WELCOME TO RACHELL ALLEN PRE-LIVE MODULES!

The Pre-Live Modules are carefully designed to help you prepare for the 10-Day Live Course. They are designed to help you refresh your basic concepts that were commonly asked in the actual NCLEX for the last 3-6 months. The modules are very crucial to your NCLEX success! According to our own study, 98.38% of Rachell Allen students who really studied the modules performed better than those who did not pay much attention to the modules prior to attending the 10-Day Comprehensive Live Course.

Since you are getting the modules for free, let us make it a habit to say "Thank You". A grateful heart attracts success, brilliance and abundance!

Happy Learning!

- The Rachell Allen Success Team

ANSWER KEY

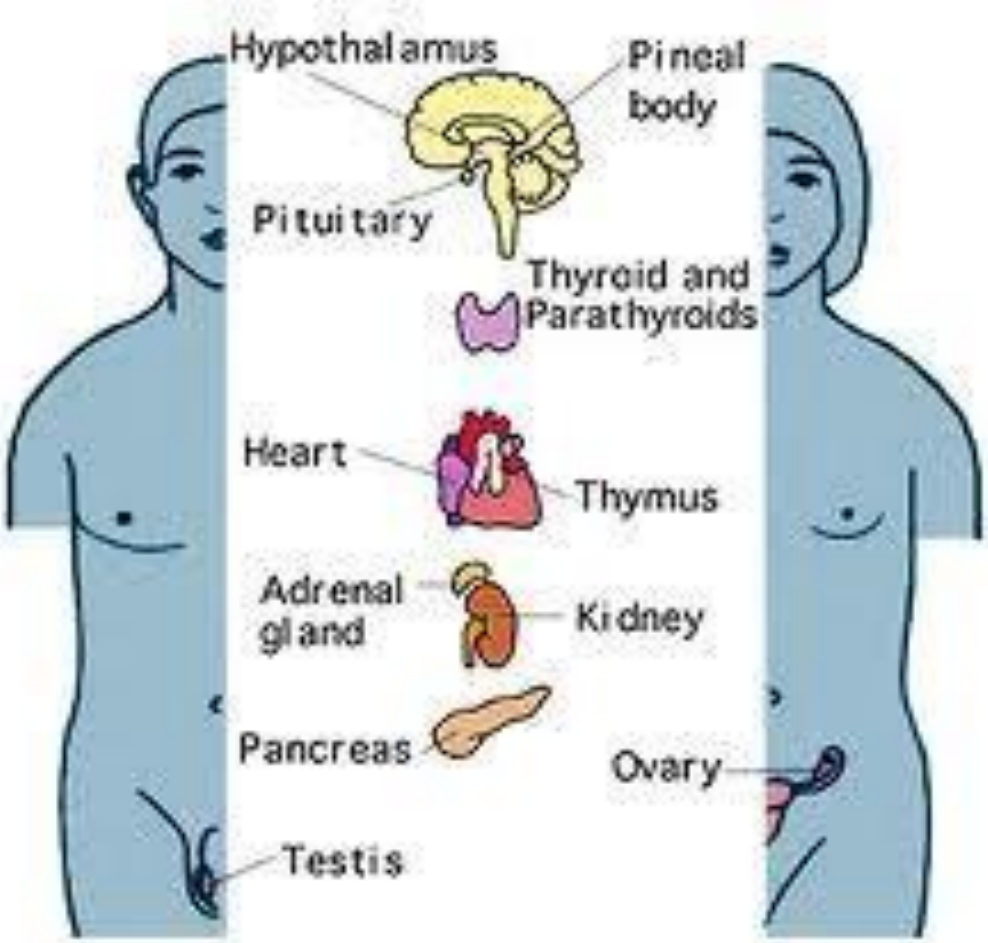
Module 2

Endocrine System

"Keep your dreams alive. Understand to achieve anything requires faith and belief in yourself, vision, hard work, determination, and dedication. Remember all things are possible for those who believe. "

Endocrine System is one of the concepts in Nursing that will make your neurons crazy! But, in this module, we will refresh and re-sharpen your mind in dealing with hormones and its related conditions. Let’s now start to love hormones again!

Review of Anatomy and Physiology



Endocrine Glands

1. Pineal
2. Hypothalamus
3. Pituitary
4. Thyroid
5. Parathyroids
6. Thymus
7. Adrenals
8. Beta cells of the islet of Langerhans
9. Ovaries
10. Testes

Hormones

Hypothalamus

The **hypothalamus** contains special cells called neurosecretory cells—neurons that secrete hormones:

- Thyrotropin-releasing hormone (TRH)
- Growth hormone-releasing hormone (GHRH)
- Growth hormone-inhibiting hormone (GHIH)
- Gonadotropin-releasing hormone (GnRH)
- Corticotropin-releasing hormone (CRH)
- Oxytocin
- Antidiuretic hormone (ADH)

All of the releasing and inhibiting hormones affect the function of the anterior pituitary gland. TRH stimulates the anterior pituitary gland to release thyroid-stimulating hormone. GHRH and GHIH work to regulate the release of growth hormone—GHRH stimulates growth hormone release, GHIH inhibits its release. GnRH stimulates the release of follicle stimulating hormone and luteinizing hormone while CRH stimulates the release of adrenocorticotropic hormone. The last two hormones—oxytocin and antidiuretic hormone—are produced by the hypothalamus and transported to the posterior pituitary, where they are stored and later released.

Pituitary Gland

1. **Posterior Pituitary:**

The neurosecretory cells in the posterior pituitary create 2 hormones in the hypothalamus that are stored and released by the posterior pituitary:

- **Oxytocin** triggers uterine contractions during childbirth and the release of milk during breastfeeding.

- **Antidiuretic hormone (ADH)** prevents water loss in the body by increasing the re-uptake of water in the kidneys and reducing blood flow to sweat glands.

2. **Anterior Pituitary:**

The anterior pituitary produces 6 important hormones:

- **Thyroid stimulating hormone (TSH),** as its name suggests, is a tropic hormone responsible for the stimulation of the thyroid gland.

- **Adrenocorticotropic hormone (ACTH)** stimulates the adrenal cortex, the outer part of the adrenal gland, to produce its hormones.

- **Follicle stimulating hormone (FSH)** stimulates the follicle cells of the gonads to produce gametes—ova in females and sperm in males.

- **Luteinizing hormone (LH)** stimulates the gonads to produce the sex hormones—estrogens in females and testosterone in males.

- **Human growth hormone (HGH)** affects many target cells throughout the body by stimulating their growth, repair, and reproduction.

- **Prolactin (PRL)** has many effects on the body, chief of which is that it stimulates the mammary glands of the breast to produce milk.

Pineal Gland

The pineal gland produces the hormone **melatonin** that helps to regulate the human sleep-wake cycle known as the circadian rhythm.

Thyroid Gland

The thyroid gland produces 3 major hormones:

- Calcitonin
- Triiodothyronine (T3)
- Thyroxine (T4)

Calcitonin functions to reduce the concentration of calcium ions in the blood by aiding the absorption of calcium into the matrix of bones. The hormones **T3** and **T4** work together to regulate the body's metabolic rate.

Parathyroid Glands

The parathyroid glands produce the hormone **parathyroid hormone (PTH)**, which is involved in calcium ion homeostasis.

Adrenal Glands

The adrenal glands are each made of 2 distinct layers, each with their own unique functions: the outer adrenal cortex and inner adrenal medulla.

- Adrenal cortex: The adrenal cortex produces many cortical hormones in 3 classes: glucocorticoids, mineralocorticoids, and androgens.

1. **Glucocorticoids** have many diverse functions, including the breakdown of proteins and lipids to produce glucose. Glucocorticoids also function to reduce inflammation and immune response.

