

Ministry of Education and Science of Ukraine
V. N. Karazin Kharkiv National University

SCHIZOPHRENIA

Methodical instruction

Kharkiv – 2020

УДК 616.895.8

S 31

Reviewers:

H. M. Kozhyna – MD, PhD, Doctor of Medical Sciences, Professor, Head of the Department of Psychiatry, Narcology and Medical psychology of Kharkiv National Medical University;

V. S. Pidkorytov – MD, PhD, Doctor of Medical Sciences, Professor, Head of Department of clinical, social and child psychiatry the “Institute of Neurology, Psychiatry and Narcology of the National Academy of Medical Sciences of Ukraine” State Institution.

Compliers :

O. I. Minko, I. V. Linskiy, T. S. Mishchenko, F. V. Gaydabrus, E. E. Semikina, A. V. Baranenko, O. V. Skrynnik, D. V. Strygol, K. I. Linska, A. V. Temnikova, N. V. Khrol.

*Approved for publishing by the decision of Scientific and Methodological Council
of V. N. Karazin Kharkiv National University
(protocol № 4 from 24.06.2020)*

Schizophrenia : methodical instruction / complies : Minko O. I., Linskiy I. V.,
Mishchenko T. S. Kharkiv : V. N. Karazin Kharkiv National University, 2020. 36 p.

Students sometimes begin working in psychiatry with a set of preconceptions about what it is – preconceptions shaped by the fact that information about psychiatry is omnipresent in popular culture. Schizophrenia is very serious mental illness. One of the greatest challenges to the student of schizophrenia is to understand the broad range of signs and symptoms that arise from its underlying cognitive and emotional impairments. Diagnosis, clinical manifestations and treatment of schizophrenia are overlooked by important meals for those with special needs and students of medical faculties. Universities. By the method of methodological instruction, knowledge and skill in diagnosing and treating schizophrenia are given.

УДК 616.895.8

© V. N. Karazin Kharkiv National University, 2020

© Minko O. I., Linskiy I. V., Mishchenko T. S., compliers, 2020

© I. M. Donchik, design of cover layout, 2020

Навчальне видання

Мінко Олександр Іванович, **Лінський** Ігор Володимирович,

Міщенко Тамара Сергіївна, **Гайдабрус** Андрій Володимирович

Семікіна Олена Євгеніївна, **Бараненко** Олексій Валерійович

Скрипник Ольга Вячеславівна, **Штриголь** Діана Вячеславівна

Лінська Катерина Ігорівна, **Темнікова** Ганна Владиславівна,

Хрол Наталя Володимирівна

Шизофренія

Методичні рекомендації з дисципліни «Психіатрія, наркологія»
для здобувачів вищої освіти IV курсу медичного факультету

(Англ. мовою)

Комп’ютерне верстання **B. B. Савінкова**

Макет обкладинки **I. M. Дончик**

Формат 60×84/16. Ум. друк. арк. 2,09. Наклад 100 пр. Зам. № 116/20.

Видавець і виготовлювач

Харківський національний університет імені В. Н. Каразіна,
61022, м. Харків, майдан Свободи, 4.

Свідоцтво суб’єкта видавничої справи ДК № 3367 від 13.01.2009

Видавництво ХНУ імені В. Н. Каразіна

Тел. 705-24-32

CONTENTS

Introduction	4
Definition	5
DSM-5 Diagnostic Criteria for Schizophrenia	5
Epidemiology	7
The causes of schizophrenia	8
Signs and symptoms	8
Clinical Findings	9
Course of illness	16
Psychological	16
Diagnosis of schizophrenia	18
Subtypes of schizophrenia	21
Differential diagnosis.....	22
History	24
Prevention	27
Clinical Management.....	27
Prognosis.....	30
Self-Assessment Questions.....	31
Tests.....	32
Bibliography	36
.	

*I felt a Cleaving in my Mind –
As if my Brain had split –
I tried to match it - Seam by Seam –
But could not make them fit.*

Emily Dickinson (American poetess)

INTRODUCTION

Topicality:

Schizophrenia is not a “split personality”, as many people assume, based on its name. The illness is called “schizo” (fragmented or split apart) “phrenia” (mind) because it causes its victims to experience profound disabilities in their capacity to think clearly and to feel normal emotions. It is probably the most devastating illness that psychiatrists treat.

Schizophrenia strikes people just when they are preparing to enter the phase of their lives in which they can achieve their highest growth and productivity – typically in the teens or early 20s – leaving most of them unable to return to normal young adult lives: to go to school, to find a job, or to marry and have children.

According to The Global Burden of Disease, a World Health Organization – sponsored study of the cost of medical illnesses worldwide, schizophrenia is among the 10 leading causes of disability in the world among people in the 15 – 44 age range.

In addition to **schizophrenia**, DSM-5 recognizes an entire spectrum of psychotic disorders that also includes delusional disorder, brief psychotic disorder, schizopreniform disorder, schizoaffective disorder, substance and medication-related psychotic disorders, and catatonic disorder due to another medical condition. Although schizotypal personality disorder is considered to fall within the schizophrenia spectrum.

Supportive software: patients, medical history.

Students must know:

1. Epidemiology.
2. Classification and Diagnostic criteria of Schizophrenia. Etiology. Pathogenesis.
3. Schizophrenia Spectrum and Other Psychotic Disorders.
4. Treatment: pharmacotherapy, psychotherapy.
5. Prognosis. Prevention.

Students should be able to:

1. Students should be able to: be able to talk with a patient with schizophrenia.
2. Carry out diagnostics positive and negative symptoms according to DSM-5 and ICD-10.
3. Outline a treatment plan.

DEFINITION

Schizophrenia – chronic progressive mental disorder that characterized by the loss of unity between thinking, motivation, emotions (increasing of emotional dullness, paralogical thinking, parabulalia) and development of specific dementia.

One of the greatest challengers to the student of schizophrenia is to understand the broad range of signs and symptoms that arise from its underlying cognitive and emotional impairments. Its symptoms include dysfunctions in nearly every capacity of which the human brain is capable – perception, inferential thinking, language, memory, and executive functions.

Schizophrenia is a mental disorder characterized by abnormal social behavior and failure to understand what is real.

- Common symptoms include false beliefs, unclear or confused thinking, hearing voices that others do not hear, reduced social engagement and emotional expression, and a lack of motivation.
- People with schizophrenia often have additional mental health problems such as anxiety, depressive, or substance-use disorders.
- Symptoms typically come on gradually, begin in young adulthood, and last a long time.

In DSM-5, schizophrenia is defined by a group of characteristic symptoms, such as hallucinations, delusions, or negative symptoms (i.e., affective flattening, alogia, avolition); deterioration in social, occupational, or interpersonal relationships; and continuous signs of the disturbance for at least 6 months.

DSM-5 DIAGNOSTIC CRITERIA FOR SCHIZOPHRENIA

A. Two (or more) of the following, each present for a significant portion of time during a 1-month period (or less if successfully treated). At least one of these must be (1), (2), or (3):

1. Delusions
2. Hallucinations
3. Disorganized speech (e.g., frequent derailment or incoherence).
4. Grossly disorganized or catatonic behavior.
5. Negative symptoms (i.e., diminished emotional expression or avolition).

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

C. Continuous signs of the disturbance persist for at least 6 months. This 6-month period must include at least 1 month of symptoms (or less if successfully treated) that meet Criterion A (i.e., active-phase symptoms) and may include periods of prodromal or residual symptoms. During these prodromal or residual periods, the signs of the disturbance may be manifested by only negative symptoms or by two or more symptoms listed in Criterion A present in an attenuated form (e.g., odd beliefs, unusual perceptual experiences).

