Treatment in Psychiatry

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Treatment in Psychiatry

- **A. BIOLOGICAL** treatment
  - Psychopharmacotherapy
  - Electroconvulsive Therapy (ECT)
  - Repetitive Transcranial Magnetic Stimulation (rTMS)
  - Deep Brain Stimulation (DBS)
  - Vagus Nerve Stimulation
  - Light Therapy

- **B. PSYCHOSOCIAL** treatment
  - Psychotherapy
  - Psychiatric rehabilitation
  - Other (music therapy, art therapy, ergotherapy…)

Main Psychopharmacological Drugs

- 1. Antidepressants
- 2. Mood stabilizers
- 3. Antipsychotics
- 4. Anxiolytics
- 5. Hypnotics
- 6. Cognition-Enhancing Drugs
- 7. Psychostimulants

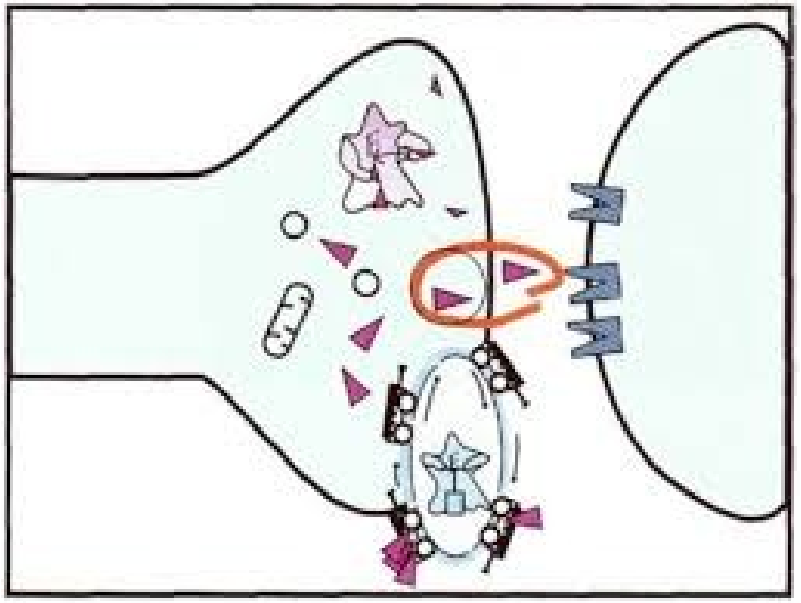
General guidelines for antidepressant use

- Antidepressant efficacy is very similar so selection is based on past history of a response, side effect profile and coexisting medical conditions.
- There is a delay typically of 2-4 weeks after a therapeutic dose is achieved before symptoms improve.
- If no improvement is seen after a trial of adequate length and adequate dose, either switch to another antidepressant or augment with another agent.

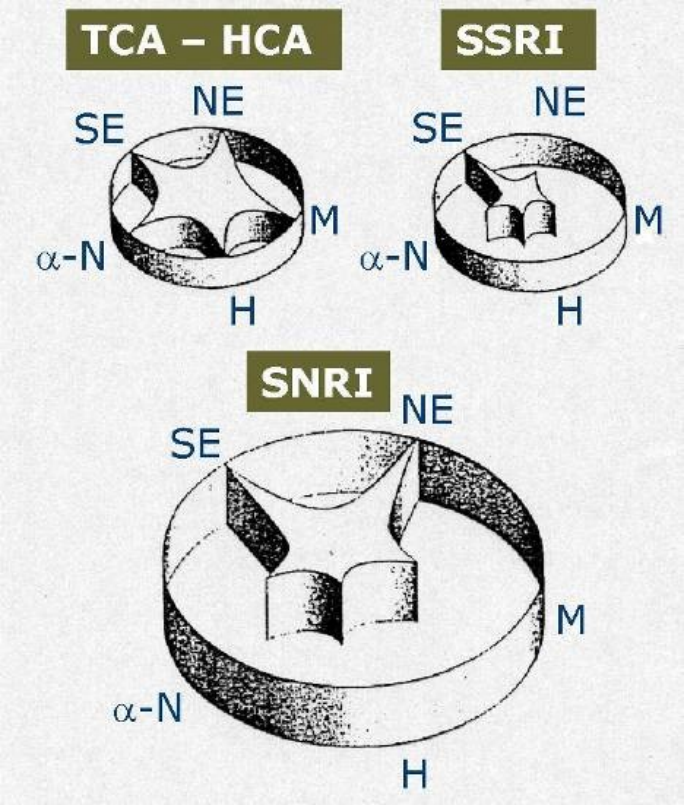
Neurobiology

- Lack of monoamine neurotransmitters → depression
- **Increase** in monoamine neurotransmitters → treatment of depression

