Schizophrenia

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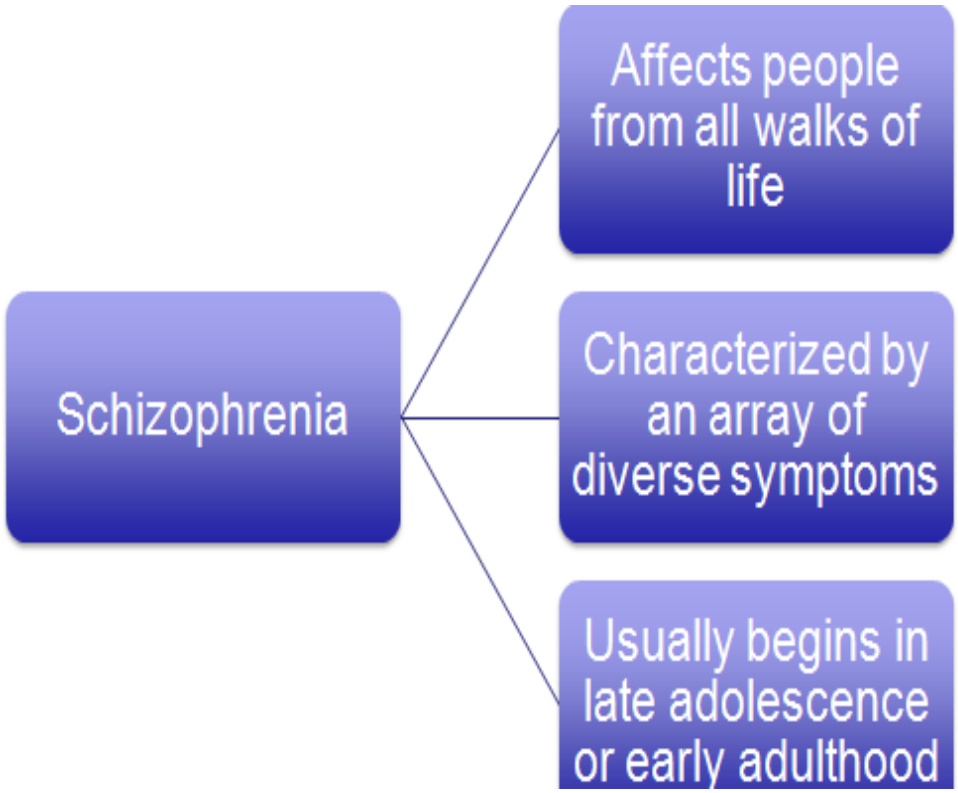


Includes, extreme oddities in:

- Perception
- Thinking
- Action
- Sense of self
- Manner of relating to others

Major Hallmark:
Psychosis- Loss of contact with reality

Case Study

Emilio is a 40-year-old man who looks 10 years younger. He is brought to the hospital, his 12th hospitalization, by his mother because she is afraid of him. He is dressed in a ragged overcoat, bedroom slippers, and a baseball cap, and he wears several medals around his neck. His affect ranges from anger at his mother ("She feeds me shit . . . what comes out of other people's rectums") to a giggling, obsequious seductiveness toward the interviewer. His speech and manner have a childlike quality, and he walks with a mincing step and exaggerated hip movements. His mother reports that he stopped taking his medication about a month ago and has since begun to hear voices and to look and act more bizarrely. When asked what he has been doing, he says "eating wires and lighting fires." His spontaneous speech is often incoherent and marked by frequent rhyming and clang associations (where sounds, rather than meaningful relationships, govern word choice).

Emilio's first hospitalization occurred after he dropped out of school at age 16, and since that time he has never been able to attend school or hold a job. He has been treated with neuroleptics (medications used to treat schizophrenia) during his hospitalizations, but he doesn't continue to take his medications when he leaves, so he quickly becomes disorganized again. He lives with his elderly mother, but he sometimes disappears for several months at a time and is eventually picked up by the police as he wanders the streets. (Modified from Spitzer et al., 2002, pp. 189–90.)

Epidemiology

- Average lifetime risk estimate: 0.7% (Some are at a higher risk than others)

Higher risk for those:

- Children whose parents have schizophrenia.
- Individuals whose fathers were older(45-50 or more) at the time of their birth.
- Having a parent who works as a dry cleaner.
- Typical onset: late adolescence and early adulthood, with 18-30 years of age- peak time for the onset of the illness
- **Gender differences**

i. Age of Onset

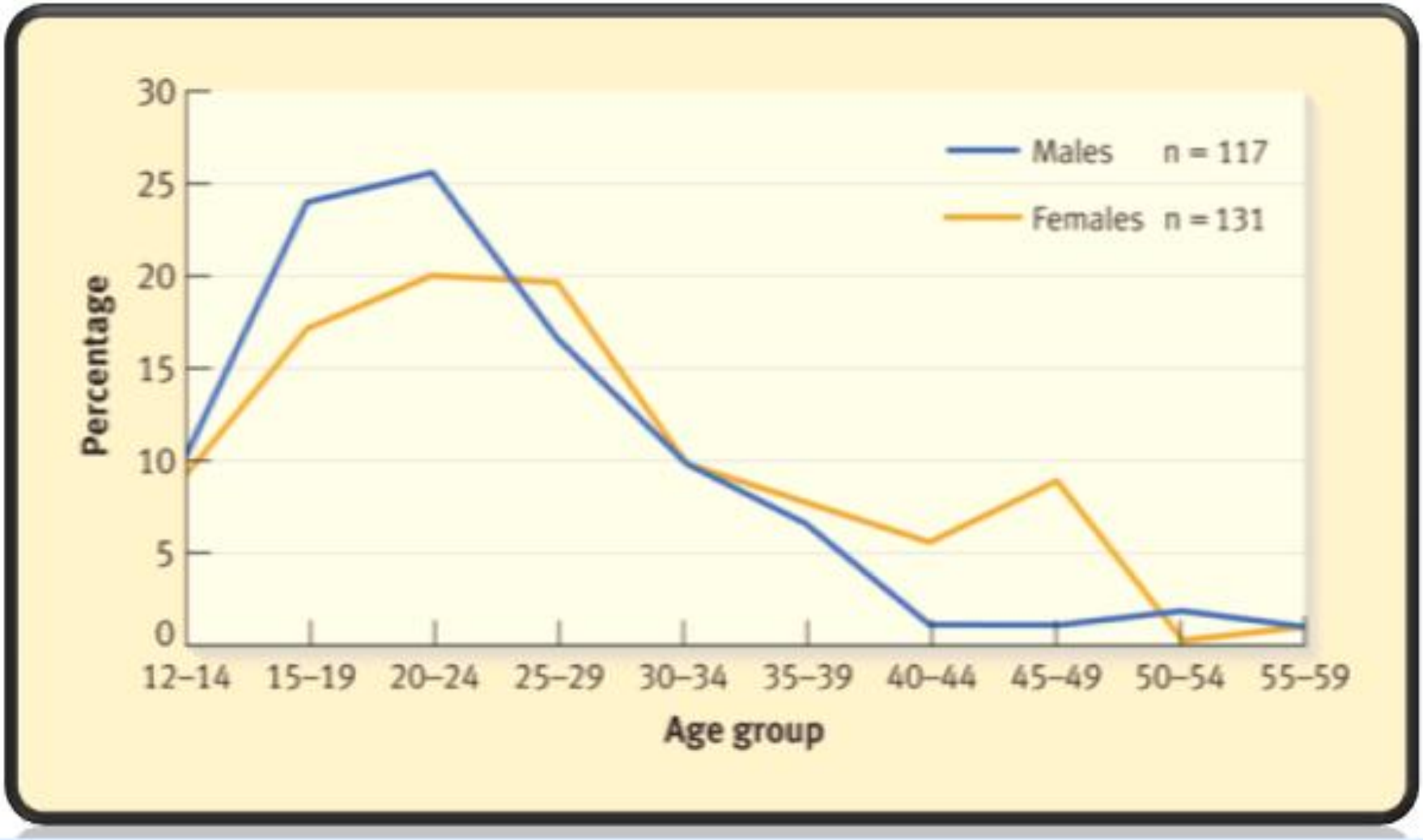
- Men: Peak onset: 20-24 years.

