

# Dual Diagnosis: Substance Abuse and Mental Illness



and a review of the  
major **PSYCHIATRIC  
MEDICINES**

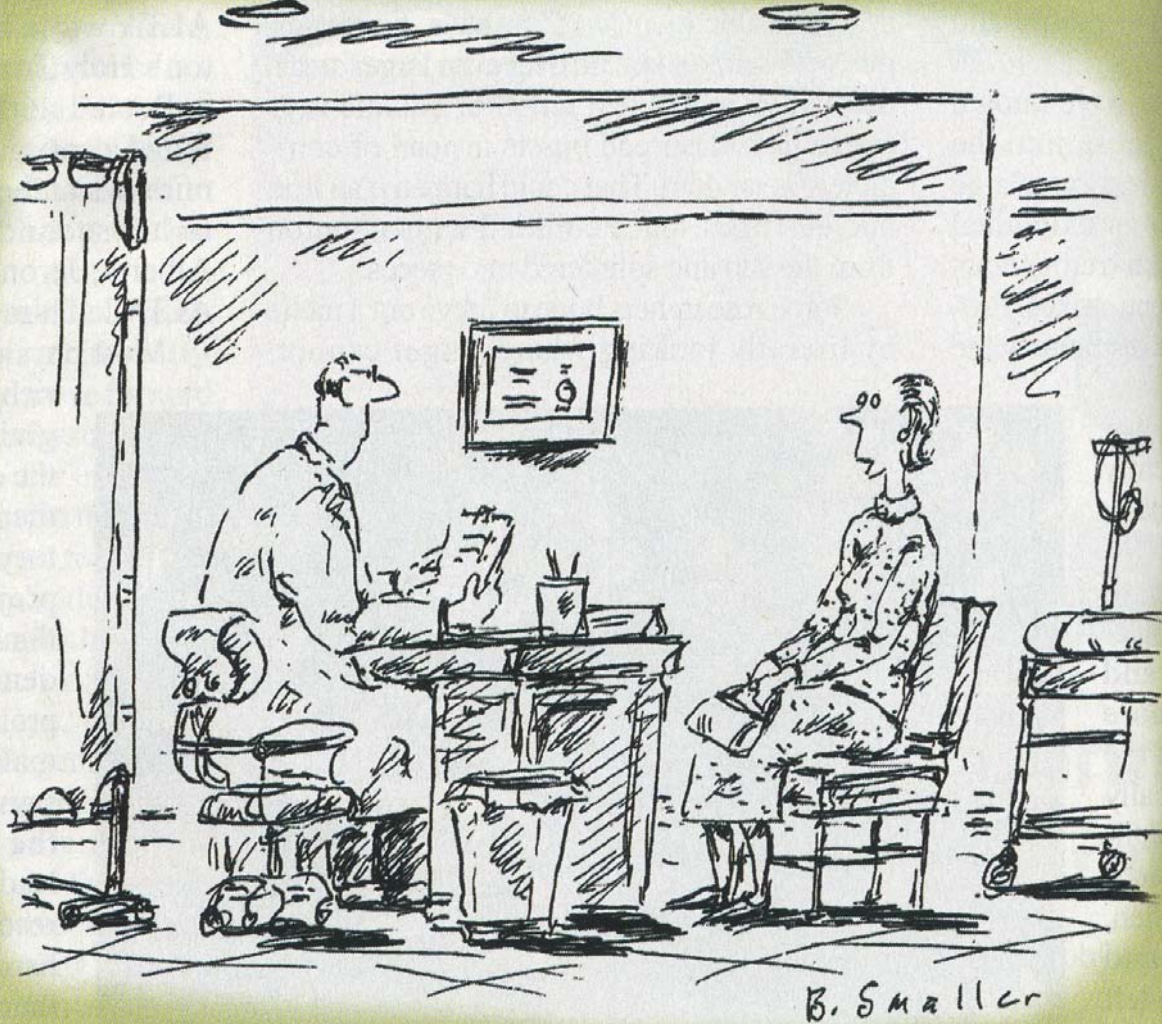
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Special appreciation to Gary L. Viale, Pharm D., BCPP, FCSHP



“I think the dosage needs adjusting. I’m not nearly as happy as the people in the ads.”

# Psychopathology

- Psychopathology refers to problematic patterns of thought, feeling, and behavior
  - Disrupted functioning at home, work, and in the person's social life
  - Patterns that cause distress in the person or in others
  - Psychopathology literally means sickness of the mind
- Psychopathology varies between and within cultures

# Psychological Disorders Commonly Seen in Addictions Treatment

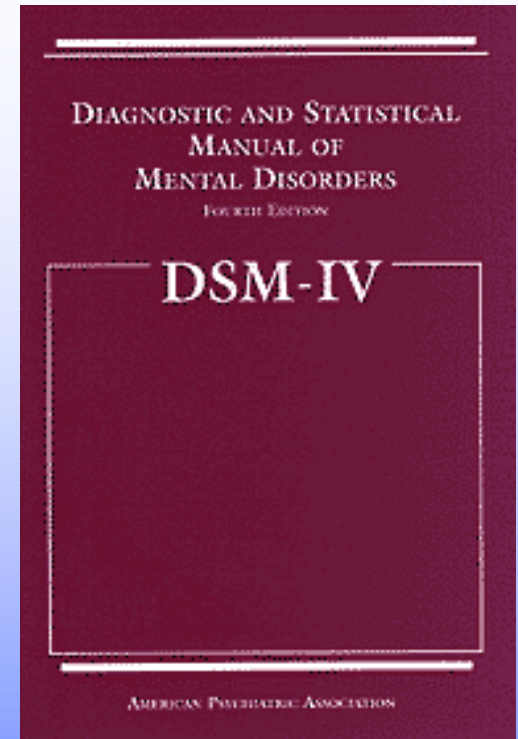
- Schizophrenia
- Mood disorders
  - Bipolar disorder (manic depression)
  - Depressive disorders
- Anxiety disorders

# Descriptive Diagnosis

- Abnormality is reflected in discrete symptoms
- As in physical illness, symptoms fall into discrete clusters called syndromes
- Syndromes are assumed to have discrete causes and are to be treated using different therapies

# DSM-IV

- The American Psychiatric Association published a diagnostic manual that attempts to classify signs and symptoms into syndromes
  - Signs are observable phenomena (temperature)
  - Symptoms are reports from patients (headache)
- The current edition is termed the DSM-IV
  - The DSM-IV uses a multi-axial system of diagnosis
    - The axes cover symptoms as well as medical conditions, stress, and current level of function



# The Axes of DSM-IV

## Axis Description

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- I Presenting Symptoms causing distress
  - II How the person carries themselves throughout their life
  - III Medical conditions that may be relevant to understanding or treating a psychological disorder
  - IV Psychosocial and environmental problems
  - V Global assessment of functioning (GAF)
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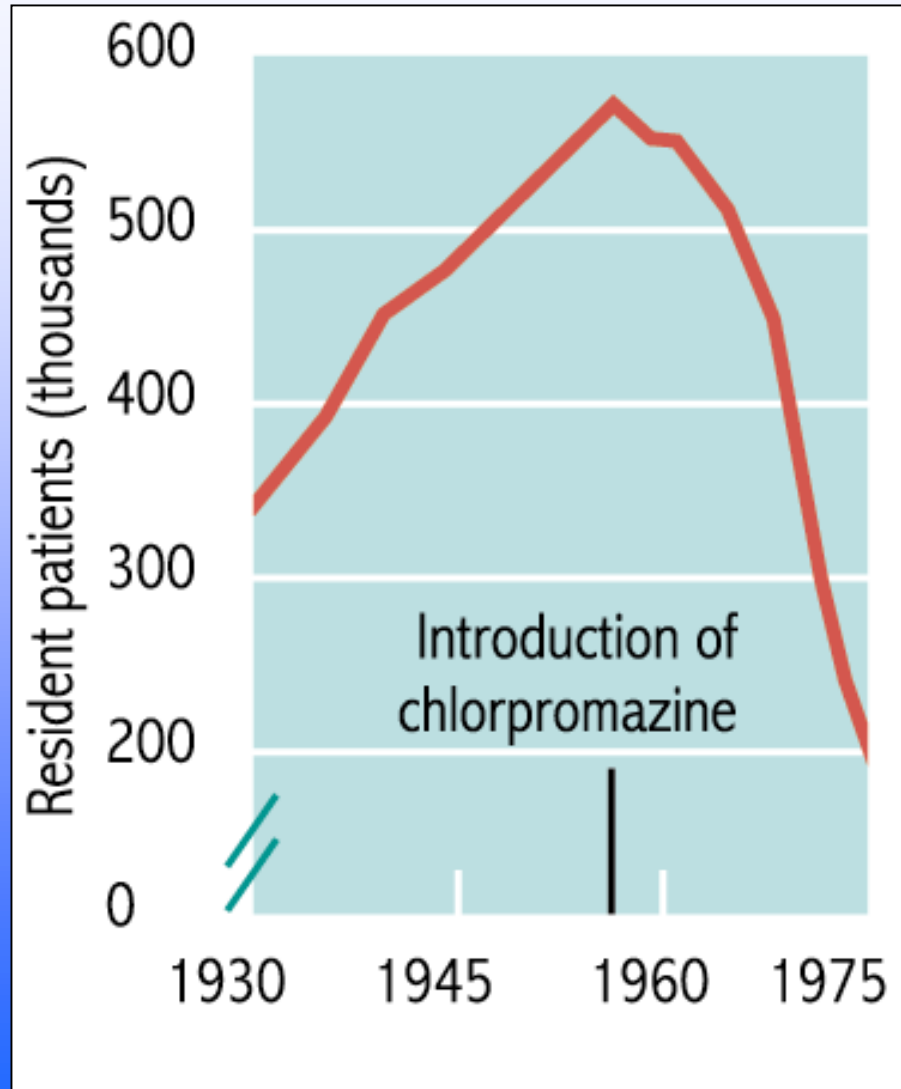
(Source: DSM-IV, American Psychiatric Association, 1994)