(Stahl 1997)



Neurotransmitter Reuptake Inhibition and Binding Affinity to Receptors



Receptors:

SE Serotonergic

NE Noradrenergic

M Muscarinic

H Histaminic

α-N alpha noradrenergic

Classification	Name	Example
st generation	Tricyclics (TCAs) and tetracyclics (TeCAs)	*amitriptyline* *clomipramine*
2nd generation		*viloxazine*
3rd generation	**SSRI** **(Selective Serotonin Reuptake Inhibitors)**	*citalopram* *escitalopram* *sertralin*
	SARI (Serotonin antagonist and reuptake inhibitor)	*trazodon*
	NRI (Nor-Adrenaline Reuptake inhibitors)	*reboxetin*
4th generation	SNRI (Serotonin/Norepinephrine reuptake inhibitors)	*venlafaxine* *milnacipran*
	DNRI (Dopamine/Norepinephrine reuptake inhibitors	*bupropione*
Other	Blockators of α2 -adrenoceptors	*mirtazapin* *mianserin*
	(MAOIs) Monoamine Oxidase Inhibitors	*moclobemide* *selegiline*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
1st generation	Tricyclics (TCAs) and tetracyclics (TeCAs)	•Inhibition of Serotonin and/or Norepinephrine reuptake followed by increase of their concentrations in synaptic cleft (react with other types of receptors → more side effects)	•Severe side effects - antihistaminic (sedation, weight gain), anticholinergic (dry mouth, constipation, potentially delirium), antiadrenergic (orthostatic hypotension, sexual dysfunction) •Can cause dangerous QT lengthening •Danger of Intoxication •Many Interactions	*amitriptyline* *nortriptyline* *clomipramine* *dosulepin*

Classification	Mechanism of Therapeutic Efficacy	Specific character	Examples
2nd generation	Norepinephrine Reuptake Inhibition	•Less anticholinergic side effects then 1st generation	*viloxazine*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
3rd generation	**SSRI (Selective Serotonin Reuptake Inhibitors)**	Block the presynaptic serotonin reuptake	**•The most commonly used** •Side effects: GI upset, sexual dysfunction, anxiety, restlessness, insomnia, fatigue or sedation, dizziness •Very little risk of cardiotoxicity in overdose	*citalopram* *escitalopram* *sertralin* *fluoxetin* *fluvoxamin* *paroxetin*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
3rd generation	SARI (Serotonin antagonist and reuptake inhibitor)	Antidepressants with Doubled Serotonergic Efficacy	•A risk of serotonin syndrome	*trazodon*
	NRI (Selective Nor-Adrenaline Reuptake inhibitors)	Increase norepinephrine		*reboxetin*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
4th generation	**SNRI** (Serotonin/Norepinephrine reuptake inhibitors)	Inhibit both serotonin and noradrenergic reuptake	•Side effects: nauzea, dizziness, blood preasure increase	*venlafaxine milnacipran*
	DNRI (Dopamine/ Norepinephrine reuptake inhibitors)	Inhibit Dopamine and Norepinephrine reuptake	•No weight gain, no sexual side effects, no sedation or cardiac interactions	*bupropione*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
other	Blockators of α2-adrenoceptors	Increasing Synthesis and Releasing of Norepinephrine, Blockade Alpha-2 Adrenoceptors on Serotonergic Neurons and Increasing Production and Releasing of Serotonin	•Side effects: Weight gain, sedation,	*mirtazapin mianserin*

Classification	Name	Mechanism of Therapeutic Efficacy	Specific character	Examples
Other	(MAOIs) Monoamine Oxidase Inhibitors	Bind irreversibly to monoamine oxidase thereby preventing inactivation of biogenic amines such as norepinephrine, dopamine and serotonin leading to increased synaptic levels.	•Side effects: weight gain, dry mouth, sedation, sexual dysfunction and sleep disturbance •Hypertensive crisis can develop when MAOI's are taken with tyramine-rich foods or sympathomimetics	*moclobemide* *selegiline*

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Mood stabilizers

- Indications: Bipolar, cyclothymia, schizoaffective, impulse control and intermittent explosive disorders.
- Classes: Lithium, anticonvulsants, antipsychotics
- Which you select depends on what you are treating and on the side effect profile.