After age 35, number of men developing schizophrenia drops

- Women: Peak onset same age, but less marked than men.

No such drop after age 35, as seen in men. Instead, rise in new cases around age 40 and early 60s.

Epidemiology



Epidemiology

ii) Illness Severity:

- Men: More severe form of schizophrenia

iii) Male to female sex ratio- 1.4:1.

Reason for better clinical outcome for women:

- Female sex hormone- estrogen- protective role.
- When estrogen levels are low , psychotic symptoms in women with schizophrenia often get worse.
- This explain the late onset schizophrenia (more common among women) around menopause when estrogen levels are low.

Hallmark Symptoms/Clinical Picture

- Delusions
- Hallucinations
- Disorganized Speech and Behaviour

Delusions

- Delusions
  - Firmly held beliefs
  - Contrary to reality
  - Resistant to disconfirming evidence
  - Disturbance in the content of thought

  Some of the delusions include:

- Delusion of control: This is a false belief that another person, group of people, or external force controls one's thoughts, feelings, impulses, or behavior. A person may describe, for instance, the experience that aliens actually make him or her move in certain ways and that the person affected has no control over the bodily movements.

- Other examples: Thought broadcasting, thought insertion and thought withdrawal.

- Delusion of reference: The person falsely believes that insignificant remarks, events, or objects in one's environment have personal meaning or significance. For instance, a person may believe they are receiving special messages from newspaper headlines; they are being talked about on the radio/tv.

- Persecutory delusion: These are the most common type of delusions and involve the theme of being followed, harassed, cheated, poisoned or drugged, conspired against, spied on, attacked, or obstructed in the pursuit of goals.

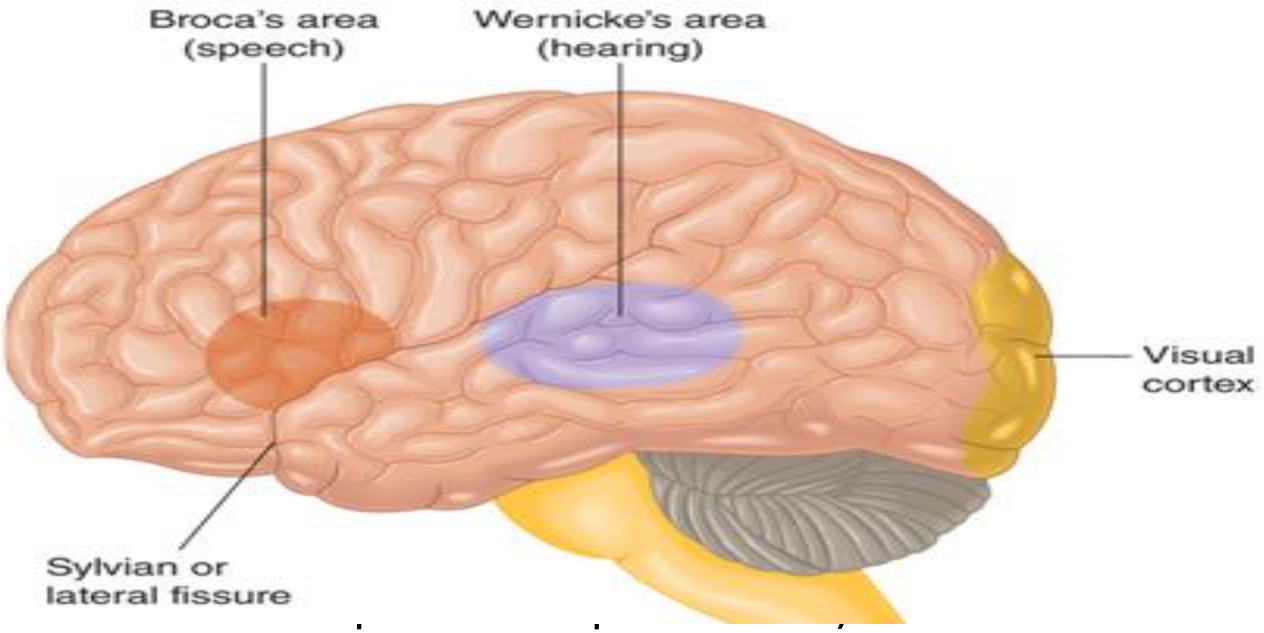
Hallucinations

- Sensory experience
- Seems real but occurs in absence of any external perceptual stimulus
- Can occur in any sensory modality

Hallucinations

Hallucinations

- Most common is auditory hallucination.



Overall, can be concluded- auditory hallucinations occur when patients misinterpret their own self-generated and verbally mediated talks (inner speech or self-talk) as coming for another source.

Disorganized Speech and Behaviour

- Disorganized Speech: External manifestation of a disorder in thought form

(Delusion- disorder of thought content)

- Range from less severe forms (the person moves rapidly from one topic to another), to severe forms (the person's speech cannot be logically understood).
- Disorganized behaviour: Goal directed activity- almost universally dropped.