# Pharmacotherapy

- Psychotropic medications are drugs that act on the brain to alter mental function
- Prior to 1956, schizophrenia was virtually untreatable with many patients confined for life in mental hospitals
  - Chlorpromazine (Thorazine) was found to reduce severity of psychotic thought, allowing people to live outside of mental institutions



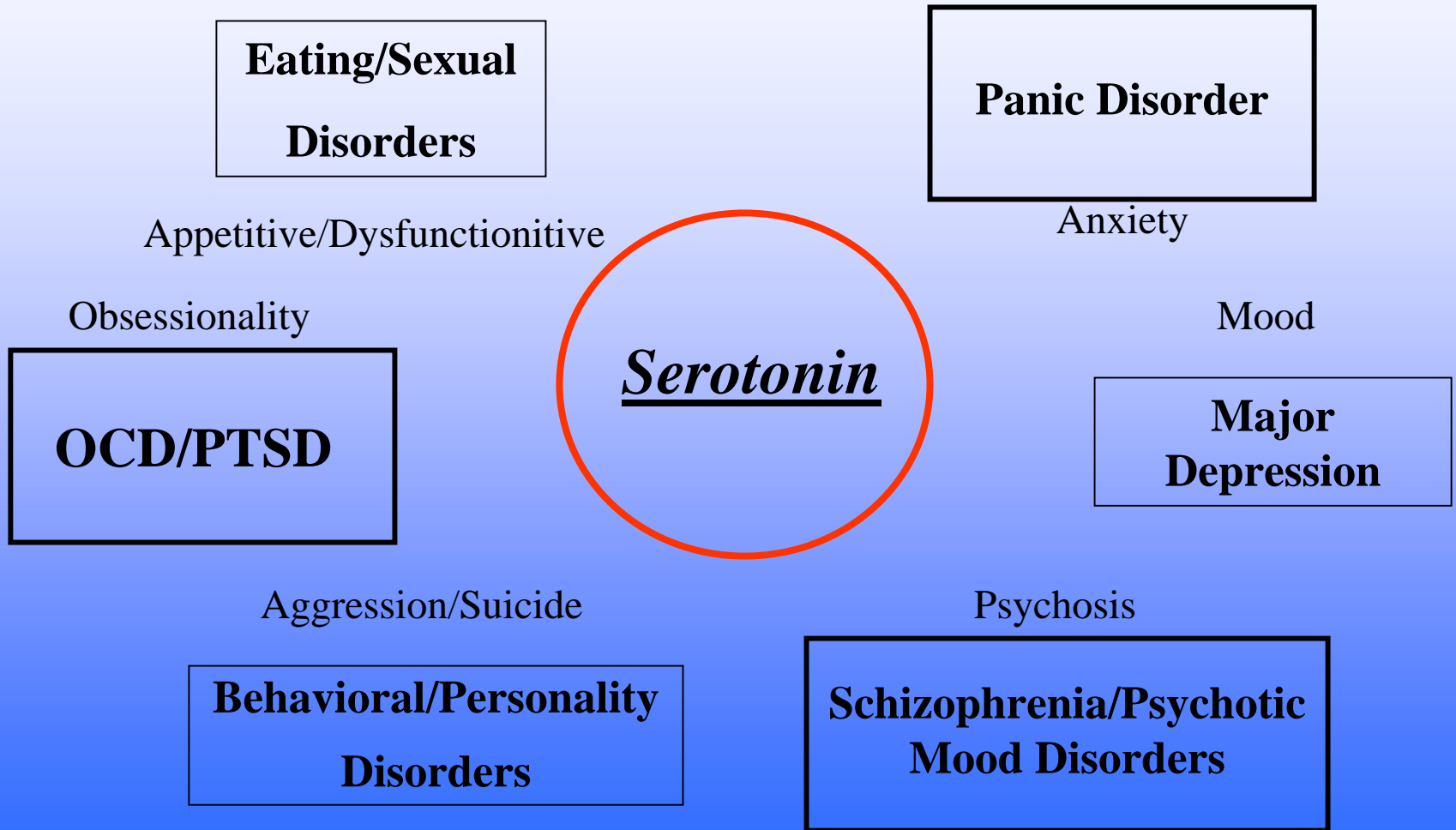
# Impact of Chlorpromazine on Institutionalization



