

Thyroid and Adrenals

Since the thyroid gland regulate metabolism, whenever you see the word “**thyroid**,” change it to “**metabolism**”

Hyperthyroidism

- **Hypermetabolism**
- So, what are the S/Sx of *hypermetabolism*?
 - Weight loss
 - HR up, BP up
 - Hyperpersonality
 - They have heat intolerance ... Can tolerate cold because body is like a furnace
 - Exophthalmos (bulging eyes) ... Think Susan Sarandon, or Don Knotts

Exophthalmos is seen in Graves disease

Run yourself into the Graves disease

Hyperthyroidism—3 Treatment Modalities

1. **Nuke it** with radioactive iodine
 - Pt must flush three times after urinating
 - Call **hazmat** team if urine is spilled on the floor
 - Pt needs a private room in the first 24 hours
 - Visitors restriction and in hospital and at home in first 24 hours
2. PTU (Propylthiouracil)
 - PTU “**Puts Thyroid Under**”
 - PTU’s primary use is for cancer—**Monitor WBC b/c pt is immunosuppress**
3. Thyroidectomy
 - Surgical removal of the thyroid is the **most common treatment**
 - To answer questions on the Board correctly, pay attention whether it is a **Total, Sub (a.k.a. Partial) thyroidectomy**
 - Total thyroidectomy needs lifelong hormone replacement, and pt is risk for hypocalcemia due to difficulty to spare the parathyroid glands

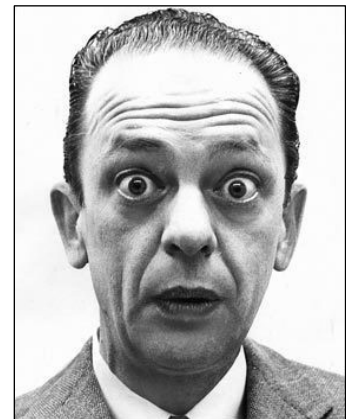
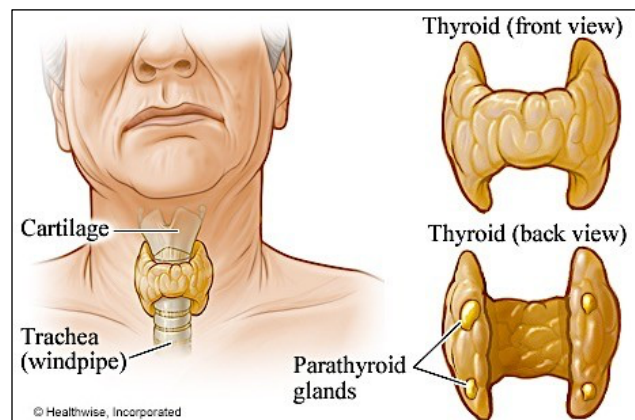


Figure 5. Don Knotts with Exophthalmos or bulging eyes.



Question

What are the symptoms of hypocalcemia?

- Paresthesia, tetany, twitching, spasm, clonus, seizure, jitteriness, tremor (all UP!). also, Chvostek and Trousseau signs

Treatment of Subthyroidectomy

- Do not need lifelong hormone replacement
- May need to supplement at first
- HOWEVER, they are at risk for thyroid storm

S/Sx of thyroid storm — A medical emergency

- Temps of 105 or above
 - Get temp down, bring oxygen up
 - Bring body temperature down using ice packs/cooling blankets
 - Oxygen per mask at 10L
 - Stay with patient
- High BP, stroke level — about 210/180
- Severe tachycardia 180 as high as 200
- Psychotically delirious

Lowering body temperature in thyroid storm

- **First step** is ice pack
- **Best step** is cooling blanket

Postop Risks in total thyroidectomy and subtotal thyroidectomy

- **First 12 hours**—risks are the same for both total and subtotal
 1. Top priority is **airway**, due to edema
 2. Next is **hemorrhage** because it is an endocrine gland—very vascular
- **Next 12 to 48 hours**—It matters what kind of surgery you've had now
 1. **Total:** big danger is **tetany** due to low calcium
TOTAL = TETANY ... Can close off airway with an irreversible spasm
 2. **Subtotal:** big danger is **thyroid storm**
SUBTOTAL = STORM (Severe)
- **After 48 hours**—risk is **infection**

Note: For any type of procedure, the risk of infection significantly increases after 72 hours

Hypothyroidism

- **Hypometabolism**
- So, what are the S/Sx of hypometabolism?
 - Obesity
 - HR down, BP down
 - Personality: Flat, boring, dull
 - They have cold intolerance ... Can tolerate heat
 - Academically challenged

Myxedema

- This is when a pt with severe hypothyroidism presents with skin involvement

Myxedema coma

- Severe hypothyroidism leading to decreased mental status, hypothermia, and other symptoms related to slowing of function in multiple organs
- Medical emergency

Treatment of hypothyroidism

- Levothyroxine (Synthroid)
- Taken in the morning 30 minutes to 1 hour before breakfast
- Taken alone on an empty stomach with water

Do not sedate these pts

- They're already super slow. They can go into a coma

Question

What pre-op order from the physician would you question?