-Poor personal hygiene, disregard for personal safety and health, unusual dressing (wearing overcoat, gloves during hot summer day)

-Catatonia: can be stuporous or excited

Examples of disorganized speech and behaviour

Disorganized Speech

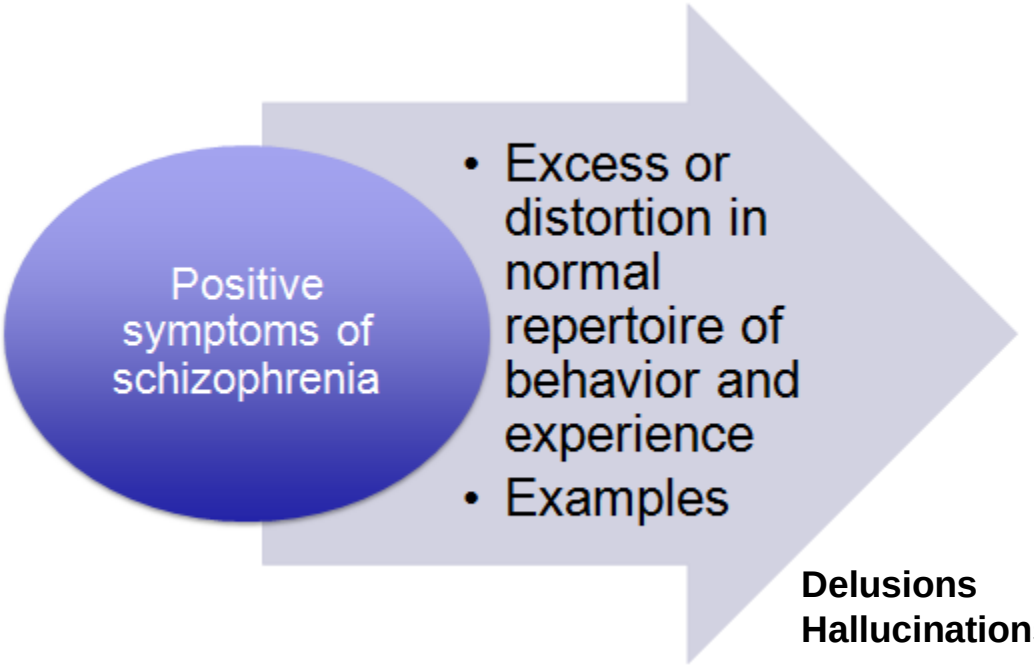
Loose associations	"I came here by bus, but bussing is kissing, I wasn't kissing but if you keep it simple that is a business tenet for KISS. That was a great group that played on and on, but I'm not playing with you. You are youthful looking. Look out for yourself too."
Word salad	"Wimple sitting purple which the twilighted cheshire, for then frames of silver ticking bubble and."
Clanging	"I want to eat neat treat seat beat." "I'm fine it's a sign fine whine wine pine dine."
Echolalia	Client repeats pieces of what is said or entire phrases: Nurse asks, "How are you today?" and the client states, "You today." Or client states, "I love smelling roses. I love smelling roses."

Behavior

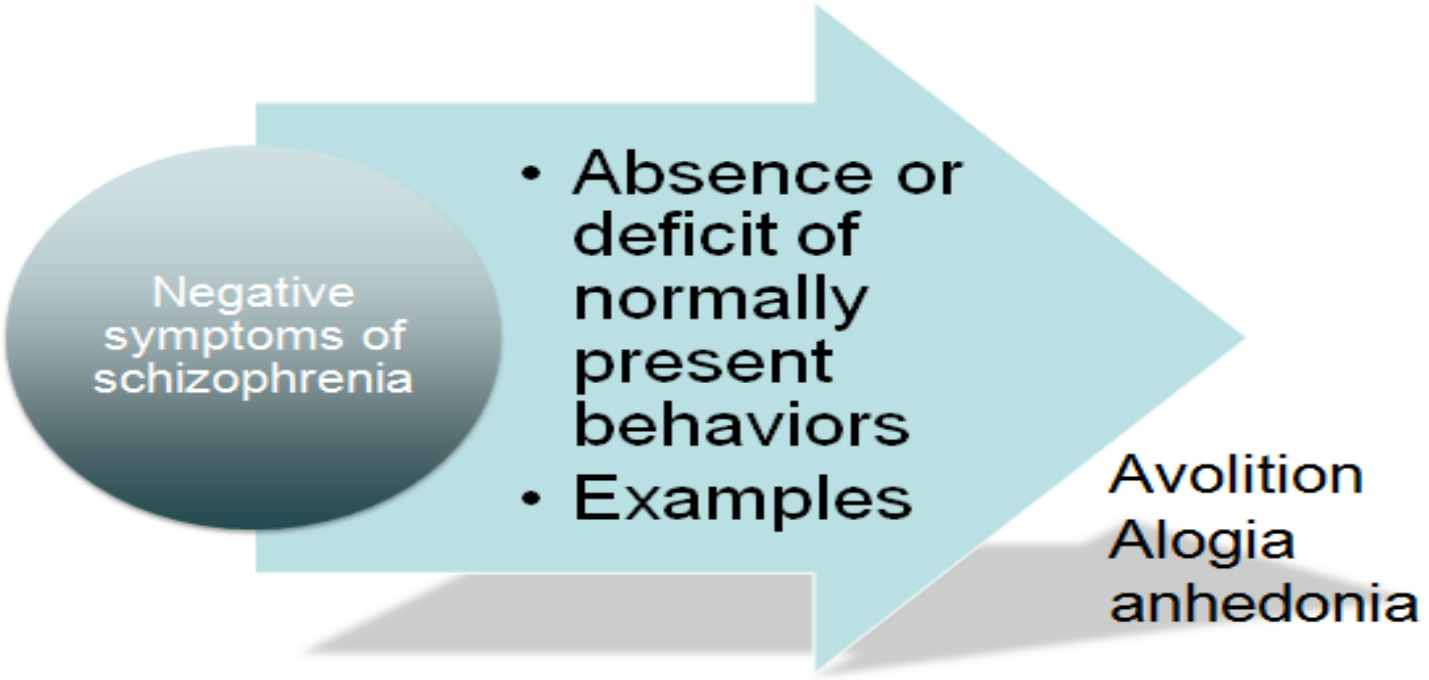
Disorganized	Client walks around aimlessly picking up everything available to him and touching all objects and surfaces.
Catatonic	Excited catatonia: A client in the ER is repeatedly assaultive, hyperactive, or cannot sit still. Waxy flexibility: Client maintains a rigid position, allows another to move him or her into new positions and maintains the new position.

A person with catatonia may maintain an odd position for minutes or even hours.