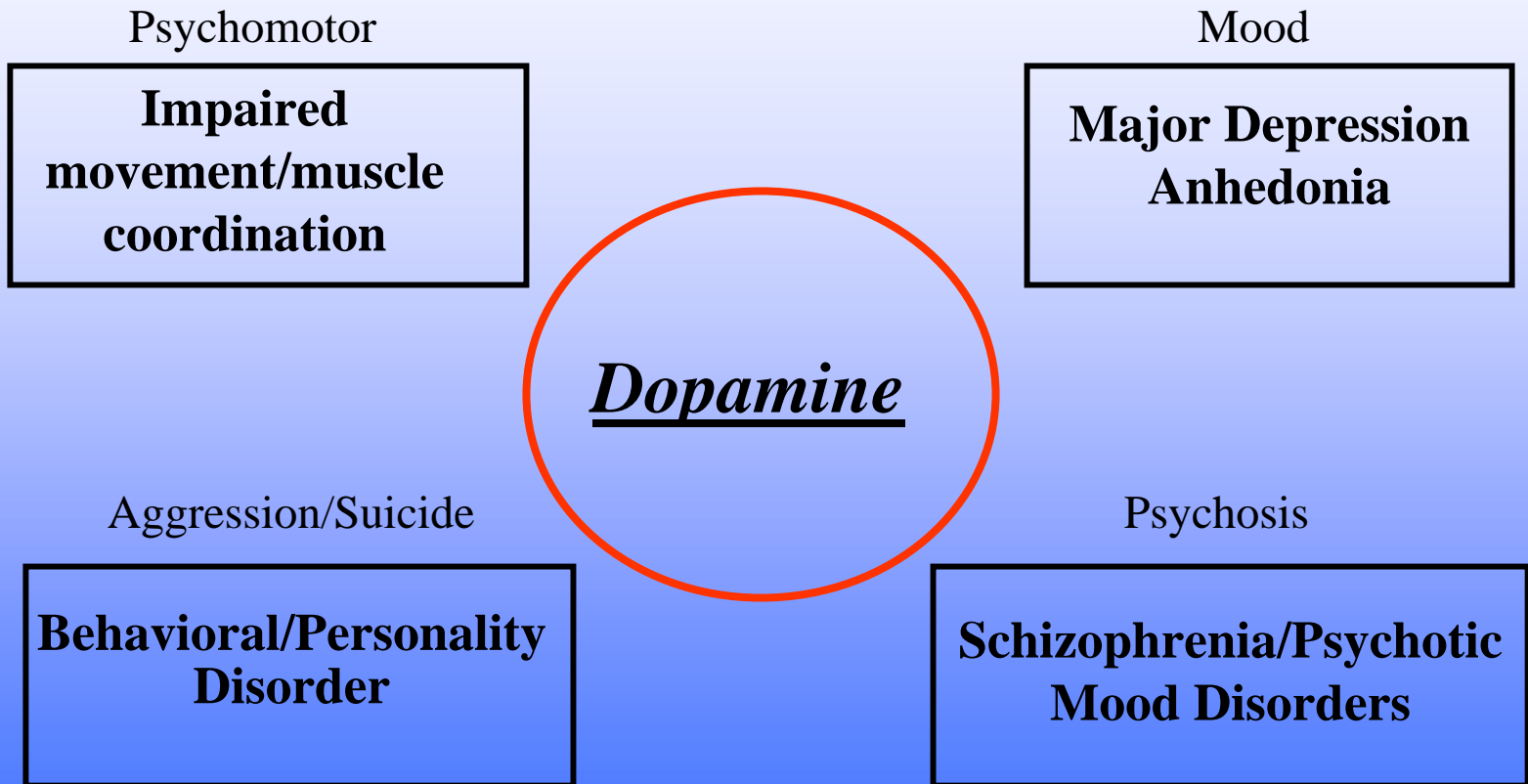
# Psychotropic Mechanisms of Action

- Psychotropic drugs can alter behavior via:
  - An interaction with neurotransmitters in brain
    - Some release specific transmitters
    - Some block the reuptake of transmitters
    - Some interact with postsynaptic receptors
    - Some may act within neuron cells
  - A placebo effect
    - Subjects believe in the efficacy of the drug and show an actual change in function (analgesia or relief from pain shows moderate placebo effects)

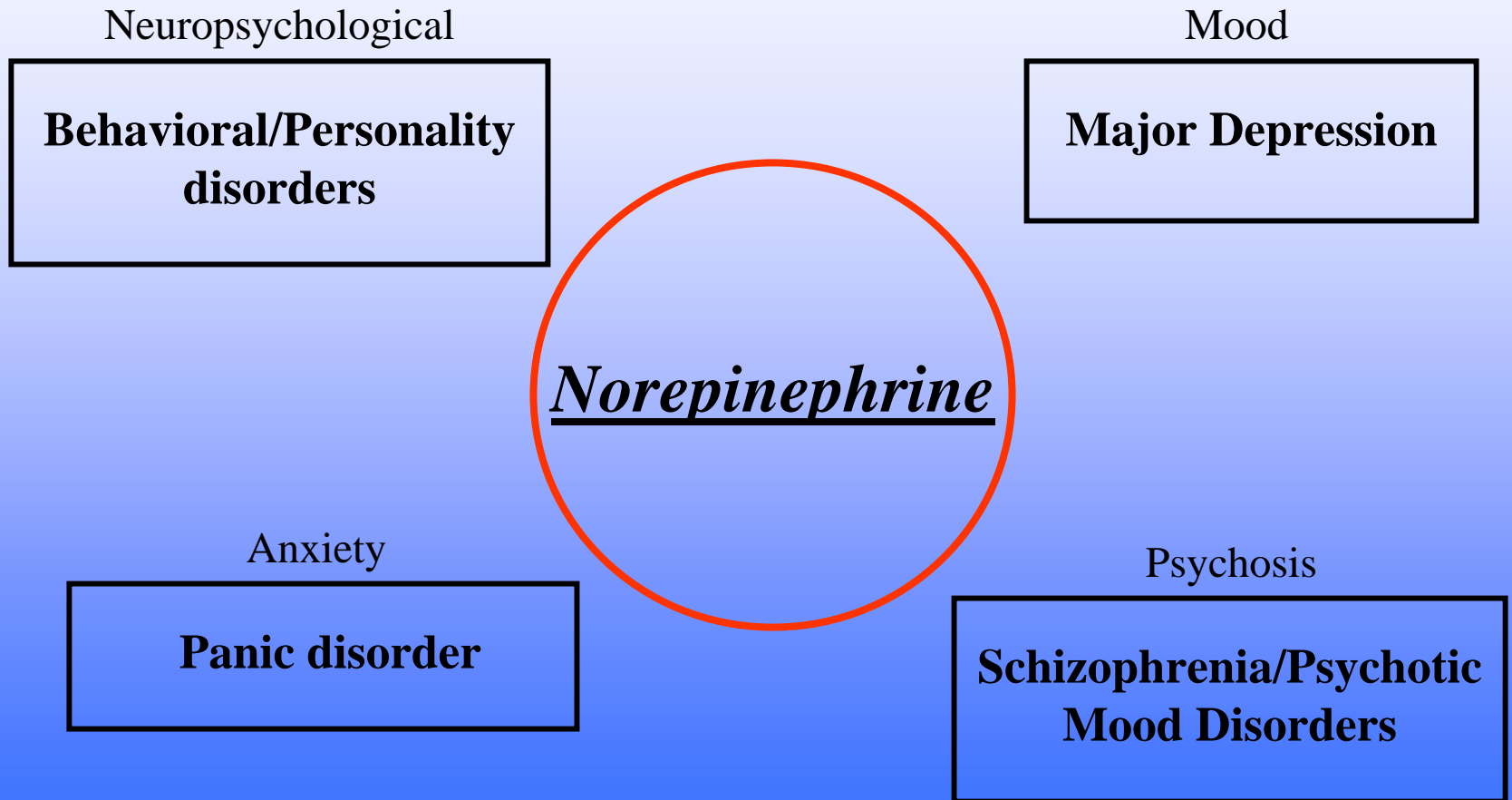
# Some Diagnoses Influenced By Serotonin Dysfunction



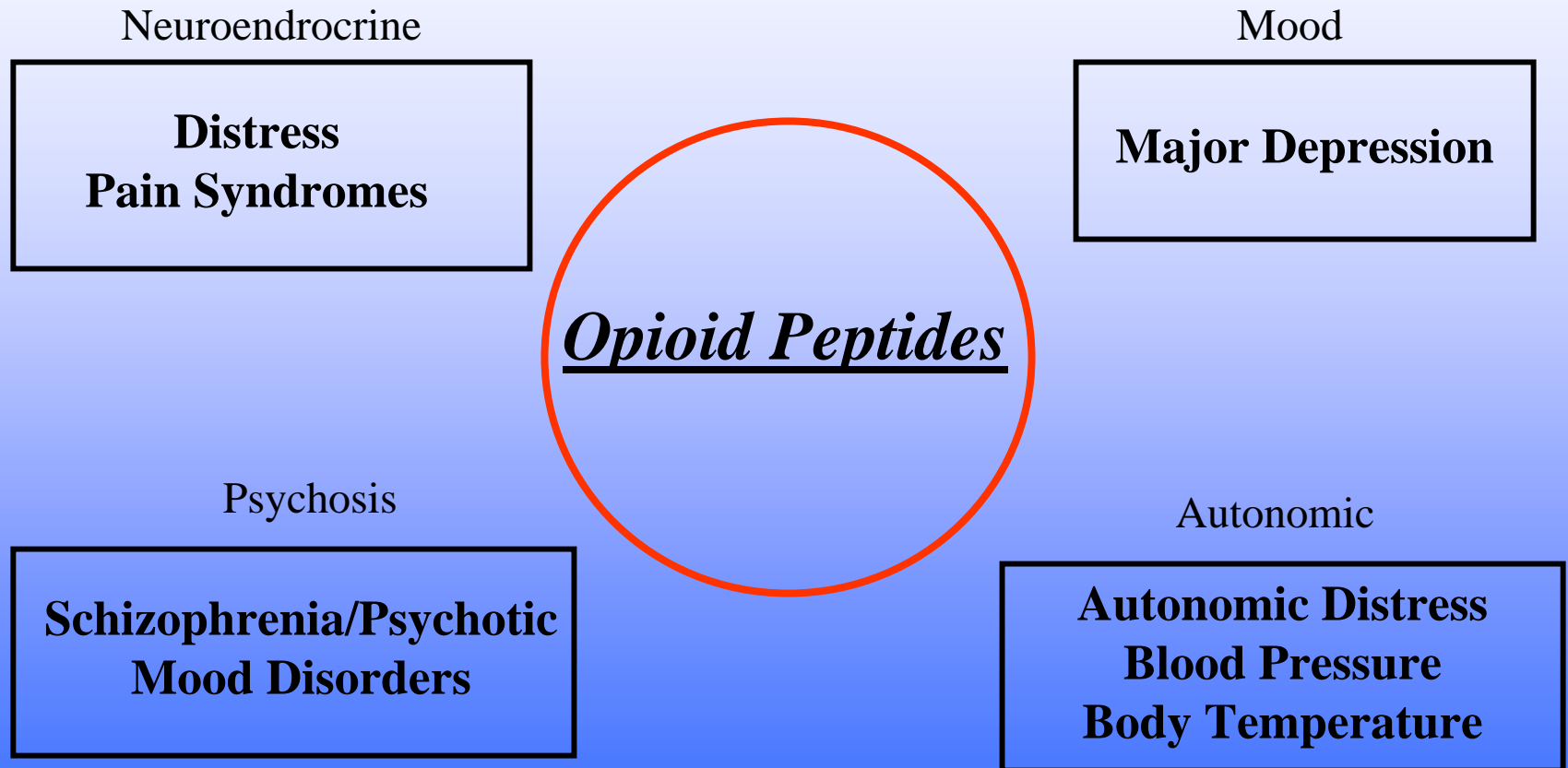
# Some Diagnoses Influenced By Dopamine Dysfunction



