u>Thought blocking:</u>	Someone is taking the thoughts out of my head.
<u>Recriminations of guilt:</u>	I am crushed by the anxiety of severe guilt.

**CRITERION A2: HALLUCINATIONS:** Most commonly, hallucinations involve hearing one or several voices which make a running commentary on the person's behaviors and thoughts. Voices are perceived as distinct from the person's own thoughts, and are often experienced as critical and threatening. Hallucinations can also occur in the other senses (seeing, smelling, taste and touch), and are generally experienced without insight into their pathological nature..

**NOTE:** *In schizophrenia, bizarre delusions and hallucinations can become "fixed" and permanent, and "stand alone" as primary first rank symptoms of schizophrenic illness.*

*In bipolar illness, delusions are more fluid, transitory and changeable; hallucinations are far less common and tend to be brief. In the acute stage of schizophrenia and mania, delusions are often grandiose, paranoid, frequently religious, with voices perceived as commands from God.*

*Depressive delusions commonly involve obsessions of guilt, sinfulness, poverty, feelings of persecution and extreme hypochondria.*

**CRITERION A3: DISORGANIZED SPEECH:** This is totally illogical thinking or "formal thought disorder" as evidenced in the person's speech. The individual may "slip off the track" (derailment), answers to questions may be totally unrelated (tangential) or even severely disorganized (incoherence, "word salad", "loosening of associations"). Often the thought itself is lost and cannot be retrieved (thought blocking).

**CRITERION A4: GROSSLY DISORGANIZED OR CATATONIC BEHAVIOR:**

Disorganized behavior ranges from childlike silliness and inappropriate reactions, to totally unpredictable agitation. There are problems in goal directed behavior and great difficulties in performing the activities of daily living. Behavior is often bizarrely disturbed (posturing, grimacing), appearance markedly disheveled, with frequent untriggered agitation, particularly swearing, shouting and negativism (refusal to accede to requests). Catatonic motor behaviors involve a marked decrease in reactivity to the environment (stupor, muteness, rigidity), or excessive, purposeless motor activity (catatonic excitement).

**NOTE:** *It is estimated that 50% of cases of catatonia occur in mania and psychotic depression.*

**CRITERION A5: NEGATIVE SYMPTOMS:** These appear as affective flattening or "blunting" (face is immobile, unresponsive; the range of emotional expressiveness is diminished), alogia (poverty of speech; characteristically, brief, laconic, empty replies and a decrease in fluency of speech), avolition (inability to initiate and persist in goal-directed activities; shows little interest in participating in work and social activities), and autism (inability to relate to others).

**NOTE:** *This criteria is perhaps the most important in distinguishing schizophrenia from the mood disorders. These symptoms do not represent an episodic mood state, but are a consequence of a disease process which blunts the capacity to feel or respond at all.*

**SOURCE:** Diagnostic and Statistical Manual (DSM-IV), American Psychiatric Association

## CLASS 2: CLASS HANDOUT # 5: OVERVIEW

### MAJOR DEPRESSION AND BIPOLAR DISORDER

- Bipolar disorder occurs in 1.2% of the population, a rate slightly higher than schizophrenia. The majority of individuals with this illness report having symptoms during their adolescence. The rates of depression are dramatically higher: 1 man in 10, and 1 woman in 5 will have a serious depression in their lives, usually before they are 40 years old.
- The affective disorders are typically episodic (recurrent). 40% of individuals with major depression have only one episode. But in more than half of all cases of major depression, the illness returns within 2 years. In these recurrent affective disorders, the average number of episodes of depression in a lifetime is about 7; for bipolar disorder, about 11.
- Suicide is a very high risk for this population. Tragically, 15% of those individuals suffering from recurrent depressive disorders kill themselves. This is a suicide rate 30 times greater than that of the general population.
- The rates stated above reflect the striking gender differences in the incidence of depression: women outnumber men by 2 to 1. A recent major study by The American Psychological Association, researching women's "double" rates of depression, concluded that this phenomenon is directly related to women's subordinate roles in American society and to the higher incidence of violence, poverty and sexual abuse in women's lives.

In men, the rate of depression peaks at age 55-70; and the highest rates of suicide in any age category occur in white males over the age of 69.