Positive Symptoms



Negative Symptoms



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Negative Symptom	Examples
Flat Affect	The client maintains the same emotional tone when told his mother has died as when told it is time to attend programs. "OK."
Apathy	The client has feelings of indifference toward people, events, activities, and learning.
Avolition	The client does not get to the job he really wanted because he couldn't get up and take the bus.
Anhedonia	The client apparently derives no pleasure from bowling when, prior to getting sick, he used to enjoy it.
Alogia	Rather than using a series of sentences or several words, the client, when asked about his day, speaks sparsely in a limited, stilted manner: "Fine."

A preponderance of negative symptoms in the clinical picture is not a good sign for the patient's future outcome.

Summary of the symptoms

Positive Symptoms	Negative Symptoms	Disorganized Symptoms
Hallucinations Delusions	Emotional flattening Poverty of speech Asociality Apathy Anhedonia	Bizarre behavior Disorganized speech

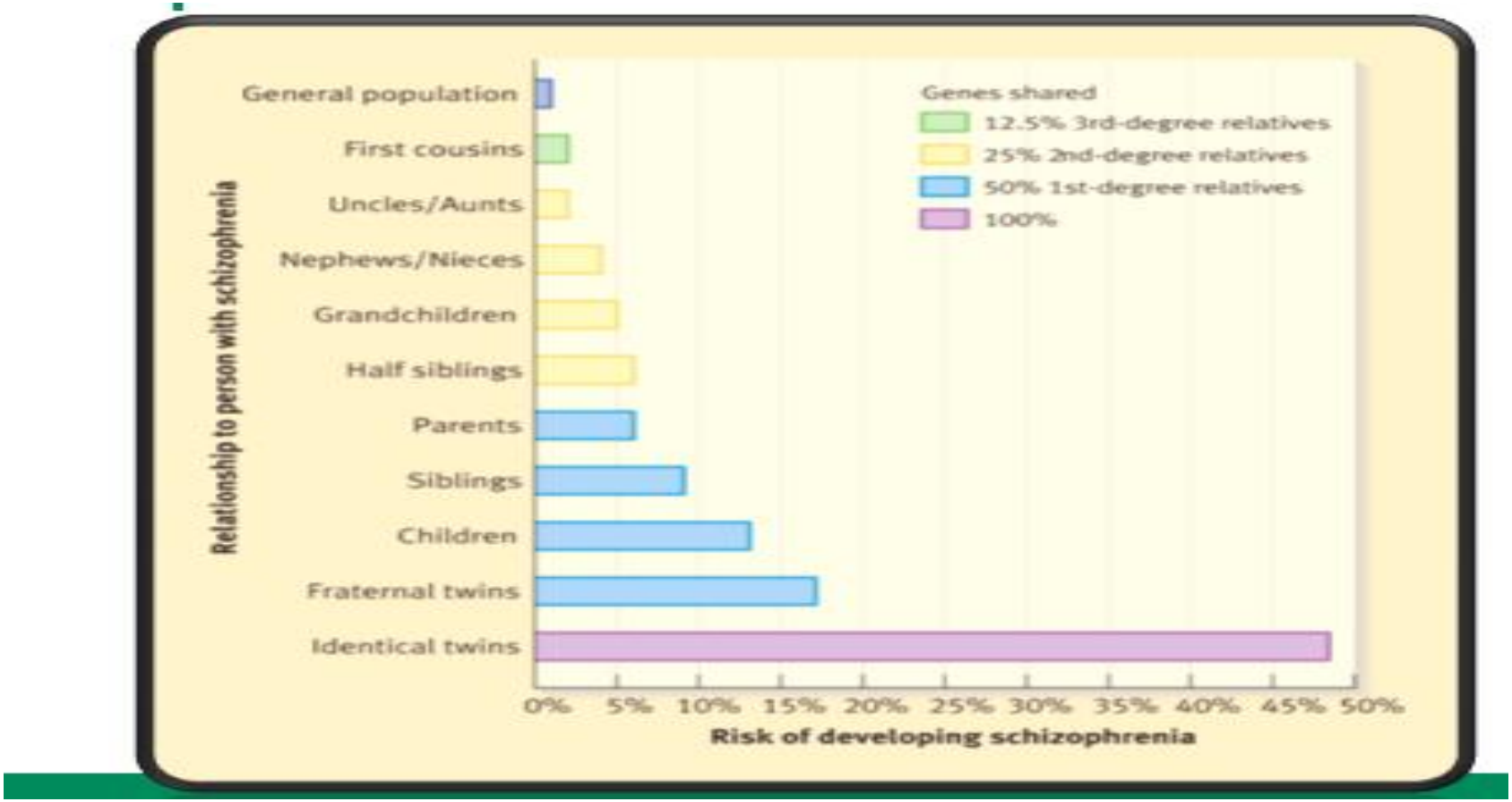
Risk and Causal Factors

Complex interplay between genetic and environmental factors.

A)Genetic Factors: Strong association between the closeness of the blood relationship(i.e. level of gene sharing) and the risk for developing schizophrenia.