# Some Diagnoses Influenced By Norepinephrine Dysfunction

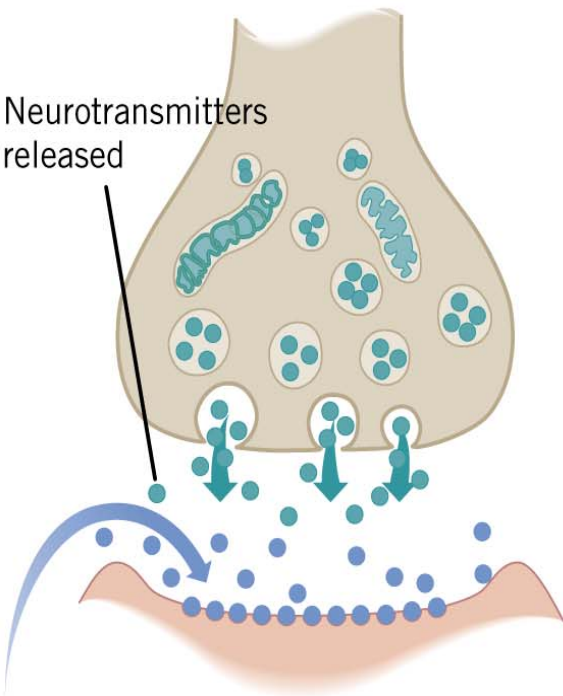


# Some Diagnoses Influenced By Opioid Peptides Dysfunction



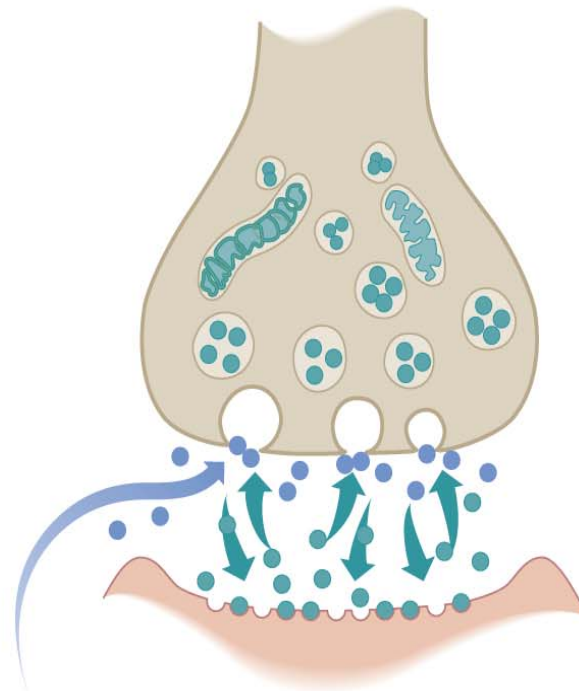
# Mechanism of Actions

(a) Decreases neural transmission by "locking up" receptor sites



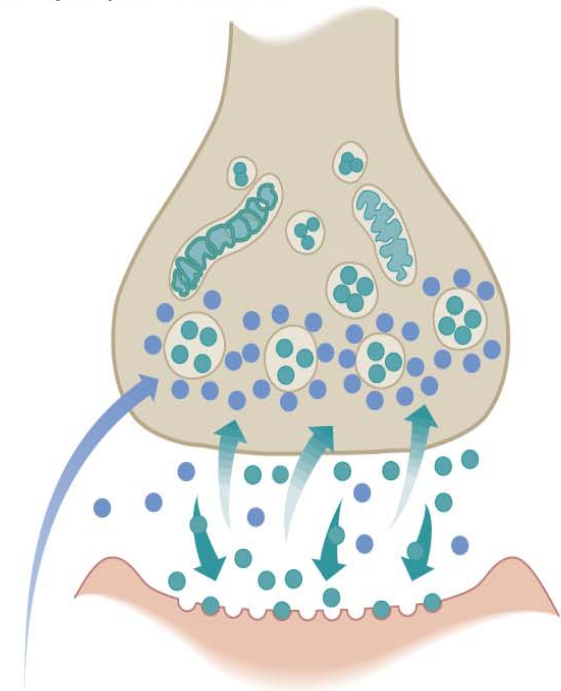
Drug binds with receptors to prevent them from being activated by the neurotransmitters in the synapse.

(b) Increases neural transmission by blocking reuptake



Drug blocks neurotransmitters from being taken back into the presynaptic membrane, leaving the neurotransmitters in the synapse longer.

(c) Increases neural transmission by blocking breakdown of neurotransmitters in synaptic vesicles



Drug prevents the neurotransmitter returning from the synapse from being broken down for storage, which keeps it available at the synapse.

# Co-Occurring Disorders

*Dual diagnosis* is a term describing those persons who suffer from co-occurring mental illness and substance abuse disorders.



# Prevalence

- 19.4 million (9.2%) adults with a substance abuse disorder
- 19.2 million (9%) adults with independent mood disorders including major depression, dysthymia, manic depression
- 23 million (11%) adults with independent anxiety disorders

# Prevalence

- Roughly, 50% of individuals with severe mental illness are affected by substance abuse
- 37% of alcohol abusers and 53% of drug abusers have at least one serious mental illness
- Of all people diagnosed as mentally ill, 29% abuse alcohol and other drugs

# Prevalence

- An estimated 50% of homeless adults with serious mental illnesses have a co-occurring substance abuse disorder.

# Prevalence

- 47% of schizophrenics also have a substance abuse disorder (4x the general population)
- 61% of people with bipolar disorder also have a substance abuse disorder (more than 5x that of the general population)

# Prevalence

- The drugs most commonly used is alcohol followed by marijuana, cocaine and methamphetamine.
- Prescription sedative and pain killer drugs are also abused in this population.

# Prevalence

- Have a higher risk for hospitalization, violence, depression, suicide, homelessness, HIV infection and incarcerations.

# Justice Services



- *16% of jail and prison inmates are estimated to have serious mental and substance abuse disorders.*
- *Among detainees with mental disorders, 72% also have a co-occurring substance abuse disorder.*

# Suicide and AOD Use

- Psychoactive drugs are present at autopsy in 30–50% of suicides
- Intoxication predisposes to suicide in those at risk by:
  - disinhibiting usual constraints on the person
  - providing ‘courage’
  - clouding judgement and the ability to see alternatives
  - deepening mood or worsening psychosis
  - misadventure.



# Why Such a High Rate?

- High-risk use of AODs can precipitate or exacerbate mental health problems:
  - psychosis in the mentally vulnerable (esp. from cannabis and stimulants)
  - depression (esp. from alcohol)
  - anxiety / social and phobia / panic attacks (esp. alcohol & benzodiazepines)
- Shared underlying causes / antecedents
  - genetics
  - environmental influences
- ‘Self-medication’ hypothesis

*Problematic AOD use and mental health problems share many antecedents.*

# Co-Occurring Disorders: So What?

- Increased rates of violence (perpetrator and victims)
- Homelessness
- Poor treatment compliance
- Reduced or potentiated effect of medication
- Slower recovery from AOD-related problems
- Higher suicide rates.

# Some Explanations for Co-occurring Disorders

1. Substance induced temporary disorders
2. Substances intensify prior psychiatric conditions
3. A few psychiatric disorders increase the risk for substance use disorders

- Drugs can cause psychiatric symptoms
- These last days to weeks
- They clear spontaneously

# Time Frames for Symptom Abatement with Abstinence

- Depression and anxiety due to alcohol dependence: 4–6 weeks (maybe longer)
- Psychosis due to amphetamines and/or cannabis: 7–10 days
- Prolonged symptoms beyond these periods suggest an underlying mental health problem.