2. **Mineralocorticoids**, as their name suggests, are a group of hormones that help to regulate the concentration of mineral ions in the body.

3. **Androgens**, such as testosterone, are produced at low levels in the adrenal cortex to regulate the growth and activity of cells that are receptive to male hormones.

- Adrenal medulla: The adrenal medulla produces the hormones **epinephrine** and **norepinephrine** under stimulation by the sympathetic division of the autonomic nervous system. Both of these hormones help to increase the flow of blood to the brain and muscles to improve the "fight-or-flight" response to stress. These hormones also work to increase heart rate, breathing rate, and blood pressure while decreasing the flow of blood to and function of organs that are not involved in responding to emergencies.

Pancreas

The pancreas is considered to be a heterocrine gland as it contains both endocrine and exocrine tissue. The endocrine cells of the pancreas make up just about 1% of the total mass of the pancreas and are found in small groups throughout the pancreas called islets of Langerhans. Within these islets are 2 types of cells—alpha and beta cells. The alpha cells produce the hormone **glucagon**, which is responsible

for raising blood glucose levels. The beta cells produce the hormone **insulin**, which is responsible for lowering blood glucose levels after a meal.

Gonads

The gonads—ovaries in females and testes in males—are responsible for producing the sex hormones of the body. These sex hormones determine the secondary sex characteristics of adult females and adult males.

- **Testes:** The testes are a pair of ellipsoid organs found in the scrotum of males that produce the androgen testosterone in males after the start of puberty. Testosterone has effects on many parts of the body, including the muscles, bones, sex organs, and hair follicles. This hormone causes growth and increases in strength of the bones and muscles, including the accelerated growth of long bones during adolescence. During puberty, testosterone controls the growth and development of the sex organs and body hair of males, including pubic, chest, and facial hair. In men who have inherited genes for baldness testosterone triggers the onset of androgenic alopecia, commonly known as male pattern baldness.
- **Ovaries:** The ovaries are a pair of almond-shaped glands located in the pelvic body cavity lateral and superior to the uterus in females. The ovaries produce the female sex hormones progesterone and estrogens. Progesterone is most active in females during ovulation and pregnancy where it maintains appropriate conditions in the human body to support a developing fetus. Estrogens are a group of related hormones that function as the primary female sex hormones. The release of estrogen during puberty triggers the development of female secondary sex characteristics such as uterine development, breast development, and the growth of pubic hair. Estrogen also triggers the increased growth of bones during adolescence that lead to adult height and proportions.

Thymus

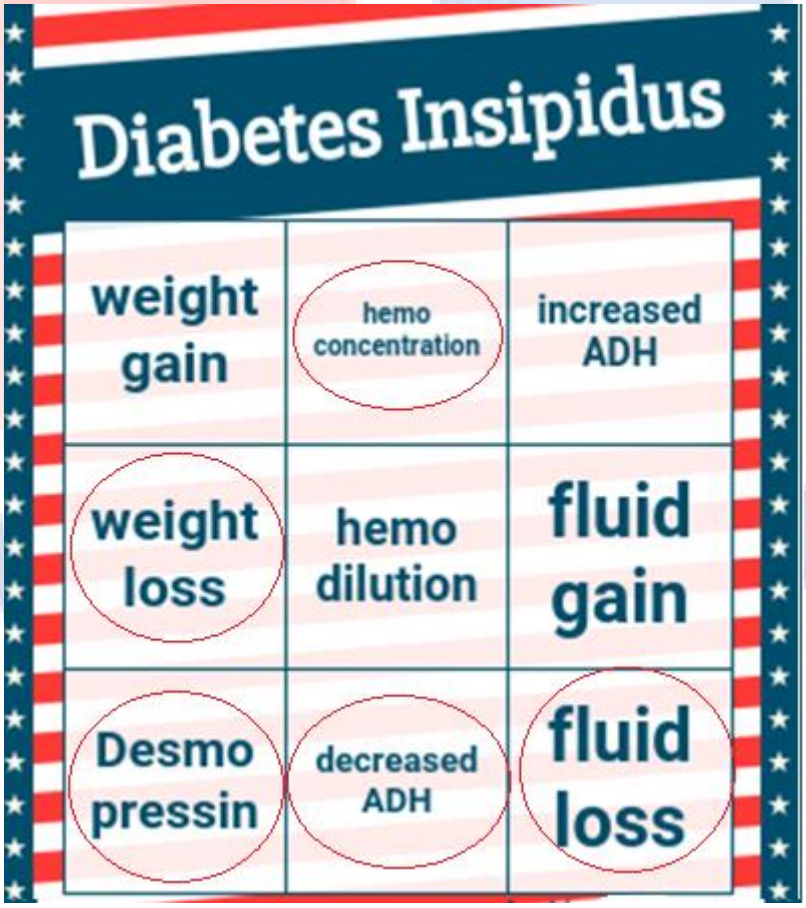
The thymus is a soft, triangular-shaped organ found in the chest posterior to the sternum. The thymus produces hormones called thymosins that help to train and develop T-lymphocytes during fetal development and childhood. The T-lymphocytes produced in the thymus go on to protect the body from pathogens throughout a person's entire life. The thymus becomes inactive during puberty and is slowly replaced by adipose tissue throughout a person's life.

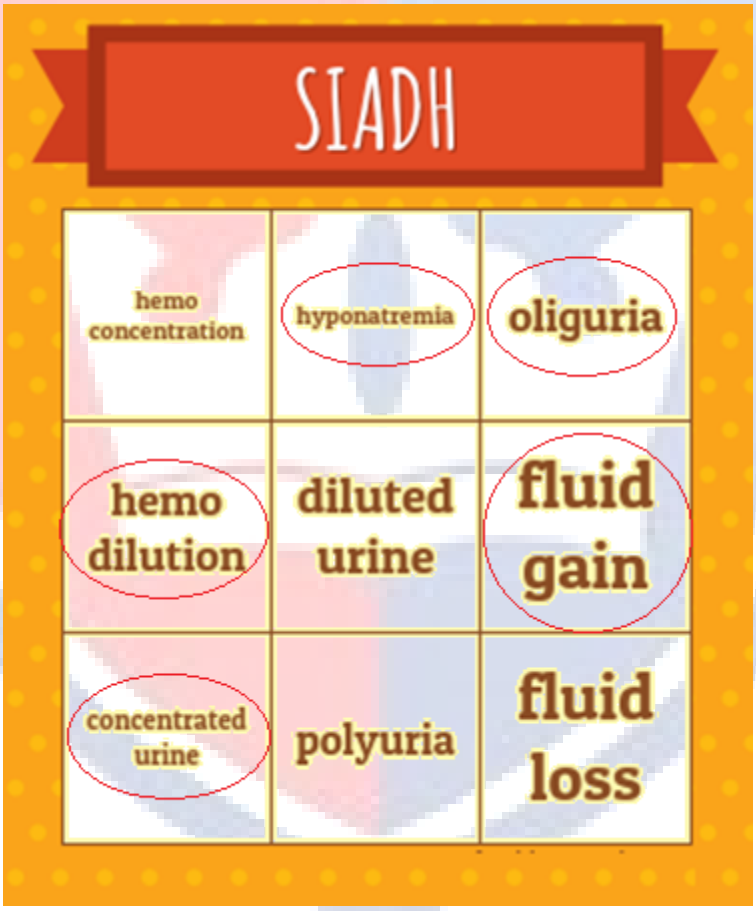
Endocrine System - Concepts

1. Thyroxine
2. Calcintonin
3. Lugols Solution
4. Levothyroxine
5. Tapazole
6. Exophthalmos
7. Agranulocytosis
8. Cretinism
9. Graves Disease
10. Myxedema