D. Schizoaffective disorder and depressive or bipolar disorder with psychotic features have been ruled out because either 1) no major depressive or maniac episodes have occurred concurrently with the active-phase symptoms, or 2) if mood episodes have occurred during active-phase symptoms, they have been present for a minority of the total duration of the active and residual periods of the illness.

E. The disturbance is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication) or another medical condition.

F. If this is a history of autism spectrum disorder or a communication disorder of childhood onset, the additional diagnosis of schizophrenia is made only if prominent delusions or hallucinations, in addition to the other required symptoms of schizophrenia, are also present for at least 1 month (or less if successfully treated).

Specify if:

The following course specifiers are only to be used after a 1-year duration of the disorder and if they are not in contradiction to the diagnostic course criteria.

First episode, currently in acute episode: first manifestation of the disorder meeting the defining diagnostic symptom and time

criteria. An acute episode is a time period in which the symptom criteria are fulfilled.

First episode, currently in partial remission: partial remission is a period of time during which an improvement after a previous episode is maintained and in which the defining criteria of the disorder are only partially fulfilled.

First episode, currently in full remission: full remission is a period of time after a previous episode during which no disorder-specific symptoms are present.

Multiple episodes, currently in acute episode: multiple episodes may be determined after a minimum of two episodes (i.e., after a first episode, a remission and a minimum of one relapse).

Multiple episodes, currently in partial remission

Multiple episodes, currently in full remission

Continuous: symptoms fulfilling the diagnostic symptom criteria of the disorder are remaining for the majority of the illness course, with subthreshold symptom periods being very brief relative to the overall course.

Unspecified

Specify it:

With catatonia (refer to the criteria for catatonia associated with another mental disorder for definition).

Coding note: use additional code for catatonia associated with schizophrenia to indicate the presence of the comorbid catatonia.

Specify current severity:

Severity is rated by a quantitative assessment of the primary symptoms of psychosis, including delusions, hallucinations, disorganized speech, abnormal psychomotor behavior, and negative symptoms. Each of these symptoms may be rated for its current severity (most severe in the last 7 days) on a 5-point scale ranging from 0 (not present) to 4 (present and severe).

Note: diagnosis of schizophrenia can be made without using this severity specifier.

EPIDEMIOLOGY

Schizophrenia affects around 0.3–0.7 % of people at some point in their life, or 24 million people worldwide as of 2011.

It occurs 1.4 times more frequently in males than females and typically appears earlier in men—the peak ages of onset are 25 years for males and 27 years for females.

Onset in childhood is much rarer, as is onset in middle or old age.

Despite the prior belief that schizophrenia occurs at similar rates worldwide, its frequency varies across the world, within countries, and at the local and neighborhood level.

This variation has been estimated to be fivefold. It causes approximately one percent of worldwide disability adjusted life years and resulted in 20,000 deaths in 2010.

The rate of schizophrenia varies up to threefold depending on how it is defined.

The World Health Organization found the percentage of people affected and the number of new cases that develop each year is roughly similar around the world, with age-standardized prevalence per 100,000 ranging from 343 in Africa to 544 in Japan and Oceania for men, and from 378 in Africa to 527 in Southeastern Europe for women.

About 1.1 % of adults have schizophrenia in the United States.

The causes of schizophrenia

The causes of schizophrenia include environmental and genetic factors.. Possible environmental factors include being raised in a city, cannabis use during adolescence, certain infections, parental age and poor nutrition during pregnancy.

- Genetic factors include a variety of common and rare genetic variants.

- Diagnosis is based on observed behavior, the person's reported experiences and reports of others familiar with the person. During diagnosis a person's **culture** must also be taken into account. As of 2013 there is no objective test. Schizophrenia does not imply a "split personality" or "dissociative identity disorder" – conditions with which it is often confused in public perception.

SIGNS AND SYMPTOMS

Individuals with schizophrenia may experience hallucinations (most reported are hearing voices), delusions (often bizarre or persecutory in nature), and disorganized thinking and speech.

The last may range from loss of train of thought, to sentences only loosely connected in meaning, to speech that is not understandable known as word salad.

Social withdrawal, sloppiness of dress and hygiene, and loss of motivation and judgment are all common in schizophrenia.

Distortions of self-experience such as feeling as if one's thoughts or feelings are not really one's own to believing thoughts are being inserted into one's mind, sometimes termed passivity phenomena, are also common.

- There is often an observable pattern of emotional difficulty, for example lack of responsiveness.
- Impairment in social cognition is associated with **schizophrenia**, as are symptoms of paranoia.
- Social isolation commonly occurs.

Difficulties in working and long-term memory, attention, executive functioning, and speed of processing also commonly occur.

- In one uncommon subtype, the person may be largely mute, remain motionless in bizarre postures, or exhibit purposeless agitation, all signs of catatonia.
- People with **schizophrenia** often find facial emotion perception to be difficult.
- It is unclear if the phenomenon called "thought blocking", where a talking person suddenly becomes silent for a few seconds to minutes, occurs in **schizophrenia**.

About 30 to 50 percent of people with schizophrenia fail to accept that they have an illness or comply with their recommended treatment. Treatment may have some effect on insight.

- People with schizophrenia may have a high rate of irritable bowel syndrome but they often do not mention it unless specifically asked.
- Psychogenic polydipsia, or excessive fluid intake in the absence of physiological reasons to drink, is relatively common in people with schizophrenia.

CLINICAL FINDINGS

Using factor analysis, researchers have repeatedly identified three dimensions (or groups of related symptoms) in schizophrenia: psychotism may be positive psychotic symptoms, negative symptoms, and disorganization. The psychotic dimension includes positive symptoms (i.e., symptoms characterized by the presence of something that should be absent, such as hearing voices). Positive symptoms are those that most individuals do not normally experience, but are present in people with schizophrenia. They can include delusions, disordered thoughts and speech, and tactile, auditory, visual, olfactory

and gustatory hallucinations, typically regarded as manifestations of psychosis.

Hallucinations are also typically related to the content of the delusional theme. Positive symptoms generally respond well to medication. The negative dimension includes negative symptoms (i.e., symptoms characterized by the absence of something that should be present, such as avolition (lack of motivation). The disorganization dimension includes disorganized speech and behavior and inappropriate affect.

The Psychotic Dimension

The Psychotic Dimension refers to hallucinations and delusions, two classic “psychotic” symptoms that reflect a patient’s confusion about the loss of boundaries between himself or herself and the external world. Hallucinations are perceptions experienced without an external stimulus to the sense organs and have a quality similar to a true perception. Patients with schizophrenia commonly report auditory, visual, tactile, gustatory, or olfactory hallucinations or a combination of these. Auditory hallucinations are the most frequent; they typically experienced as speech (“voices”). The voices may be mumbled or heard clearly, and they may speak words, phrases, or sentences. Visual hallucinations may be simple or complex and include flashes or light, persons, animals, or objects. Olfactory and gustatory hallucinations are often experienced together, especially as unpleasant tastes or odors. Tactile hallucinations may be experienced as sensations of being touched or pricked, electrical sensations, or formication, which is the sensation of insects crawling under the skin.

Schizophrenics are characterized by pseudo-hallucinations. The pseudo hallucinations are inside (often head – in the case of acoustical and eyes – visual). They can have not sensual vivacity – to be as dim shadows or to be present outside a vision field (behind a back) – extracampinious. Very much frequently at the patients the sensation like someone encloses these votes or images in patient’s head.

Mental hallucinations – the type of pseudo hallucinations the patient perceives an idea of the interlocutor silently, or feeling of introduction of another's ideas in a head. Delusions involve disturbance in thought rather than perception; they are firmly held beliefs that are untrue as well as contrary to a person’s educational and cultural background. Delusions typically have somatic, grandiose, religious, nihilistic, sexual, or persecutory themes and often differ according to the patient’s cultural background.

