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PSYCHOMOTOR STIMULANTS. ANTIDEPRESSANTS. NOOTROPIC DRUGS. ADAPTOGENS. ANALEPTICS

CONTENTS

1. Psychomotor stimulants
2. Antidepressants
3. Nootropic drugs as cognition enhancers
4. Adaptogens
5. Analeptics as medications for emergency help
6. Use of CNS stimulants in dentistry and their oral side effects
7. Control tasks

PSYCHOMOTOR STIMULANTS: definition and classification

Psychomotor stimulants are the drugs stimulating mainly cortical part of CNS. They always increase mental and physical performance.

CLASSIFICATION

A. Purinergic

1. Methylxantines

– Caffeine (Cofeinum natrii-benzoas)

– Theophylline

B. Adrenergic

1. Phenilalkilamines

– Amphetamine (Phenaminum)

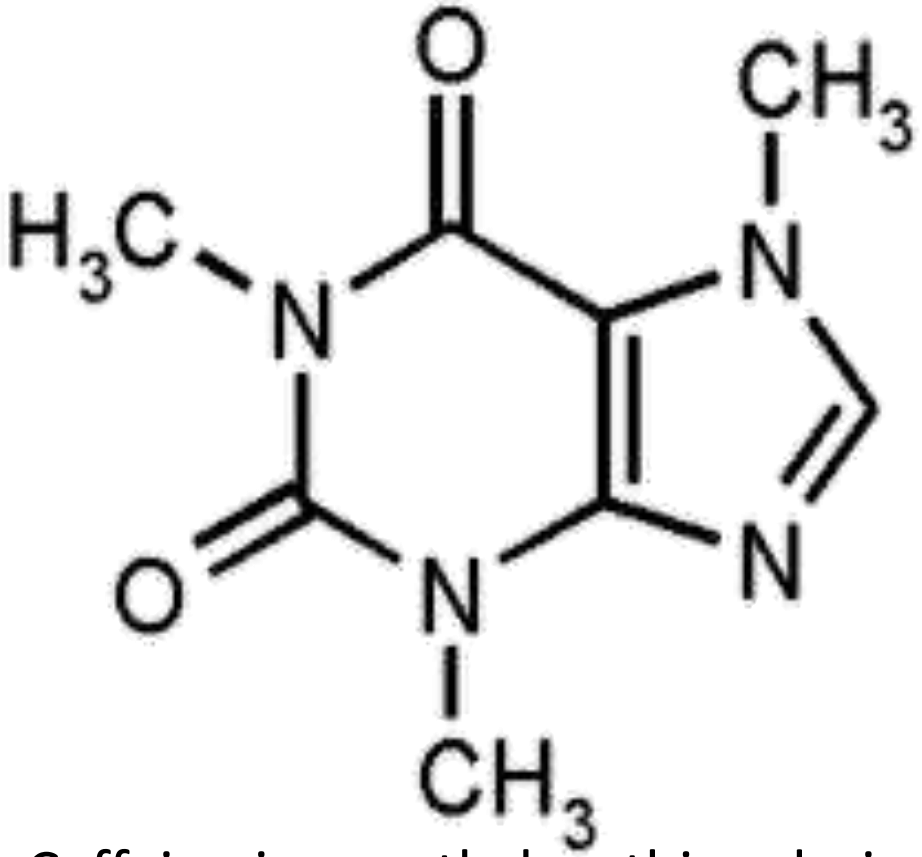
2. Piperidine derivatives

– Meridile

3. Sydnonimine derivatives

– Mesocarb (Sydnocarb).

PURINERGIC PSYCHOMOTOR STIMULANTS: Caffeine



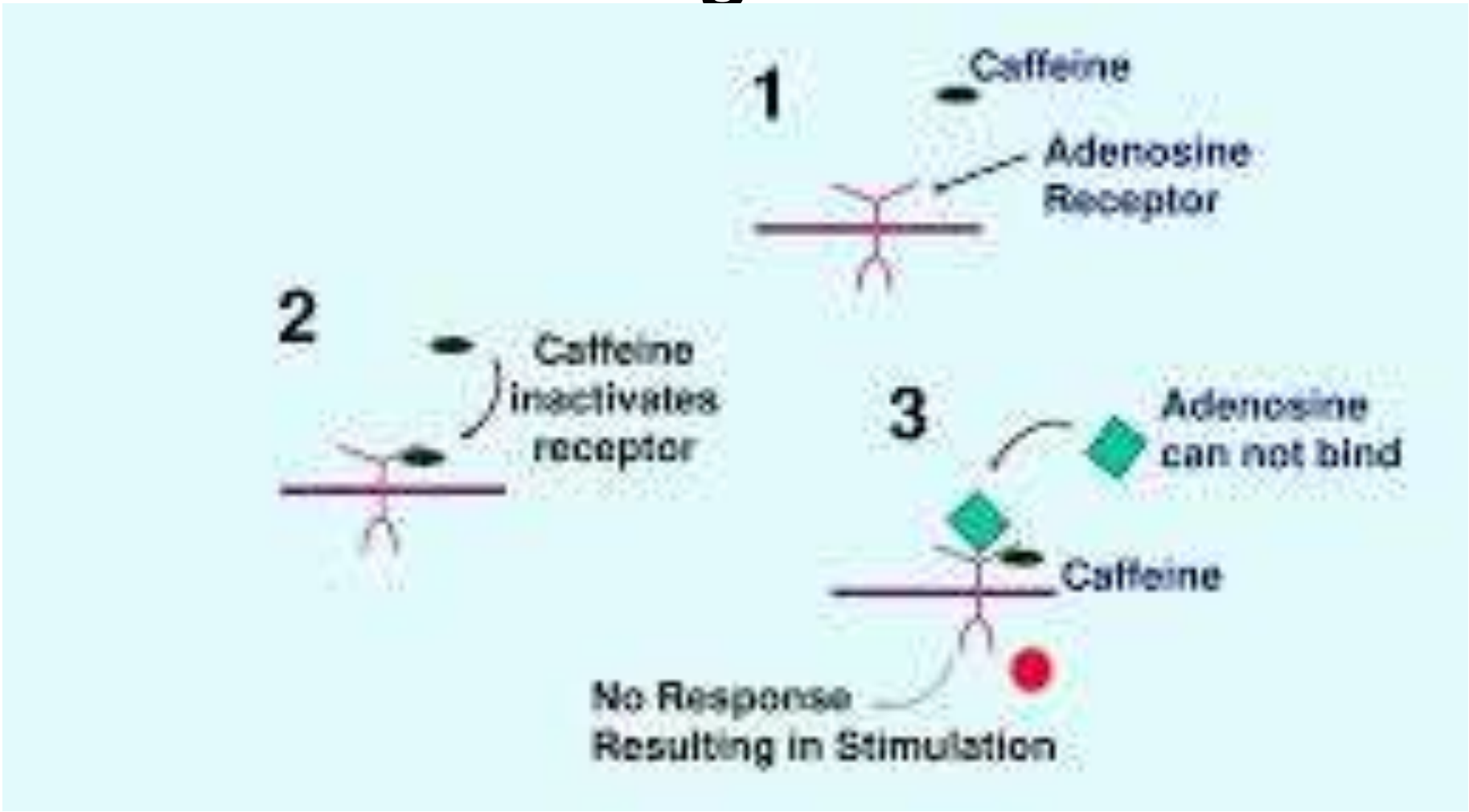
Caffeine is a methylxanthine derivative

PLANTS CONTAINING CAFFEINE:
Coffe arabica (at left), Thea chinensis (at right)

CAFFEINE: pharmacokinetics

- is administered orally, SC, IM, IV
- is well absorbed in the GI tract
- penetrates CNS and placenta
- is metabolized in the liver
- is excreted with urine and mother's milk
- acts during 4 hrs; T½ = 3,9 -5,3 hrs, is completelly eliminated for 24 hrs.