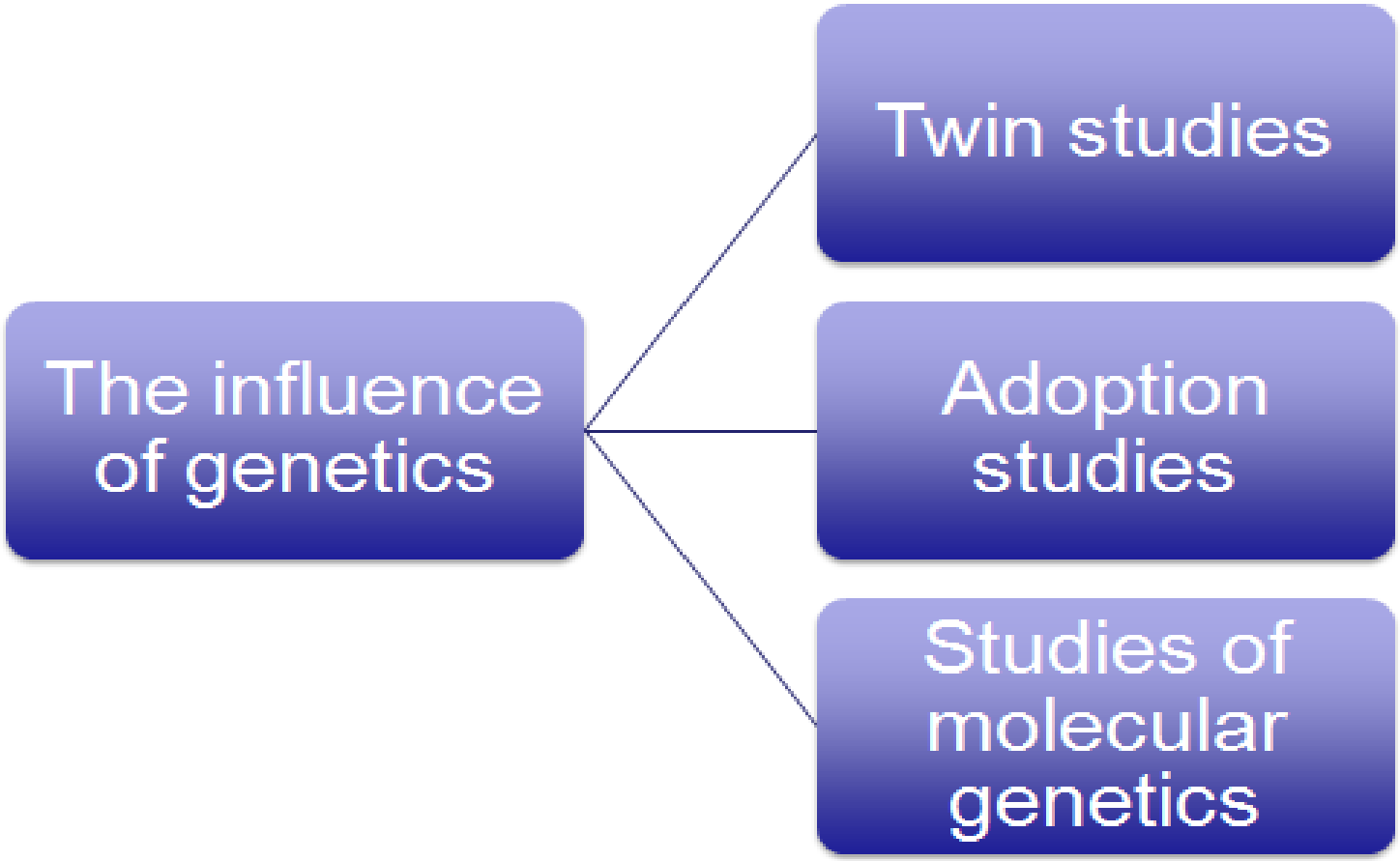
- First degree relatives: Prevalence- 10%
- Second degree relatives: Prevalence- 3%

Risk and Causal Factors



Having a relative with the disorder significantly raises a person's risk of developing schizophrenia.

Genetic Factors



1)Twin Studies: **Concordance rate (**the probability that a pair of individuals will both have a certain characteristic, given that one of the pair has the characteristic.)

For identical twins- significantly higher than those for fraternal twins/siblings.

- Torrey et al, (1994):Overall pairwise concordance rate- 28% in MZ twins, 6% in DZ Twins

A predisposition to schizophrenia may remain “unexpressed” unless “released” by unknown environmental factors.

2) Adoption Studies

i)Study by Heston (1966):

47 children born to mothers with schizophrenia and subsequently placed in foster home were followed up.

Results showed:

a)16.6% of these children were later diagnosed with schizophrenia. On the contrary, none of the 50 controls (children in foster homes whose biological mother did not have schizophrenia) developed Schizophrenia.

b) The 47 children were more likely to be diagnosed with other mental disorders-

Thus any genetic liability conveyed by the mothers is not specific to schizophrenia but also includes a liability for other forms of psychopathology.

ii) Adoption Study by Kendler et al (1984): Schizophrenia more common in biological than adoptive relatives of adoptees with schizophrenia.

- **The Quality of the adoptive family:**

Study by Tienari et al(1987): Finnish Adoption Family Study of Schizophrenia

- Followed up the adopted-away children of women who were hospitalized for schizophrenia.
- Compared their functioning with control sample of adoptees over 21 year follow up.
- It was found that the index adoptees developed more schizophrenia and schizophrenia-related disorders than did the controls.
- Study also looked at communication deviance

Communication deviance is a measure of how understandable and "easy to follow" the speech of a family member.

High communication deviance- vague, confusing and unclear communication.

Results: Genetic risk and high communication deviance- most problematic.

- Genetic risk+ high communication deviance- high levels of thought disorder
- Genetic risk+ low communication deviance: were much healthier

- Conclusion: **Strong interaction between genetic vulnerability and an unfavourable family environment- causal pathway to schizophrenia.**
- Genotype- environment interaction: Children who were raised in dysfunctional families and had high genetic risk for schizophrenia went on to develop schizophrenia.
- Children at high genetic risk who were raised in healthy family environment did not develop problems any more frequently than did children at low genetic risk.