Classification	Example	Characteristics
Lithium	*Lithium*	•Only medication to reduce suicide rate •I:Effective in long-term prophylaxis of both mania and depressive episodes •SE: Thyroid abnormalities, Polyuria/polydypsia , intention tremor •BS: examination of renal, cardiac and thyreoidal function, pregnancy
Antiepil. 2nd generation	*carbamazepine*	•I: acute mania and mania prophylaxis •SE: Rash, nauzea, vomiting, drug interactions!!! •BS: baseline liver function tests, CBC and an EKG
	salts of valproic acid	•I: as effective as Lithium in mania prophylaxis but is not as effective in depression prophylaxis Effective in dysforic mania •SE: Thrombocytopenia and platelet dysfunction, transaminitis, sedation •BS: liver function, CBC, pregnancy
Antiepil. 3rd generation	*lamotrigine*	•I: Also used for neuropathic/chronic pain •SE: Nausea/vomiting, dizziness, toxic epidermal necrolysis and Stevens Johnson's Syndrome BS: liver function
	gabapentine	

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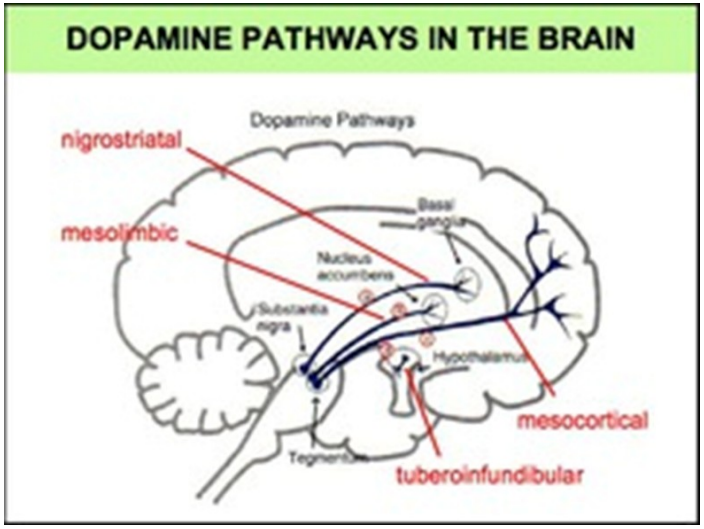
Neurobiology

- Excess of DOPAMINE → schizophrenia
- **Decrease** in Dopamine → treatment of schizophrenia



Neurobiology

- **MESOCORTICAL**- associated with negative and cognitive symptoms
- **MESOLIMBIC**- associated with positive symptoms (hallucinations, delusions, and thought disorders)
- **NIGROSTRIATAL**- associated with movement regulation, Parkinsonian movements i.e. rigidity, bradykinesia, tremors), akathisia and dystonia
- **TUBEROINFUNDIBULAR** - associated with hyperprolactinemia(gynecomastia/galactorrhea /decreased libido/menstrual dysfunction).

Classification

- **A. Typical antipsychotics**
  (=1st generation antipsychotics, classical neuroleptics,)
- **B. Atypical antipsychotics**
  (=2nd generation antipsychotics)

A.Typical antipsychotics (1st generation)

- previous generation
- are D2 dopamine receptor antagonists
- **High potency** typical antipsychotics bind to the D2 receptor with high affinity. As a result they have higher risk of extrapyramidal side effects.
- Examples: *fluphenazine, haloperidol, flupenthixol*
- **Low potency** typical antipsychotics have less affinity for the D2 receptors but tend to interact with nondopaminergic receptors resulting in more cardiotoxic and anticholinergic adverse effects including sedation, hypotension.
- Examples: *chlorpromazine, thioridazine*