- Ambien (zolpidem) at hs
- (at hs = at bedtime)

Question

A pt dx with hypothyroidism will be undergoing surgery the next morning. The physician ordered the pt NPO at 12:00 am. Pt is on Synthroid and multivitamin pills. What should the nurse question?

- Clarify the NPO order for the Synthroid ... Why?
 - The pt needs the Synthroid medication to get through surgery. Otherwise, the condition may potentiate the suppressing effects of the anesthesia during surgery
 - Therefore, don't hold thyroid pills unless explicitly orders

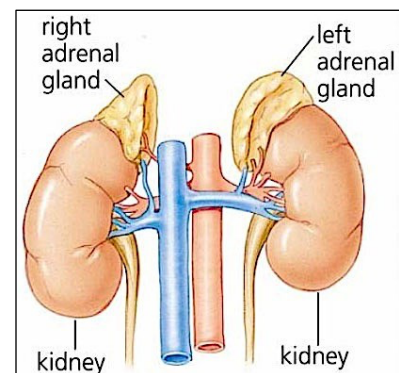
Adrenal Cortex Disease

Interestingly, all adrenal cortex diseases either start with an "A" or a "C"

- Addison Disease (a.k.a. hypoadrenalism or adrenal insufficiency), Cushing

Addison disease

- Under **secretion** of steroids (they are a time bomb!)
- S/Sx: pts are Hyperpigmented (very tan)
- They do NOT adapt to stress



Question

What is the purpose of the stress response in an individual?

- To maintain
 - A normal blood pressure to perfuse the brain and other organs

- An adequate level of glucose to feed the body

Question

What could happen if these pts can't adapt to stress?

- Under stress, pts with Addison disease will go into shock and have an hypoglycemic episode (Addisonian crisis)

Treatment

- Give steroids
- Glucocorticoids drugs that end in **-SONE**
 - Prednisone
 - Methylprednisone
- “In Addison, you ADD-a-SONE”

Cushings Syndrome

- If you have a cushy touchie ... You got more
- **Oversecretion** of adrenal cortex (steroids)

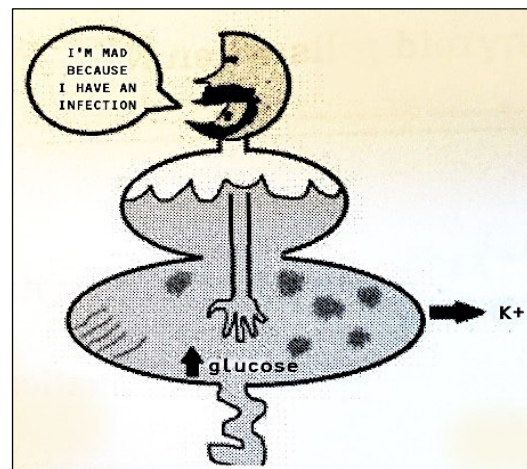
All the S/Sx of Cushings are the S/E of Steroid medications

- Draw picture of a little man
- Give man a **MOON FACE**
- Give him a beard—hirsutism
- Draw a big body—truncal or central obesity
- Arms and legs are skinny—muscle atrophy
- Bump on front—gynecomastia (big breast)
- Bump on back—buffalo hump
- Fill him full of water (he is retaining Na^+ and water)
He is losing K^+ out the back
- Give him some striae—stretch marks
- **Most important one of all—high serum glucose**
 - Do Accu-Checks q6h. They look like diabetics
- Easy bruising—put bruises all over him
- Make him say something in a speech balloon ...
“I'M MAD, BECAUSE I HAVE AN INFECTION”
 - Grouchy (“Roid rage”)
 - Immunosuppressed



Figure 6. Cushings disease.

Important! ... Draw this picture over and over, while repeating the list on the left such that to commit to memory the S/Sx of Cushings and the S/E of steroid medications



Question

A pt comes in with an acute exacerbation of COPD. The pt is being treated with Solu-Medrol (methylprednisolone) IV push q8 hours to reduce the inflammation in the airway. What nursing action needs to be taken while the pt is on the medication?