RACHELLALLEN
WHERE NURSES EXCEL

The Pituitary Gland





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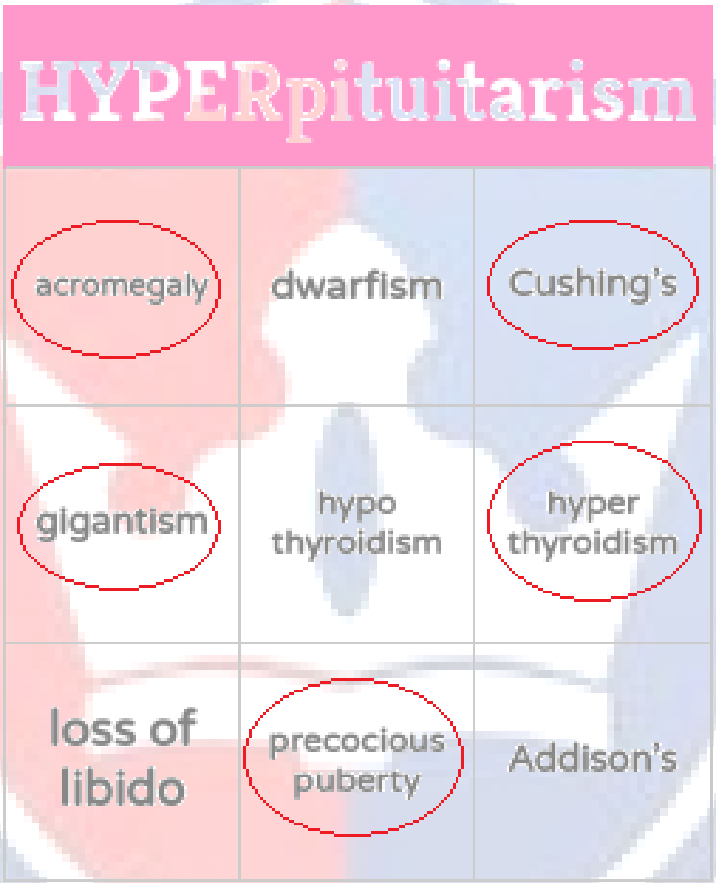

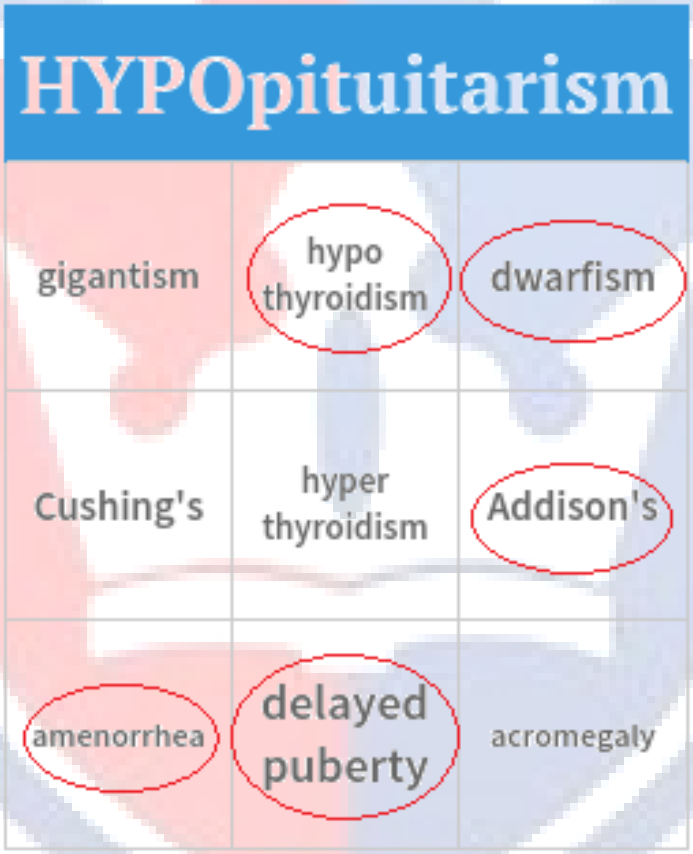

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Hypophysectomy Complications

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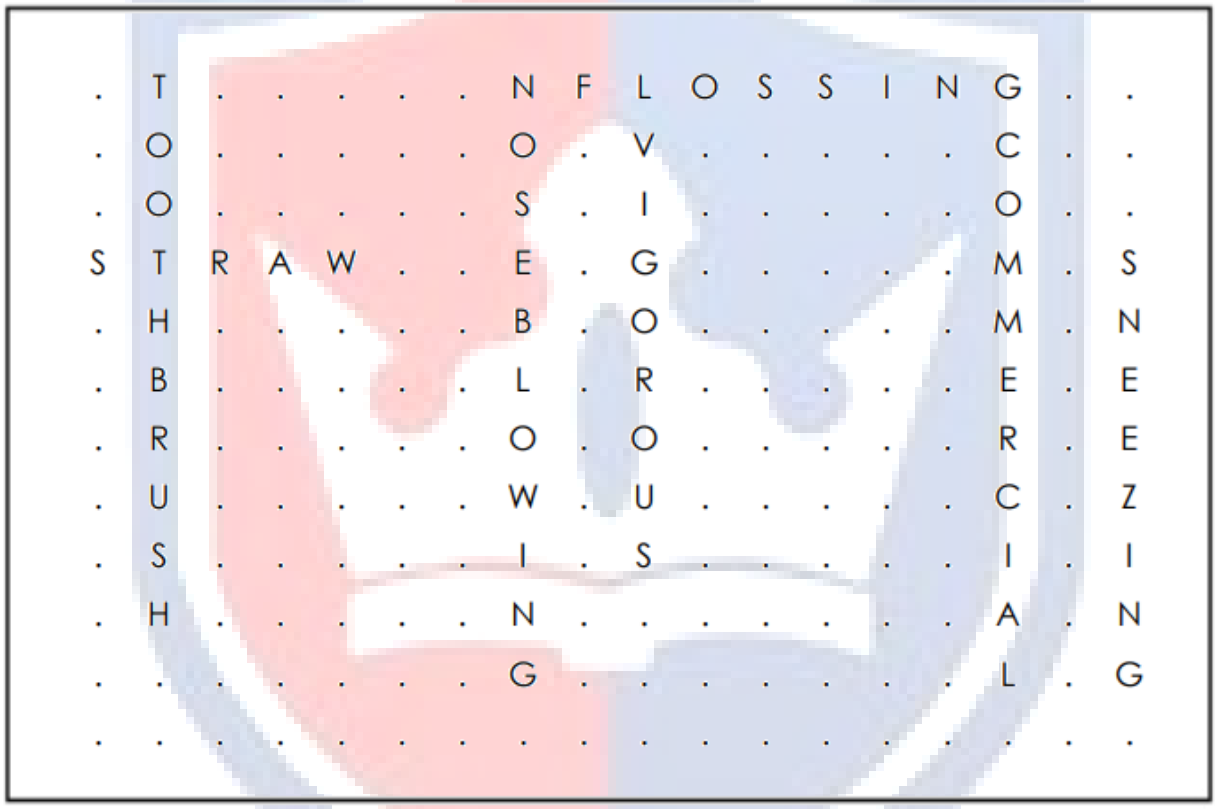
WHERE NURSES EXCEL

Hypophysectomy Management



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FLOSSING (E,9,1)
NOSEBLOWING (S,8,1)
SNEEZING (S,18,4)
STRAW (E,1,4)
TOOTHBRUSH (S,2,1)
VIGOROUS (S,10,2)