B.Atypical Antipsychotics (2nd generation)

- dopamine D2 receptor-blocking effect is lowered in affinity
- combined with effects on other receptors
- better influencing of negative and affective symptoms
- significantly reduce or prevent the cognitive impairment
- signifinantly less side effects
- examples: *risperidon, olanzapin, quetiapin*

Adverse effects

- Extrapyramidal side effects (EPS): Acute dystonia, Parkinson syndrome, Akathisia
- Neuroleptic Malignant Syndrome (NMS): Characterized by severe muscle rigidity, fever, altered mental status, autonomic instability, elevated WBC, CPK Potentially fatal.
- Weight gain, sedation, dyslipidemia, hyperprolactinemia, agranulocytosis, sexual dysfunctions…

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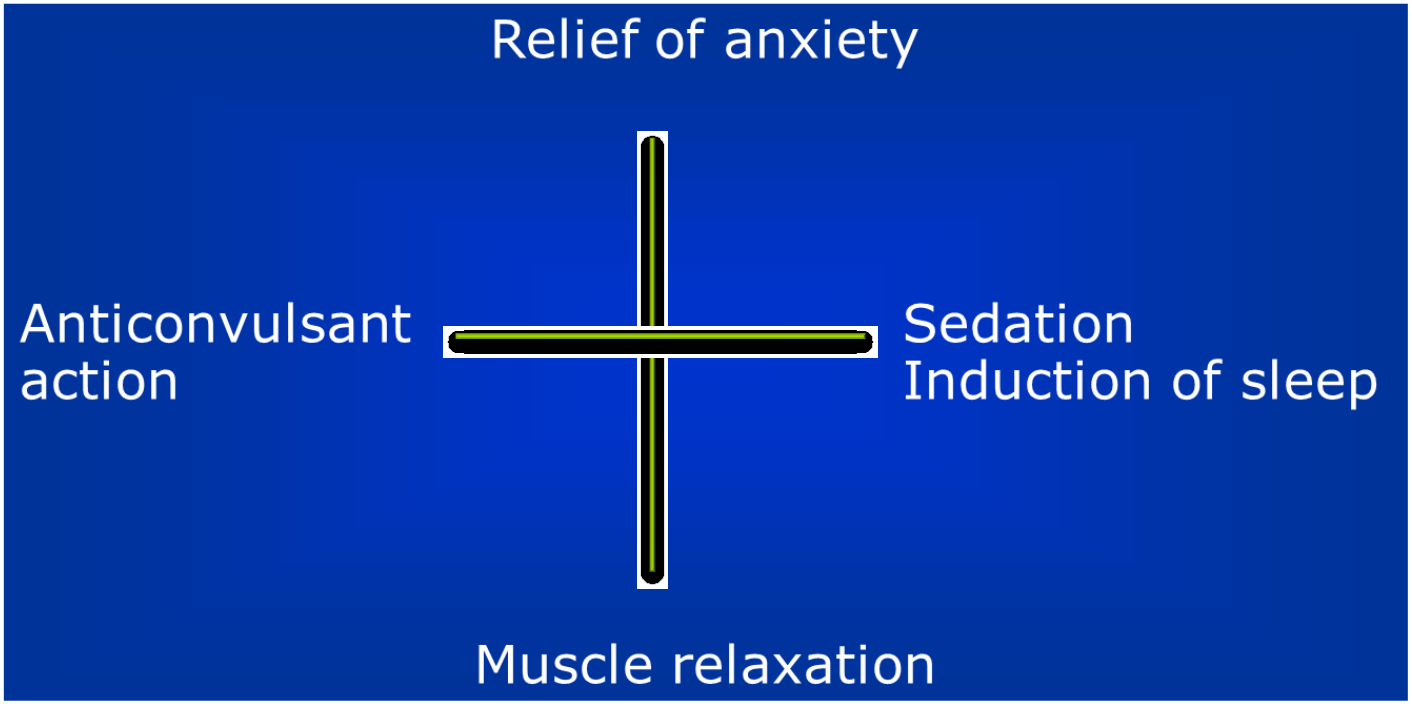
General information

