PHARMACOLOGY

DENTALELLE TUTORING
- Transported by the blood to target organs.
- Help maintain homeostasis by regulating body functions.
PITUITARY HORMONES
The pituitary gland is located at the base of the brain and is called the MASTER GLAND.

**Anterior Lobe (adenohypophysis)**
- growth hormone (somatotropin),
- luteinizing hormone (LH); (used to treat infertility)
- follicle-stimulating hormone (FSH); (used to treat infertility)
- thyroid-stimulating hormone (TSH) or thyrotropin,
- adrenocorticotropic hormone (ACTH) or corticotropin, and
- Prolactin
- Human chorionic gonadotropin (hCG) (hCG contains FSH & LH and is commercially available as menotropin (Pergonal))
- **Posterior Lobe** *(neurohypophysis)*
- Secrets vasopressin (antidiuretic/ADH) and oxytocin
- Synthetic vasopressins (Stimate) are used to treat: (1) diabetic, (2) hemophilia A and von Willebrand disease (clotting disorders)
- **Oxytocin** *(Pitocin, Syntocinon)* used via injection to: induce labor, control postpartum hemorrhage, induce postpartum lactation
HYPOPITUITARISM

- Deficiency of the pituitary:
  - Dwarfism, hypothyroidism, decreased metabolism, diabetes, Addisons disease
Hyperpituitarism

- Pituitary hyper secretion:
  - Early puberty, goiter (increased thyroid gland), Cushing disease, Acromegaly (too much growth hormone)
THYROID HORMONES
THYROID HORMONES

- Iodine
  - Hypothyroidism
  - Hyperthyroidism

- The thyroid gland secretes two iodine-containing thyroid hormones:
  - triiodothyronine (T3)
  - tetraiodothyronine (thyroxine [T4]);

  - Important for energy metabolism, growth, and development.
  - Are synthesized from iodine and tyrosine and stored as complex protein until TSH stimulates their release.
  - In addition, calcitonin regulates calcium metabolism.
The thyroid gland requires intake of adequate iodine.

Marine life is the only common food that is naturally rich in iodine.

If iodine intake is deficient, normal amounts of thyroid hormones cannot be made.

TSH is secreted in excess, and the thyroid hypertrophies (simple or nontoxic goiter).
Hypothyroidism = ↓ in thyroid function.

- Called cretinism in a child.
- Called myxedema or simple hypothyroidism in an adult.
- Malocclusion, delayed tooth eruption, can develop peri easier, poorly shaped teeth & carious, inflamed or pale & enlarged gingiva.
- Mental and physical retardation could result.
- Patients are usually drowsy, weak, and listless and exhibit an expressionless, puffy face with edematous tongue and lips.
- Abnormally sensitive to CNS depressants including opioids & sedatives.
- Hypothyroid pregnant women tend to give birth to offspring with LARGE teeth.
TREATMENT OF HYPOTHYROIDISM

- Oral replacement therapy with exogenous thyroid hormones.
- levothyroxine (Synthroid)
HYPERTHYROIDISM

- Hyperthyroidism = ↑ in thyroid function.

- THYROID HYPERFUNCTION:
  - Diffuse toxic goiter: (Graves disease) - Characterized by a diffusely enlarged, highly vascular thyroid gland. YOUNG ADULTS
  - Toxic nodular goiter: (Plummer disease) - Characterized by nodules that secrete excessive hormone while the rest of the glandular tissue is atrophied. OLDER ADULTS.
  - Hashimoto’s disease - Lymphocytes enter thyroid, inflammation as well. Enlarged eyes

- EFFECTS - Accelerated tooth eruption, marked loss of alveolar process, diffuse demineralization of jawbone, rapidly progressive periodontitis.
TREATMENT

- RADIOACTIVE IODINE
- THYROIDECTOMY
- Either treatment usually results in hypothyroidism.