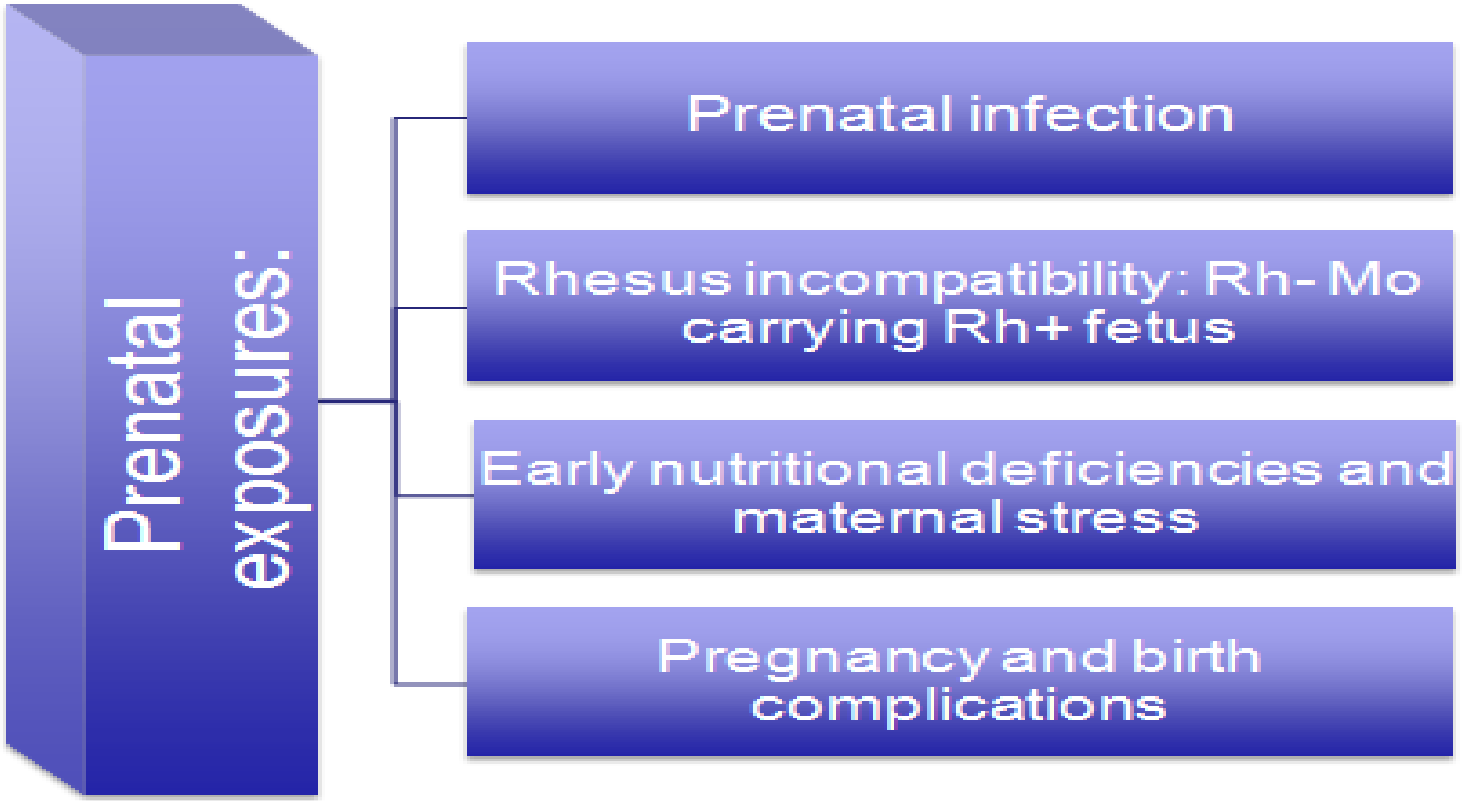
Molecular Genetics

- Unlikely that schizophrenia is linked to only one gene.

- Studies in Molecular Genetics: Schizophrenia probably involves many genes working together to confer susceptibility to the illness. The individual's "dose" of schizophrenia genes may explain why one person develops schizophrenia and another develops a milder variant within the schizophrenia spectrum.
- Various genes implicated in schizophrenia: neurelugin 1 gene, dysbindin gene, DISC1 gene and several dopamine receptor genes.

Many genes, each with a small effect, probably contribute to the development of schizophrenia. Genes that play a role in brain development may be especially implicated.

Prenatal Exposures



Environmental risk factors that might either cause schizophrenia or trigger it in a genetically vulnerable person

An Neurodevelopmental Perspective

Current thinking is that schizophrenia is a disorder in which the development of the brain is disturbed very early on.

Risk for schizophrenia may start with the presence of certain genes that, if turned on, have the potential to disrupt the normal development of the nervous system.

Children with a genetic risk for schizophrenia are more deviant than control children on research tasks that measure attention

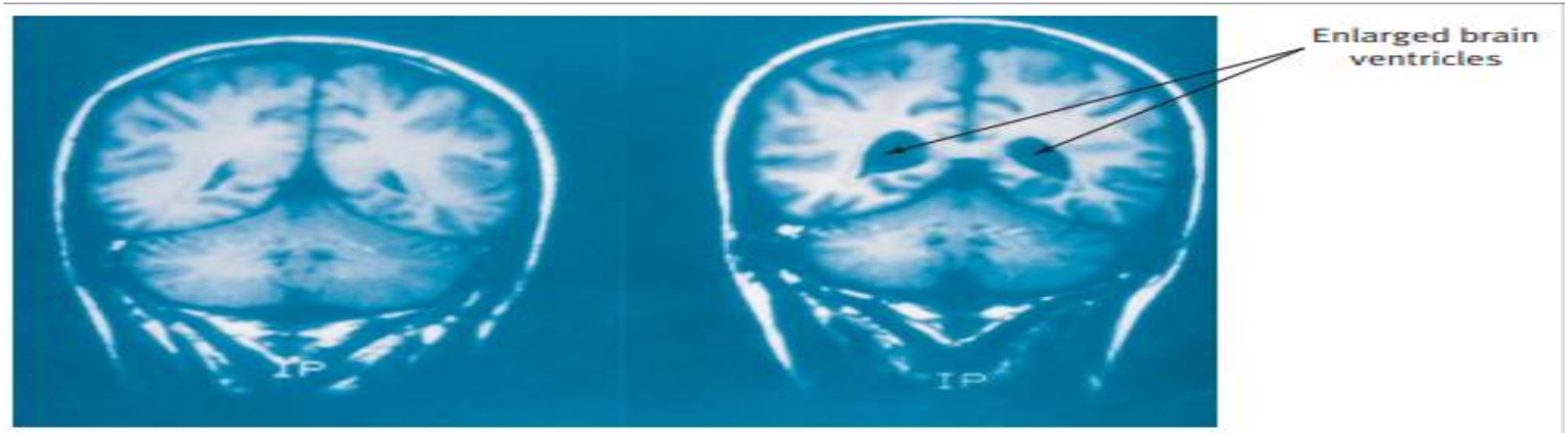
Adolescents at risk for schizophrenia are also rated lower in social competence than adolescents at risk for affective illness

Early motor abnormalities might be an **especially strong predictor of later schizophrenia.** it may be that the first signs of the illness can instead be found in the way that children move. This could be because movement abnormalities and psychotic symptoms share some of the same neural circuitry in the brain. Problems in this neural circuitry might show themselves first via movement abnormalities. Then, as the brain matures, problems in the same neural circuits manifest themselves in psychotic symptoms

Structural and Functional Brain Abnormalities

Schizophrenia patients experience many problems with their neurocognitive functioning; problems with the active, functional allocation of attentional resources

LOSS OF BRAIN VOLUME: Compared with controls, patients with schizophrenia have enlarged brain ventricles (fluid-filled spaces that lie deep within the brain), with males possibly being more affected than females



- Enlarged brain ventricles: indicator of reduction in the amount of brain tissue; brain areas that border the ventricles have somehow shrunk or decreased in volume, the ventricular space becoming larger as a result.

- MRI studies of patients with schizophrenia show about a 3 percent reduction in whole brain volume relative to that in controls (Hulshoff Pol & Kahn, 2008).

AFFECTED BRAIN AREAS : Reduction in volume of brain areas involved in memory, decision making, and in the processing of auditory information.