- Used to treat many diagnoses including panic disorder, generalized anxiety disorder, substance-related disorders and their withdrawal, insomnias and parasomnias.
- In anxiety disorders often use anxiolytics in combination with SSRIS or SNRIs for treatment.
- Main group – Benzodiazepines – cave – the **risk of addiction !!!!**

Action Profiles of Benzodiazepines



Examples

- Short-term: *oxazepam, lorazepam*
- Medium-term: *alprazolam, bromazepam*
- Long-term: *diazepam, clonazepam*

Non-benzodiazepine anxiolytics

- Non-addictive
- Delayed onset of therapeutic effect

- Examples: *guaiphenesine, hydroxyzine, buspirone*

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General information

- drugs with sedative effect
- primary function is to induce sleep and to be used in the treatment of insomnia

Classification	Name	Example
1st Generation	barbiturates	*phenobarbital*
2nd Generation	benzodiazepines	*midazolam, flunitrazepam, cinolazepam*
3rd Generation	Z-drugs	*zolpidem, zopiclone, zaleptone*
Other Drugs with Hypnotic Efficacy	Antihistaminics	*promethazine*
	antidepressants	*mirtazapine, trazodone*
	melatonins	
	antipsychotics	*quetiapin*

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General information

- improve cognition
- to treat Alzheimer's disease and other cognitive deficits
- A. ACETYLCHOLINESTERASE INBITORS
- *-rivastigmine, donepezil*

- B. NMDA (N-methyl-D-aspartate) RECEPTOR ANTAGONISTS
- *-memantine*

Main Psychopharmacological Drugs

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- 6. Cognitives
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General information

- reduce fatigue, promote alertness and wakefulness and have possible mood enhancing properties
- indicated for attention deficit hyperactivity disorder (ADHD), narcolepsy
- Blocators of re-uptake dopamine and norephinephrine→ increase of dopamine and norephinephrine in synaptic cleft
- Adverse effects: insomnia, agitation, anxiety and confusion,
- *Methylphedinate, atomoxetine*

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Electroconvulsive therapy

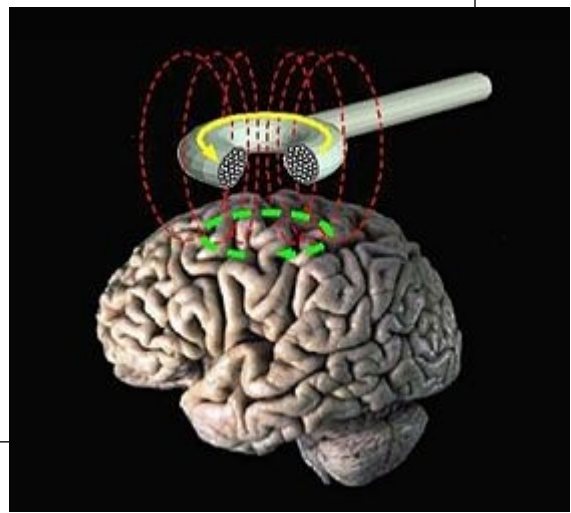
- procedure, in which small electric currents are passed through the brain, intentionally triggering a brief seizure
- ECT seems to cause changes in brain chemistry that can quickly reverse symptoms of certain mental illnesses
- when other treatments are unsuccessful

Electroconvulsive therapy

- informed consent must be signitured
- ECT is administered under anesthetic with a muscle relaxant
- ECT can differ in its application in three ways: electrode placement, frequency of treatments, and the electrical waveform of the stimulus.
- side effects: confusion and memory lost
- main indications: major depressive disorder, mania, and catatonia

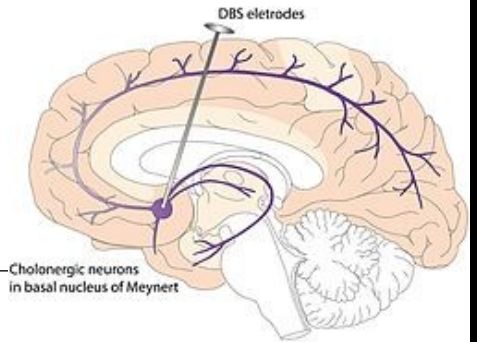
Repetitive transcranial magnetic stimulation (rTMS)