- Do an Accu-Checks q6 hours
- Since pt is on steroid, his condition is similar to diabetes even though he is not diabetics

- The complications are worse if pt is diabetic

Treatment for Cushings

- Adrenalectomy
- What happens with a bilateral adrenalectomy?
 - Now pt has Addison disease
 - Now give steroids (ending in SONE) to treat.
 - Pt will start looking like Cushman (Cushinoid-like)
 - It takes about a year or so—after a lot of titration—for the pt to start looking normal

Kids Toys (50:16)

When you select toys and play activities for children, there are three things to consider

1. Is it safe?
2. Is it age appropriate?
3. Is it feasible?
 - Is it possible to do easily or conveniently?
 - For instance, swimming in hospital with body cast

Safety

- Size (no small toys for kids under 4)
- Over 4 small pieces are fine
- NO **Metal** (or **dye-cast**) if oxygen is in use
 - Think of a flint-sparks!
- Beware of **fomites**
 - A fomite is a non-living object that harbors microorganisms, such as stuffed animals—the worst type of fomites
 - Hard plastic toys are fine ... They can easily be disinfected

Note

If you have a child who is immunosuppressed ... Give them a hard plastic action figure. It can easily be disinfected

Age appropriate toys (See Piaget's Theory of Cognitive Development on page 79)

Infants

- 0 to 6 months— **Sensorimotor**. Best toy is a **musical mobile** (Best choice)
Toy should be **large** but **soft** (2nd best choice)
- 6 to 9 months— **Object permanence**. Best toy teach them to **Cover/Uncover**
This is to teach them that the object is still there even if they can't see it
Examples are: **Jack-in-the-Box** and **Peek-a-Boo**
Toy should be **large** but **firm**
Worse toy after 6 months is the Musical Mobile because of the risk of strangulation



- 9 to 12 months— **Vocalization.** Best toys are **speaking** or **verbal** toys
Good list of toys are: **Tickle me Elmo, Woody Cowboy, See and Say-Barnyard Friends, Talking books**
For purposeful play, the infant should be **at least 9 months** or older
 - These words mean **purposeful** play: **build, sort, stack, make, and construct**
 - Baby in womb for 9 months, another 9 months for purposeful play

Toddlers

- 1 to 3 years— **Work on Gross Motor skills**, which is **running, jumping**
Best toys for this age group are Push/Pull toys
Examples are: **Lawn mowers, Wagon, dog with floppy feet**
They can paint (They use the hand to paint)
They are characterized **Parallel Play** (think terrible two)



Preschoolers

- 3 to 6 years— **Work on fine motor skills**
Therefore, preschoolers have **finger dexterity**; hence, can write, draw, use colored pencils, scissors
Work on balance—Dance, ice skates, tricycles, tumbling
They are characterized by **Cooperative Play**
 - Need to cooperate in Preschool (= Pretend)
 - You'd be the sheriff, I'll be robber ...**Highly imaginative**



School age

- 7 to 11 years— **Concrete**
Characterized by the “3 Cs”
 1. **Creative**—Give them blank paper to draw, they like to get involved ...
Toys: Legos, Transformers
 2. **Collective**—Baseball cards, Webkinz, Barbies, Beanie Babies
 3. **Competitive**—Winner/losers

Adolescents

- 12 to 18 years— **Peer group association**
Allow adolescents to be in each other's rooms unless one of them has been/is
 1. Recently post-op for <12 hrs
 2. Immunosuppressed
 3. Contagious



Note: When given a variety of ages to choose from, always go **younger** because children **regress**, when sick you want to give them **time to grow**

Laminectomy (78:32)

Lamina: the vertebral spinous process (bumpy bones along backbone)

Ectomy: removal

Laminectomy is the removal of the vertebral spinous process

Question

Why perform a laminectomy?

- To relieve nerve root compression ... In other words, cutting away the bony prominence gives the nerve more room

Question

What the S/Sx of nerve root compression?

- The 3 “Ps”
 1. Pain
 2. Paresthesia (tingly)
 3. Paresis (muscle weakness)

When you get a laminectomy question, pay attention to **location, location, location**

- There are 3 different locations where laminectomy is performed
 1. Cervical
 2. Thoracic
 3. Lumbar