CAFFEINE: adenosine receptor antagonist

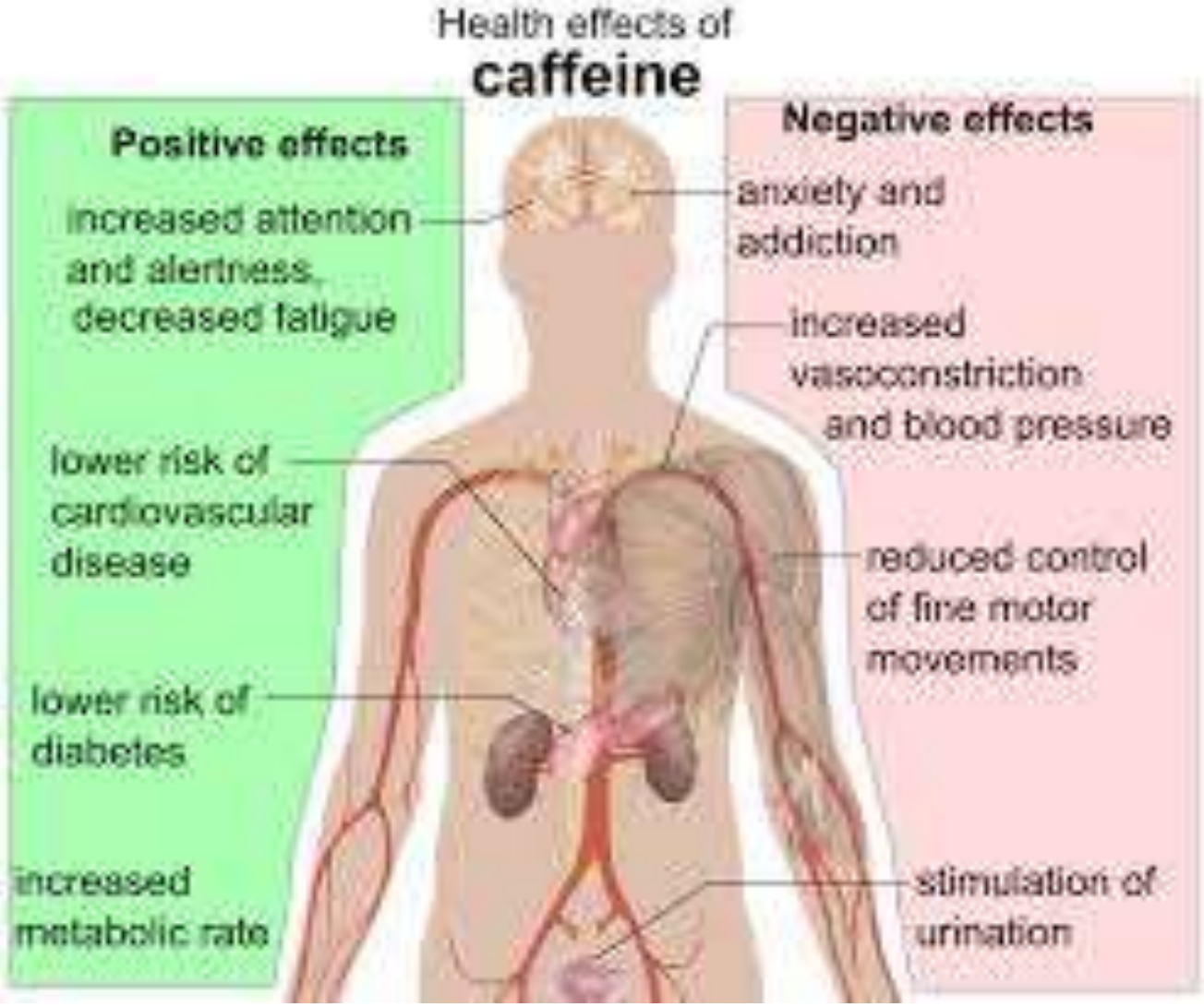


CAFFEINE: mechanism of action

- Caffeine blocks all subtypes of adenosine receptors and decreases their inhibiting influence in brain.
- Caffeine stimulates translocation of extracellular calcium into cells.
- It inhibits phosphodiesterase and increases cAMP concentration in cells.
- It increases the activity of phosphorilase resulting in the increase of glycogen metabolism and forming of the energy.

CAFFEINE: pharmacodynamics

- ***Psychomotor stimulant action*** (an increase in excitement in the cortex of brain; a decrease in time of answer on different irritants; an increase in mental and motor activity; decrease in fatigue and somnolence)
- ***analeptic action*** (direct stimulation of respiratory and vasomotor centers in the brain medulla)
- ***stimulation of reflexive activity of the spinal cord***
- ***changes of the heart rate*** which depend on ratio between direct action on the heart and indirect one resulting from stimulation of the center of n.vagus (as a rule, increase in heart rate)
- ***action on blood vessels*** which is the sum of central action (vasoconstriction) and peripheral action (vasodilatation): blood vessels in the heart, lungs, kidney, skeletal muscles are dilated; blood vessels in brain covers are dilated from the first, then – constricted (that results in decrease of headache)
- ***elevation of BP*** (in some individuals – lowering of BP or without changes)
- ***stimulation of gastric secretion***
- ***diuretic action***.


Health effects of
caffeine
Positive effects
increased attention and alertness, decreased fatigue
lower risk of cardiovascular disease
lower risk of diabetes
increased metabolic rate
Negative effects
anxiety and addiction
increased vasoconstriction and blood pressure
reduced control of fine motor movements
stimulation of urination

CAFFEINE: indications

- Decreased mental and physical ability to work
- Asthenia
- Fatigue
- Hypotension
- Collapse
- Oppression of respiration
- Bronchopulmonary dysplasia in premature infants for both prevention and treatment.
- Diagnostic of gastric secretory function
- Headache (as an ingredient of combined drugs).

CAFFEINE: side effects and contraindications

Side effects

1. Agitation, anxiety
2. Insomnia
3. Tachycardia, arrhythmia
4. Hypertension
5. Pain in stomach
6. Drug dependence
7. Withdrawal syndrome (lethargy, irritability, headache in users who have consumed more than 600mg per day).

Contraindications

1. Psychomotor excitement
2. Hypertension
3. Arrhythmia
4. Atherosclerosis
5. Hyperthyroidism
6. Gastritis, ulcer of stomach

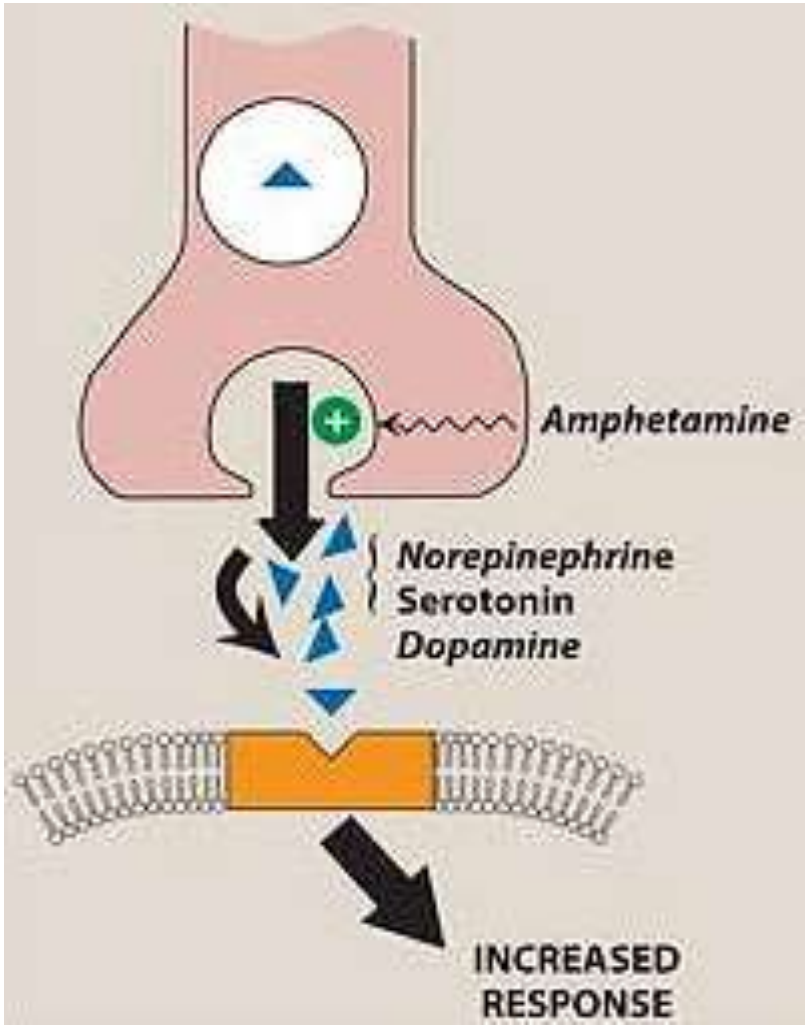
CAFFEINE: interesting facts

- Caffeine is the world's most widely consumed psychoactive drug.
- Caffeine citrate is on the WHO Model List of Essential Medicines.
- Caffeine can produce a mild form of drug dependence – associated with withdrawal symptoms such as sleepiness, headache, and irritability
- A cup of coffee contains 80–175 mg of caffeine, depending on what "bean" (seed) is used
- Caffeine is classified as generally recognized as safe. Toxic doses, over 10 g per day for an adult, are much higher than the typical dose of under 500 mg per day.
- The addition of caffeine to paracetamol or ibuprofen modestly improves the proportion of people who achieve pain relief.
- Consumption of caffeine after abdominal surgery shortens the time to recovery of normal bowel function and shortens length of hospital stay.