- DRUGS – Iodine
- ANTITHYROID DRUGS - Radioactive iodine (iodine 131)
- SURGERY - Partial thyroidectomy
REMEMBER

- CV system is hyperactive thus, epinephrine is contraindicated (cardiac dose okay but careful); propranolol used to counteract tachycardia.
- 0.04 cardiac dose SOME TEXTBOOKS have it as 0.2, or 0.02.
PANCREATIC HORMONES
Two primary hormones secreted by islets of Langerhans of the pancreas are:

- **INSULIN**: promotes fuel storage (glucose out of blood)
- **GLUCAGON**: promotes fuel mobilization (glucose into the blood)

**Diabetes**:
- **Type I** (insulin-dependent DM [IDDM])
- **Type II** (non–insulin-dependent DM [NIDDM])

Symptoms and complications result, usually from inadequate or poorly timed secretion of insulin from the pancreas and/or insulin resistance of the cells.
## DIABETES

- **Type I:**
  - **Younger than age 30 years** and results from autoimmune destruction of pancreatic beta cells.
  - Associated with a complete lack of insulin secretion, increased glucagon secretion, rapid onset of disease, ketosis, and severe symptoms.
  - Treated with injections of insulin

- **Type II:**
  - **Older than age 40 years**, (more cases of type II diabetes are being reported in persons younger than 20 years because of a much more inactive lifestyle and lack of exercise)
  - The pancreas can secrete insulin to prevent ketoacidosis but not enough to normalize plasma glucose and insulin secreted does not reduce glucose levels in serum to normal levels

- **Type III**
  - Drug induced
Oral surgery should be performed 1.5 to 2 hours after the patient has eaten a normal breakfast and has taken regular anti-diabetes medication.

Uncontrolled diabetes is very important because so much can go wrong – infections, eye sight, loss of limbs, slower healing, etc.

Drugs that may ↓ insulin release or ↑ insulin requirements, should be used with caution in patients with diabetes, such as: epinephrine, glucocorticoids, or opioid analgesics.

Gangrene can occur in the peripheral extremities due to depressed immunity, less effective white blood cells, microvascular changes, and neuropathy.

BUT IF DIABETES IS UNDER CONTROL, NO ISSUES 😊
LAB TESTS

- **SERUM GLUCOSE** - measure of glucose at the time that blood is sampled; *not a good reflection on patient’s OVERALL glucose control*

- **GLYCOSYLATED HEMOGLOBIN (HbA1c)** – reflects glucose control over a 2-3 month period; *more accurately reflects patient’s OVERALL glucose control.*
TREATMENT OF HYPOGLYCEMIA

- SIGNS OF HYPOGLYCEMIA: increased stress, not eating, not exercising, overdose of insulin
  - The patient becomes weak, sweats, confused.

- IF UNCONSCIOUS (& lacks swallowing reflex): intravenous dextrose (50%)
  - If CONSCIOUS: sugar, orange juice, chocolate..anything with sugar in it 😊

- Clinically difficult to distinguish between hypo- & hyperglycemia so give sugar anyways.
  - It won’t do any additional damage to hyperglycemics
DIABETES TYPES

- **Type I:**
  - Insulin - Usually administered by subcutaneous injection, *large molecular size prevents it from being absorbed from the gastrointestinal tract.*

- **Type II:**
  - Sulfonylureas > oral hypoglycemic agents
  - Biguanides
  - Glucosidase inhibitors > antihyperglycemics
  - Thiazolidinediones
<table>
<thead>
<tr>
<th>INSULIN</th>
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<tr>
<td><strong>FAST ACTING</strong></td>
</tr>
<tr>
<td>• insulin aspart (Novolog)</td>
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<tr>
<td>• insulin lispro (Humalog)</td>
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<tr>
<td>• insulin gallisin (Apidra)</td>
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<tr>
<td><strong>SHORT ACTING</strong></td>
</tr>
<tr>
<td>• insulin regular (Novolin R, Humulin R)</td>
</tr>
<tr>
<td><strong>INTERMEDIATE ACTING</strong></td>
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<tr>
<td>• insulin NPH (Humulin N, Novolin N)</td>
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<tr>
<td>• Humulin L Lente</td>
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<tr>
<td><strong>LONG ACTING</strong></td>
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<tr>
<td>• insulin detemir (Levimir)</td>
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<tr>
<td>• insulin glargine (Lantus)</td>
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MANAGEMENT OF THE DIABETES PATIENT