# Schizophrenia

- Schizophrenia refers to a profound disturbance in human function including:
  - Thought: Illogical thought systems (delusions) and loosening of associations
  - Perception: Presence of hallucinations
  - Language: Word salad, disconnected ideas
  - Affect: Emotion (often flat or absent)
- Symptoms can be viewed as:
  - Positive: Delusions are an added function
  - Negative: Signal the absence of a function (flat affect)

# Epidemiology of Schizophrenia

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- 1% of lifetime prevalence (over 2,000,000 Americans)
- 200,000 new cases per year in USA
- 300,000 acute schizophrenic episodes annually
- 0.025 – 0.5% of total population treated for schizophrenia in any one year
- 2/3 of these require hospitalization
- More prevalent than Alzheimer's disease, multiple sclerosis, insulin-dependent diabetes

# Dopamine and Schizophrenia

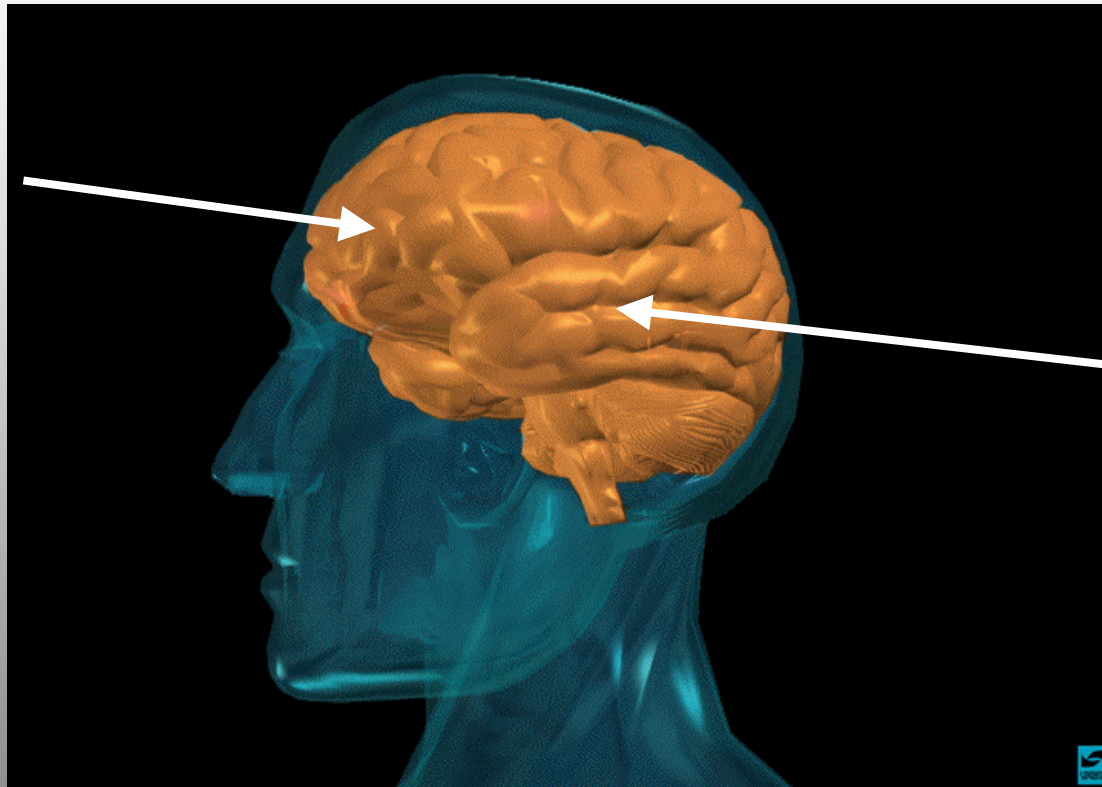
- The positive symptoms of schizophrenia reflect too much brain dopamine activity
  - Antipsychotic drugs are effective antagonists of dopamine receptors (block the action of dopamine)
  - Drugs such as amphetamine release dopamine from terminals; too much amphetamine exposure can induce a psychotic state in humans
- Negative schizophrenic symptoms may reflect brain damage.



# Schizophrenia: How antipsychotic meds work

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*Decreased*  
activity  
prefrontal  
cortex  
(negative  
symptoms)



*Increased*  
activity  
mesolimbic  
structures  
(positive  
symptoms)



# Schizophrenia: Core Symptoms/Spectrum Disorder

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## **Positive Symptoms**

Delusions

Hallucinations (hearing)

Disorganized speech

## **Negative Symptoms**

No emotions

Unmotivated

Nothing pleasurable

# Substance Use Disorders Among Schizophrenics

# Lifetime Risks: General Population

- Schizophrenia 1%
- Nicotine dependence 28% men & women
- Alcohol dependence 12% men, 5% women
- Marijuana dependence 5%
- Cocaine dependence 2%

# Lifetime Risks: Schizophrenic Population

- Nicotine dependence 70%
- Alcohol dependence 37%
- Marijuana dependence 23%
- Cocaine dependence 13%

# Consequences

- General population
- Special issues in schizophrenics

# Consequences of Alcohol in General Population

- Intoxication: Poor judgment, anger, violence, impaired coordination
- Medical complications: Cardiomyopathy, anemia, cirrhosis
- Hallucinations
- Delirium tremens

# Consequences of Alcohol in Schizophrenics: Special Issues

- Small amounts have greater effect
- Alcohol can increase cognitive deficits and enhance depression



# Consequences of Methamphetamine in the General Population

- Myocardial infarction
- Arrhythmias
- Cerebrovascular accident
- Chestpains (when smoked), dyspnea, hyperthermia, chest X ray normal
- Paranoia
- Mood swings
- Depression (severe)

# Consequences of Methamphetamine in Schizophrenics: Special Issues

- Destabilization and symptoms reemergence
- Frequent rehospitalizations
- Increased odds of violent behavior
- Increased risk of HIV infections
- Poor overall treatment compliance

# Combined Methamphetamine and Alcohol Use

- Direct toxic effect on myocardium
- Increased risk of panic states
- Increases duration of elevated blood pressure (hypertension crisis)

# To produce an effect:

1. A drug must bind to and interact with receptors (located on cell membranes)
2. Receptors are usually located on the surface of neurons
3. Drug-receptor binding leads to a change in the functional properties of the neuron

# Receptors for Drug Action

Receptor: a large molecule (usually a protein) present on the surface of or within a cell.

Neurotransmitters : biologically active, naturally occurring endogenous compounds produce their effects by binding to receptors.

## EXAMPLE

- Serotonin (5-HT) is a neurotransmitter that binds to more than 25 different serotonin receptor proteins
- Each receptor has a small difference in amino acid composition. They have been named as 5-HT1, 5-HT2, 5-HT2a, etc.
- A given drug can bind to one or multiple receptors.

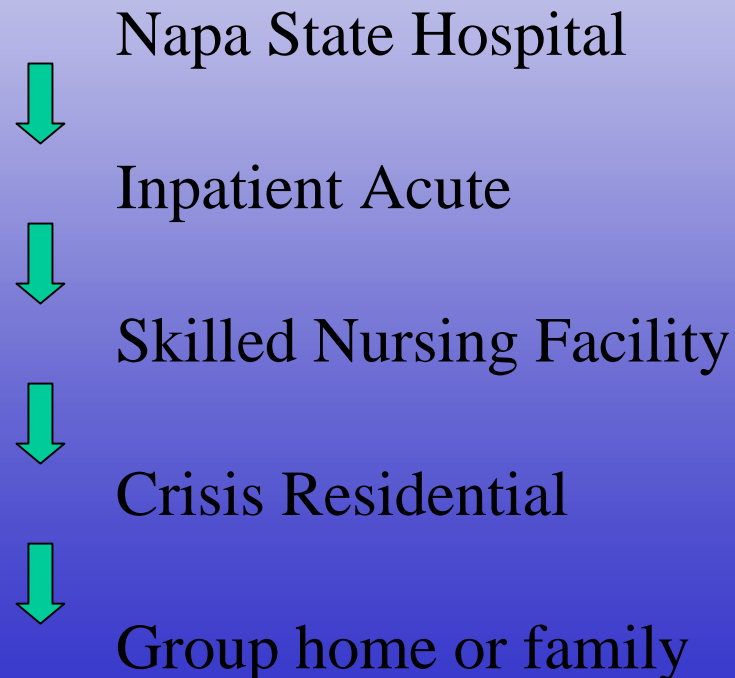
Understanding receptor subtypes allows for the development of new medications that are more selective in where they target their action causing fewer side effects

Resulting in improved patient  
medication compliance!