ADRENERGIC PSYCHOMOTOR STIMULANTS: Amphetamine

Amphetamine is a phenylalkilamine; is taken orally, is completely absorbed from the GI tract, metabolized in the liver, and excreted with urine, penetrates CNS, acts during 4-6 hrs; causes strong psychostimulation, euphoria, anorexia, peripheral adrenomimetic action; is indicated for increase of mental and physical capacity to work, narcolepsy, attention deficit syndrome; ***is used very rarely due to its side effects and abuse potential***; may cause insomnia, irritability, weakness, tremor, confusion, delirium, panic state, anorexia, hypertension, tachycardia, arrhythmia, tolerance, addition; causes psychic and physical dependence, "amphetamine psychosis" ; treatment of overdose includes acidification of urine, administration of chlorpromazine, labetalol for cardio-vascular normalization.

ADRENERGIC PSYCHOMOTOR STIMULANTS: amphetamine's mechanism of action

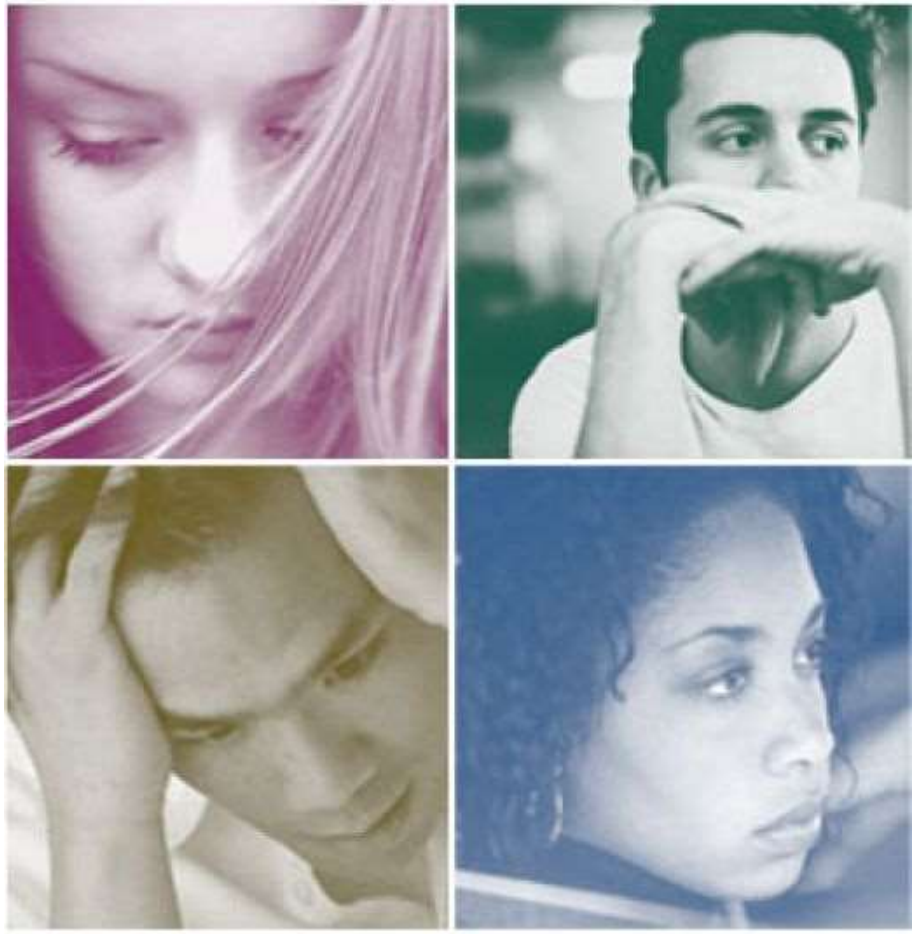


ADRENERGIC PSYCHOMOTOR STIMULANTS: other drugs

Sydnocarb is asydnoimine derivative; is taken orally; has slow onset of psychomotor stimulation, does not producer euphoria, motor agitation, increase in BP or other peripheral adrenomimetic effects; is used for treatment of asthenia with dormancy and apathy, attention deficit in children, for decrease in asthenia and myorelaxation caused by neuroleptics and anxiolytics; has such side effects as anxiety, anorexia, hypertension; is contraindicated to patients with agitation, arrhythmia, atherosclerosis, hypertension.

Meridil is similar to amphetamine on structure and mechanism of action, but has a light action without significant peripheral adrenomimetic effects; is used to treat asthenia and hyperactivity with attention deficit; may cause anxiety, insomnia, worsening in phychopathologic symptoms, hypertension.

DEPRESSION



Depression is mood altering disease, affective disorder. It is characterized by hopelessness, despair, inability to experience pleasure in ordinary life, loss of interest to usual activity, suppression of appetite, sleep disturbance.

There are three types of depressions: 1) reactive (or secondary); 2) endogenous; 3) manic-depressive disease.

According to ***biogenic monoamine theory*** development of depression is resulting from deficiency of monoamines (norepinephrine and serotonin) in certain areas of brain. Pharmacological management of depression includes regulation of adrenergic and serotoninergic processes in CNS.

ANTIDEPRESSANTS:
classification on mechanism of action

A. Inhibitors of monoamine re-uptake

1. Non-selective inhibitors of monoamines re-uptake

– Imipramine (Imizin)

– Amitriptyline

2. Selective inhibitors of serotonin re-uptake

– Fluoxetine

3. Selective inhibitors of norepinephrine re-uptake

– Maprotiline

B. MAO inhibitors

1. Non-selective (MAO-A and MAO-B)

– Phenelzine

– Tranylcypromine

– Nialamide

2. Selective (MAO-A)

– Pirlindole (Pirazidol)

– Moclobemide

C. Atypical antidepsessants

– Trazodone

– Mianserin

ANTIDEPRESSANTS:

classification on additional action

A. Thymoleptics (+ sedative effect)

– Amitriptyline

B. Thymoerectics (+psychostimulation)

– Nialamide

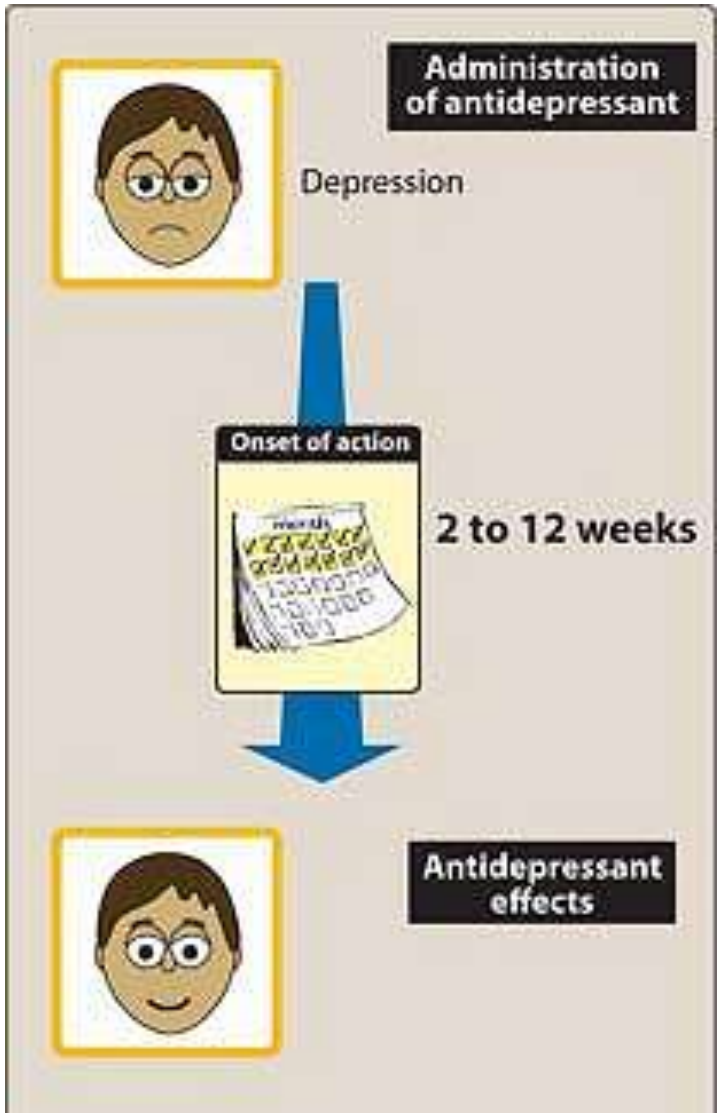
C. Mixed-acting

– Imipramine

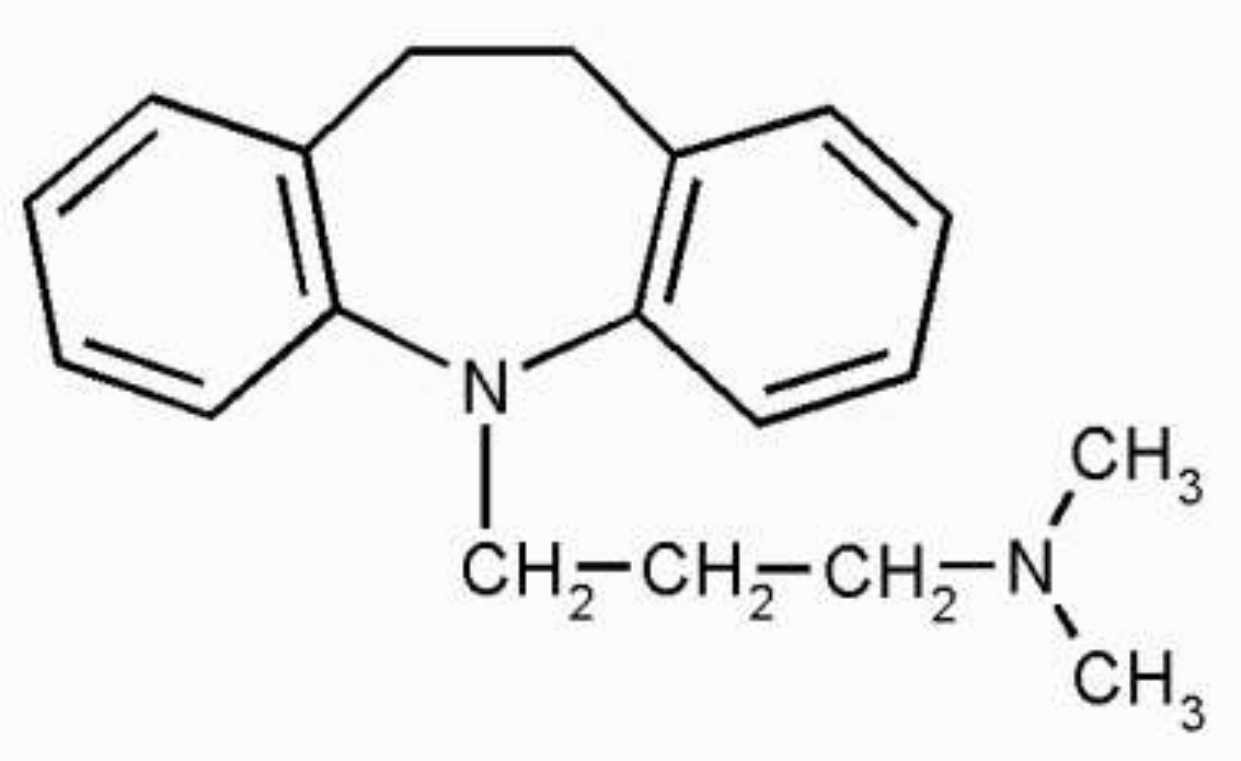
– Pirlindole.

ANTIDEPRESSANTS:

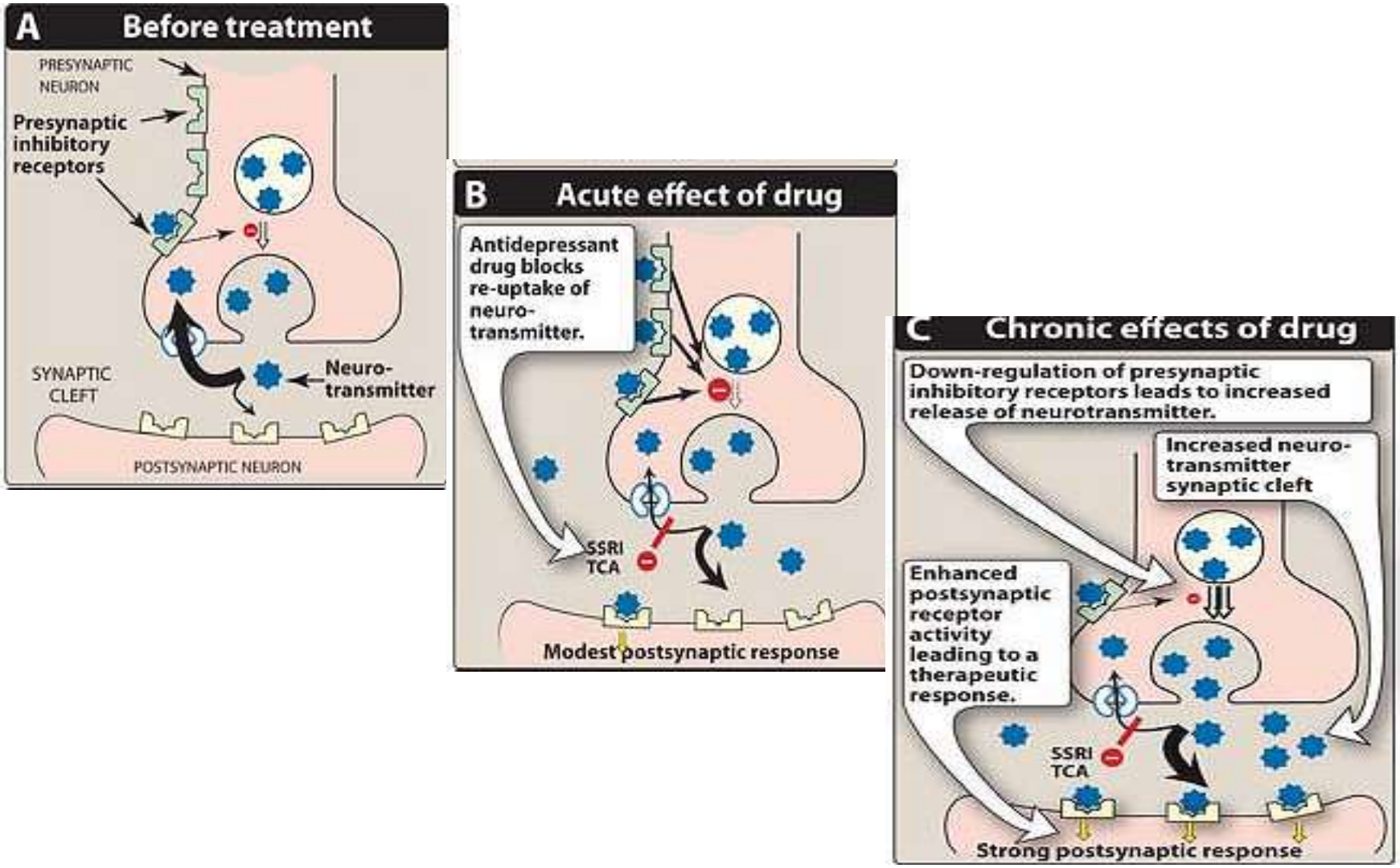
latent period before clinical effect



IMIPRAMINE:
tricyclic structure



IMIPRAMINE: mechanism of action



IMIPRAMINE:
pharmacodynamics and indications

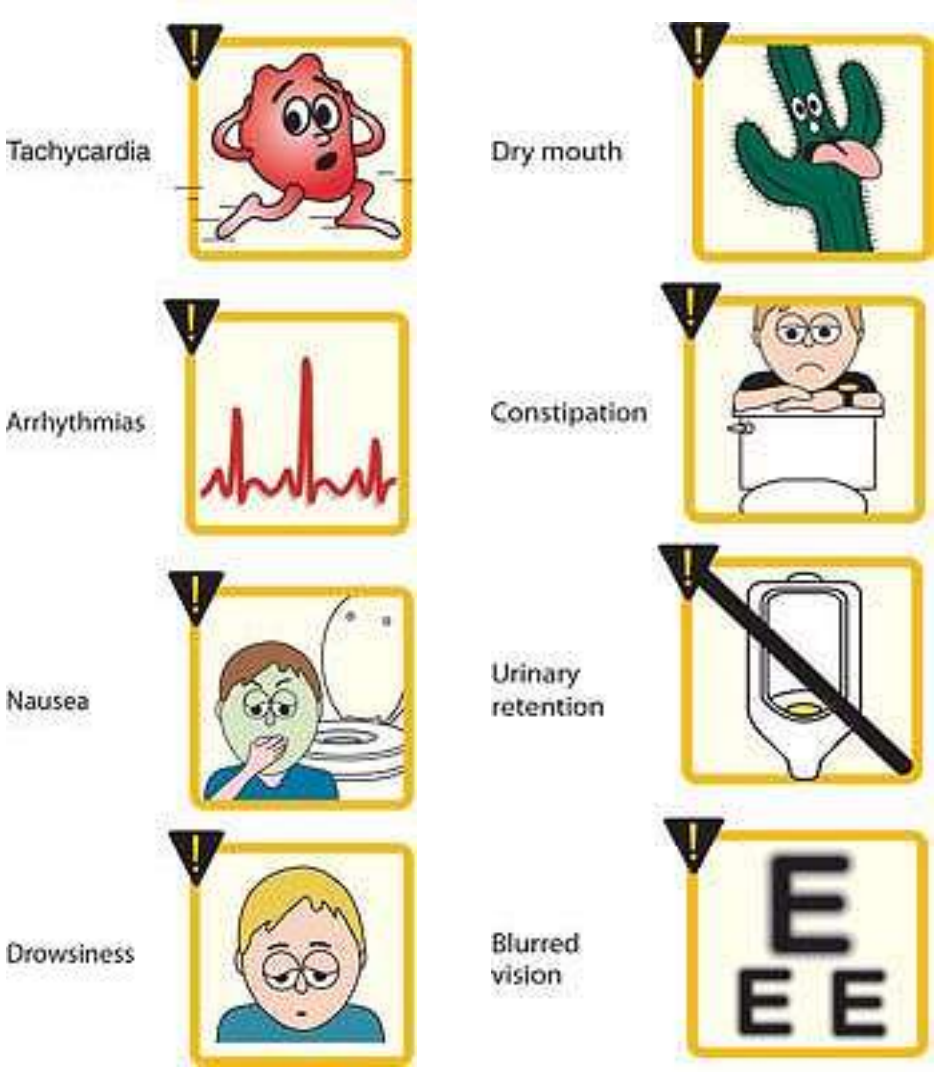
Pharmacodynamics	Indications
1. Antidepressive action 2. Thymoleptic action in emotional sphere (sedative or weak psychostimulant action) 3. Absence of CNS stimulation or mood elevation in normal individuals 4. Central and peripheral M-cholinoblocking action 5. Alpha-adrenoblocking and antihistamine action.	1. Severe major depression 2. Enuresis (in children older than 6 years).

IMIPRAMINE:

side effects and contraindications

Side effects	Contraindications
1. Excitement 2. Insomnia 3. An increase in the agitation and hallucination 4. Headache 5. Tremor 6. Lowering of BP 7. Tachycardia, arrhythmia 8. Allergy 9. Changes in blood film 10. Dry mouth 11. Disturbances of accomodation 12. An increase in the intraocular pressure 13. Retention of urine, constipation 15. Drug dependence.	1. Psychic excitement 2. Schizophrenia 3. Glacouma 4. Adenoma of prostate 5. Atony of urinary bladder 6. Diseases of blood 7. Diabetes mellitus 8. Tuberculosis 9. Infections 10. Severe diseases of the heart, liver, and kidney 11. Should not be taken in the evening 12. Should not be taken together or after withdrawal of MAO-inhibitors due to the danger of elevation in BP, rise in body temperature, convulsions, coma.

IMIPRAMINE: side effects



PECULIARITIES OF OTHER RE-UPTAKE INHIBITORS

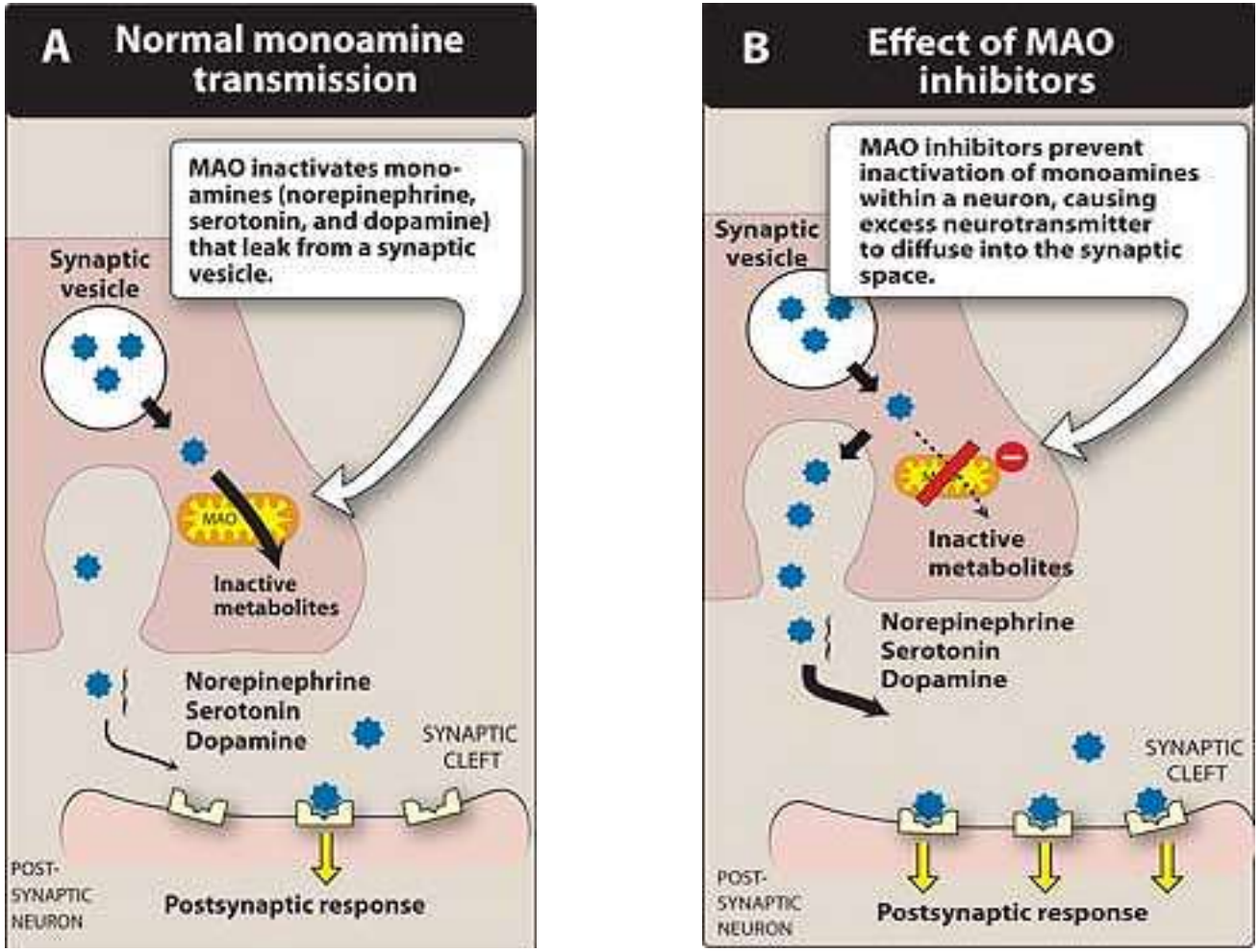
Amitriptyline has a tri-cyclic structure; is administered orally or IM, manifests antidepressant action in 10-14 days after the start of treatment; is non-selective inhibitor of monoamines re-uptake; is thymoleptic; does not provoke agitation and hallucinations, does not cause insomnia; may be taken in the evening; is indicated to patients in whom depression is accompanied by panic and anxiety; has M-cholinoblocking action and side effects resulting from antimuscarinic effect.

Fluoxetine contains fluorine; is taken orally; half-life is 1-10 days; is characterized by latent period of 1-4 weeks; is selective serotonin re-uptake inhibitor (SSRI); possesses psychostimulation effect; has not M-cholinoblocking and adrenobloking effects; is widely used to treat depression, neurotic bulemia, neurotic anorexia, panic disorders, some pain syndromes, premenstrual syndrome; has low toxicity but may cause headache, nervousness, insomnia, appetite disturbances, skin rash, sexual disturbances; should not be combined with non-selective MAO-inhibitors (may cause serotonin syndrome).