1. Cervical—neck

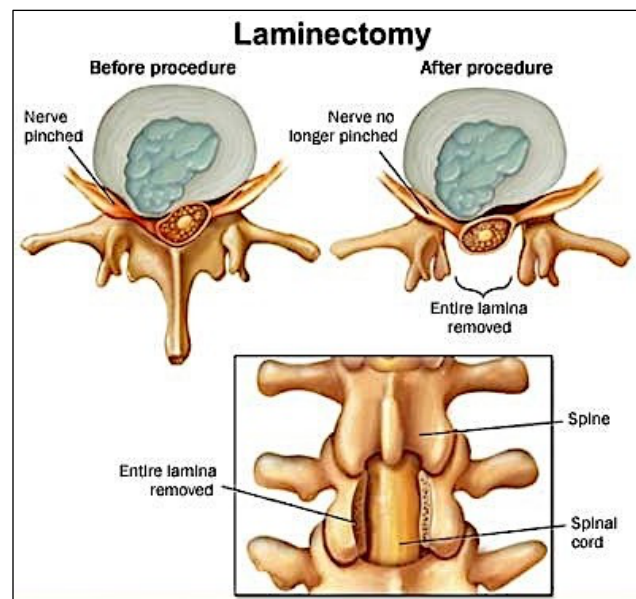
- What is the most important pre-op assessment for cervical?
 - Cervical innervates the **diaphragm** and the **arms**
 - First, **assess for breathing**
 - Next, check **functions of arms/hands**
- Post-op complication
 - Watch for pneumonia

2. Thoracic—upper back

- What is most important pre-op for thoracic?
 - Thoracic innervates gut/abdominal muscles ... **Assess cough and bowels** (cannot cough when you cannot contract abs)
- Post-op complication
 - Pneumonia and paralytic ileus

3. Lumbar—lower back

- What is most important pre-op for lumbar?
 - Lumbar innervates Bladder and legs ... Assess for **urinary retention or last time pt voided or is the bladder empty**
 - Next best answer is to evaluate **leg functions**
- Post-op complication



- Urinary retention and Leg problems
- Lumbar = Legs, Urinary retention

Postop Laminectomy

- Number 1 answer for postop laminectomy, including spinal surgery, is **log roll**
- Better pick **log roll**

Mobilizing pt after laminectomy or spinal surgery

- Do not dangle these pts—have them seat at the edge of the bed
- They should go from supine to walking as soon as possible
- Can they sit on bed long enough to overcome orthostatic hypotension?
 - Yes, but not for 10 to 15 minutes
- Do not allow pt to sit for more than 30 minutes
- So, what post-op order would you question for a laminectomy?
 - Up in chair for 1 hour TID
- These pts may
 - Walk, stand, lie down without restriction
 - **Sitting is bad**

Question

You are caring for a pt with a lumbar oligodendroglioma. What is the #1 problem?

- Airway
- Ileus
- Cardiac arrhythmia
- Urinary retention

Answer

Who cares what oligodendroglioma is. The lesion is in the lumbar spine. Therefore, we should assess for urinary retention, then for leg problems

- If the question instead mentions lumbar abscess or lumbar surgery, lumbar ependymoma, the answer would be the same

Note

Typically there are no chest tubes with Laminectomy. However, the anterior thoracic will have chest tubes

- What does anterior thoracic means?
 - From the front through the chest to the spine

Recap—Laminectomy

- Cervical = Neck and Arms
- Thoracic = Lungs and GI
- Lumbar = Bladder and Legs

Laminectomy with fusion

- This involves taking a bone graft from (1) the iliac crest and (2) the spine
- Bone from your hip is taken and put it in place so no bone-to-bone

Questions

Of the two incisions, which site has the most Pain?

- THE HIP

Of the 2, which one will have/need the most Bleeding/Drainage?

- THE HIP

- This is where the HEMOVAC, JP will be

Of the 2, which one has the higher risk of infection?

- They are equal

Of the 2, which one has the higher risk for rejection?

- The spine

Since the hip gives more problems, surgeons want to get rid of hip incision. Why?

- Because, it is shorter recovery ... It cuts the infection in half ... It decreases the drainage by 80% ... Decreases the pain by 80%
- That is why surgeons are using cadaver bone from banks because the risk of rejection is very low
 - Bone are not protein and protein is what triggers the antigen-antibody response

Discharge Teaching?

There are 4 temporary restrictions and 3 permanent

- Temporary restrictions ... (**6 weeks**)
 1. Do not sit for **>30** minutes
 2. Lie flat, log roll for **6** weeks
 3. Don't drive for **6** weeks
 4. Don't lift more than 5 lbs for **6** weeks (gallon of milk) Permanent restrictions
- Permanent restrictions
 1. Laminectomy patients will never be allowed to lift by bending at waist (use knees)
 2. Cervical laminectomy should never be allowed to lift anything over the head
 3. No horseback riding, off trail biking, jerky amusement park rides, etc. ...

Note

This lecture on laminectomy can be used to get any spinal cord question correct ...

Pay attention to location