There is a reduction in the volume of amygdala (which is involved in emotion), the hippocampus (which plays a key role in memory), and the thalamus—a relay center that receives almost all sensory input . Important to note that the alterations in brain structure that are found in schizophrenia are not specific only to this diagnosis

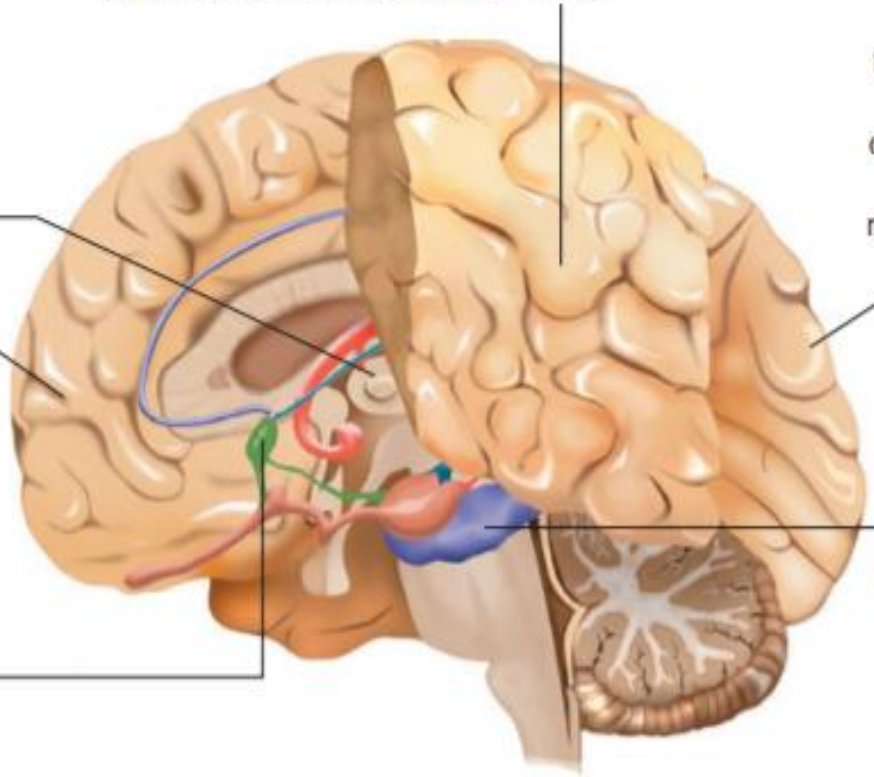
THE BRAIN IN SCHIZOPHRENIA

BASAL GANGLIA
Involved in movement and emotions and in integrating sensory information. Abnormal functioning in schizophrenia is thought to contribute to paranoia and hallucinations. (Excessive blockade of dopamine receptors in the basal ganglia by traditional antipsychotic medicines leads to motor side effects.)

FRONTAL LOBE
Critical to problem solving, insight, and other high-level reasoning. Perturbations in schizophrenia lead to difficulty in planning actions and organizing thoughts.

LIMBIC SYSTEM
Involved in emotion. Disturbances are thought to contribute to the agitation frequently seen in schizophrenia.

AUDITORY SYSTEM
Enables humans to hear and understand speech. In schizophrenia, overactivity of the speech area (called Wernicke's area) can create auditory hallucinations–the misperception that internally generated thoughts are real voices coming from the outside.



OCCIPITAL LOBE
Processes information about the visual world. People with schizophrenia rarely have full-blown visual hallucinations, but disturbances in this area contribute to such difficulties as interpreting complex images, recognizing motion, and reading emotions on others' faces.

HIPPOCAMPUS
Mediates learning and memory formation, intertwined functions that are impaired in schizophrenia.

WHITE MATTER PROBLEMS: Myelin sheath-

White matter abnormalities have been shown to be correlated with cognitive impairments.

Cytoarchitecture: Genetic vulnerabilities, combined with prenatal insults, can lead to disruption of the migration of neurons in the brain.

If this is true, some cells will fail to arrive at their final destinations, and the overall organization of cells in the brain (the brain's cytoarchitecture) will be compromised.

There are also abnormalities in the distribution of cells in different layers of the cortex and hippocampus

Neurochemistry:

- The most important neurotransmitter implicated in schizophrenia is **dopamine** which induces psychosis. Dysregulated dopamine transmission may actually make us pay more attention to and give more significance to stimuli that are not especially relevant or important.

- Glutamate is an excitatory neurotransmitter that is widespread in the brain. A dysfunction in glutamate transmission might be involved in schizophrenia.

Psychosocial and Cultural Factors

A)Families and Relapse: Expressed emotion is a measure of the family environment. It has three main elements: criticism, hostility, and emotional overinvolvement (EOI).

- EE is important because it has been repeatedly shown to predict relapse in patients with schizophrenia

Patients with schizophrenia are highly sensitive to stress. Environmental stress is thought to interact with preexisting biological vulnerabilities to increase the probability of relapse.

- Two of the major neurotransmitters implicated in schizophrenia (dopamine and glutamate) are affected by cortisol, which is released when we are stressed.
- Negative (stress-inducing) behaviors by relatives can trigger increases in unusual thinking in patients with schizophrenia.

B)**URBAN LIVING :** Being raised in an urban environment seems to increase a person's risk of developing schizophrenia.It has been estimated that if this risk factor could be removed (that is, if we all lived in relatively rural settings) the number of cases of schizophrenia could decrease by about 30 percent (see Brown, 2011).

C)**IMMIGRATION** :Research suggests that recent immigrants have much higher risks of developing schizophrenia.

Experiences of being discriminated against could lead some immigrants to develop a paranoid and suspicious outlook on the world, which could set the stage for the development of schizophrenia.

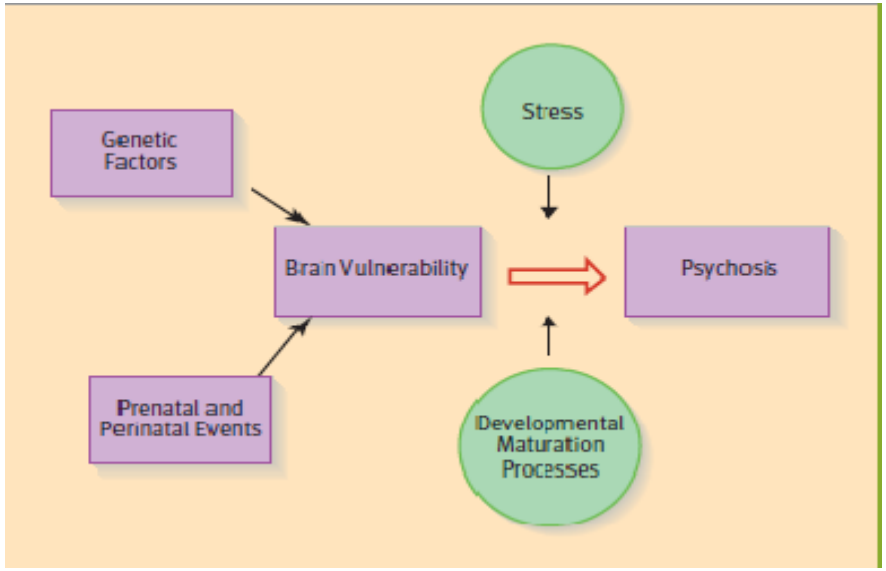
- Healthy people who felt discriminated against were more likely to develop psychotic symptoms over time than were healthy people who did not perceive any discrimination (Janssen et al., 2003).
- Possibility of stress that results from social disadvantage

CANNABIS ABUSE:

- People with schizophrenia are twice as likely as people in the general population to smoke cannabis.
- Research by Zammit, et. al (2002) revealed that young men who were heavy cannabis users by the time they were 18 were more than six times more likely to have developed schizophrenia 27 years later.
- Cannabis use may actually accelerate the progressive brain changes that seem to go along with schizophrenia.