**CLASS 2: CLASS HANDOUT #6: SYMPTOMS LEADING TO A DIAGNOSIS OF  
DEPRESSION AND MANIA: CHECKLIST**

DESCRIPTIVE CATEGORIES	MAJOR DEPRESSION (UNIPOLAR)*	BIPOLAR DISORDER; MANIA (AND HYPOMANIA)
MOOD "AFFECT"	<input type="checkbox"/> Depressed, sad or very irritable; cannot be "cheered up" (dysphoria) <input type="checkbox"/> Loss of interest and pleasure in daily activities (anhedonia)	<input type="checkbox"/> Abnormally elevated, expansive, high (euphoric) <input type="checkbox"/> Irritable, critical, argumentative, stubborn
PHYSICAL (BODY) SYMPTOMS	<input type="checkbox"/> Insomnia or sleeping too much <input type="checkbox"/> Loss of appetite or eating too much <input type="checkbox"/> Feeling slowed down or too agitated to sit still <input type="checkbox"/> Extreme fatigue and lack of energy <input type="checkbox"/> Decreased sexual drive <input type="checkbox"/> Catatonia (psychotic stage)	<input type="checkbox"/> Decreased need for sleep <input type="checkbox"/> Insomnia; stays up all night <input type="checkbox"/> Increased appetite <input type="checkbox"/> Sudden weight loss <input type="checkbox"/> Increased sexual drive (often to point of hypersexuality) <input type="checkbox"/> Catatonia (psychotic stage)
BEHAVIOR	<input type="checkbox"/> Decreased motivation <input type="checkbox"/> Decreased task performance <input type="checkbox"/> Withdrawal and isolation <input type="checkbox"/> Loss of gratification in effort <input type="checkbox"/> Lack of attention to hygiene and appearance <input type="checkbox"/> No desire to talk, interact, socialize <input type="checkbox"/> Grossly disorganized (psychotic stage)	<input type="checkbox"/> Impulsive <input type="checkbox"/> Intrusive, uninhibited <input type="checkbox"/> Increased goal setting and creativity <input type="checkbox"/> Anger and rage <input type="checkbox"/> Disorganized, easily distracted <input type="checkbox"/> Recklessness: spending money, bad business investments, sexual misadventures <input type="checkbox"/> No concern about consequences of behavior <input type="checkbox"/> Grossly disorganized (psychotic stage)
THINKING	<input type="checkbox"/> Accusatory, self-blaming thoughts <input type="checkbox"/> Dwelling on guilt and personal failures <input type="checkbox"/> Having very low self-esteem <input type="checkbox"/> Inability to think, remember, concentrate <input type="checkbox"/> Marked indecisiveness <input type="checkbox"/> Recurrent thoughts of death; suicidal thoughts; suicidal plans <input type="checkbox"/> Delusions (psychotic stage) <input type="checkbox"/> Disorganized, incoherent speech (psychotic stage)	<input type="checkbox"/> Inflated self-concepts of power, greatness, importance (grandiosity) <input type="checkbox"/> Pressured Speech <input type="checkbox"/> Racing thoughts (flight of ideas) <input type="checkbox"/> Rapid shifts of attention <input type="checkbox"/> Poor concentration <input type="checkbox"/> Memory distortion <input type="checkbox"/> Lack of insight <input type="checkbox"/> Delusions (psychotic stage) <input type="checkbox"/> Disorganized, incoherent speech (psychotic stage)
SENSES	<input type="checkbox"/> Heightened sensitivity of the central nervous system (CNS) <input type="checkbox"/> Hypersensitive to noise, light, stress <input type="checkbox"/> Hallucinations (psychotic stage)	<input type="checkbox"/> Lowering of CNS excitability: Lack of sensitivity to heat, cold, hunger, thirst, pain, injury <input type="checkbox"/> Seeks over-stimulation <input type="checkbox"/> Hallucinations (psychotic stage)
CRITERIA FOR DIAGNOSIS	<input type="checkbox"/> 1 primary Mood disturbance <input type="checkbox"/> At least 4 of the symptoms in the Physical, and/or Thinking categories <input type="checkbox"/> Symptoms present every day for 2 weeks <input type="checkbox"/> No history of mania (unipolar)*	<input type="checkbox"/> Both Mood symptoms <input type="checkbox"/> At least 4 of the symptoms in the Physical, Behavior and/or Thinking categories <input type="checkbox"/> Symptoms lasting at least 1 week

**CLASS 2: CLASS HANDOUT #7: HOW CAN WE SORT OUT MYTHS FROM FACT? WHAT ABOUT THE TIMES WHEN OUR RELATIVES ARE ASSAULTIVE OR SUICIDAL?**