While very common in schizophrenia, delusions and hallucinations also occur in other conditions, such as the neurocognitive disorders and the mood disorders.

Kurt Schneider, a German psychiatrist working in the early twentieth century, argued that certain types of hallucinations and delusions were of the “1st rank” symptoms:

- Hallucinations - thoughts aloud, arguing, commenting
 - Thoughts alienation phenomena – withdrawal, thoughts insertion, thoughts broadcasting
 - Passivity phenomena – “made” feelings, acts, impulses (like a robot)
 - Delusional perception with a private, illogical meaning
- 2nd rank symptoms:
- Other hallucinations
 - Perplexity
 - Affect disturbance

Other symptoms

Abnormal social behavior and failure to understand what is real. False beliefs (delusions), unclear or confused thinking, hearing voices (hallucinations), reduced social engagement and emotional expression, and a lack of motivation.

Symptoms typically come on gradually, begin in young adulthood, and last a long time.

The Negative Dimension

Negative symptoms are deficits of normal emotional responses or of other thought processes, and are less responsive to medication. DSM-5 lists two negative symptoms as characteristic of schizophrenia: diminished emotional expression and avolition. Other negative symptoms common of schizophrenia are alogia and anhedonia. These symptoms are described below:

– Diminished emotional expression (affective flattening or blunting) is a reduced intensity of emotional expression and response. It is manifested by unchanging facial expression, decreased spontaneous movements, poverty of expressive gestures, poor eye contact, lack of voice inflections, and slowed speech.

– Avolition is a loss of the ability to initiate goal-directed behavior and to carry it through to completion. Patients seem inert and unmotivated.

– Alogia is characterized by a diminution in the amount of spontaneous speech or a tendency to produce speech that is empty or impoverished in content when the amount is adequate.

– Anhedonia is the inability to experience pleasure. Patients may describe themselves as feeling emotionally empty and unable to enjoy activities that previously gave them pleasure, such as playing sports or visiting with family or friends.

They commonly include flat expressions or little emotion, poverty of speech, inability to experience pleasure, lack of desire to form relationships, and lack of motivation.

Negative symptoms appear to contribute more to poor quality of life, functional ability, and the burden on others than positive symptoms do.

People with greater negative symptoms often have a history of poor adjustment before the onset of illness, and response to medication is often limited.

Negative symptoms Deficits of normal emotional responses or of other thought processes

Social withdrawal

"Flat affect," dull or monotonous speech, and lack of facial expression

Besides

Difficulty expressing emotions

Lack of self-care and Inability to feel pleasure (anhedonia)

The Disorganization Dimension

The Disorganization Dimension refers to disorganized speech, disorganized or bizarre behavior, and inappropriate affect.

Disorganization speech, or thought disorder, was regarded as the most important symptom by Eugen Bleuler, who was responsible for coining the term schizophrenia to highlight the importance of fragmenting of thought. Standard definitions for various types of thought disorders have been developed that stress objective aspects of language and communication (which are empirical indicators of "thought"), such as derailment (loose associations), poverty of speech, poverty of content of speech, and tangential replies, and all have been found to occur frequently in both schizophrenia and mood disorders. Manic patients often have a thought disorder characterized by tangentiality, derailment, and illogicality. Depressed patients manifest thought disorder less frequently than do maniac patients but often have poverty of speech, tangentiality, or circumstantiality. Other types

of formal thought disorder include perseveration, distractibility, clang, neologism, echolalia, and blocking. With the possible exception of clang in mania, none appears to be disorder specific.

Many patients with schizophrenia have various types of disorganized motor and social behavior, another aspect of this dimension. Abnormal motor behaviors include.

- Catatonic stupor: The patient is immobile, mute, and unresponsive, yet fully conscious.

- Catatonic excitement: The patient has uncontrolled and aimless motor activity. Patients sometimes assume bizarre or uncomfortable postures (e.g., squatting) and maintain them for long periods.

- Stereotypy: The patient has a repeated but non-goal-directed movement, such as back-and-forth rocking.

- Mannerisms: The patient has goal-directed activities that are either odd in appearance or out of context, such as grimacing.

- Echopraxia: The patient imitates movements and gestures of another person.

- Automatic obedience: The patient carries out simple commands in a robot-like fashion.

- Negativism: The patient refuses to cooperate with simple requests for no apparent reason.

Disorganized behavior is common in schizophrenia patients, particularly as the illness advances. Patients neglect themselves, become messy or unkempt, and wear dirty or inappropriate clothing. They ignore their surroundings so that they become cluttered and untidy. Patients sometimes develop other odd behaviors that break social conventions, such as foraging through garbage bins or shouting obscenities. Many of today's street people have schizophrenia.

Inappropriate affect is another component of the disorganized dimension. Patients may smile inappropriately when speaking of neutral or sad topics or giggle for no apparent reason.

Cognitive dysfunction Indicator of patient's functional state

Predictor of how functional an individual will be the quality of occupational performance, and how successful the individual will be in maintaining treatment.

Deficits in cognitive abilities are widely recognized as a core feature of **schizophrenia**. The extent of the cognitive deficits an individual experiences is a predictor of how functional an individual will be, the quality of occupational performance, and how successful the individual will be in maintaining treatment.

The presence and degree of cognitive dysfunction in individuals with schizophrenia has been reported to be a better indicator of functionality than the presentation of positive or negative symptoms.

The deficits impacting the cognitive function are found in a large number of areas: working memory, long-term memory, verbal declarative memory, semantic processing, episodic memory, attention, learning (particularly verbal learning). Deficits in verbal memory are the most pronounced in individuals with schizophrenia, and are not accounted for by deficit in attention. Verbal memory impairment has been linked to a decreased ability in individuals with schizophrenia to semantically encode (process information relating to meaning), which is cited as a cause for another known deficit in long-term memory.

When given a list of words, healthy individuals remember positive words more frequently (known as the Pollyanna principle), however, individuals with schizophrenia tend to remember all words equally regardless of their connotations, suggesting that the experience of anhedonia impairs the semantic encoding of the words.

These deficits have been found in individuals before the onset of the illness to some extent. – First-degree family members of individuals with schizophrenia and other high-risk individuals also show a degree of deficit in cognitive abilities, and specifically in working memory.

A review of the literature on cognitive deficits in individuals with schizophrenia shows that the deficits may be present in early adolescence, or as early as childhood.

The deficits which an individual with schizophrenia presents tend to remain the same over time in most patients, or follow an identifiable course based upon environmental variables.

Although the evidence that cognitive deficits remain stable over time is reliable and abundant, much of the research in this domain focuses on methods to improve attention and working memory. Efforts to improve learning ability in individuals with schizophrenia using a high- versus low-reward condition and an instruction-absent or instruction-present condition revealed that increasing reward leads to poorer performance while providing instruction leads to improved performance, highlighting that some treatments may exist to increase cognitive performance.

Training individuals with schizophrenia to alter their thinking, attention, and language behaviors by verbalizing tasks, engaging in cognitive rehearsal, giving self-instructions, giving coping statements to the self to handle failure, and providing self-reinforcement for success, significantly improves performance on recall tasks.

This type of training, known as self-instructional (SI) training, produced benefits such as lower number of nonsense verbalizations and improved recall while distracted.

Late adolescence and early adulthood are peak periods for the onset of **schizophrenia**, critical years in a young adult's social and vocational development. In 40 % of men and 23 % of women diagnosed with **schizophrenia**, the condition manifested itself before the age of 19.