- Hypoglycemia – when did they have their last meal?
- Surgery should be 1-2 hours after a meal
- Should see patients after they eat
- Infection more likely
- Healing prolonged
- Drug interactions – Large doses of salicylates may produce hypoglycemia.
- Give client an appointment in the morning AFTER breakfast and insulin or oral hypoglycemic agent.
- Provide quick glucose source for hypoglycemia
- Check for oral complications related to diabetes.
- Ask client what the result of his or her blood glucose monitoring have been
FEMALE SEX HORMONES
The two major female sex hormones are **ESTROGENS** and **PROGESTINS**.

The are secreted primarily by the **ovaries but also by the testes and placenta**.

They are largely responsible for producing female sex characteristics, developing the reproductive system, and preparing the reproductive system for conception.

The **corpus luteum is the primary source of progesterone during the normal female sexual cycle**.

**Progesterone** - Female sex hormone; plays role in reproduction, **thickens uterine lining**.

**Ovaries** - Two almond-shaped glands located at the opening of the fallopian tubes on both sides of the uterus; produce eggs and the sex hormones estrogen and progesterone.
An ovarian egg matures in response to increased FSH.

The follicle in which it is contained grows in size and begins to secrete estrogen.

After ovulation, LH causes secretory cells of the follicle to develop into a corpus luteum that secretes large quantities of estrogen and progesterone.

This causes a feedback decrease in the secretion of both FSH and LH.

The corpus luteum completely degenerates on approximately day 26.

The ↓ in estrogen and progesterone leads to menstruation and ↑’ed release of FSH and LH.

The FSH initiates growth of new follicles to begin a new cycle.
Menopause - The period in a woman’s life when menstruation stops, resulting in a reduced production of estrogen and cessation of egg production.

In addition to their presence in oral contraceptives, estrogens are used to treat menstrual disturbances (such as uterine bleeding), osteoporosis, etc.
GINGIVITIS

- The increase in gingiva inflammation may occur even with a decrease in the amount of plaque.
- This circumstance may be a result of increased levels of prostaglandin E (PGE), estradiol, and progesterone in the saliva.
PROGESTINS

- Available as an intramuscular injection administered every 3 months, as a progestin-only pill, in the form of an intrauterine device (IUD), or as an implant under the skin on the arm.

- IUD has progesterone agent levonorgestrel (Norplant) – implanted under skin of arm – provides contraception for at least 5 years.

- medroxyprogesterone (Provera)
  - is used orally in conjunction with estrogens by postmenopausal women.

- It prevents an increase in the risk of uterine cancer that can occur when estrogen is used alone.
**DRUGS**

- **Tamoxifen (Nolvadex)**
  - Inhibitor of estradiol at the receptor.
  - Palliative treatment of advanced breast cancer in postmenopausal women.
  - **Prophylaxis for women at high risk of developing breast cancer.**
  - **Raloxifene (Evista)** is newer/similar

- **Clomiphene** - Has the ability to induce ovulation in some women.
- **Leuprolide** - Is used in the management of endometriosis and to treat infertility.
- **Danazol** - Is used to treat endometriosis and fibrocystic disease in women.
- **Aromatase Inhibitors** - Reduce almost the entire amount of estrogen made in the bodies of postmenopausal women.
ORAL CONTRACEPTIVES

- A combo of estrogens and progestins
- **Interfere with fertility by inhibiting FSH & LH & therefore preventing ovulation.**
- Also interferes with impregnation by altering endometrium & secretions of the cervix.