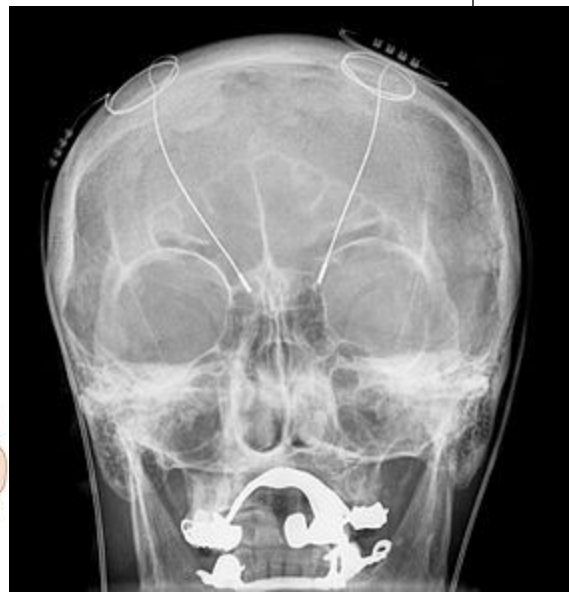
- is a magnetic method used to stimulate small regions of the brain
- a magnetic field generator, or "coil", is placed near the head
- The coil produces small electric currents in the region of the brain just under the coil via electromagnetic induction. The coil is connected to a pulse generator, or stimulator, that delivers electric current to the coil.
- Indication: major depressive disorder, negative symptoms of schizophrenia, auditory hallucinations,
- Side effects: epileptiform paroxysm, mild headaches



Deep brain stimulation (DBS)

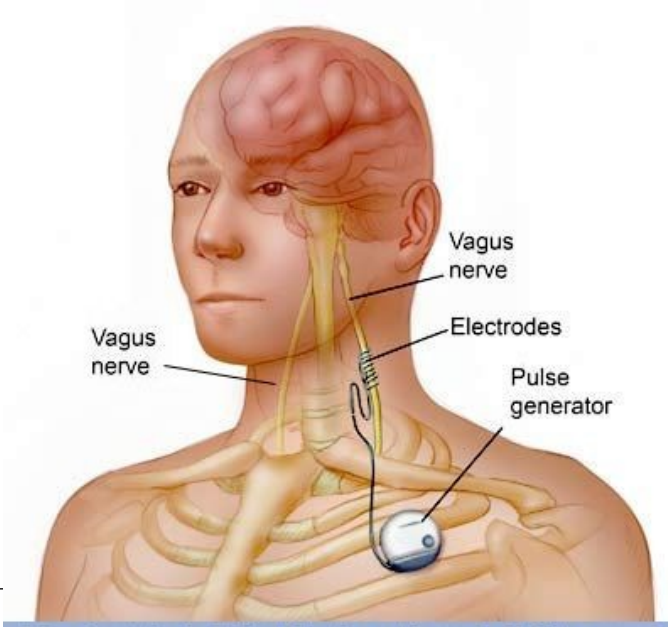
- is a neurosurgical procedure
- involving the implantation of a medical device called a neurostimulator (sometimes referred to as a 'brain pacemaker'), which sends electrical impulses, through implanted electrodes, to specific targets in the brain (brain nuclei) for the treatment of movement and neuropsychiatric disorders (major depression, OCD)
- has been used in a small number clinical trials





Vagus nerve stimulation

- is a medical treatment that involves delivering electrical impulses to the vagus nerve. It is used as an adjunctive treatment for certain types of intractable epilepsy and treatment-resistant depression.
- the device sends electrical signals along the vagus nerve to the brainstem, which then signals to certain areas brain.



Light Therapy

- involves daily scheduled exposure to bright artificial light
- During light therapy, you sit or work near a device called a light therapy box. The box gives off bright light that mimics natural outdoor light.
- Light therapy is thought to affect brain chemicals linked to mood and sleep
- Biorhythm
- Indication: treatment for SAD (Seasonal Affective Disorder), other types of depression, sleep disorders and other conditions
- Side effects: eye strain, headache, nausea, irritability or agitation

Thank you very much for your attention