Manifestations of cognitive deficit Inability to process information and make decisions

- Difficulty focusing or paying attention
- Disturbance of memory learning new tasks
 - working memory,
 - long-term memory,
 - verbal declarative memory,
 - Semantic processing, etc.

Other Symptoms

Many patients **lack insight**; they do not believe they are ill and reject the idea that they need treatment. Orientation and memory usually are normal, unless they are impaired by the patient's psychotic symptoms, inattention, or distractibility.

Nonlocalizing **neurological soft signs** occur in some patients and include abnormalities in stereognosis, graphesthesia, balance, and proprioception. Some patients have disturbances of sleep, sexual interest, and other bodily functions. Many schizophrenic patients have inactive sex drives and avoid sexual intimacy.

Substance abuse is common and includes alcohol and other drugs. Patients who abuse substances tend to be young, male, and poorly adherent with treatment; they also have more frequent hospitalizations than those who do not abuse substances. It is thought that many schizophrenic patients abuse substances in an attempt to lift their mood, boost their level of motivation, or reduce their medication side effects (e.g., akinesia).

The main psychopathological syndromes in patients with schizophrenia are hallucinatory-paranoid; syndrome mental automatisms named Kandinskiy-Clérambault – a type of paranoid syndrome. It consists on mental automatisms (the patient thinks that somebody directs, manages his actions (motor), his mind (mental), his thoughts (mental) and his somatic functions and sensations (sensory) and/or pseudo hallucinations and/or delusion of influence and control; catatonic; hebephrenic (or Disorganized); apathy-abulic.

COURSE OF ILLNESS

Schizophrenia typically begins with a prodromal phase in the mid to late teens that is characterized by subtle changes in emotional, cognitive, and social functioning. This is followed by an active phase, during which psychotic symptoms develop. Many patients go for as long as 2 years before symptoms become so troubling that a psychiatrist is consulted. The psychotic symptoms usually respond relatively well to antipsychotic treatment, but ongoing problems such as blunted emotions or odd behavior tend to persist as the person passes into a residual phase. Acute exacerbations tend to occur from time to time, even when the patient continues to take medication.

Breaking the news about the diagnosis to the patient and his or her family can be very difficult. The first question that they will ask is "What does the future hold?" While it is always difficult to know for sure in any particular case, many clinicians were taught the "rule of thirds": about one-third of patients first diagnosed with schizophrenia will have a relatively good outcome, with minimal symptoms and mild impairments in cognition and social functioning; one-third will have a poor outcome, with persistence of psychotic symptoms, prominent negative symptoms, and significant psychosocial impairment; and one-third will have an outcome somewhere in the middle. As originally formulated, the rule of thirds was based on relatively limited clinical observation rather than rigorous scientific studies. Nonetheless, these studies stressed an important fact: schizophrenia has a variable outcome. In fact, follow-up studies show that a variety of features are associated with outcome. Among these, IQ is one of the strongest predictors of outcome, with age at onset, gender, severity and type of initial symptoms. And structural brain abnormalities also having predictive value.

Cross-cultural studies show that patients in less developed countries tend to have better outcomes than those in more developed ones.

Individuals with schizophrenia may be better accepted in less developed societies, have fewer external demands (e.g., work, school), and be more likely to be taken care of by family members.

PSYCHOLOGICAL

Many psychological mechanisms have been implicated in the development and maintenance of **schizophrenia**. Cognitive biases have been identified in those with the diagnosis or those at risk, especially when under stress or in confusing situations.

Some cognitive features may reflect global neurocognitive deficits such as memory loss, while others may be related to particular issues and experiences.

Despite a demonstrated appearance of blunted affect, recent findings indicate that many individuals diagnosed with **schizophrenia** are emotionally responsive, particularly to stressful or negative stimuli, and that such sensitivity may cause vulnerability to symptoms or to the disorder.

Some evidence suggests that the content of delusional beliefs and psychotic experiences can reflect emotional causes of the disorder, and that how a person interprets such experiences can influence symptomatology.

The use of "safety behaviors" (acts such as gestures or the use of words in specific contexts) to avoid or neutralize imagined threats may actually contribute to the chronicity of delusions.

Further evidence for the role of psychological mechanisms comes from the effects of psychotherapies on symptoms of **schizophrenia**.

Neurological

Functional magnetic resonance imaging (fMRI) showing two levels of the brain; areas in orange were more active in healthy controls than in medicated people with schizophrenia. People with **schizophrenia** who are medication compliant have an association with enlarged lateral ventricles in the brain.

Schizophrenia is associated with subtle differences in brain structures, found in forty to fifty percent of cases, and in brain chemistry during acute psychotic states.

Studies using neuropsychological tests and brain imaging technologies such as fMRI and PET to examine functional differences in brain activity have shown that differences seem to occur most commonly in the frontal lobes, hippocampus and temporal lobes.

Reductions in brain volume are most pronounced in grey matter structures, and correlate with duration of illness, although white matter abnormalities have also been found.

A progressive increase in ventricular volume as well as a progressive reduction in grey matter in the frontal, parietal, and temporal lobes has also been observed.

These differences have been linked to the neurocognitive deficits often associated with **schizophrenia**.

Because neural circuits are altered, it has alternatively been suggested that **schizophrenia** could be thought of as a neuro-

developmental disorder with psychosis occurring as a possibly preventable late stage.

There has been debate on whether treatment with antipsychotics can itself cause reduction of brain volume.

Particular attention has been paid to the function of dopamine in the mesolimbic pathway of the brain. This focus largely resulted from the accidental finding that phenothiazine drugs, which block dopamine function, could reduce psychotic symptoms.

It is also supported by the fact that amphetamines, which trigger the release of dopamine, may exacerbate the psychotic symptoms in **schizophrenia**.

The influential dopamine hypothesis of **schizophrenia** proposed that excessive activation of D₂ receptors was the cause of (the positive symptoms of) **schizophrenia**.

Although postulated for about 20 years based on the D₂ blockade effect common to all antipsychotics, it was not until the mid-1990s that PET and SPET imaging studies provided supporting evidence.

While dopamine D₂/D₃ receptors are elevated in **schizophrenia**, the effect size is small, and only evident in medication naive schizophrenics. On the other hand, presynaptic dopamine metabolism and released is elevated despite no difference in dopamine transporter.

The altered synthesis of dopamine in the nigrostriatal system have been confirmed in several human studies.

Hypo activity of dopamine D₁ receptor activation in the prefrontal cortex has also been observed.

The hyperactivity of D₂ receptor stimulation and relative hypo activity of D₁ receptor stimulation is thought to contribute to cognitive dysfunction by disrupting signal to noise ratio in cortical microcircuits.

The dopamine hypothesis is now thought to be simplistic, partly because newer antipsychotic medication (atypical antipsychotic medication) can be just as effective as older medication (typical antipsychotic medication), but also affects serotonin function and may have slightly less of a dopamine blocking effect.

Interest has also focused on the neurotransmitter glutamate and the reduced function of the NMDA glutamate receptor in **schizophrenia**, largely because of the abnormally low levels of glutamate receptors found in the postmortem brains of those diagnosed with **schizophrenia**, and the discovery that glutamate-blocking drugs

such as phencyclidine and ketamine can mimic the symptoms and cognitive problems associated with the condition.

Reduced glutamate function is linked to poor performance on tests requiring frontal lobe and hippocampal function, and glutamate can affect dopamine function, both of which have been implicated in **schizophrenia**; this has suggested an important mediating (and possibly causal) role of glutamate pathways in the condition.

But positive symptoms fail to respond to glutamatergic medication.