The Thyroid Gland

DISORDERS OF THE THYROID GLAND

1. Hypothyroidism
2. decreased
3. myxedema

Hypothyroidism

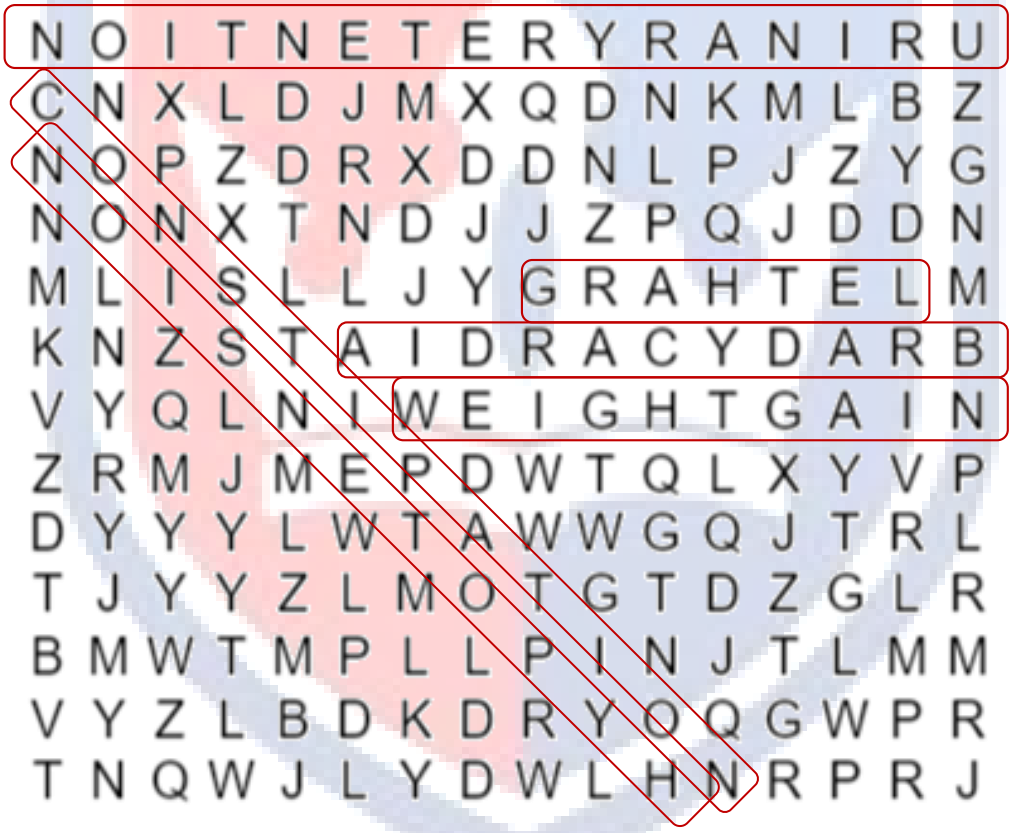
1. hypothalamus
2. pituitary
3. Myxedema
4. decreased
5. respiratory
6. increased
7. decreased