# Treatment of Psychiatric Disorders

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## Compliance Improvements Can Mean:

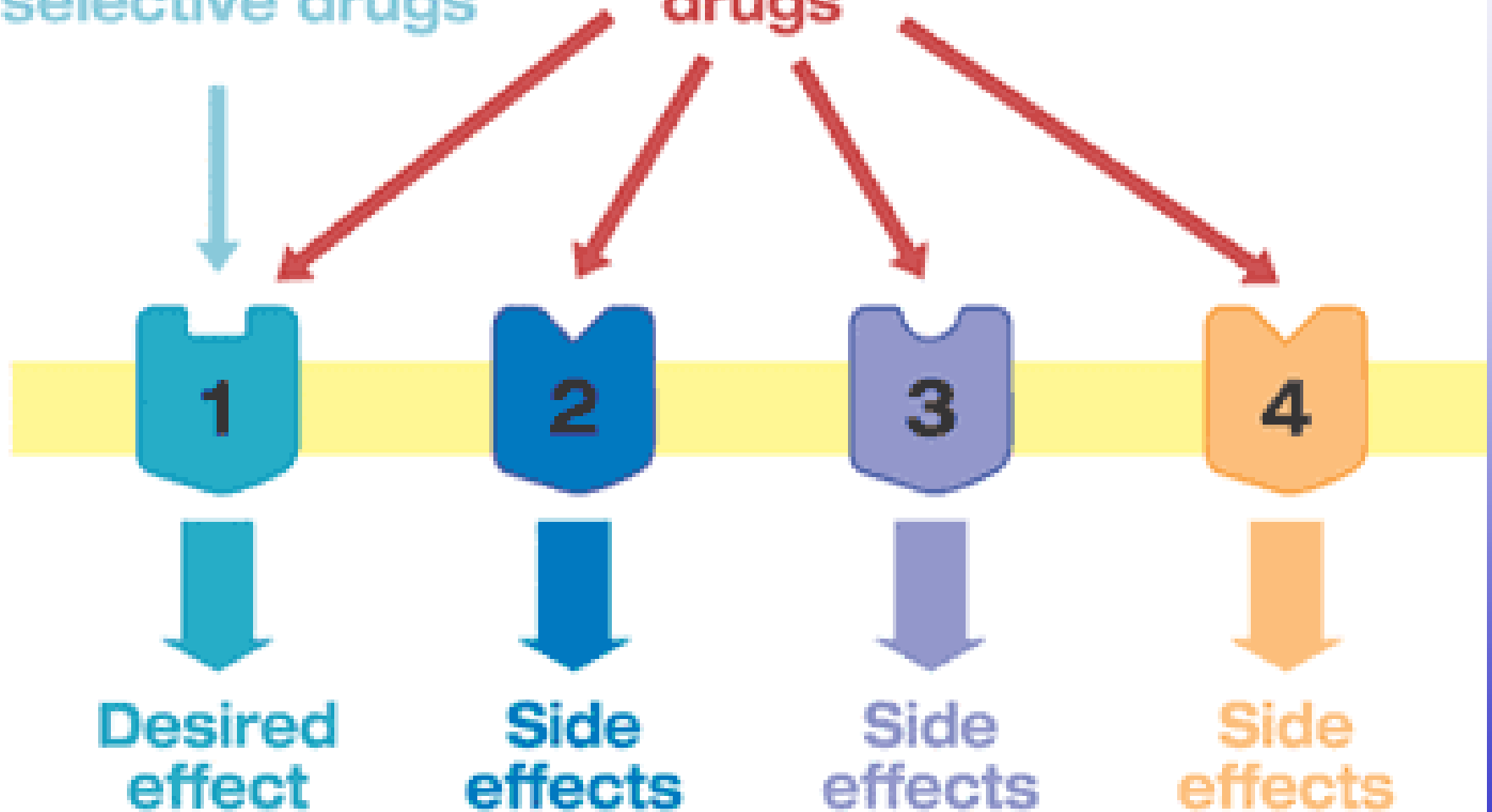




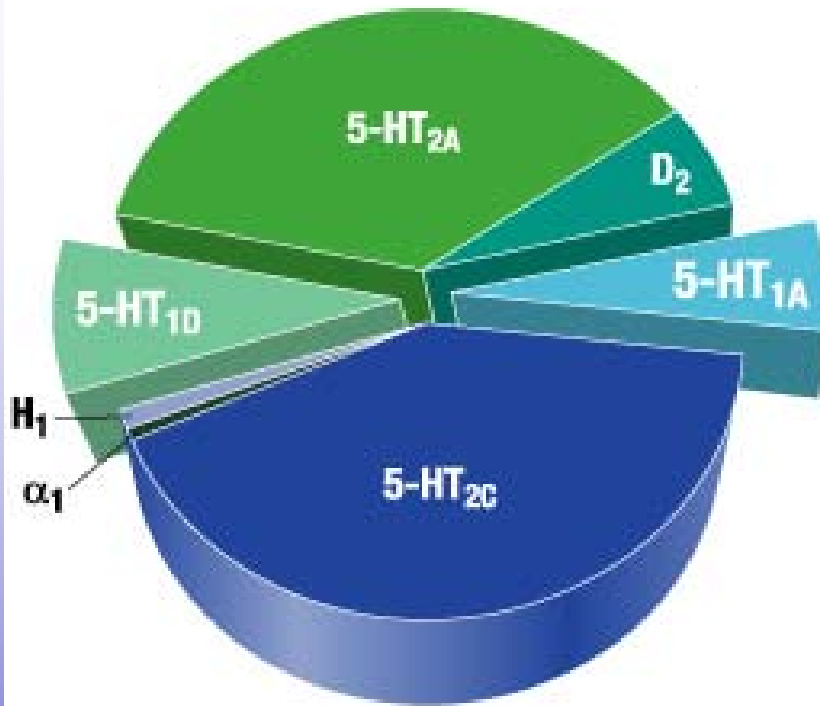
# Receptor Subtypes

Subtype-selective drugs

Non-selective drugs



# Ziprazidone (Geodon)



## POSITIVE SYMPTOMS

### **D<sub>2</sub> - Antagonism**

Efficacy in positive symptoms

### **High 5-HT<sub>2A</sub>/D<sub>2</sub> - Affinity ratio**

antipsychotic efficacy, reduced EPS  
(compared to D<sub>2</sub> antagonism alone)

## NEGATIVE SYMPTOMS

### **5-HT<sub>2A</sub> - Antagonism**

Efficacy in negative symptoms

## OVERALL SYMPTOMS

### **5-HT<sub>2C</sub> - Antagonism**

Antipsychotic activity

## **COGNITIVE AND DEPRESSIVE SYMPTOMS AND SYMPTOMS OF SOCIAL IMPAIRMENT**

### **5-HT<sub>1A</sub> - Agonism**

Antidepressant and anxiolytic activity and improved cognition

### **5-HT<sub>1D</sub> - Antagonism**

Efficacy in depressive symptoms

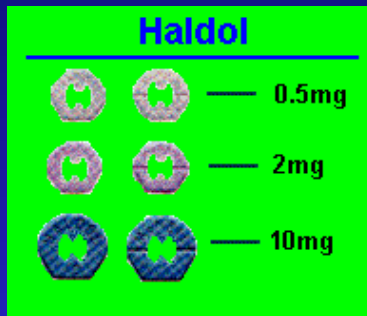
# Anti-psychotic Medications

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- Clozaril (clozapine)
- Risperdal (risperidone)
- Zyprexa (olanzapine)
- Seroquel (quetiapine)
- Geodon (ziprasidone)
- Abilify (aripiprazole)
- Invega (paliperidone)

# Antipsychotic Medications

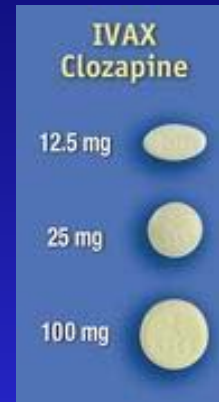
Haldol ®  
(haloperidol)



Geodon ®  
(ziprasidone)



Clozaril ®  
(clozapine)