NIALAMIDE: a non-selective MAO-inhibitor

- is a non-selective MAO-inhibitor: inhibits both MAO-A and MAO-B. In such way prevents inactivation of monoamines within neuron and increases the release of monoamines into synaptic space. That is why it increases neurotransmission in certain areas of brain
- is thymoerectic
- increases the effects of adrenomimetics and sympathomimetics, is reserpine antagonist
- decreases pain syndromes
- is used in depressions unresponsible to tri-cyclic antidepressants, depressions accompanied by severe anxiety, phobic states, pain syndromes, euralgia of n.trigeminus
- has side effects, such as insomnia, headache, hypotension, dry mouth, constipation, cheese syndrome (it occurs in patients treated with MAO-inhibitors after use of cheese, beer, and other products containing tyramine; manifests by hypertensive crisis and cerebro-vascular accidents; needs IV injection of α-adrenoblocker as emergency help).

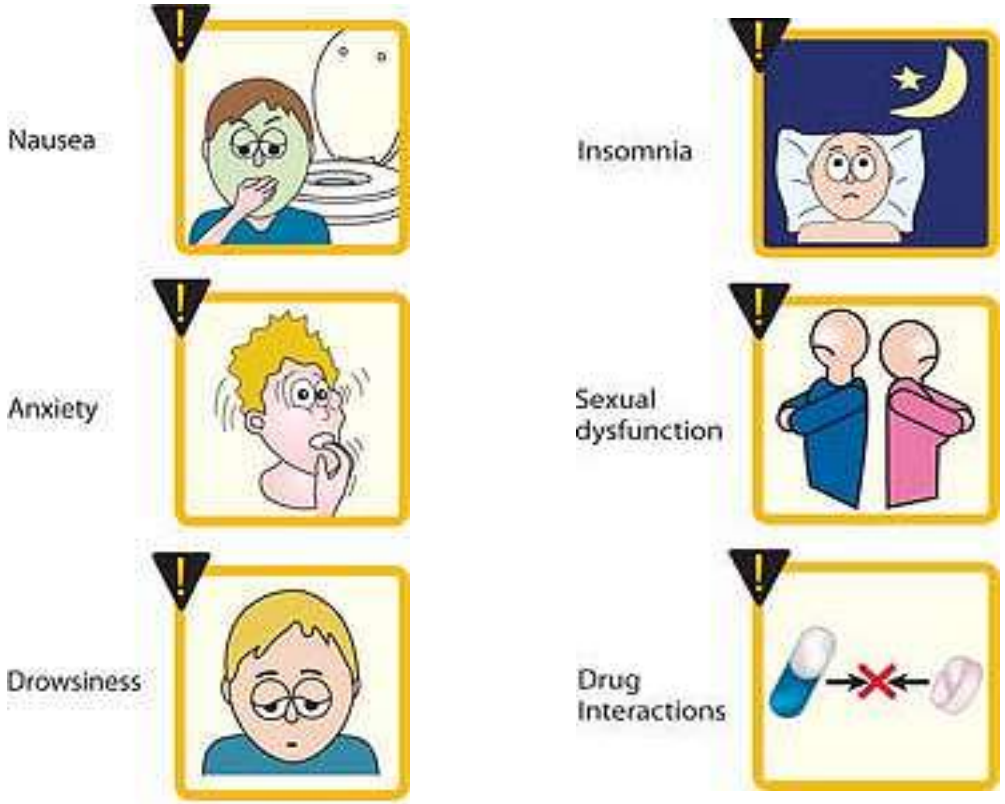
MAO-INHIBITORS: mechanism of action



PECULIARITIES OF OTHER MAO-INHIBITORS

Pirlindole has a tetra-cyclic structure; is selective inhibitor MAO-A with reversible action; has regulatory influence on emotions: causes psychostimulation under the conditions of fatigue and dormancy, as well as sedation under the conditions of anxiety; has not M-cholinoblocking properties; is indicated in depressions, manic-depressive disease, some types of schizophrenia, has low toxicity; may be used in patients with glaucoma, adenoma of prostate, myocardial infarction.

MAO-INHIBITORS: side effects



COGNITION PROBLEMS

There are several signs that a person may show when they have a cognitive problem, these may include:

- Memory problems
- Difficult concentrating
- Altered verbal fluency
- Inability to learn quickly
- Poor concentration
- Poor judgement

These symptoms are often secondary to their illness: cerebral atherosclerosis, stroke, cranial trauma, neuroinfection, or intoxication (chronic alcoholism). They are accompanying aging, neurodegenerative diseases, and mental retardation in children.

NOOTROPIC DRUGS = cognition enhancers

CLASSIFICATION

1. Pyrolidon derivatives

Piracetam (Nootropil), Pramiracetam

2. GABA derivatives

Aminalon, Phenibut, Pantogam,. Picamilon

3. Neuropeptides

Sinacten-Depo, Thyroliberin, Melatonin, Cerebrolysin

4. Cerebrovascular drugs

Vinpocetin, Nicergoline, Pentoxyphylline, Cinnarisine

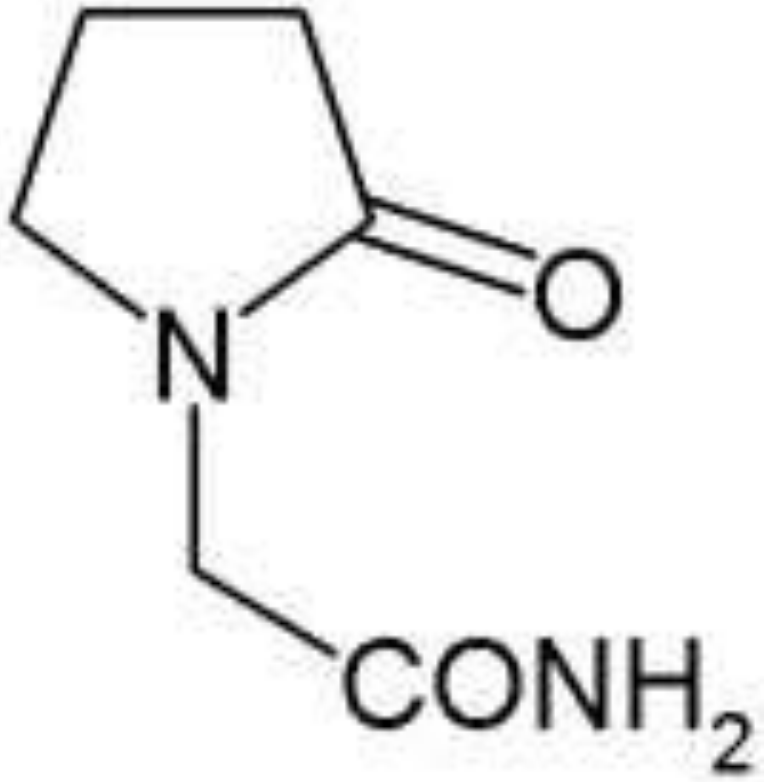
5. Pyridoxine derivatives

Pyritinol (encephabol)

6. Antioxidants

Mexidol.

NOOTROPIC DRUIGS: Piracetam



On chemical structure piracetam is similar to cyclic form of GABA

PIRACETAM: pharmacokinetics

- is administered orally, IM, IV
- is well absorbed from the GI tract, has bioavailability of 90%
- develops maximal concentration in the blood plasma in 30 min after administration; maximal concentration in brain – in 1-4 hrs after the administration
- penetrates CNS and placenta
- does not metabolized in the organism
- is excreted with urine
- acts during 12 hrs.

PIRACETAM: mechanism of action

- Piracetam has combined mechanism of action. ***It acts due to binding with receptors, as well as due to regulation of cell metabolism.***
- The influence on cognition is resulting from ***stimulation of aspartate and glutamate receptors, $GABA_A$ and $GABA_B$ receptors.***
- It increases macromolecules synthesis, stimulates glucose metabolism and production of ATP, increases the turnover of neurotransmitters, inhibits lipid peroxidation, normalizes structure and functions of cell membranes, decreases cortical discharge of L-proline.
- It also inhibits phosphodiesterase, increases the content of cAMP in cells, thus dilates blood vessels in brain and has anti-platelet action.