**ANTIBIOTICS & ORAL CONTRACEPTIVES**
Evidence exists that antibiotics may reduce the effectiveness of hormonal contraceptives.
The patient might want to use an additional method of contraception until the end of her cycle.
MALE SEX HORMONES
ANDROGENs are responsible for development of male sex characteristics (can be used illegally for gaining muscle as well)

MAIN ANDROGEN: testosterone, has both androgenic & anabolic effects.
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ADRENOCORTICOSTEROIDS
TWO MAJOR GROUPS

- Adrenocorticosteriods:
  - **Glucocorticoids - cortisol (hydrocortisone).** Anti-inflammatory
  - **Mineralocorticoids – aldosterone.** Sodium retention in the kidney

- Glucocorticoids & mineralocorticoids released from the adrenal cortex.
  - Adrenocorticotropic hormone (ACTH):
  - Secreted by pituitary, causes release of hormones from the adrenal cortex.
Prednisone (Deltasone)
Methylprednisone
Triamcinolone (Nasacort)
Mometasone (Nasonex)
Fluticasone (Flonase)
Fluticasone propionate (Flovent)
Budesonide (Rhinocort Aqua)
ADRENOCORTICOSTEROIDS
ADRENOCORTICOSTEROIDS

- Adrenal glands – secrete hormones for chemical releases
  - **outer region** = adrenal cortex
  - **inner region** = adrenal medulla

- Adrenocorticosteroids can be used topically to treat inflammation and systemically for arthritis. **Adrenocorticosteroids are naturally occurring in the body secreted by the adrenal cortex**

- Some common natural hormones are **corticosterone, cortisone, & aldosterone**.

- In dentistry, steroids are used primarily to decrease post-operative edema and manage oral inflammatory diseases.
MECHANISM OF RELEASE

- When stressed, the hypothalamus releases corticotropin-releasing hormone (CRH) which acts on the pituitary gland.
- The pituitary gland secretes adrenocorticotropic hormone (ACTH) which stimulates the adrenal cortex to release hydrocortisone (cortisol).
- **Negative feedback** happens when sufficient levels of hydrocortisone have been reached, hydrocortisone causes the pituitary gland and hypothalamus to inhibit the release of their respective hormones.
- Exogenous steroids act in the same way as hydrocortisone; they also inhibit the release of CRH and ACTH.
- With long-term administration of steroids, ACTH release is suppressed.
- Adrenal crisis may occur if exogenous steroids are abruptly withdrawn.
ADDISONS DISEASE

- Disease/condition produced by a deficiency of adrenocorticosteroids.
- **Hypofunction** – the adrenal glands aren’t working as they normally should
- Hyperpigmentation, inability to maintain fasting blood sugar, weakness, fatigue, hypotension
- Management: Hydrocortisone 20-30mg/day
CUSHING SYNDROME

- Too much of ‘adrenocorticosteroids’
- **Moon (round) Face**, muscle wasting, and **buffalo hump** (fat deposit on back of neck).
- Treatment:
  - Surgery, **hydrocortisone 300 mg IV** on the day of the surgery, then **maintenance oral dose**.
VARIous EFFECTS

- Of oral corticosteroids:
  - Further weight gain, thinning skin which can bruise easily, muscle weakness, moon face (Cushing's syndrome features), osteoporosis, onset of diabetes, high BP, delayed wound healing, reduced growth in children
  - Side effects depend on: Dose, Frequency, Duration of Treatment, Time of Administration
  - Exogenous steroids (drugs) produce many different effects on the body.
  - Pharmacologic effects & adverse reactions are closely related.

- Effects for which they are used include:
  - Anti-inflammatory action &
  - Suppression of allergic reactions
  - Corticosteroids DO NOT CURE, they cover up the SYMPTOMS
The adrenal crisis occurs because of a lack of corticosteroids during stress, the adrenal gland is damaged (Addison's disease) and/or the pituitary gland is injured (cannot release ACTH).