Hyperthyroidism

1. Hyperthyroidism
2. Graves' disease
3. exophthalmos
4. exophthalmos
5. decreased

6. increased
7. increased
8. increased
9. thyroid storm

THE THYROID

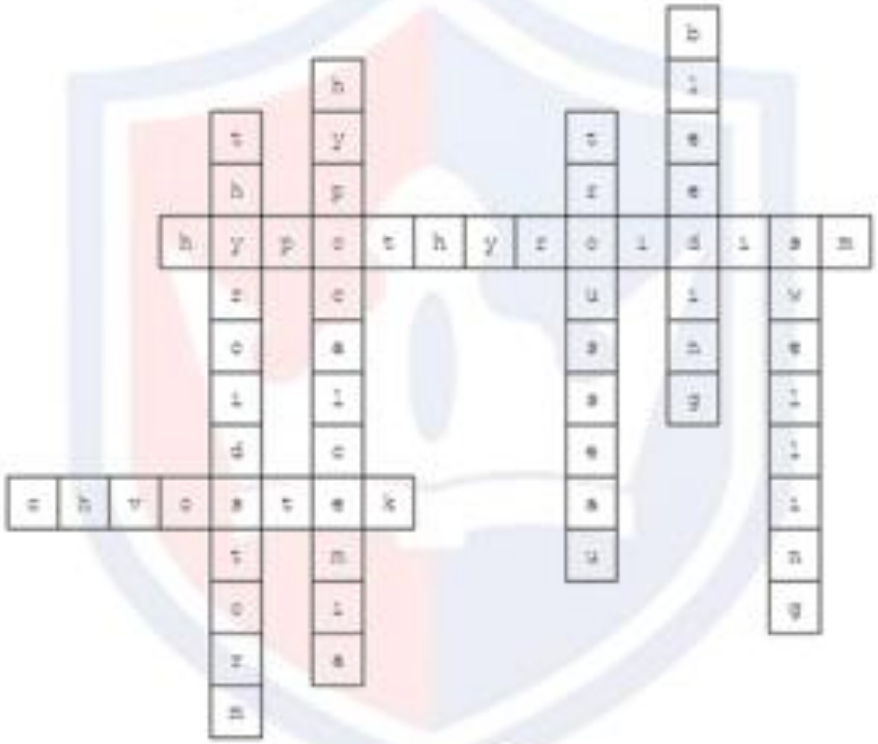


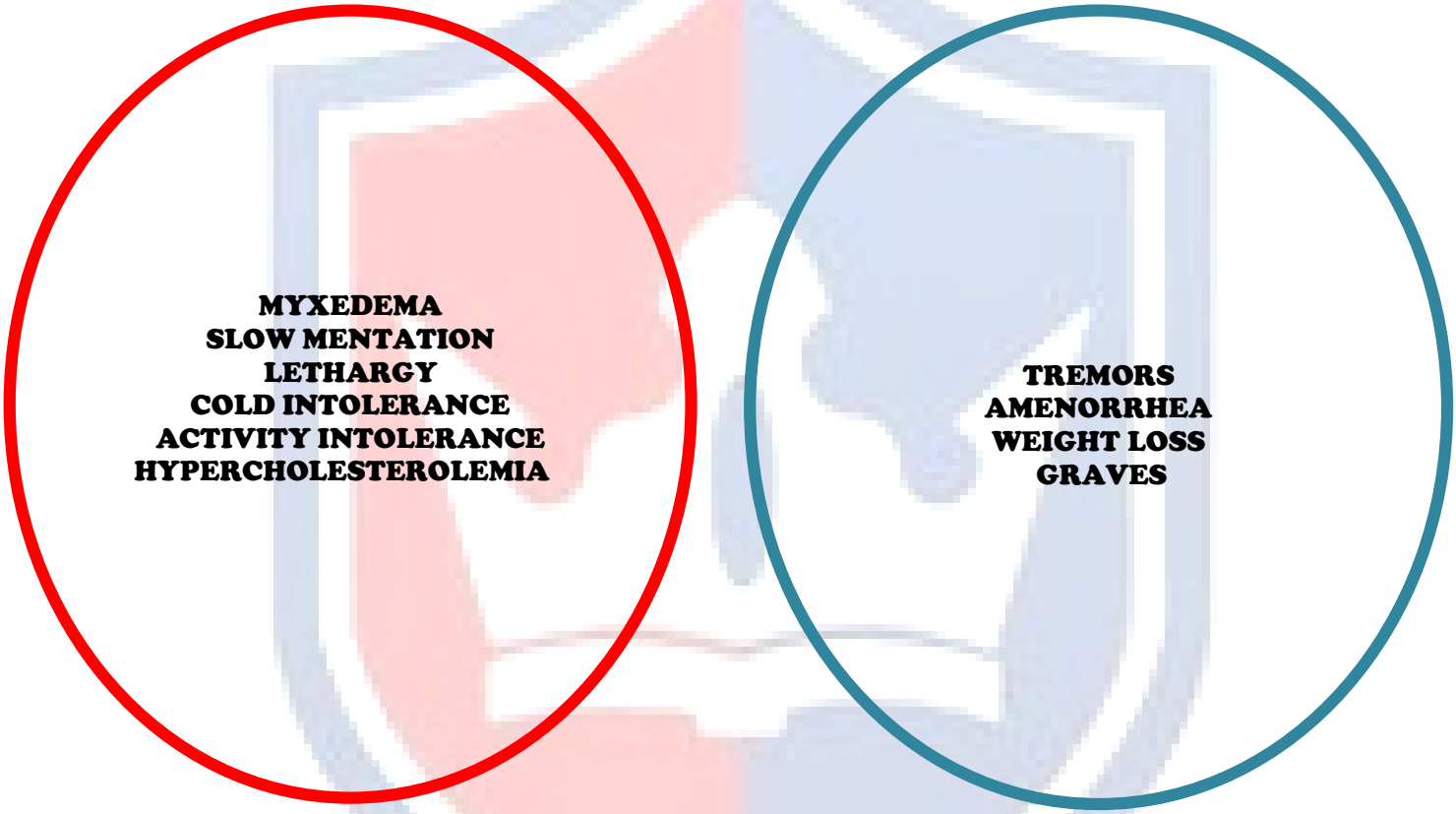
BRADYCARDIA
LETHARGY