Closely related to evidence of glutamate dysfunction in schizophrenia is the observed changes GABAergic transmission. Post-Mortem studies demonstrate decreased expression of GAD67, GAT-1 and GABA_A receptor subunits in the prefrontal cortex, although this appears to be restricted to a certain subsets of parvalbumin containing GABAergic neurons. While *in vivo* imaging of GABAergic signaling appears to be moderately reduced, this may be dependent upon treatment and disease stage.

Schizophrenia diagnosis criteria Schizophrenia is diagnosed based on criteria in either the American Psychiatric Association's (APA) fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), or the World Health Organization's International Statistical Classification of Diseases and Related Health Problems (ICD-10).

These criteria use the self-reported experiences of the person and reported abnormalities in behavior, followed by a clinical assessment by a mental health professional.

DIAGNOSIS OF SCHIZOPHRENIA

Symptoms associated with **schizophrenia** occur along a continuum in the population and must reach a certain severity and level of impairment, before a diagnosis is made.

As of 2013 there is no objective test.

Criteria

In 2013, the American Psychiatric Association released the fifth edition of the DSM (DSM-5). To be diagnosed with schizophrenia, two diagnostic criteria have to be met over much of the time of a period of at least one month, with a significant impact on social or occupational functioning for at least six months.

The person had to be suffering from delusions, hallucinations, or disorganized speech. A second symptom could be negative symptoms, or severely disorganized or catatonic behavior.

The definition of schizophrenia remained essentially the same as that specified by the 2000 version of DSM (DSM-IV-TR), but DSM-5 makes a number of changes.

Subtype classifications – such as catatonic and paranoid schizophrenia – are removed. These were retained in previous revisions largely for reasons of tradition, but had subsequently proved to be of little worth.

Catatonia is no longer so strongly associated with **schizophrenia**.

In describing a person's **schizophrenia**, it is recommended that a better distinction be made between the current state of the condition and its historical progress, to achieve a clearer overall characterization.

Special treatment of Schneider's first-rank symptoms is no longer recommended.

Schizoaffective disorder is better defined to demarcate it more cleanly from **schizophrenia**.

An assessment covering eight domains of psychopathology – such as whether hallucination or mania is experienced – is recommended to help clinical decision-making.

The ICD-10 criteria are typically used in European countries, while the DSM criteria are used in the United States and to varying degrees around the world, and are prevailing in research studies. The ICD-10 criteria put more emphasis on Schneiderian first-rank symptoms.

In practice, agreement between the two systems is high. The current proposal for the ICD-11 criteria for **schizophrenia** recommends adding self-disorder as a symptom.

If signs of disturbance are present for more than a month but less than six months, the diagnosis of schizopreniform disorder is applied.

Psychotic symptoms lasting less than a month may be diagnosed as brief psychotic disorder, and various conditions may be classed as psychotic disorder not otherwise specified, while schizoaffective disorder is diagnosed if symptoms of mood disorder are substantially present alongside psychotic symptoms.

If the psychotic symptoms are the direct physiological result of a general medical condition or a substance, then the diagnosis is one of a psychosis secondary to that condition.

Schizophrenia is not diagnosed if symptoms of pervasive developmental disorder are present unless prominent delusions or hallucinations are also present.

SUBTYPES OF SCHIZOPHRENIA

With the publication of DSM-5, the APA removed all sub-classifications of **schizophrenia**. The five sub-classifications included in DSM-IV-TR were:

Paranoid type: Delusions or auditory hallucinations are present, but thought disorder, disorganized behavior, or affective flattening are not. Delusions are persecutory and/or grandiose, but in addition to these, other themes such as jealousy, religiosity, or somatization may also be present. (DSM code 295.3/ICD code F20.0)

Disorganized type: Named *hebephrenic schizophrenia* in the ICD. Where thought disorder and flat affect are present together. (DSM code 295.1/ICD code F20.1)

Catatonic type: The subject may be almost immobile or exhibit agitated, purposeless movement. Symptoms can include catatonic stupor and waxy flexibility. (DSM code 295.2/ICD code F20.2)

Undifferentiated type: Psychotic symptoms are present but the criteria for paranoid, disorganized, or catatonic types have not been met. (DSM code 295.9/ICD code F20.3)

Residual type: Where positive symptoms are present at a low intensity only. (DSM code 295.6/ICD code F20.5)

The ICD-10 defines additional subtypes:

Post-schizophrenic depression: A depressive episode arising in the aftermath of a schizophrenic illness where some low-level schizophrenic symptoms may still be present. (ICD code F20.4)

Simple schizophrenia: Insidious and progressive development of prominent negative symptoms with no history of psychotic episodes. (ICD code F20.6)

Other **schizophrenia** include cenesthopathic **schizophrenia** and schizopreniform disorder NOS (ICD code F20.8).

“Other **schizophrenia**” (F20.8) in the Russian version of the ICD-10 includes: hypochondriacal **schizophrenia** (ICD-10 code F20.8xx1), cenesthopathic **schizophrenia** (ICD-10 code F20.8xx2), childhood type **schizophrenia** (ICD-10 code F20.8xx3), atypical types of **schizophrenia** (ICD-10 code F20.8xx4), **schizophrenia** of other specified types (ICD-10 code F20.8xx8).

Latent schizophrenia (F21.1), schizophrenic reaction (F21.2), pseudoneurotic schizophrenia (F21.3), pseudopsychopathic schizophrenia (F21.4), “symptom-depleted” schizophrenia (F21.5) are in the Russian version of the ICD-10. They are in the category of “schizotypal” disorder in section F21 of chapter V.

DIFFERENTIAL DIAGNOSIS

Psychotic symptoms may be present in several other mental disorders, including bipolar disorder, borderline personality disorder, drug intoxication, and drug-induced psychosis. Delusions ("non-bizarre") are also present in delusional disorder, and social withdrawal in social anxiety disorder, avoidant personality disorder and schizotypal personality disorder. Schizotypal personality disorder has symptoms that are similar but less severe than those of schizophrenia.

Schizophrenia occurs along with obsessive-compulsive disorder (OCD) considerably more often than could be explained by chance, although it can be difficult to distinguish obsessions that occur in OCD from the delusions of schizophrenia.

A few people withdrawing from benzodiazepines experience a severe withdrawal syndrome which may last a long time. It can resemble schizophrenia and be misdiagnosed as such. A more general medical and neurological examination may be needed to rule out medical illnesses which may rarely produce psychotic schizophrenia-like symptoms, such as metabolic disturbance, systemic infection, syphilis, AIDS dementia complex, epilepsy, limbic encephalitis, and brain lesions. Stroke, multiple sclerosis, hyperthyroidism, hypothyroidism, and dementias such as Alzheimer's disease, Huntington's disease, frontotemporal dementia, and Lewy Body dementia may also be associated with schizophrenia-like psychotic symptoms.

It may be necessary to rule out a delirium, which can be distinguished by visual hallucinations; acute onset and fluctuating level of consciousness, and indicates an underlying medical illness.

Investigations are not generally repeated for relapse unless there is a specific *medical* indication or possible adverse effects from antipsychotic medication. In children hallucinations must be separated from typical childhood fantasies.

Risk Factors

There are several factors that contribute to the risk of developing schizophrenia.

Genes and environment: Scientists have long known that **schizophrenia** sometimes runs in families. However, there are many people who have **schizophrenia** who don't have a family member with the disorder and conversely, many people with one or more family members with the disorder who do not develop it themselves.

Scientists believe that many different genes may increase the risk of schizophrenia, but that no single gene causes the disorder by itself. It is not yet possible to use genetic information to predict who will develop schizophrenia.

Scientists also think that interactions between genes and aspects of the individual's environment are necessary for schizophrenia to develop. Environmental factors may involve:

Exposure to viruses

Malnutrition before birth

Problems during birth

Psychosocial factors

What are the causes schizophrenia?