What can happen in an adrenal crisis?
- Syncope, collapse & death.
- Once adrenal suppression occurs, it can take weeks or months for the adrenal gland to respond normally.
- Adrenal steroids may need to be administered BEFORE a stressful situation to prevent crisis.
- Generally, low and very high doses do not present problems; problems occur with mid-range doses.
ORAL CANDIDIASIS

- Oral candidiasis may result with use of oral steroid inhalers.
- Always tell your patients they need to rinse their mouth with water after using their inhaler.
OSTEOPOROSIS

- May be seen in patients taking long-term adrenocorticosteroids.
- With long-term use: fractures; tooth loss.
ANTIBIOTIC PROPHYLAXIS

Because steroids can delay wound healing, patients receiving long-term oral steroids may require antibiotic prophylaxis prior to dental appointments.

Should always check with the family physician.

**RECENT GUIDELINES – PROBABLY NOT**
USES

- Used for:
  - Rheumatoid arthritis, rheumatic fever, systemic lupus, scleroderma, inflammation of the joints and soft tissues, acute bronchial asthma, severe and acute allergic reactions & severe allergic dermatoses.
  - Oral corticosteroid: prednisone most common.
  - Topical steroids: hydrocortisone can be used for skin conditions

- Used to treat: lichen planus, erythema multiforme, pemphigus, desquamative gingivitis, benign mucous membrane pemphigoid
- Used in surgery to reduce edema, trismus, and pain
- Epinephrine use may need to be avoided if the patient's blood pressure is elevated.
PRODUCTS - CORTICOSTEROIDS

- **Short acting**
  - Hydrocortisone (Cortisol) – the weakest potency
  - Prednisone (Deltasone)
  - Methylprednisolone (Medrol)
- **Intermediate acting**
  - Triamcinolone
  - Prednisolone
- **Long acting**
  - Dexamethasone
  - Betamethasone

**An easy way to remember the corticosteroid meds is they all end in ONE**
BOX 19-3

Management of Dental Patient Taking/Has Taken Corticosteroids

Most dental patients taking steroids having normal dental treatment rendered DO NOT need additional corticosteroids. Supplemental steroids may be required if patient has severe dental fears or for major surgical procedures.

Precautions to Avoid Stress
Obtain good anesthesia
Check blood pressure
Provide postoperative analgesics (prn)

No Supplementation
Stop using >1 year ago
Dose <20 mg/d HC or 5 mg/day prednisone
Dose >40 mg/d HC or 10 mg/day prednisone
Duration of therapy <1 mo
Every other day therapy
Topical use—rash, asthma inhaler, nose spray

May Need Supplementation
Dose 20-40 mg HC or 5-10 mg prednisone/day
Duration >2 wk
Topical (above) in very large doses or over entire body
If supplementing—different regimens
• Double normal dose morning of appointment
• Double normal dose the day before, the day of, and 2 days after (depends on stress/pain level) appointment

HC, Hydrocortisone.
REMEMBER TO ASK THE PATIENT…

- Obtain a detailed medication history
- Obtain a detailed health history
- **Given that corticosteroids can elevate blood pressure, the dental hygienist should check the patient’s blood pressure and pulse at each visit.**
- **Encourage the patient to avoid the use of NSAIDs and aspirin because they can cause gastrointestinal (GI) upset and ulcers. Corticosteroids also increase the risk for GI upset and ulcer.**
- Corticosteroids can mask the symptoms of infection and delay wound healing.
- **Antibiotics may be necessary for patients using corticosteroids on a long-term basis --*RECENT GUIDELINES PROBABLY NOT.**
- Check for symptoms of osteoporosis of the jaw and bone because corticosteroids can increase the risk for osteoporosis.
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ANTICONVULSANTS
DRUGS TO REMEMBER

- **VALPROIC ACID** (Depacon) – GI distress and bleeding could be prolonged. **PHENYTOIN**

- **CARBAMAZEPINE** (Tegretol) – also used to treat bipolar disorder and trigeminal neuralgia. Can cause blood dyscrasias (can cause clotting disturbances), white blood cell count to be monitored. Can cause petechiae or infections. Oral effects are dry mouth and glossitis. Warfarin and oral contraceptives are the known drug interactions.