CONSTIPATION

WEIGHT GAIN
HYPOTENSION
URINARY RETENTION

RACHELLALLEN
WHERE NURSES EXCEL

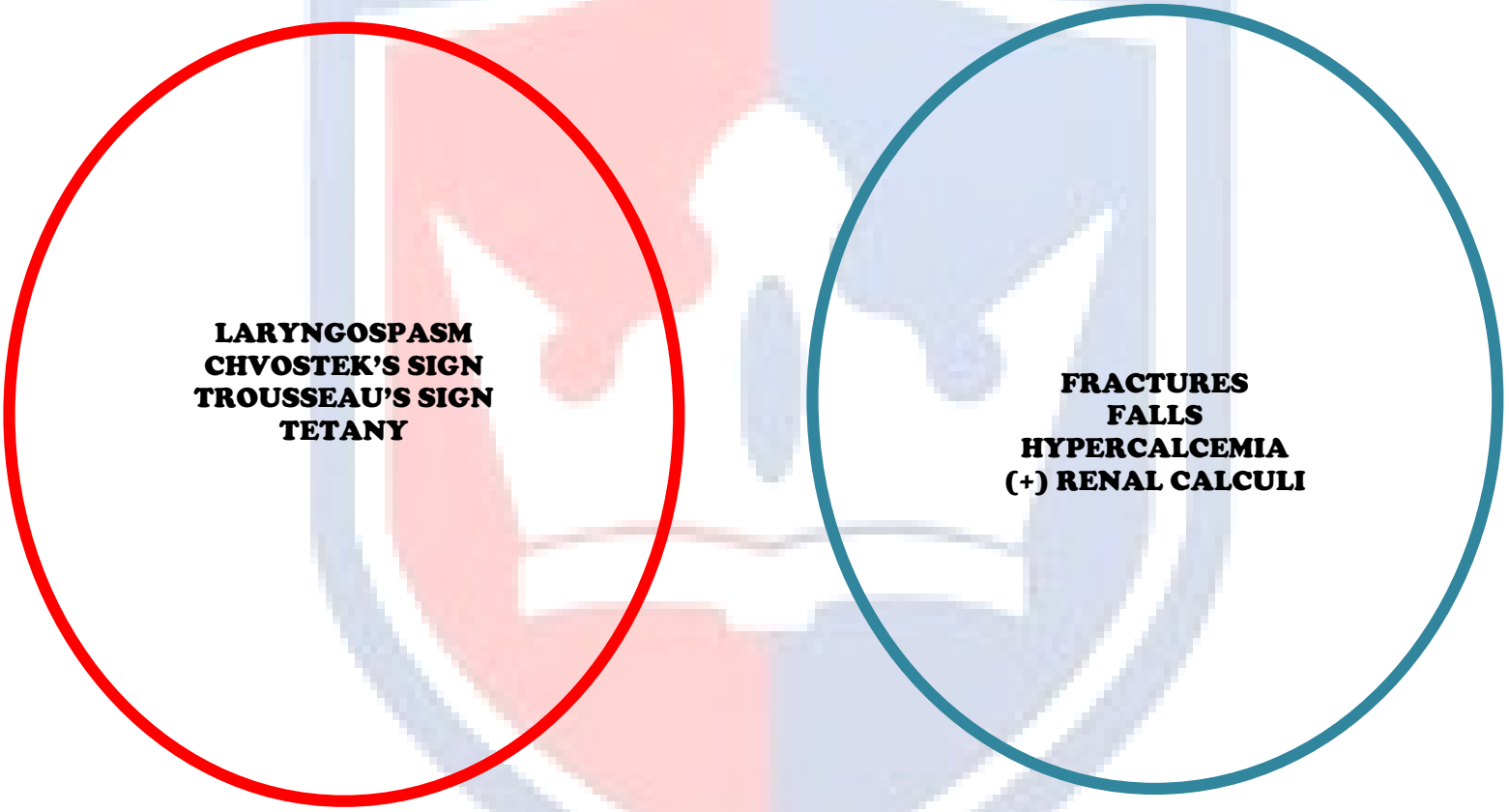
Complications of Thyroidectomy





The Parathyroid Gland

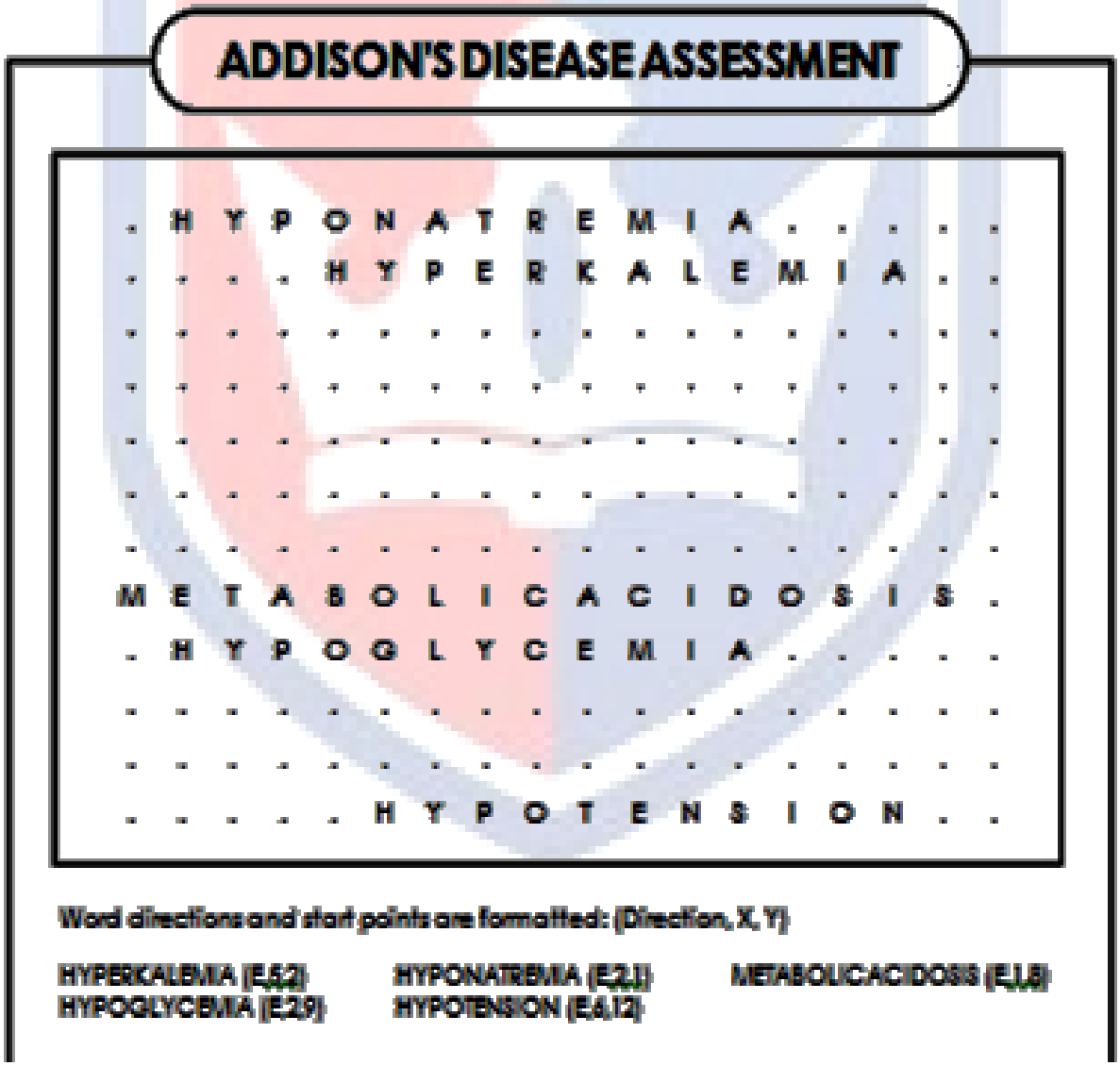
1. serum calcium
2. serum phosphate
3. increases