Because of the bizarre and frightening aspects of behavior manifested in the major mental illnesses, many myths exist – that people with mental illness are all dangerous, or they are "psychopathic" killers (a common confusion with the term "psychotic".) None of this is true. However, individuals with schizophrenia and mania who refuse medication and remain untreated are more prone to violence than those who do not have a brain disorder. Let's look at some facts:

- People with schizophrenia and mania who take medication regularly are no more aggressive than the rest of the population. In fact, most people with schizophrenia are customarily withdrawn, frightened and passive.
- People with schizophrenia and mania who are untreated are 6 times more liable to commit a violent act. If they are on street drugs (crack, cocaine, speed, PCP) or abusing alcohol, they are even more likely to act on the violent thoughts and paranoid delusions they are having. The combination of major mental illness and substance abuse is a significant predictor of aggressive behavior.
- The likelihood of violence is greatest among males in their late teens or early 20's.
- The best prediction of future behavior is past behavior. There is good reason to be wary of an individual who was aggressive before becoming ill, or of individuals who have previously been violent when they were particularly disturbed. If your relative has never been aggressive, or never aggressive in a period of psychosis, it is unlikely that s/he will become so.
- Warning signs of immanent physical violence that inpatient staff are taught to look for are: Tremor, rigid posture, clenching jaws and fists, pulsing arteries in the temples, verbal abuse and profanity, and hyperactivity.

Besides our concern about aggression, we all deal with our dread that our family members will do something harmful to themselves. The depression that occurs after a psychotic break (or manic break) is something we need to know about and be prepared for. Many families struggle through the active phase of schizophrenia only to be stunned by a family member's suicide attempt in the residual phase of the illness. Even if these critical events don't happen in our experience, it is important to know about them. As we say in NAMI, "We never know when another family will desperately need what we know."

## CLASS 4: CLASS HANDOUT #8: ROLE OF CHEMICAL MESSENGERS

For each of the vital brain centers to function normally, the chemical messengers (or neurotransmitters) by which they communicate signals must be balanced and working properly. In brain disorders, these regulated neuro-chemical control systems are thrown out of balance. Early theories of causality tended to single out one primary neurotransmitter as the “culprit”, and targeted a single site (receptors in the synapse) as the locus of this biological dysregulation.

The most prominent of these early theories was the Dopamine Hypothesis. This thesis holds that schizophrenia occurs because the brain has too many dopamine receptors, or overly-sensitive receptors, which react to excess dopamine in the brain. Although the theory has never actually been proven, it did lead to a new discovery related to the illness itself. Medications that blocked dopamine in the brain effectively treated (and muted) the psychotic symptoms of the illness, revealing another group of symptoms formerly hidden by these bizarre behaviors. Hence the determination of positive and negative symptoms in schizophrenia

Positive symptoms are not present “before the illness”; they are psychotic in nature and probably reflect excess dopamine in the limbic systems of individuals with schizophrenia and mood disorder psychoses.

Negative symptoms occur in the prodromal (onset) and residual phases of schizophrenic illness and reflect dopamine dysregulation in the frontal cortex. These symptoms reflect a loss of attributes which were part of the personality before the illness struck, but are now greatly diminished. In psychiatric terminology, this is the “A-List.”

Alogia: Impoverished thinking and speech

Avolition: Loss of drive, initiative, motivation

Anhedonia: Inability to experience joy, pleasure

Affective flattening: Diminished ability to feel and convey emotional feelings

Autism: Loss of ability to relate to others

We want to add here that to lose these vital human functions is Absolutely Awful—another two “A-words” to remember as we try to understand diminished function in mental illness.

Current research reveals a much more complicated picture of nerve transmission, caused by neuron damage, rapidly confirming the certainty that mental disorders result from complex subcortical neurotransmitter imbalance syndromes, as well as significant pathophysiology in the neurons themselves. (Now you have a handle on the second Tongue Twister on the list!)

## CLASS 4: CLASS HANDOUT #8A: PATHOPHYSIOLOGY OF BRAIN CELLS AND NEUROGENESIS

In light of advances in understanding how genes and proteins “work” in the brain, research is rapidly moving to explore the molecular dimensions of neuronal damage and regeneration in the brain. According to this new account, the basic “culprit” is the neuron itself, whose normal cellular development is critically compromised by genetic defects.

Unraveling the gene-protein interaction in the brain now plays a commanding role in brain research. The genes we inherit encode simple molecules in neurons (primarily protein molecules), which function to regulate neuron and glial cell development, and control how these cells relay and respond to stimuli. Mutated genes subvert these protein “building-blocks” of brain cells, causing cell shrinkage, cell atrophy and weaknesses in signaling function. In other words, mental illness may occur because brain cells are fundamentally unhealthy, impaired and “mis-wired” because of defective genes.