- **PHENOBARBITAL** (Luminal) – THE MOST COMMONLY USED. Tonic clonic and partial seizures.

- Phenytoin (Dilantin) – **ALSO COMMONLY USED**. Has been used to treat trigeminal neuralgia. Excessive hairiness could happen. Deficiency may involve vitamin D and folate. **GINGIVAL ENLARGEMENT in 50% of users. Excellent oral hygiene is needed.**

- *(take all drugs with food to limit adverse effects with GI distress)*
Also these drugs can be used for chronic pain as well, NOT ONLY FOR SEIZURES

- Always ask the patient why they are taking a certain drug
- Bipolar or chronic migraines are common
MORE EXAMPLES TO TREAT TONIC CLONIC AND STATUS EPILEPTICUS

- **ORAL EXAMPLES:**
  - clonazepam (Klonopin) & clorazepate (Tranxene)

- **PARENTERAL EXAMPLES:**
  - diazepam (Valium) & lorazepam (Ativan)

- Benzodiazepines are indicated for epilepsy because they limit the spread of abnormal activity to other parts of the brain.
DRUGS ARE FOR…

- Drugs are used to block nerve impulses
- Drugs are used to reduce the number of seizures. A low dose is always tried first.
- Anticonvulsants are CNS depressants and USED FOR LIFE.
- Prevents electrical impulses through the brain.
Epilepsy – A group of disorders involving a chronic recurrent attack of involuntary behavior or experience or changes in neurologic function caused by electrical activity in the brain. Seen on an ECG.

- **Generalized seizures** – petite mal (absence seizures – no aura with this one, no loss of body functions and is over quickly, the patient isn’t aware (they appear zoned out) VALPROIC ACID IS THE DRUG OF CHOICE. LASTS A FEW QUESTIONS

- **Grand mal** (tonic clonic seizures) and status epilepticus. THIS IS THE MOST COMMON. The patient may experience an aura (sense of emotions or smell prior to a seizure). Body becomes rigid and lasts longer. Urination may happen by the patient. Loss of body control. TRUE AURA DOES NOT OCCUR. VALPROIC ACID AND PHENYTOIN ARE THE DRUGS OF CHOICE. GRAND MAL COULD LEAST SEVERAL MINUTES. STATUS EPILEPTICUS LASTS 30 MINUTES OR MORE.

- **Partial seizures** – only activates part of the brain

- Seizure disorders are estimated to affect approx. 1% of the population.
STATUS EPILEPTICUS

- Seizures last more than 30 minutes
- This is not good! The patient will likely need emergency care, call 911
- diazepam (Valium) is the drug of choice
PARTIAL (FOCAL) SEIZURES

- **Simple** partial attack: consciousness NOT impaired.

- **Complex** partial attack: consciousness impaired; slow to return, last several minutes
  - An aura may be present

- DRUGS COULD BE carbamazepine, phenytoin, phenobarbital
ADVERSE REACTION

- Most common adverse reaction is a depressed CNS.
- Additive with other CNS depressants such as opioids.
- **Tolerance develops to sedative effects of the medication**
- Learning activities may be delayed, and the patient may appear sedative
- Most important interaction: stimulation of hepatic microsomal enzymes which causes reduction in blood level of affected drugs.
- Rashes and skin conditions can develop
- **If level too high – toxicity; too low – loss of seizure control.**
TERATOGENICITY

- Can result in abnormal growth to the fetus but also abrupt cancellation of the drug can result in seizures.
- Increased risk of congenital malformations if taken in the first trimester of pregnancy has been reported with floppy infant syndrome.
The majority of epileptic patients have idiopathic epilepsy, meaning an unknown cause.
Always review the medical history!

Determine the **type, duration, and frequency of seizures.**

Determine when the client had his or her last seizure.

Determine if the patient is experiencing any adverse effects

Find out how often the patient takes his or her medication and if it was taken on the day of the appointment.