Experts believe several factors are generally involved in contributing to the onset of schizophrenia. Evidence suggests that genetic and environmental factors act together to bring about schizophrenia. The condition has an inherited element, but environmental triggers also significantly influence it. Below is a list of the factors that are thought to contribute towards the onset of schizophrenia:

Genetic inheritance

If there is no history of schizophrenia in a family, the chances of developing it are less than 1 percent. However, that risk rises to 10 percent if a parent was diagnosed.

Chemical imbalance in the brain

Experts believe that an imbalance of dopamine, a neurotransmitter, is involved in the onset of schizophrenia. Other neurotransmitters, such as serotonin, may also be involved.

Family relationships

There is no evidence to prove or even indicate that family relationships might cause schizophrenia, however, some patients with the illness believe family tension triggers relapses.

Environmental factors

Although there is no definite proof, many suspect trauma before birth and viral infections may contribute to the development of the

disease. Stressful experiences often precede the emergence of schizophrenia. Before any acute symptoms are apparent, people with schizophrenia habitually become bad-tempered, anxious, and unfocused. This can trigger relationship problems, divorce, and unemployment. These factors are often blamed for the onset of the disease, when really it was the other way round - the disease caused the crisis. Therefore, it is extremely difficult to know whether schizophrenia caused certain stresses or occurred as a result of them.

Different brain chemistry and structure:

Scientists think that an imbalance in the complex, interrelated chemical reactions of the brain involving the neurotransmitters (substances that brain cells use to communicate with each other) dopamine and glutamate, and possibly others, plays a role in schizophrenia.

Some experts also think problems during brain development before birth may lead to faulty connections. The brain also undergoes major changes during puberty, and these changes could trigger psychotic symptoms in people who are vulnerable due to genetics or brain differences.

HISTORY

The term "schizophrenia" was coined by Eugen Bleuler. In the early 20th century, the psychiatrist Kurt Schneider listed the forms of psychotic symptoms that he thought distinguished schizophrenia from other psychotic disorders. These are called ***first-rank symptoms*** or Schneider's first-rank symptoms.

They include delusions of being controlled by an external force, the belief that thoughts are being inserted into or withdrawn from one's conscious mind, the belief that one's thoughts are being broadcast to other people, and hearing hallucinatory voices that comment on one's thoughts or actions or that have a conversation with other hallucinated voices.

They include delusions of being controlled by an external force, the belief that thoughts are being inserted into or withdrawn from one's conscious mind, the belief that one's thoughts are being broadcast to other people, and hearing hallucinatory voices that comment on one's thoughts or actions or that have a conversation with other hallucinated voices.

Although they have significantly contributed to the current diagnostic criteria, the specificity of first-rank symptoms has been

questioned. A review of the diagnostic studies conducted between 1970 and 2005 found that they allow neither a reconfirmation nor a rejection of Schneider's claims, and suggested that first-rank symptoms should be de-emphasized in future revisions of diagnostic systems. The absence of first-rank symptoms should raise suspicion of a medical disorder, however.

The history of schizophrenia is complex and does not lend itself easily to a linear narrative.

Accounts of a schizophrenia-like syndrome are thought to be rare in historical records before the 19th century, although reports of irrational, unintelligible, or uncontrolled behavior were common. A detailed case report in 1797 concerning James Tilly Matthews, and accounts by Philippe Pinel published in 1809, are often regarded as the earliest cases of the illness in the medical and psychiatric literature.

The Latinized term *dementia praecox* was first used by German alienist Heinrich Schule in 1886 and then in 1891 by Arnold Pick in a case report of a psychotic disorder (hebephrenia). In 1893 Emil Kraepelin borrowed the term from Schule and Pick and in 1899 introduced a broad new distinction in the classification of mental disorders between *dementia praecox* and mood disorder (termed manic depression and including both unipolar and bipolar depression).

Kraepelin believed that *dementia praecox* was probably caused by a long-term, smouldering systemic or "whole body" disease process that affected many organs and peripheral nerves in the body but which affected the brain after puberty in a final decisive cascade. His use of the term "*praecox*" distinguished it from other forms of dementia such as Alzheimer's disease which typically occur later in life.

It is sometimes argued that the use of the term *démence précoce* in 1852 by the French physician Bénédict Morel constitutes the medical discovery of schizophrenia. However, this account ignores the fact that there is little to connect Morel's descriptive use of the term and the independent development of the *dementia praecox* disease concept at the end of the nineteenth century. The word *schizophrenia*—which translates roughly as "splitting of the mind" and comes from the Greek roots *schizein* (σχίζειν, "to split") and *phrēn*, *phren-* (φρήν, φρεν-, "mind")—was coined by Eugen Bleuler in 1908 and was intended to describe the separation of function between personality, thinking, memory, and perception.

American and British interpretations of Bleuler led to the claim that he described its main symptoms as four *A*'s: flattened *affect*,

autism, impaired **association** of ideas, and **ambivalence**. Bleuler realized that the illness was **not** a dementia, as some of his patients improved rather than deteriorated, and thus proposed the term schizophrenia instead.

Treatment was revolutionized in the mid-1950s with the development and introduction of chlorpromazine. In the early 1970s, the diagnostic criteria for schizophrenia were the subject of a number of controversies which eventually led to the operational criteria used today. It became clear after the 1971 US–UK Diagnostic Study that schizophrenia was diagnosed to a far greater extent in America than in Europe.

The term schizophrenia is commonly misunderstood to mean that affected persons have a "split personality". Although some people diagnosed with schizophrenia may hear voices and may experience the voices as distinct personalities, schizophrenia does not involve a person changing among distinct, multiple personalities; the confusion arises in part due to the literal interpretation of Bleuler's term "schizophrenia". Bleuler originally associated schizophrenia with dissociation, and included split personality in his category of schizophrenia.

Society and culture

John Nash, an American mathematician and joint recipient of the 1994 Nobel Prize for Economics, who had schizophrenia. His life was the subject of the 2001 Academy Award-winning film *A Beautiful Mind*.

In the United States, the cost of schizophrenia—including direct costs (outpatient, inpatient, drugs, and long-term care) and non-health care costs (law enforcement, reduced workplace productivity, and unemployment)—was estimated to be \$62.7 billion in 2002. The book and film *A Beautiful Mind* chronicles the life of John Forbes Nash, a Nobel Prize-winning mathematician who was diagnosed with schizophrenia.

Onset of disease

– More often in late adolescence and early adulthood (14–19 years old)

Prevalence

– 0.3–0.7 % of people at some point in their life,
– appr. 24 million people worldwide

Classification ICD-10

F20 Schizophrenia

- F20.0 Paranoid schizophrenia
- F20.1 Disorganized schizophrenia
- F20.2 Catatonic schizophrenia
- F20.3 Undifferentiated schizophrenia
- F20.5 Residual schizophrenia
- F20.8 Other schizophrenia
- F20.81 Schizophreniform disorder
- F20.89 Other schizophrenia
- F20.9 Schizophrenia, unspecified

Schizophreniform disorder lasts at least 1 month but less than 6 months whereas schizophrenia lasts at least 6 months); typically causes less impairment in the individual's social and occupational functioning.

PREVENTION

Prevention of schizophrenia is difficult as there are no reliable markers for the later development of the disorder. There is tentative evidence for the effectiveness of early interventions to prevent schizophrenia. While there is some evidence that early intervention in those with a psychotic episode may improve short-term outcomes, there is little benefit from these measures after five years. Attempting to prevent schizophrenia in the prodrome phase is of uncertain benefit and therefore as of 2009 is not recommended.

Cognitive behavioral therapy may reduce the risk of psychosis in those at high risk after a year and is recommended in this group, by the National Institute for Health and Care Excellence (NICE). Another preventative measure is to avoid drugs that have been associated with development of the disorder, including cannabis, cocaine, and amphetamines.