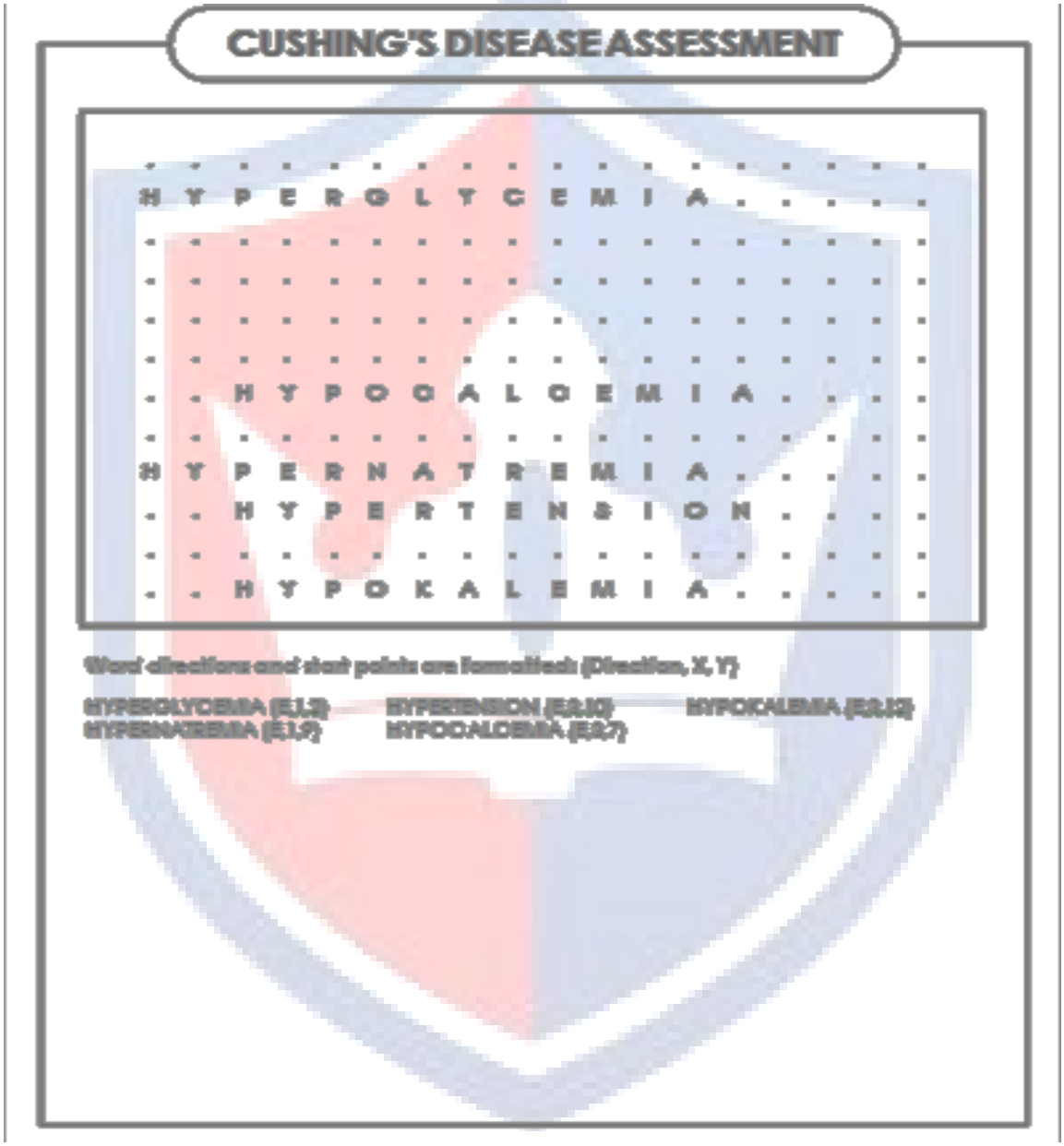


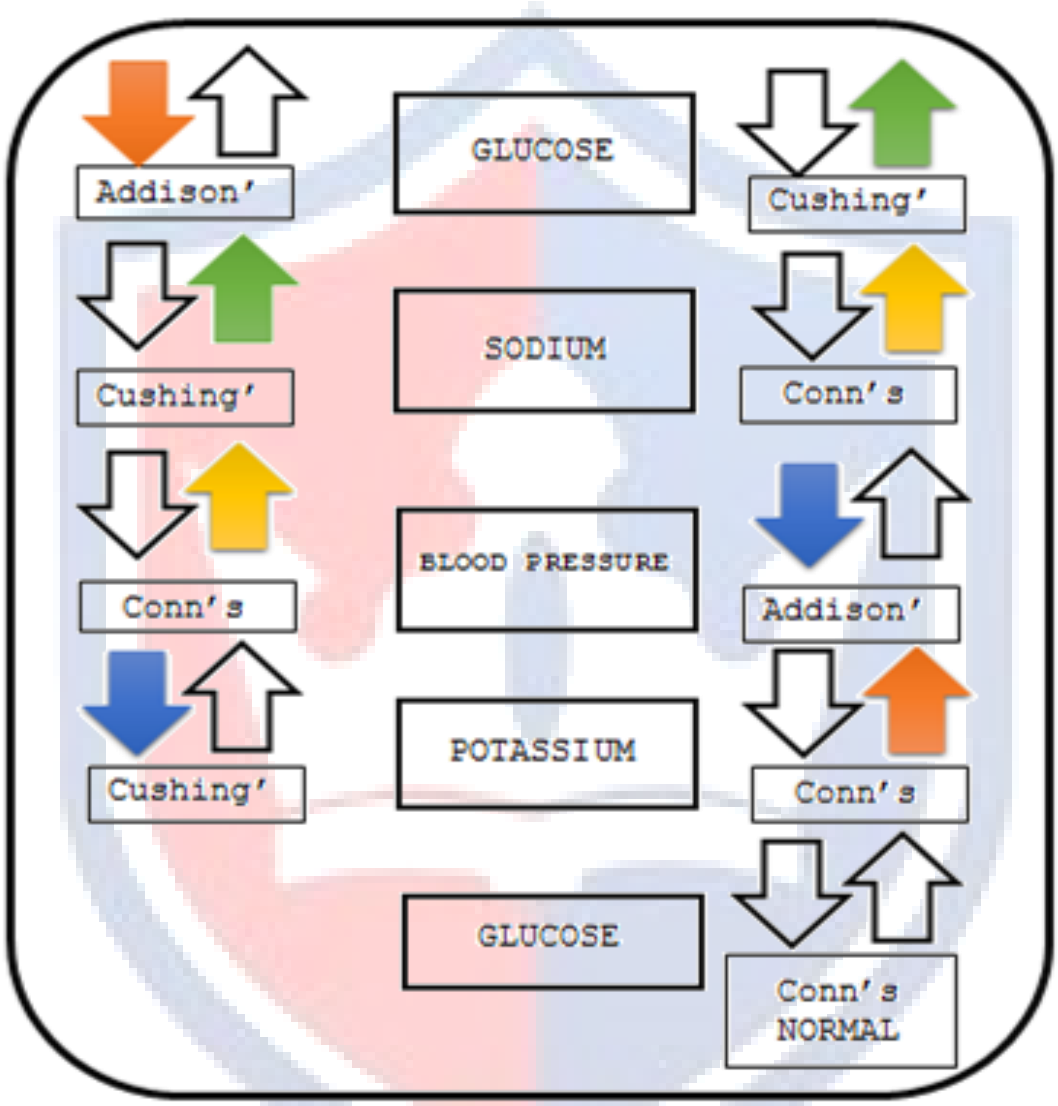
The Adrenal Glands

ADRENAL CORTEX

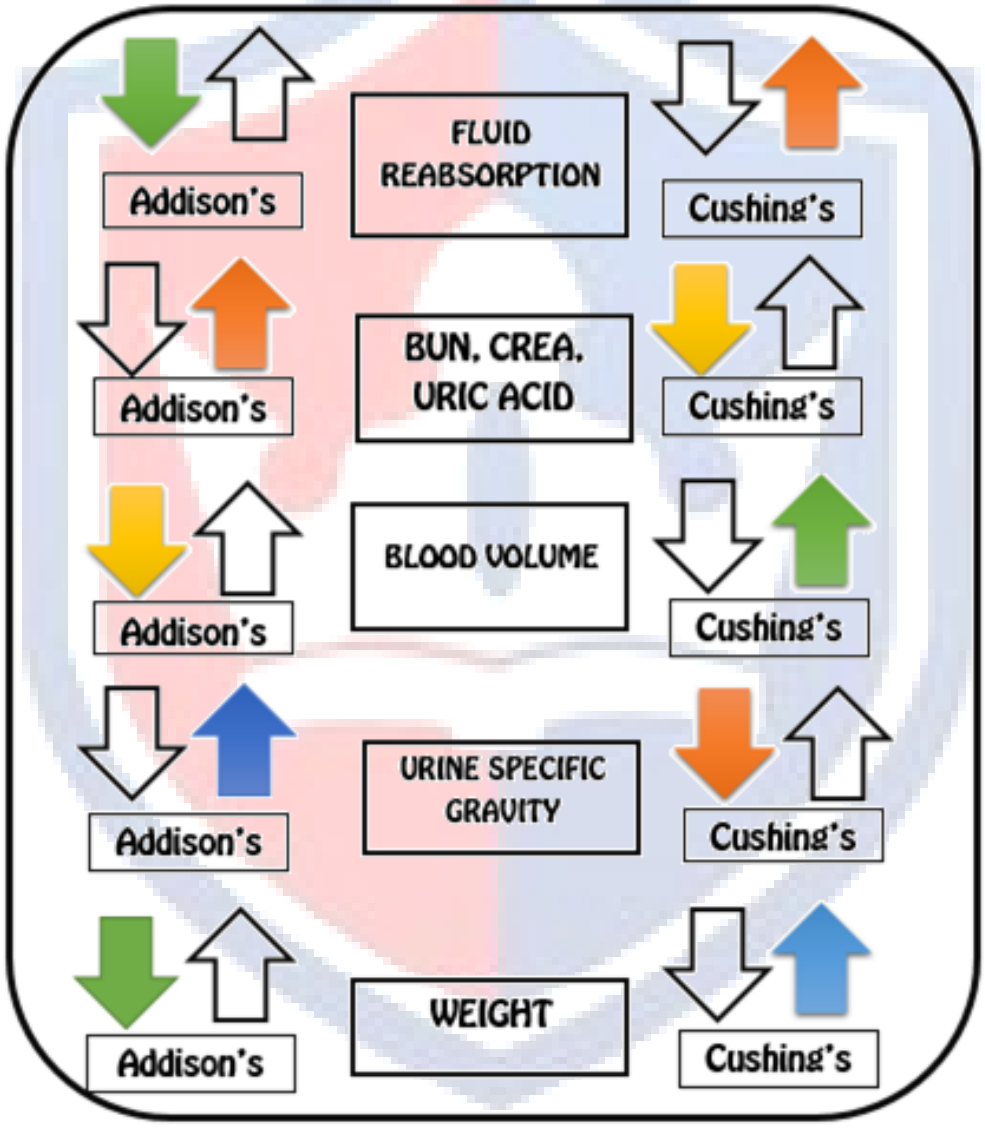
1. Addison's disease
2. Cushing's syndrome
3. Conn's syndrome







RACHELLALLEN
WHERE NURSES EXCEL



ADRENAL MEDULLA

1. epinephrine
2. norepinephrine
3. catecholamines
4. Pheochromocytoma

Pheochromocytoma

1. Palpitations
2. Hypertension
3. Diaphoresis
4. Hypermetabolism
5. Headache
6. Hyperglycemia
7. Hyperhidrosis

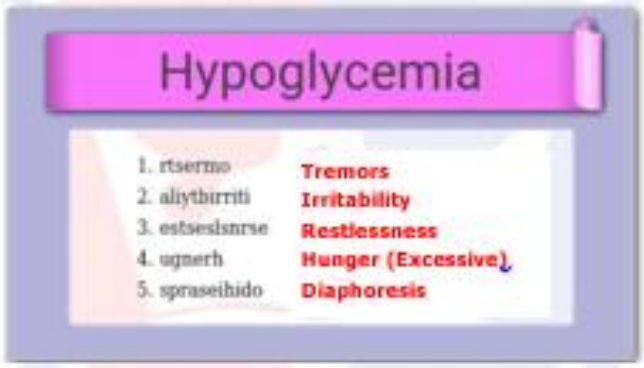
The Pancreas

1. acinar
2. islet of Langerhans
3. insulin
4. carbohydrate
5. Insulin
6. glucose
7. hyperglycemic
8. liver
9. glucose
10. decreasing
11. glycogen

DIABETES MELLITUS

1. diabetes mellitus
2. insulin dependent diabetes mellitus
3. non-insulin dependent diabetes mellitus
4. Polydipsia
5. Polyuria
6. Polyphagia