PIRACETAM: pharmacodynamics

- ***nootropic action:*** stimulation of higher cortical function, improving of the memory, enhancing of cognition, stimulation of educational process
- ***regulation of emotional state*** (weak dose-dependent psychostimulating or tranquilizing effect)
- ***stress-protective action*** with development of active forms of adaptation
- ***antihypoxic action*** (an increase in the brain stability to hypoxia)
- ***cytoprotective action*** (an increase in brain stability to neurotropic poisons)
- ***anticonvulsant-action*** in some forms of epilepsy
- ***an increase in efficacy of treatment by neuroleptics*** and antidepressants, a decrease in their side effects
- ***a decrease of abstinence*** in alcohol abused persons
- ***improvement of the cerebral blood circulation***, reduction of blood viscosity
- ***cardioprotective action*** (a decrease of myocardium lesion under the conditions of hypoxia).

PIRACETAM: indications

A. Long-lasting treatment

Memory disturbances of different origin, cognition disturbances in elderly patients, cerebral circulation disturbances, cerebral Atherosclerosis, chronic alcoholism, mental deficiency in children, cortical myoclonus epilepsy, sickle-cell anemia (as additional drug)

B. Urgent therapy

Trauma of the brain,. edema of the brain, stroke,. comatose state, acute intoxications with neurotropic poisons, abstinence in alcohol abusers, myocardial infarction (as additional drug),. hypoxia of fetus and newborn

C. Use in healthy persons for improving of education processes, memory, and adaptation.

The drug is not toxic and causes side effects rarely (anxiety,. insomnia)

OTHER NOOTROPIC DRUGS

Pramiracetam is piracetam derivative, has simiar action and indications, is more active

Aminalon contains GABA; crosses through blood-brain barrier and re-synthesized into GABA, interacts with $GABA_A$ and $GABA_B$ receptors; has nootropic, anticonvalsant, antihypoxixc, and light antihypertesive effects; is used after the disturbunces of cerebral blood circulation, for encephalopathy, mental retardation in children has low toxicity.

Vinpocetin (cavinton) is an alkaloid; is administered orally and by IV infusion; is the inhibitor of phosphodiesterase and increases cAMP concentration in cells; dilates cerebral blood vessels; improves cerebral circulation; has nootropic and antihypoxic actions; increases glucose metabolism in brain; has anti-platelet action; is indicated in disturbances of cerebral blood circulation, cerebral atherosclerosis, memory disturbances associated with cerebral ischemia, vertigo, pathology of blood vessels in retina and internal ear; may cause hypotension, arrhythmia, hyperemia of the face.

OTHER NOOTROPIC DRUGS

Pentoxiphylline is similar to alkaloid theobromine; is administered orally, IV; is phosphodiesterase inhibitor; dilates both cerebral and peripheral blood vessels of arterial type; has anti-platelet action; has nootropic action, especially associated with pathology of cerebral circulation; is indicated in acute and chronic disturbances of cerebral and peripheral blood circulation, ischemic stroke, diabetic angiopathia, angiopathia of ocular blood vessels; has such side effects as hypotension, weakness, vertigo, hyperemia of skin, dyspepsia; is contraindicated to patients with myocardial infarction, bleeding, hypotension, severe atherosclerosis, pregnancy.

Nicergoline *(sermion)* is administered orally and by IV infusion; has α-adrenoblocking action, dilates cerebral and peripheral blood vessels, improves cerebral and peripheral circulation, thus displays nootropic action in CNS; has indications similar to the same of pentoxiphylline; may cause hypotension, decrease in cardiac output, vertigo, weakness, hyperemia of skin, pain in epigastrium.

ADAPTOGENS

Adaptogens are drugs improving adaptation and non-specific resistance of the organism. Majority of adaptogens have vegetable origin.

CLASSIFICATION

1. Preparations from medicinal plants

– Tincture of G*inseng*

– Tincture of *Schizandra*

– Tincture of *Aralia*

– Extract of *Eleuterococcus*

2. Preparations from animal tissues

– Pantocrinum

MEDICINAL PLANTS CONTAINING ADAPTOGENS

A

B

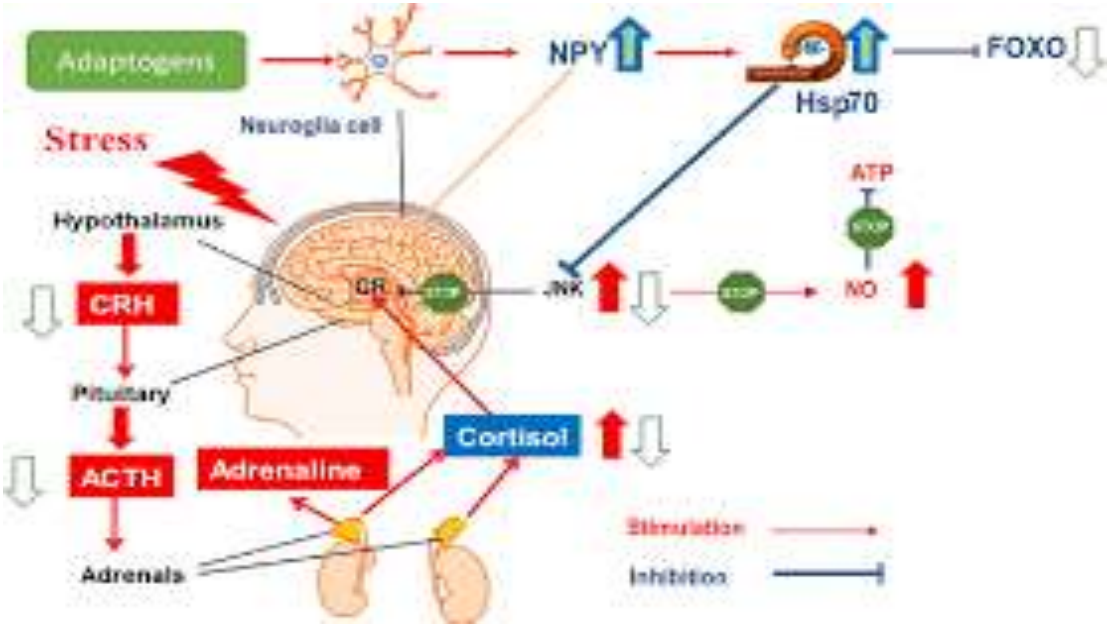
C

A – *Panax Ginseng*, B – *Schizandra chinensis*,

C – *Leuzea carthamoides*

ADAPTOGENS: mechanism of action

- Mechanim of action relates to steroidal compounds and is based on activation of RNA and protein synthesis, stimulation of glucose metabolism and ATP synthesis, inhibition of lipid peroxidation.
- Regulation of the activity of hypophysial-adrenal system is very important component in adaptogens' mechanism of action. They limit the activity of this system under the conditions of acute stress or stimulate it under the conditions of chronic exhausting stress.



ADAPTOGENS: pharmacodynamics

- an increase in resistance to unfavorable factors
- optimization of adaptation
- a decrease in negative influence of acute and chronic stress on the organism
- an increase in physical and mental working capacity
- restoration of normal daily rhythms
- a decrease in atherogenesis
- stimulation of cardiovascular system, an increase in low BP
- normalization of decreased appetite
- stimulation of reproductive processes, especially in males
- stimulation of non-specific immunity.

ADAPTOGENS: clinical use

Indications

Asthenia, hypotension, vegeto-vascular dystonia, ecovery period after Infections atherosclerosis, sexual asthenia, impotence, stress and adaptation in healthy persons, physical and mental overstrain, non specific prophylaxis of infections.

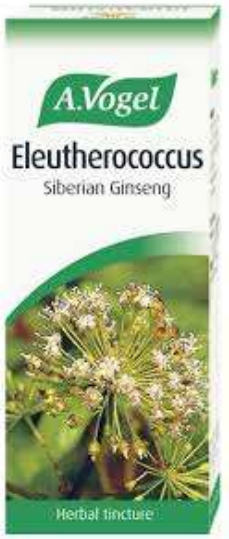
Side effects

Restlessness, nervousness, insomnia, hypertension, hyperglycemia.

Contraindications

Insomnia, hypertension, bleeding, menstruation, severe atherosclerosis, organic heart lesions.

Should not be taken in the evening!



ANALEPTICS

Analeptics are the drugs which stimulate mainly respiratory and vasomotor centers in medullar part of CNS.