Recent discoveries suggest that schizophrenia involves a major defect in protein production in the brain (causing severe protein deficiency), and that mood disorders are related to defective neurons which “under-produce” the inhibitory neurotransmitter GABA (the amount of GABA in depressed people is about half that of people not affected by depression).

Linking the new “cell theory” to neurotransmitter imbalance, research indicates that deficiencies in the glutamate messenger system (and its component neuro-regulators GABA and NMDA) cause excess production of dopamine in the brain. The hunt is on to trace how defective glutamate-producing cells reduce glutamate transmission, and to identify how this deficiency causes neural over-stimulation.

The glutamate reduction inquiry will impact bipolar research as well. All signs indicate that the molecular basis of this disorder involves decreased inhibitory control, causing over-stimulation within and between brain cells. On another front, researchers are exploring how medications for bipolar illness affect the inositol signaling mechanism within neurons – a central system mediating nerve cell growth, and influencing the release of neurotransmitters.

The hottest new area in brain research is neurogenesis, a still-controversial hypothesis claiming that brain cells can heal, or regenerate, by stimulating “neuron birth.” Physical and mental “workouts” are proposed to rejuvenate fatigued brain cells, and even create new ones, while preliminary animal research suggests that anti-depressants and lithium may actually spur development of new cells, and increase neuronal connections in the brain.

**CLASS 4: CLASS HANDOUT #9: CONCORDANCE RATES IN MENTAL ILLNESS**

Current research indicates that an individual's risk of developing mental illness correlates with his/her genetic relatedness to a first degree relative.

<b>• <u>No Genetic Relationship</u> (Base Rate)</b>	<b>My risk of getting it is:</b>	<b>My chances of <i>not</i> getting it are:</b>
Schizophrenia Bipolar Disorder Panic Disorder OCD Major Depression	1 % 1.2% 1.6% 2-3% 5%	99% 98.8% 98.4% 98-97% 95%
<b>• <u>First Degree Relatives</u></b>	<b>My risk of getting it is:</b>	<b>My chances of <i>not</i> getting it are:</b>
<b><u>My brother or sister has:</u></b>		
Schizophrenia Bipolar Depression	10% 12% 15%	90% 88% 85%
<b><u>One of my parents has:</u></b>		
Schizophrenia Depression Bipolar Disorder	13% 15% 27%	87% 85% 73%
<b><u>Both my parents have:</u></b>		
Schizophrenia Bipolar	37-46% 74%	63-54% 26%
<b><u>My identical twin has:</u></b>		
Schizophrenia Major Depression Bipolar	35-50% 59% 74-80%	65-50% 41% 26-20%

**NOTE:** Statistics cannot be used to predict the course of individual lives. They can be used as a kind of ballpark risk guide, but they do not evaluate your particular case. Any statement about risk is done on an actuarial basis in the same way that insurance companies compile lists of features about people at risk for automobile accidents.

**SOURCE:** E. Fuller Torrey, M.D., Surviving Schizophrenia, 4th Edition. NY: HarperCollins, 2001.

## CLASS 4: CLASS HANDOUT #10: LOOKING FOR THE "SECOND HIT" IN THE ENVIRONMENT

In discussing the causality of any biological illness, the word "environment" is a very big term. "Environment" could logically include the world of viruses, or neo-natal injury, or exposure to toxic substances, or auto-immune processes (where cells mysteriously destroy each other). It could also include the effects of countless variables arising from our interactions with others and with the world around us.

Two theories are now an important focus of research—the virus theory and the epigenetic theory.

1. Virus Theory: The fact that similar risk factors operate for both schizophrenia and mood disorders suggest that these illnesses have some common infectious environmental causes. There is the well-documented fact that an excess of births occur, in the winter and spring months, of people who later develop these illnesses. This means there may be a seasonal "slow virus" involved. Mothers may have caught the virus during pregnancy; the virus could effect the fetal brain, but pathological changes would not show up until many years after birth.

Being raised in a city is another shared risk factor for people who develop these illnesses: areas of dense population mean that viruses are more easily transmitted. Also, pregnant women known to have viral infections, or compromised immune systems due to malnutrition, are at much greater risk of having children who develop these illnesses.

Researchers at one of the Stanley Research Centers have discovered a link between the Borna disease virus, and more severe depressive episodes in the mood disorders. It is also likely that the protein deficiency now associated with schizophrenia may be caused by virus infections in the brain.