CLINICAL MANAGEMENT

Antipsychotic medication is the treatment mainstay. The probable mechanism of action is their ability to block postsynaptic dopamine D₂ receptors in the limbic forebrain. This blockade is thought to initiate a cascade of events responsible for both acute and chronic therapeutic actions. These drugs also block serotonergic,

noradrenergic, cholinergic, and histaminic receptors to differing degrees, accounting for the unique side effect profile of each agent.

Treatment of Acute Psychosis

High-potency conventional antipsychotics (e.g., haloperidol) and second-generation antipsychotics (e.g., risperidone, olanzapine) are considered first-line treatments. Second-generation antipsychotics are generally better tolerated because they have less potential to cause extrapyramidal side effects, but they can cause weight gain, glucose intolerance, and lipid dysregulation. Clozapine is a second-line choice because it can – in rare cases – cause agranulocytosis. Nonetheless, it is associated with a reduction in suicidal behavior and may be particularly useful in patients with schizophrenia at high risk for suicide.

Reasons to hospitalize patients with schizophrenia

1. When the illness is new, to rule out alternative diagnoses and to stabilize the dosage of antipsychotic medication.
2. For special medical procedures such as electroconvulsive therapy.
3. When aggressive assaultive behavior presents a danger to the patient or others.
4. When the patient becomes suicidal.
5. When the patient is unable to properly care himself (e.g., refuses to eat or take fluids).
6. When medication side effects become disabling or potentially life threatening (e.g., severe pseudo Parkinsonism, neuroleptic malignant syndrome).

Maintenance Therapy

Sustained control of psychotic symptoms is the goal of maintenance treatment. At least 1-2 years of treatment with antipsychotic medication are recommended after the initial psychotic episode because of the high risk of relapse and the possibility of social deterioration from further relapses. At least 5 years of treatment for multiple episodes is recommended because high risk of relapse remains. Beyond this, data are incomplete, but indefinite – perhaps lifelong – treatment is likely to be needed by most patients. Long-acting injectable antipsychotics are available and are particularly useful in patients who lack insight or have been shown to be noncompliant with medication. Some patients may prefer injections to oral medication.

Adjunctive Treatments

Adjunctive psychotropic medications are sometimes useful in the schizophrenic patient, but their role has not been clearly defined. Many patients benefit from anxiolytics (e.g., benzodiazepines) when anxiety is prominent. Lithium carbonate, valproate, and carbamazepine can be used to reduce impulsive and aggressive behaviors, hyperactivity, or mood swings, although their effectiveness in patients with schizophrenia has not been fully determined. Antidepressants are sometimes used to treat depression in schizophrenic patients and appear effective. Electroconvulsive therapy is sometimes used, particularly to treat concurrent depression or catatonic symptoms.

Psychosocial Interventions

Most treatment occurs in the community and not in the hospital. Hospitalization should be reserved for patients who pose a danger to themselves or others; are unable to properly care for themselves (e.g., refuse food or fluids); or require special medical observation, tests, or treatments. The outpatient clinic will be the best setting in which to coordinate care for most schizophrenic patients. A well-equipped clinic should be able to provide medication management, adjunctive behavioral and cognitive treatments, and case management.

Partial hospital or day treatment programs can be helpful for patients with symptoms that have not responded well to medication (e.g., psychosis, depression) and who need more structure. These programs generally operate on weekdays, and patients return home in the evenings and on weekends. Medication management and various psychosocial services are provided.

Assertive community treatment (ACT) programs are available in some areas. They employ careful monitoring of patients through mobile mental health teams and individually tailored programming. ACT programs have staff available 24 hours a day and have been shown to reduce hospital admission rates and to improve the quality of life for many patients.

Other Approaches

Family therapy, combined with antipsychotic medication, has been shown to reduce relapse rates in schizophrenia. Families need realistic and accurate information about the symptoms, course of illness, and available treatments. They also will benefit from learning how to improve communications with their schizophrenic relative and how to provide constructive support.

Cognitive rehabilitation involves the remediation of abnormal thought processes known to occur in schizophrenia, using methods pioneered in the treatment of brain-injured persons.

Social skills training aims to help patients develop more appropriate behavior.

Psychosocial rehabilitation serves to integrate the patient back into his or her community rather than segregating the patient in separate facilities as has occurred in the past. This may involve patient clubhouses available in some areas to encourage socialization.

Vocational rehabilitation may help a patient obtain supported employment, competitive work in integrated settings, and more formal job training programs.

Appropriate and affordable housing is a major concern for many patients. Depending on the community, options may range from supervised shelters and group homes (“halfway houses”) to boarding homes to supervised apartments.

Drug induced schizophrenia

- Marijuana and LSD are known to cause schizophrenia relapses. Additionally, for people with a predisposition to a psychotic illness such as **schizophrenia**, usage of cannabis may trigger the first episode.
- Some researchers believe that certain prescription drugs, such as steroids and stimulants, can cause psychosis.

PROGNOSIS

Schizophrenia has great human and economic costs.

It results in a decreased life expectancy by 10–25 years.

This is primarily because of its association with obesity, poor diet, sedentary lifestyles, and smoking, with an increased rate of suicide playing a lesser role.

Antipsychotic medications may also increase the risk.

These differences in life expectancy increased between the 1970s and 1990s.

Schizophrenia is a major cause of disability, with active psychosis ranked as the third-most-disabling condition after quadriplegia and dementia and ahead of paraplegia and blindness.

Approximately three-fourths of people with schizophrenia have ongoing disability with relapses and 16.7 million people globally are deemed to have moderate or severe disability from the condition.

- Most people with schizophrenia live independently with community support.
- About 85% are unemployed.
- Some evidence suggests that paranoid schizophrenia may have a better prospect than other types of schizophrenia for independent living and occupational functioning.
- In people with a first episode of psychosis a good long-term outcome occurs in 42 %, an intermediate outcome in 35 % and a poor outcome in 27 %.

Outcomes for schizophrenia appear better in the developing than the developed world.

These conclusions, however, have been questioned.

There is a higher than average suicide rate associated with schizophrenia. This has been cited at 10 %, but a more recent analysis revises the estimate to 4.9 %, most often occurring in the period following onset or first hospital admission.

- Several times more (20 to 40 %) attempt suicide at least once.

There are a variety of risk factors, including male gender, depression, and a high intelligence quotient

Schizophrenia and smoking

- Schizophrenia and smoking have shown a strong association in studies worldwide.
 - Use of cigarettes is especially high in individuals diagnosed with schizophrenia, with estimates ranging from 80 to 90 % being regular smokers, as compared to 20 % of the general population.
 - Those who smoke tend to smoke heavily, and additionally smoke cigarettes with high nicotine content. Among people with schizophrenia use of cannabis is also common.

SELF-ASSESSMENT QUESTIONS

1. How does delusional disorder differ from schizophrenia?
2. What are the subtypes of delusional disorder?
3. Describe brief psychotic disorder?
4. How is schizophrenia diagnosed? What is its differential diagnosis?
5. What are typical signs and symptoms of schizophrenia?
6. What are the subtypes of schizophrenia?

7. What evidence supports a neurobiological basis for schizophrenia?
8. What is the natural history of schizophrenia?
9. How is schizophrenia managed pharmacologically and psychosocially?
10. How does schizoaffective disorder differ diagnostically from both schizophrenia and psychotic mood disorders?