Examine the patient for gingival enlargement or overgrowth or other oral manifestations

Have the patient describe his or her seizure symptoms to you and how the seizure resolves itself.
If a seizure happens

- If the patient is having a seizure:
  - Moving the patient to the floor if possible but in my opinion the dental chair safe
  - Tilting the patient’s head to one side to prevent aspiration, and
  - Removing objects from the patient’s mouth before the seizure to prevent fractured teeth.
  - DO NOT use tongue blades or others
Organic – Congenital or caused by Injury (**PRIMARY**)

Functional – Psychogenic Origin (**SECONDARY**)

- **Psychosis** - schizophrenia
- **Neurosis** - phobias, panic disorders & obsessive-compulsive disorder
- **Affective Disorder** – bipolar depression
Remember that antipsychotic agents:

- **Conventional antipsychotics** - *Phenothiazines*. More side effects and little effect on negative.

- **Atypical antipsychotics** - Have action at more than one receptor - the *dopamine*, *serotonin*, and *norepinephrine* receptors. *Dibenzepines*. Produce increase nausea and fewer anticholinergic and sedative effects than conventional antipsychotics.
Dependent on their ability to target both the positive and the negative symptoms of schizophrenia.

- **Higher-potency agents** have more extrapyramidal effects and less sedation
  - Fluphenazine (Prolizine)
  - Haloperidol (Haldol)

- **Lower-potency agents** have more: sedation, more peripheral side effects and more autonomic effects
  - Chlorpromazine (Thorazine) – most common med
EXTRAPYRAMIDAL EFFECTS

- Most common effect; all phenothiazines (conventional antipsychotics) can cause:
  - **Acute dystonia**: muscle spasms of face, tongue, neck, and back.
  - Tremors
  - **Tardive dyskinesia**: irreversible dyskinesia of tongue, lips, face & jaw (involuntary muscle performance). Movements coordinated & rhythmic.
  - Pain in the TMJ
  - *Counteract the extrapyramidal effects* like this by giving anticholinergics like benztropine (Cogentin).
WHAT DO ANTIPSYCHOTIC AGENTS DO?

- Slows psychomotor activity and calms emotions and suppression of hallucinations and delusions (positive symptoms).

- **Antiemetic** – prevents vomiting (and can also cure hiccups 😃)
  - Conventional antipsychotics prevent or inhibit vomiting.
    - prochlorperazine (Compazine)
    - haloperidol (Haldol);
    - chlorpromazine (Thorazine)
BIPOLAR

- **Endogenous** (involuntary) and **exogenous** (reactive)
  - unipolar depression (only depression) and bipolar depression (mania).

- *(Eskalith, Lithobid)* **Lithium** is the major drug used
  - Monitor toxicity related to lithium levels, seating and salt intake can alter levels.
  - Drowsiness additive with other CNS depressants.
  - Xerostomia or excessive salivation reported.
  - Naproxen (other NSAIDs) can produce lithium toxicity.
- Anxiety – electric shock therapy has been used to treat depression but can also LOSE MEMORY

- TRICYCLIC ANTIDEPRESSANTS
  - Sometimes known as first-generation antidepressants. Normal patient → undesirable sedation & fatigue & strong atropine-like side effects and the depressed patient → feeling of well-being, elevation of mood & dulling of depression.

  - Imipramine (Tofranil)
  - Amitryptline (Elavil)
  - Nortriptyline (Pamelor)
The most serious peripheral side effect associated with the tricyclic antidepressants is cardiac toxicity.

Myocardial infarction and congestive heart failure have occurred during the course of treatment and arrhythmias and tachycardia can be caused.

Vasoconstricting drugs in local anesthetic solution must be administered with caution to patients taking tricyclic antidepressants, the cardiac dose (0.04 mg) can be safely administered to patients who do not have pre-existing arrhythmias.
NEWER ANTIDEPRESSANTS

- Newer antidepressants have much fewer side effects 😊 -
  - nefazodone (Serzone)
  - trazodone (Desyrel)
  - wellbutrin (Zyban) – but could cause seizures, also used to quit smoking
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