They always have such effects as:

- ***an increase in respiration resulting from stimulation of respiratory center***
- ***an increase in BP resulting from stimulation of vasomotor center***
- ***a decrease in action of drugs inhibiting CNS (awakening effect)***
- ***seizures (in higher doses).***

ANALEPTICS: classification

On type of action

1. ***Direct-acting***

Bemegride, Etimizol , Strychnine nitrate, Caffeine

2. ***Indirect-acting (M-cholinomimetics)***

Cytizin (Cytiton), Lobeline

3. Mixed-acting

Camphor, Sulfocamphocaine, Nikethamide (Cordiaminum),

On mechanism of action

1. Membrane-tropic: Camphor, Sulfacamphocaine

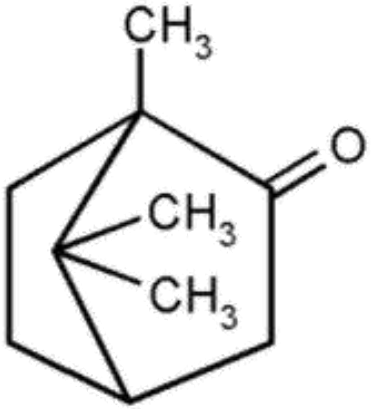
2. Barbituratergic Bemegride

3. Benzdiazepinergic: Nikethamide

4. Purinergic: Caffeine, Etimizol

5. Glycinergic: Strychnine.

ANALEPTICS: Camphor



Camphor is a bicyclic ketone,

may be natural or synthetic.

Natural and synthetic camphor are isomeric

forms and both have pharmacological activity.

Natural camphor is contained in the camphor tree.

Camphor is in-dissolved in water but is well dissolved in oil and alcohol, has specific aroma.

CAMPHOR: pharmacokinetis

- is administered SC, orally, or topically
- is absorbed in small intestine
- penetrates blood-brain barrier
- is metabolized in microsomes of the liver
- is excreted with urine, bronchial liquid, nursing mother's milk.

CAMPHOR: mechanism of action

- Camphor is ***a mixed-acting analeptic***. It has direct and indirect action.
- ***Direct action*** includes disturbances in permeability of neuronal membrane to Na^+. They results in the increase of Na^+ concentration in the cells that leads to supporting of excitement of neurons in the medulla of brain.
- ***Indirect component*** of camphor's mechanism of action is realized by stimulation of chemoreceptors of zona carotis and reflexive excitation of centers in the prolonged medulla.

CAMPHOR: pharmacodynamics

- ***local action***: antiseptic, irritating, trophic, whitening
- ***stimulation of the respiratory center*** in its moderate oppression resulting in the acceleration and deepening of breath
- ***stimulation of vasomotor center*** in its oppression resulting in the increase of BP
- ***awakening action*** and a decrease in effects of CNS inhibitors
- ***positive inotropic action*** (an increase in strength of heart contractions under the conditions of heart failure resulting from the enhance of myocardium sensitivity to catecholamines and intensification of metabolic processes)
- ***improvement of microcirculation***
- ***antiplatelet action***
- ***expectorant action*** resulting from the drug's excretion by bronchial glands

CAMPHOR: clinical use

Indications

- Moderate oppression of respiration caused by infections and intoxications
- Collapse, shock
- Acute and chronic heart failure
- Pneumonia
- Skin diseases, external otitis, myalgia, myositis, arthralgia, arthritis, for prophylaxis of trophic disturbances of skin in long layer patients (topically).

Side effects

Allergy, seizures, infiltrate in the site of injection, fat embolism if the drug is administered IV or IM.

Contraindications

Hypersensitivity to camphor, epilepsy, prone to seizures

Should not be administered IV or IM!

OTHER ANALEPTICS

Sulfacamphocaine is complex compound of camphor and procaine; is water-soluble; is administered SC, IM, IV; is not applied topically; is used for oppression of respiration, collapse, shock, overdose of drugs inhibiting CNS, heart failure; is contraindicated to patients with allergy to procaine.

Nikethamide (Cordiaminum) is a commercial name of 25% solution of diethylamide of nicotinic acid; is administered IV, IM, SC, orally; has short action; is mixed-acting analeptic (its direct action is resulting from inhibition of benzodiazepine receptors of Cl^- channels); has typical analeptic effects; improves metabolism in the heart and liver; is indicated in oppression of respiration, collapse, shock, overdose of CNS inhibitors, chronic heart failure (orally); may cause seizures, hyperemia of skin, pain in the site of injection; is contraindicated to patients with epilepsy, psychic excitement, hypersensitivity to nicotinic acid.

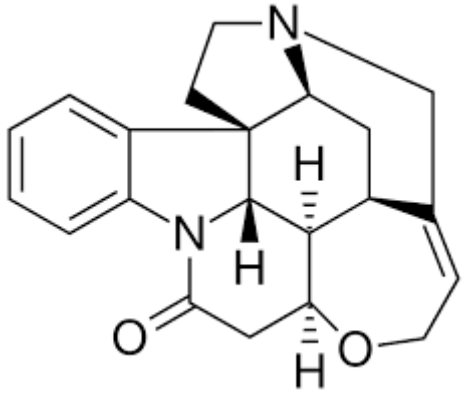
OTHER ANALEPTICS

Bemegride is a derivative of piperidine; is administered IV; begins to act quickly; is widely distributed in the body; is metabolized in the liver and excreted with urine; is a strong direct-acting analeptic inhibiting barbiturate receptors; awakening action is the strongest effect in comparison with other effects of bemegride; is indicated in acute poisonings with barbiturates, alcohol, narcotic analgesics; overdose of general anesthetics; oppression of respiration; may cause seizures, tremor, hyperventilation, arrhythmia

Etimizol is an imidazole derivative; is administered IV, IM, and orally; is a direct-acting analeptic inhibitinig adenosine receptors; decreases PDE activity, thus increases cAMP in cells; produces stimulation of respiratory and vasomotor centers, awakening action; stimulates ACTH secretion resulting in the anti-inflammatory and anti-allergic effects, displays cognitive enhance, improvement of the tone of myocardium and skeletal muscles, dilates bronchi; increases surfactant synthesis in lungs; is used in oppression of respiration, asphyxia of newborns, bronchial asthma, pneumonia, rheumatoid arthritis; may cause dyspepsia, vertigo, restlessness, insomnia; is contraindicated in epilepsy, psychic disorders, excitement.

OTHER ANALEPTICS

Strychnine is an alkaloid of vomiting nut; is administered SC and orally; is a direct-acting drug inhibiting glycine receptors; acts mainly on spinal cord, stimulates reflexive activity of spinal cord; stimulates cortex parts of analyzators, especially vision analizator; is used in neurological diseases accompanied by hypotonia, paralysis, paresis, asthenia, disturbances of vision resulting from encephalytis, atonia of the GI tract and urinary bladder, impotence; ***is used very rarely due to high toxicity: is a seizure poison*** (Seizures caused by strychnine are treated by myorelaxants).



CNS STIMULANTS AND DENTISTRY

Antidepressants (selective serotonin reuptake inhibitors and MAO inhibitors) are used to treat some pain syndromes in the maxilla-facial area, e.g. neurolgia n. trigeminus

Analeptics are used parenterally for emergency help in dental clinic.

Analeptic camphor is used topically treat pulpitis and deep caries as an ingredient of stomatologial pastes.

Adaptogens are used for the improvement of non-specific resistance in patients with chronic inflammatory diseases of the oral mucosa and periodontium.

Some ***antidepressants with M-cholinoblocking action*** can cause hyposalivation, xerostomia, and candidiasis relating to them.

Strychnine may cause trismus in overdose.

CONTROL TASKS

- A 24-year-old patient has affective disorder characterized by hopelessness, despair, inability to experience pleasure in ordinary life, loss of interest to usual activity, sleep disturbance. A diagnosis is endogenous depression. Which tri-cyclic antidepressant with sedative component in its action may be prescribed to this patient?

  A. Imipramine B. Amitriptyline C. Fluoxetine D. Mapotiline E. Pirlindole. (B)

- A patient with collapse was administered with directly-acting analeptic drug also known as purinergic psychomotor stimulant. What medication was used?

  A. Codeine phosphate B. Ephedrine hydrochloride C. Caffeine-sodium benzoate D. Atropine sulfate E. Lobeline hydrochloride. (C)

CONTROL TASKS

- A patient is hospitalized with cerebro-vascular accident. He has had ischemic stroke 4 years ago which resulted in memory impairment and attacks of headache. Which of the listed drugs should be used to improve cerebral blood circulation and mental performance?

  A. Sydnocarb B. Pentoxiphylline C. Diazepam D. Caffeine

  E. Nkikethamide. (B)

- A healthy student asks a physician to recommend him non-toxic drug which can increase physical and mental working capacity, restore normal daily rhythms and decrease negative influence of stress on the organism at the end of semester. Which group of drugs is suitable for this purpose?

  A. Analeptics B. Anxiolytics C. Adaptogens D. Hytpnotics

  E.Sedatives (C)