2. Epigenetic Theory: For many years, stress was thought to be the cause of schizophrenia in genetically vulnerable individuals. Although it is well recognized that stress can mediate the timing of onset in schizophrenia, and that stress definitely affects relapse in this illness, there is a growing consensus among researchers that stress as a causal factor has been vastly overrated.

The new position argues that schizophrenic illness probably results from damage to the frontal lobes, in utero or early childhood, which lies dormant until the late teens when the frontal cortex of the brain reaches full development. This "silent lesion" could be hereditary, or could result from birth complications, head injuries (both of which occur at an unusually high rate in schizophrenia), virus, toxins or auto-immune reactions—all of which could "stress" a vulnerable neo-natal brain.

It is now widely believed that Central Nervous System maturation plays a crucial role in this illness in late adolescence, as frontal and limbic circuits do not reach functional maturity until early adulthood.

In this sense, then, schizophrenia is an epigenetic encephalopathy—an organic brain disease—resulting from an early injury whose consequences are there, from the beginning, but do not "unfold" or make a behavioral impact, until the time when cortical connections fully develop.

As we noted in the sections on glial cell loss and viral theory, various perinatal forms of neuro-developmental damage may also occur in bipolar disorder and depression.

Now you have the 4<sup>th</sup> Tongue Twister.

## CLASS 4: CLASS HANDOUT #14: THE LIFE COURSE OF MENTAL ILLNESS

### 10 YEAR PROGNOSIS IN SCHIZOPHRENIA (Torrey, *Surviving Schizophrenia*, p. 130)

25% recover completely. Recovery occurs within the first two years of the illness, and there are usually no more than two discrete episodes of the illness.

25% are much improved. These individuals usually respond well to antipsychotic medication and continue to do well as long as they take it. They can live relatively independently, have a social life, and may be capable of working part or full-time.

25% are modestly improved. These individuals respond less well to medication, often they have "negative" symptoms, and have a history of poor adjustment prior to the onset of their illness. These persons require an extensive support network if they are to lead satisfactory lives.

15% are unimproved. Torrey claims we have nothing to offer these treatment-resistant patients except humane care.

10% deceased. Mostly by suicide.

### 30 YEAR COURSE OF SCHIZOPHRENIA

The course of the disease over thirty years is better than it is over 10 years. A person who is severely incapacitated at age 25 may have only residual traces of positive symptoms at age 50. However, in this span of time, the death rate increases to 15%.

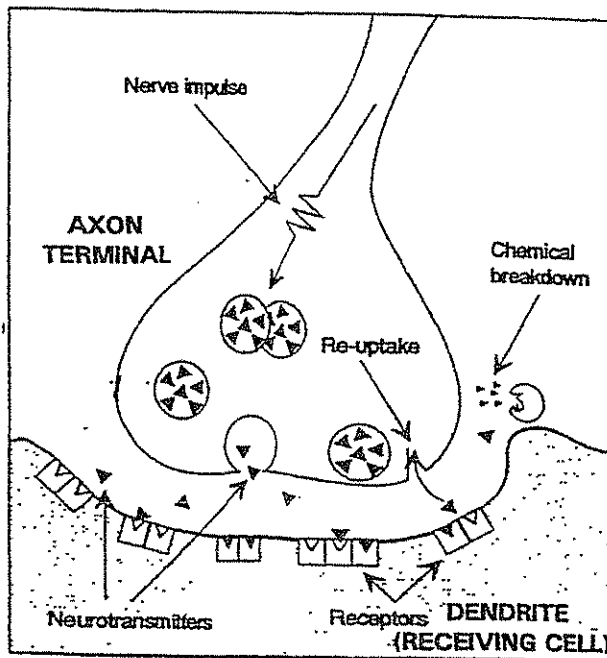
### PROGNOSIS IN BIPOLAR AND DEPRESSION (Torrey, *Surviving Manic Depression* p.110)

For many these are chronic lifelong illnesses. More than half the individuals with these illnesses will have some functional disability which persists throughout their lives. As a rule, the more episodes a person has, the more likely they are to have future episodes. These illnesses have the highest completed suicide rates of any psychiatric disorder.

### PROGNOSIS IN ANXIETY DISORDERS & OCD

For many, these are also chronic lifelong illnesses. Panic disorder has the highest rate of attempted suicide of any psychiatric disorder.