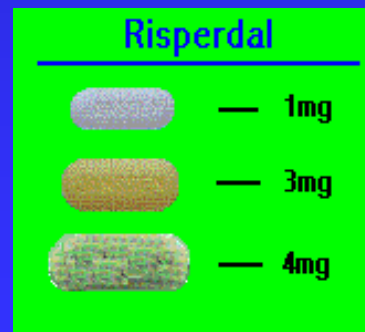
Seroquel ®  
(quetiapine)



Zyprexa ®  
(olanzapine)



Risperdal ®  
(risperidone)



Abilify ®  
(aripiprazole)





# Depression and Antidepressant Medications

# Epidemiology of Depressive Disorders

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- High rate of occurrence
- 5% lifetime prevalence
- 10 –14 million people in U.S. depressed in a given year
- Episodes of long duration
- > 50% rate of occurrence
- Morbidity comparable to angina and advanced coronary artery disease
- High mortality from suicide

# Criteria for Major Depressive Syndrome

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- Depressed mood and/or loss of interest or pleasure (pervasive for 2 weeks)
- 4 of the following symptoms (3 with both depressed mood and loss of interest or pleasure)

## Physical

- Sleep disorder
- Appetite change
- Fatigue
- Psychomotor agitation/  
retardation

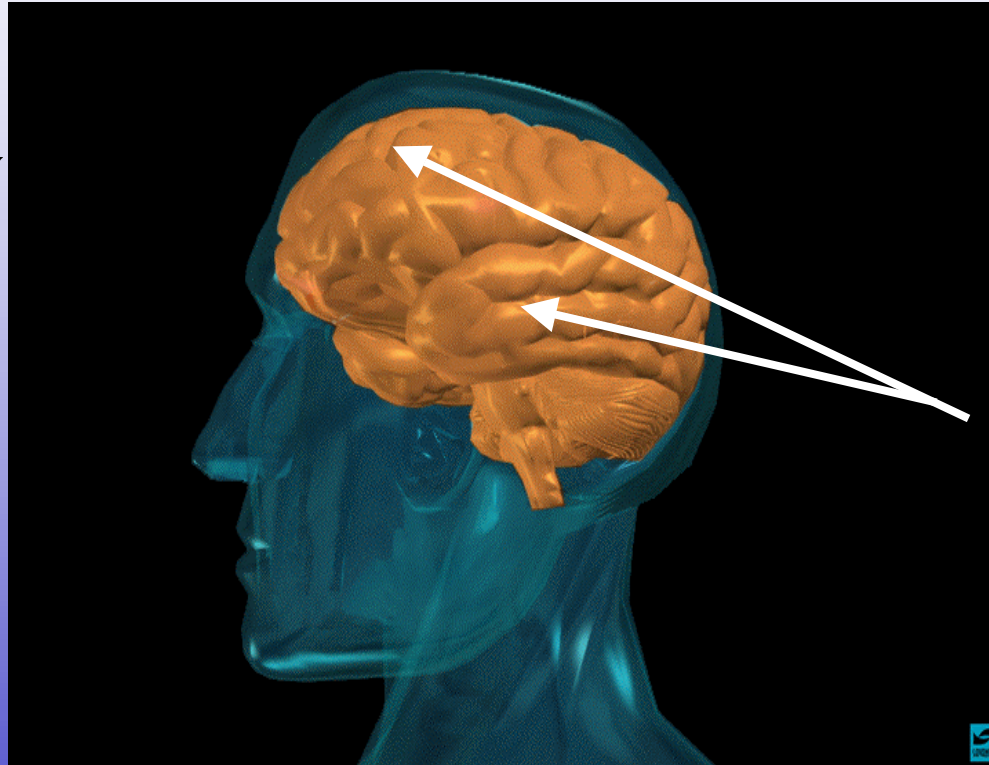
## Psychologic

- Low self esteem/guilt
- Poor concentration  
indecisiveness
- Thoughts of death/  
suicidal ideation

# Depressive Disorders: How antidepressant meds work

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Predominantly  
lower levels  
of dopamine  
and serotonin  
in the brain



Decreased  
activity  
throughout the  
brain but focus  
on mesolimbic  
structures



# Antidepressant Medication Side Effect Concerns

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## CNS

### Activation

- insomnia
- anxiety
- nervousness
- agitation
- tremor

### Sedation

- somnolence
- fatigue

## GI

- nausea
- constipation
- *weight gain*
- dyspepsia

## Sexual Function

- *decreased libido*
- *impotence*
- *ejaculation disorder*
- *anorgasmia*

## Other (anticholinergic)

- dry mouth
- increased sweating
- urinary retention

# Depression Is A Highly Treatable Disorder

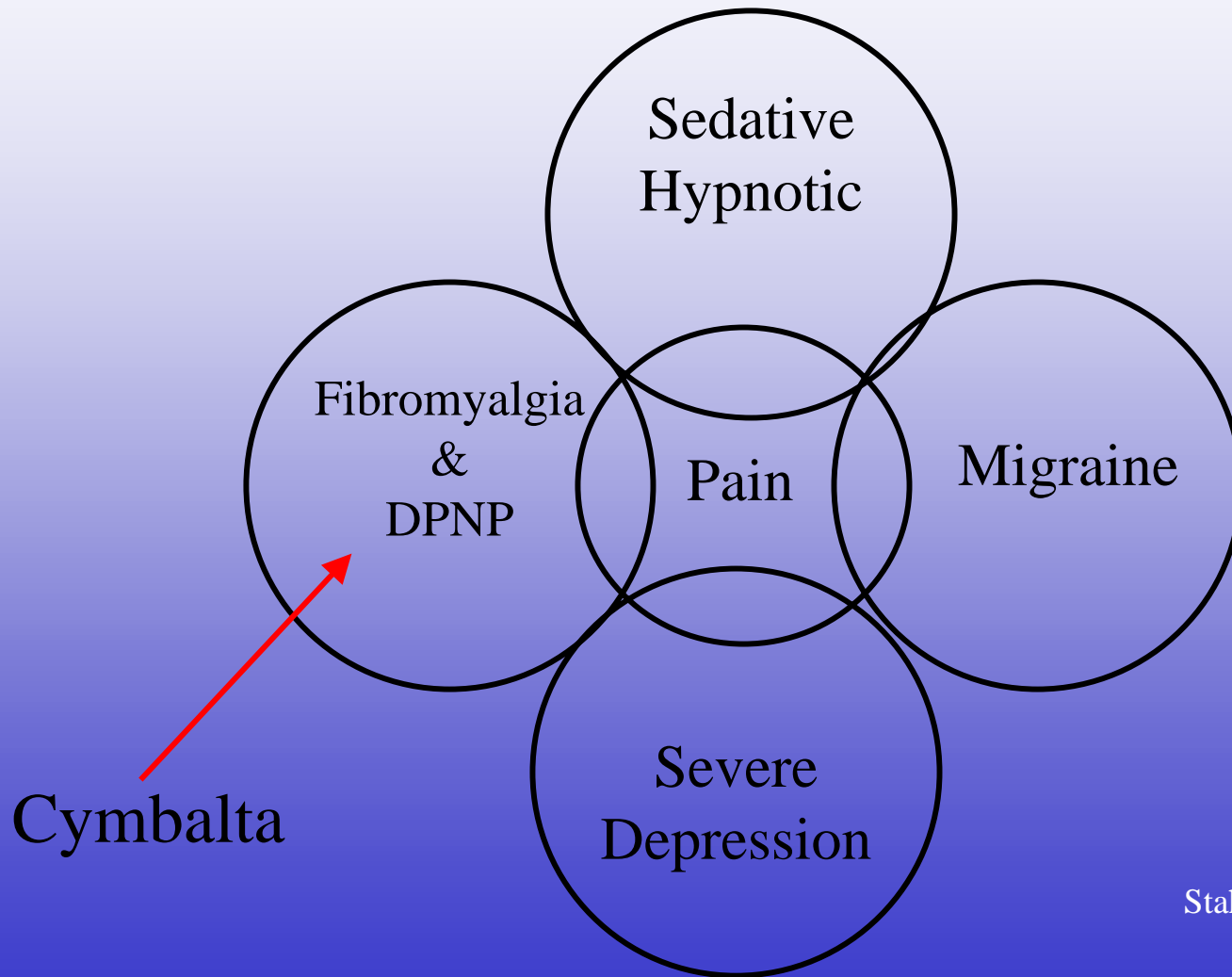
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*Antidepressants are successful in  
65% - 80% of all cases!*

*Best when combined with  
counseling therapy*

# Preferred Uses of Antidepressant Medications

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# Several Commonly Used Antidepressant Medications