7. E
8. A
9. B
10. D
11. C

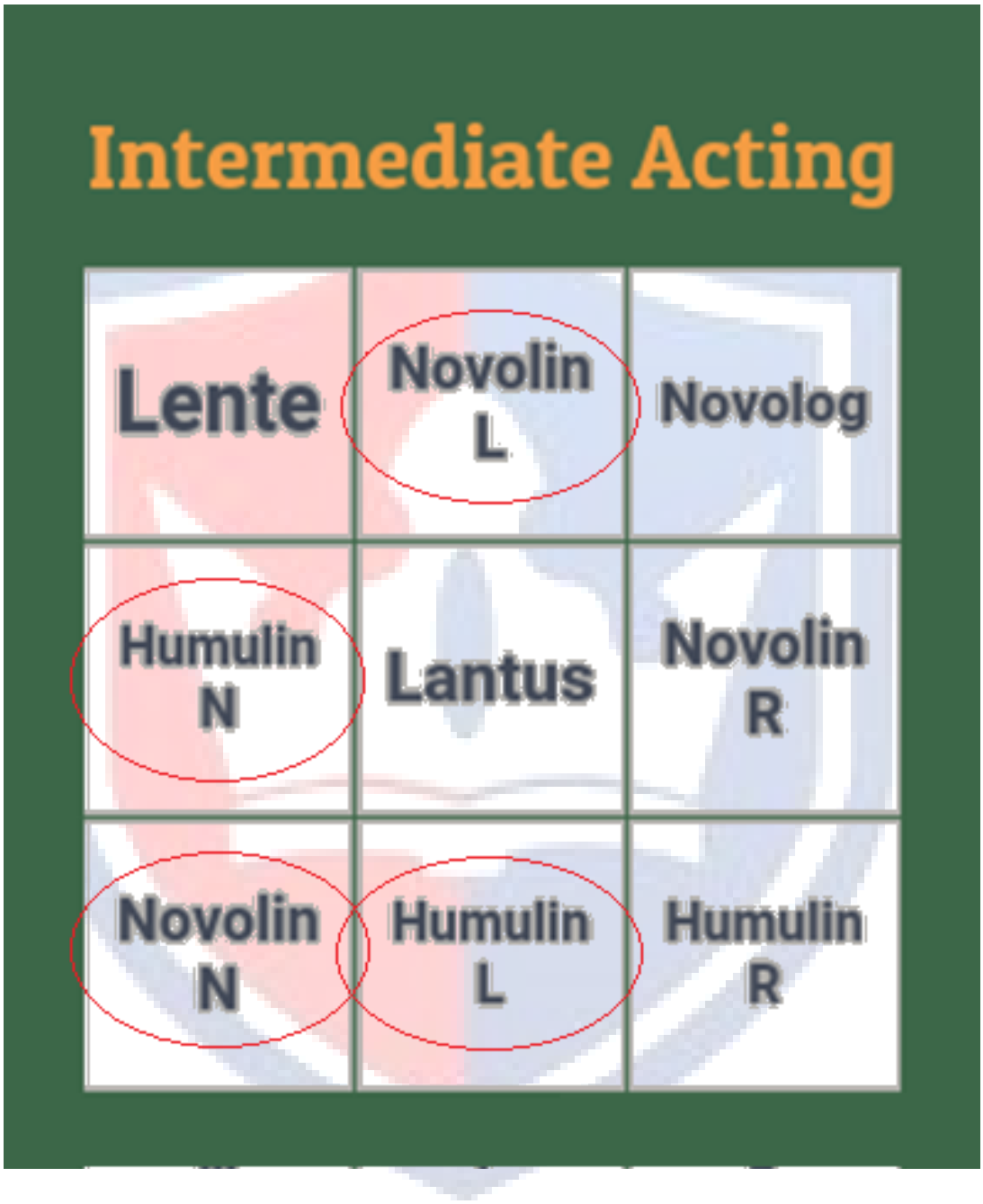


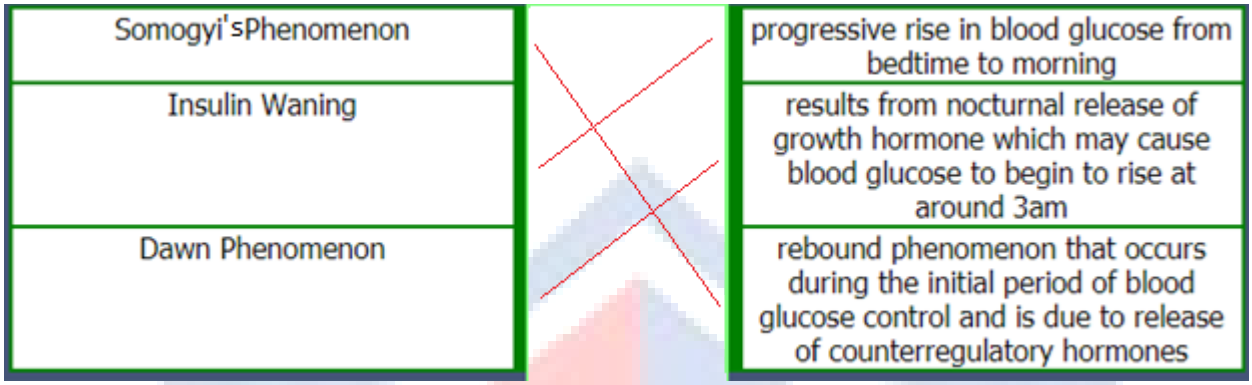
Insulin Administration

1. insulin therapy
2. diet
3. exercise
4. B
5. A
6. C
7. regular
8. subcutaneous

Complications of Diabetes Mellitus

1. non-insulin dependent diabetes mellitus
2. hypoglycemia
3. 60mg/dL
4. Hyperglycemia
5. retinopathy
6. Diabetic ketoacidosis
7. Hyperglycemic, hyperosmolar, nonketotic





NCLEX-RN Style Questions

1. (3) The client is grieving a change in health status, and possibly a change in usual routine, which is important. The nurse should make a full assessment of the client's dietary habits before moving forward. It is possible to work the client's favorite foods into the meal plan.
2. (2) Lollipops should be avoided because they are pure sugar, and refined sugars are the most important thing to avoid.
3. (2) Diaphoresis is a classic sign of hypoglycemia. The client experiencing ketoacidosis has dry rather than moist skin.
4. (1) Polyuria, polydipsia, and polyphagia are classic signs of diabetes mellitus, a metabolic disorder characterized by hyperglycemia.
5. (4) The client in diabetic ketoacidosis is at great risk for fluid volume deficit. The profound hyperglycemia the client experiences causes a hyperosmolar state which causes the client to have decreased intracellular and intravascular voume.
6. (1) A person with Type II diabetes mellitus has impaired insulin secretion. They may produce too little insulin, adequate levels of insulin, or too much insulin. The problem lies in their impaired ability to utilize the insulin they produce. The Type II diabetic may have peripheral insulin resistance and increased hepatic glucose production. This insulin resistance may result from decreased insulin receptors on cell surfaces or a decreased intracellular response to insulin.

7. (4) This client's complaint is suggestive of peripheral vascular disease. Presence or absence of peripheral pulses is an indicator of adequate circulation to the extremities.

8. (3) Warming the fingers causes vasodilation and an increase in blood supply to the area, thereby increasing the chance of obtaining an adequate blood supply.

9. (1) 0.9% is the rehydrating solution that will be ordered for this client. The client in diabetic ketoacidosis is severely dehydrated due to the hypertonic effect of severe hyperglycemia and needs rapid volume replacement. It is not unusual for the client to receive 500-1,000 ml/hour for the first 2-3 hours, then 200-500 ml/ hour with a gradual decrease in volume infusion according to client parameters, such as urine output, blood pressure, blood sugar, pulmonary status, etc.

10. (1) The islet of Langerhans performs the endocrine functions of the pancreas. The beta cells secrete insulin, which is essential for protein, carbohydrate, and fat metabolism.