Psychosocial and Cultural Factors

- **A Diathesis-Stress Model of Schizophrenia:**
- Focuses on gene - environment interaction
- Genetic predispositions can be shaped by environmental factors such as prenatal exposures, infections, and stressors that occur during critical periods of brain development.
- **Favourable environments may also reduce the chance that a genetic predisposition will result in schizophrenia.**



Genetic factors and acquired constitutional factors
(such as prenatal events and birth complications) combine to result in brain vulnerability.
Normal maturational processes, combined with stress factors (family stress, cannabis use, urban living, immigration, etc.), may push the vulnerable person across the threshold and into Schizophrenia
Conclusion: Schizophrenia is genetically influenced, not genetically determined

Treatments and Outcome

- **Clinical Outcome:**

- Studies of clinical outcome show that 15 to 25 years after developing schizophrenia, around **38 percent** of patients have a generally **favourable outcome** and can be thought of as being recovered (Harrison et al., 2001). This does not mean that patients return to how they were before they became ill. Rather, it means that with the help of therapy and medication, patients can function quite well.

- For around 12 percent, long-term institutionalization is necessary and around a third of patients show continued signs of illness, usually with prominent negative symptoms. A "cure" for schizophrenia has not materialized

- Patients who live in less industrialized countries tend to do better overall than patients who live in more industrialized nations (Jablensky et al., 1992). This may be because levels of expressed emotion are much lower in countries such as India than in the United States and Europe.

- **Mortality**:

- Schizophrenia is a disorder that reduces life expectancy.

- Some of the factors implicated in the early deaths of these patients are long term use of antipsychotic medications, obesity, smoking, poor diet, use of illicit drugs, and lack of physical activity and high risk of committing suicide (12%)

Treatments and Outcome

- **Treatment:**

a) Pharmacological Approach

1. First-generation antipsychotics :

- Introduced in the 1950s
- Also referred to as neuroleptics/ typical antipsychotics.
- Examples: chlorpromazine (Thorazine) and haloperidol (Haldol).
- They are dopamine antagonists. This means that they block the action of dopamine, primarily by blocking (occupying) the D2 dopamine receptors.
- Some clinical change can be seen within the first 24 hours of treatment. However, it may take several weeks or even months for maximal clinical benefit to be achieved.
- **First-generation antipsychotics work best for the positive symptoms of schizophrenia.**
- Common side effects: drowsiness, dry mouth, weight gain and *extra pyramidal side effects* (EPS). These are involuntary movement abnormalities (muscle spasms, rigidity, shaking) that resemble Parkinson's disease.

Treatments and Outcome

2. Second-generation antipsychotics

- Introduced in 1980s
- Example: Clozapine (Clozaril), risperidone (Risperdal) etc.

  these medications are called “second-generation antipsychotics” is that they cause fewer extrapyramidal symptoms than the earlier antipsychotic medications
- side effects: Drowsiness, considerable weight gain and Diabetes

- Antipsychotic medications may actually contribute to the progressive brain tissue loss we see in schizophrenia

Treatments and Outcome

- **b)Psychosocial Approaches:**

1.Family Therapy:

- High family levels of Expressed emotions predicts relapse in patients with schizophrenia.
- Family intervention programs focus on reducing relapse in schizophrenia by changing aspects of the patient–relative relationship.
- This generally involves working with patients and their families to educate them about schizophrenia, to help them improve their coping and problem-solving skills, and to enhance communication skills, especially the clarity of family communication.

2. Case management

- Case managers are people who help patients find the services they need in order to function in the community by , referring the patient to the people who will provide the needed service (e.g., help with housing, treatment, employment, and the like).
- Assertive community treatment programs are a specialized form of case management. They involve multidisciplinary teams which delivers all the services the patient needs.

Treatments and Outcome

3. Social-skills training

- Social-skills training is designed to help patients acquire the skills they need to function better on a day-to-day basis. These skills include employment skills, relationship skills, self-care skills, and skills in managing medications or symptoms.
- Social routines are broken down into smaller, more manageable components.
- Patients learn these skills, get corrective feedback, practice their new skills using role-playing, and then use what they have learned in natural settings
- Social-skills training does seem to help patients acquire new skills, be more assertive, and improve their overall levels of social functioning
- Patients who receive social-skills training are less likely to relapse and need hospital treatment.

Treatments and Outcome

4. Cognitive Remediation:

- Cognitive remediation training does seem to help patients improve their attention, memory, and executive functioning skills.
- Patients who receive cognitive remediation training also show improvements in their social functioning.

5. Cognitive-behavioral therapy

- The goal of CBT is to decrease the intensity of positive symptoms, reduce relapse, and decrease social disability.
- The therapist and the patient explore the subjective nature of the patient's delusions and hallucinations, examine evidence for and against their veracity and subject delusional beliefs to reality testing.
- CBT is not very helpful for negative symptoms

6. **Mindfulness, Acceptance and Commitment Therapy**

Mindfulness, part of ACT can be described as "paying attention in a particular way on purpose, in the present moment and nonjudgmentally" Regard thoughts as mental events and not as accurate reflections of reality.

Cognitive defusion- important process in ACT.

Treatments and Outcome

6. Individual treatment:

- Personal therapy is a nonpsychodynamic approach that equips patients with a broad range of coping techniques and skills.
- The therapy is staged, which means that it comprises different components that are administered at different points in the patient's recovery.
- For example, in the early stages, patients examine the relationship between their symptoms and their stress levels. They also learn relaxation and some cognitive techniques.
- Later, the focus is on social and vocational skills.
- Overall, this treatment appears to be very effective in enhancing the social adjustment and social role performance of discharged patients.

7. Psycho education:

- Educating patients about the illness and its treatment is.
- Patients who receive psychoeducation in addition to standard treatment are less likely to relapse