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- *Tricyclics*

Elavil, Tofranil, Anafranil, Pamelor, Norpramin, Sinequan

- *MAOIs*

Nardil, Parnate, Marplan, Emsam







- *SSRIs*

Prozac, Paxil, Zoloft, Luvox, Lexapro, Celexa

- *Miscellaneous Antidepressants*

Effexor, Wellbutrin, Remeron, Desyrel (trazodone), Serzone, **Cymbalta**







# Antidepressant Medications (SSRIs)

| Brand Name   | Prozac®   | Paxil®  | Zoloft®   | Luvox®  | Lexapro®  | Celexa®   |
|--------------|---|---|---|---|---|---|
| Picture      |  |  |  |  |  |  |
| Generic Name | fluoxetine  | paroxetine  | sertraline  | fluvoxamine   | escitalopram  | citalopram  |





# Antidepressant Medications

|                     |   |  |  |  |
|---------------------|---|--|--|--|
| <b>Brand Name</b>   | Effexor®  | Serzone®   | Remeron®   | Wellbutrin®  |
| <b>Picture</b>      |  A tan, octagonal tablet with the letters 'VW' and the number '50' embossed on it. |  A white, hexagonal tablet with 'BNS' and '100' embossed on it. |  An orange, oval tablet with the word 'Organon' embossed on it. |  A red, circular tablet with 'WELLBUTRIN' and '150' embossed on it. |
| <b>Generic Name</b> | venlafaxine   | nefazodone   | mirtazapine  | bupropion  |

# Antidepressant Medications (TCAs)




| Brand Name   | Tofranil®   | Norpramin®  | Elavil®  | Aventyl®;<br>Pamelor®   | Sinequan®;<br>Zonalon®  | Anafranil®  |
|--------------|---|---|--|---|---|---|
| Picture      |  |  |  |  |  |  |
| Generic Name | imipramine  | desipramine   | amitriptyline  | nortriptyline   | doxepin   | Clomipramine<br>(5-HT)  |

# Antidepressant Medications

| <b>Brand Name</b>   | Surmontil®  | Vivactil®  | Ludiomil®   | Asendin®  |
|---------------------|---|--|---|---|
| <b>Picture</b>      |  |  |  |  |
| <b>Generic Name</b> | trimipramine  | protriptyline  | maprotiline   | amoxapine   |



# Antidepressant Medications (MAOIs)

|                     |   |  |   |
|---------------------|---|--|---|
| <b>Brand Name</b>   | Parnate®  | Nardil®  | Marplan®  |
| <b>Picture</b>      |  |  |  |
| <b>Generic Name</b> | tranylcypromine   | phenelzine   | isocarboxazid   |

# **Bipolar Disorder and Mood Stabilizers**

# Epidemiology of Bipolar Disorder

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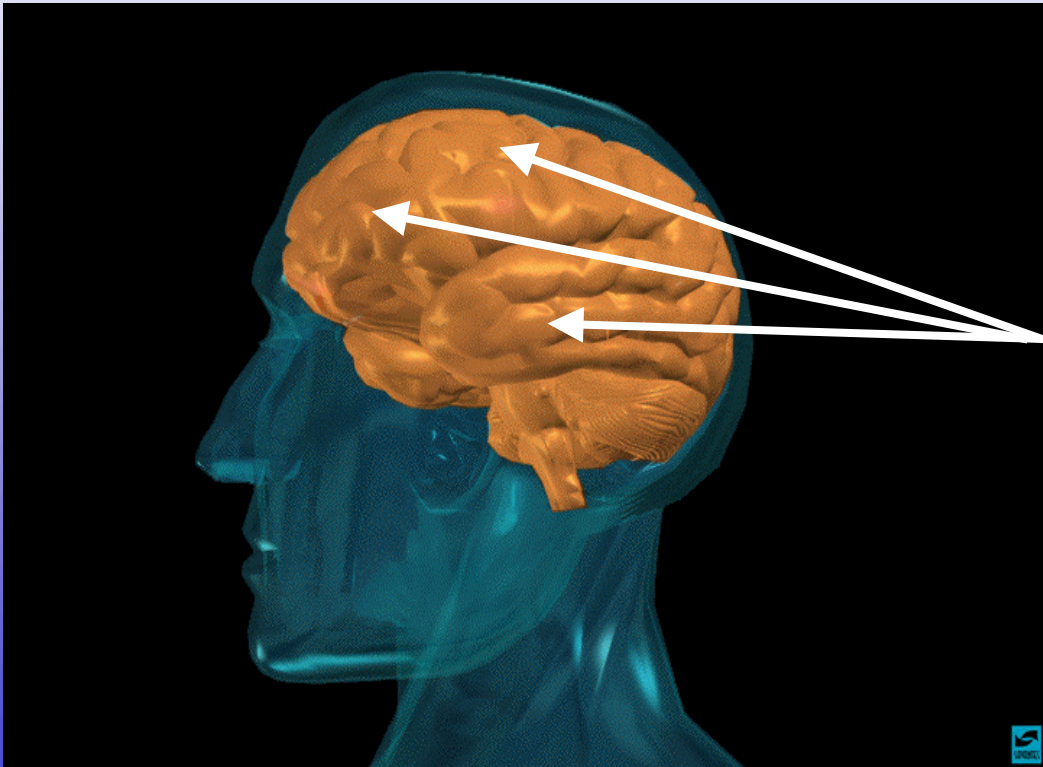
- Prevalence: 1% of U.S. population (2.7 million people)
- Cause: Genetics plus developmental, social , cultural and environmental event.
- Peak Age of Onset: 15 – 19 years
- Mean Age of First Tx: 22 years
- Mean Age of First Hospitalization: 26 years
- Course of Illness:
  - High morbidity and mortality
  - Recurrent in most cases

# Criteria for Mania

- A. Mood abnormally elevated, expansive or irritable
- B. At least 3 of the following symptoms:
  1. Grandiosity
  2. Decreased need for sleep
  3. Pressured speech
  4. Flight of ideas
  5. Distractibility
  6. Increase in activity'
  7. Activities – resulting in painful consequences
- C. Marked impairment in occupational functioning
- D. No delusions or hallucinations for as long as 2 weeks in the absence of prominent mood symptoms

# Bipolar I Disorder: How anti-mania (mood stabilizer) meds work

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Increased activity  
throughout  
various brain  
areas

# Treatment for Bipolar Disorder

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## Mood Stabilizers:

Lithium (Eskalith and others)

Tegretol (carbamazepine)

Depakote (divalproex, valproic acid)

Topamax (topiramate)

Lamictal (lamotrigine)

Trileptal (oxcarbazepine)

# Mood Stabilizers

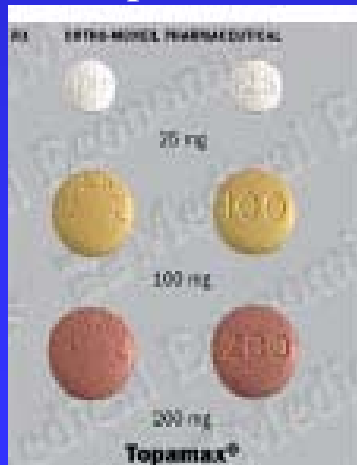
Depakene®/Depakote®  
(divalproex sodium)



Eskalith® (lithium carbonate)



Topamax®  
(topiramate)



Tegretol®  
(carbamazepine)



Lamictal®  
(lamotrigine)



## Side Effect Profile:

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- *Lithium toxicity looks like drunkenness but no smell of alcohol.*
- Lithium (Lithium carbonate) requires close monitoring of blood levels.
- Antipsychotic medications are sometimes used as anti-mania drugs in combination with mood stabilizers (I.e. Zyprexa, Seroquel).



# Long Term Prognosis of Bipolar Disorder

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- Untreated, high morbidity/mortality rates
  - 20 –25% attempt or commit suicide
  - Overall functional impairment great
- Lifetime rate of substance abuse is 50 –60%
  - Requires identification and therapy for both disorders
- Treatable disorder for high percentage of patients
  - Balance between side effects and control possible
  - On-going relationship with provider important



**Co-occurring Disorders Can  
Be Treated Effectively**

**Integrated Treatment for Dual  
Diagnosis:**

**Treat both conditions  
concurrently**

# Recovery refers to...

- The process by which people are able to live, work, learn, and participate fully in their communities
- The ability to live a fulfilling and productive life despite a disability
- A reduction or complete remission of symptoms
- The ability to help make important decisions affecting one's own life.