TESTS

Question # 1

An 18-year-old college freshman without prior psychiatric history is brought to the emergency room after being found on her dormitory roof dressed only in her underwear, despite freezing temperatures. Campus police report she was flapping her hands and climbing the banister on the roof, stating to an unseen other, "I will do as you command – soar to my death to fulfill your prophecy!" She accused the policemen of being "Satan's horsemen" and cursed as she was being taken down. Her roommates confirm that for the past 5 weeks the patient has been acting bizarrely, and her speech has been increasingly disorganized. You plan to obtain collateral information from her family. She was started on appropriate treatment. One year later this woman returns to your office with her mother for follow-up. Her symptoms remitted within a month. However, she has not done well in her freshman year and for the past several months has continued to experience worsening social isolation and amotivation. While she has not used any substances since she last saw you, she reluctantly admits to occasionally hearing the devil communicating with her. She tries to ignore the communication, and has taken to arranging her books in a certain manner to present his controlling her thoughts. On her mental status examination she makes poor eye contact and her affect is blunted. Her mother reports that the patient now rarely calls home, though before she'd do so twice weekly. Which of the following is the most likely diagnosis?

- (A) Brief psychotic disorder
- (B) Schizophreniform disorder
- (C) Schizophrenia
- (D) Substance-induced mood disorder
- (E) Substance-induced psychotic disorder

Question # 2

You are a research psychiatrist who is studying signs and symptoms associated with certain psychiatric disorders, and notice a category of patients who have sensory gating deficits, short-term memory difficulties, and abnormalities in smooth-pursuit eye movements. Which of the following diagnoses is most likely to be found in this patient population?

- (A) Attention-deficit/hyperactivity disorder (ADHD)
- (B) Major depressive disorder (MDD)
- (C) Obsessive-compulsive disorder (OCD)
- (D) Posttraumatic stress disorder (PTSD)
- (E) Schizophrenia

Question # 3

A 45-year-old separated female is brought by her brother into the emergency room with the chief complaint of “strange behavior”. She has been living with her brother for the past 2 years, and she stopped her medications 12 months ago. The brother states that over the past 6 months she has become increasingly paranoid and delusional, believing that the neighbors are spying on her. She insists that the Chinese government is using her as an agent to combat terrorism, and that they communicate their instructions via a wireless signal transmitted directly to her brain. She is often noticed to be talking when no one else is in her room. In addition, over the past month she has been staying up most of the night, passing around the house and attempting to construct an anti-terrorism machine, using parts of various household electronics. She states that it is important that she alone completes her mission that she is the most senior spy in the organization with a top-secret clearance “that only the President and I possess”. Her brother has had a hard time calming her down as she speaks too quickly to follow, goes from one topic to another, and “won’t sit still.” Which of the following diagnoses would be the most likely for this patient?

- (A) Bipolar disorder
- (B) Delusional disorder
- (C) Major depressive disorder with psychotic features
- (D) Schizoaffective disorder
- (E) Schizophrenia

Question # 4

A 24-year-old man is hospitalized because he has been hearing voices for 6 months telling him to kill himself and now fears that he may act on them. He lost his job 2 months ago and on mental status examination appears unkempt and disorganized, with a flat affect. He is begun on aripiprazole, and his symptoms eventually decrease enough for him to be discharged. On a follow-up visit to your office, he reports that his hallucinations have improved but that he “can’t sit still” and feels like he needs to be constantly in motion. The patient intermittently stands up and walks around your office as you interview him. Which of the following conditions account for his new complaints?

- (A) Acute dystonic reaction
- (B) Akathisia
- (C) Manic episode
- (D) Neuroleptic malignant syndrome
- (E) Tardive dyskinesia

Question # 5

The patient is a 59-year-old female with schizophrenia, as well as poorly controlled diabetes mellitus, obesity, hyperlipidemia, and hypertension. She has been treated for over 35 years with various first-generation antipsychotics, and although she is on an adequate dose, she still has residual psychotic symptoms and has now begun to develop involuntary blinking and tongue-rolling movements. She is agreeable to switching to an atypical/second-generation antipsychotic. Which of the following medications would be the most appropriate for this patient?

- (A) Aripiprazole
- (B) Clozapine
- (C) Olanzapine
- (D) Quetiapine
- (E) Risperidone

Question # 6 and 7

A 44-year-old woman with schizophrenia is struggling with paranoia, auditory hallucinations, and delusions. She lives with her mother but has a poor relationship with her. She tells you that everyone wants her to spend a lot of money and buy drugs.

6. Which of the following responses would be the most useful?

- (A) “Well, deciding for yourself is best.”
- (B) “If you buy drugs, I’ll call the police.”

(C) "Perhaps we should look at what your mother would think about that."

- (D) "Why do you think everyone wants you to do that?"
(E) "No, they don't."

7. You decide that supportive therapy would be helpful to this patient. Which of the following would be the most appropriate goal of supportive therapy for this patient?

- (A) Correcting faulty ideas
(B) Exploring the feeling of meaninglessness in life
(C) Investigating the freedom of individuals
(D) Personality change
(E) Strengthening of defenses

Question # 8 and 9

A 29-year-old man with a history of chronic schizophrenia comes to the emergency department with a temperature 39, 4 C, labile blood pressure rising to 210/110 mm Hg, a pulse of 110/min, and a respiratory rate of 22 breaths/min. This patient's medications include haloperidol, benztropine (Cogentin), and clonazepam. He cannot correctly identify the day, date, or year, and believes himself to be in a city from which he moved 10 years ago. A family member indicates that 3 days ago he was healthy and completely oriented and that he has no significant medical or surgical history. Physical examination reveals that he is in acute distress with hypertonicity. Laboratory examination reveals creatinine phosphokinase of 45, 0 IU/L, white blood cell count of 15, 0/ μ L and no left shift, sodium of 145 mEq/L, and creatinine of 2, 5 mg/dL. Lumbar puncture produces clear fluid with a slightly elevated protein count.

8. Which of the following is the most likely diagnosis?

- (A) Anticholinergic syndrome
(B) Central nervous system infection
(C) Malignant hyperthermia
(D) Neuroleptic malignant syndrome
(E) Prolonged immobilization

9. With appropriate treatment, the patient recovers completely and returns home. In a month's time, he comes to the emergency department stating that the "voices in the walls" are telling him to kill himself. He has taken no medications since he left the hospital. His vital signs are stable and a medical workup is negative. Which of the following therapies should be initiated first?

- (A) ECT
- (B) Haloperidol depot injections
- (C) Olanzapine
- (D) Physical restraints
- (E) Safety monitoring only

10. A 27-year-old man with schizophrenia notices the development of breasts, a decreased libido, and not ejaculating when he has an orgasm. Which of the following medications is most likely responsible for these side effects?

- (A) Aripiprazole
- (B) Clozapine
- (C) Quetiapine
- (D) Risperidone
- (E) Ziprasidone

BIBLIOGRAPHY

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th Edition, Arlington, VA, American Psychiatric Association, 2013.

Andreasen NC, Liu D, Ziebell S, et al: Relapse duration, treatment intensity, and brain tissue loss in schizophrenia: a prospective longitudinal MRI study. Am J Psychiatry 170:609-615, 2013.

Introductory textbook of psychiatry / Donald Black, Nancy Andreasen / - Sixth edition. Washington, London. 2014. 760 p.

Large Q & A psychiatry. Eleventh edition. / Sean M. Blitzstein. New York. 2017. 295 p.

Lauriello J, Pallanti S (eds): Clinical Manual for Treatment of Schizophrenia. Washington, DC, American Psychiatric Publishing, 2012.

Psychiatry / Gavenko V. L., Samardakova G. A., Sinayko V. M., Korostiy V. I., Kozhina A. M., Mozgovaya T. P., Dyomina O. O. (edited by Prof. Gavenko V. L.) Manual for English medium students of higher medical schools and interns. 2014. 389 p.