## CLASS 6: CLASS HANDOUT #2: BASIC NEURO-TRANSMISSION AT THE SYNAPSE



This is a schematic drawing of an axon terminal, the synapse and the dendrite (or receiving cell).

Neurotransmitter molecules are stored at the end of each axon terminal (the triangles within the circles on the drawing.)

On the other side of the synapse, the dendrite membrane is covered with protein molecules called receptors (the square "boxes" on the drawing.)

The nerve impulse (or electrical signal) causes the axon to release neurotransmitters (the open circle with triangles flowing into the synapse.)

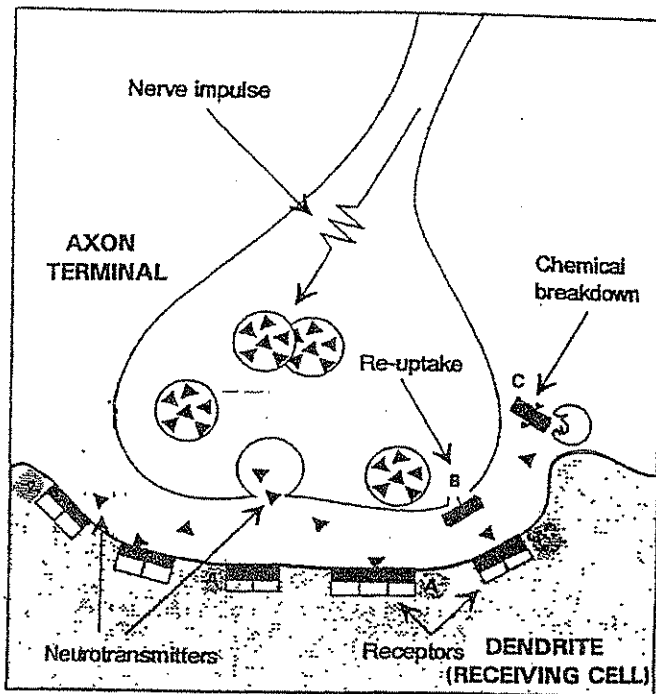
SOURCE: The Biology of Mental Disorders: New Developments in Neurosciences

The neurotransmitters diffuse across the synapse and attach themselves (or bind) to their specific receptors. Receptors are "docking sites"—that is, molecules specifically shaped to fit each neurotransmitter. For example, dopamine (DA) binds solely with DA receptors; serotonin (5-HT) binds only with 5-HT receptors; norepinephrine (NE) binds with only the NE receptors, etc.

Once the neurotransmitter has activated its receptors, it unbinds from the docking sites. Then it is removed from the synapse so the synapse will be available for a new message. This removal process is done in 2 ways:

- 1) Re-uptake: This is a process of re-absorption. Special proteins called "transporters" actually pump neurotransmitters from the synapse back into the axon terminal (the "re-uptake" site on the drawing.)
- 2) Metabolism: The axon releases chemicals which break down neurotransmitters in the synapse into metabolites (the "chemical breakdown" on the drawing.)

**CLASS 6: CLASS HANDOUT #2A: HOW PSYCHIATRIC MEDICATIONS ALTER NEURO-TRANSMISSION**



A. All anti-psychotic drugs prevent dopamine (DA) from binding to key enzymes in the receiving cell membrane.

Anti-psychotic medications do this by “occupying” the dopamine receptor sites so that transmission is blocked. (A)

Strong DA blockades mean less dopamine activity; a weak DA blockade will allow more dopamine transmission to take place.

New “atypical” antipsychotic medications selectively block DA, 5-HT and NE receptors in the brain to produce specific therapeutic benefits.

SOURCE: The Biology of Mental Disorders: New Developments in Neurosciences.

B. Anti-depressant medications do not interfere with transmission across the synapse. These drugs target the removal process—that is, anti-depressants block the reuptake of NE, 5-HT or DA back into the axon terminal. (B)

C. Anti-depressant drugs called MAO Inhibitors prevent the metabolic breakdown of these neurotransmitters in the synapse. (C)

When neurotransmitters are not reabsorbed or metabolized in the synapse, it increases the amount available for stimulation of receptors on the receiving cell membrane.

It is now evident that receptor binding or blocking merely “kicks-off” a series of chemical events which occur “downstream” from receptor sites, inside the cell body and nucleus of the receiving neuron. These chemical processes eventually produce significant changes in the way the sending and receiving neurons function. It is these changes which account for the eventual effectiveness of psychiatric drugs. This is why research will now concentrate on intra-cellular processes as more effective targets for drug action.