

# Medication and Management Pearls for Common Medical Conditions

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# Just Pearls—And a lot of them

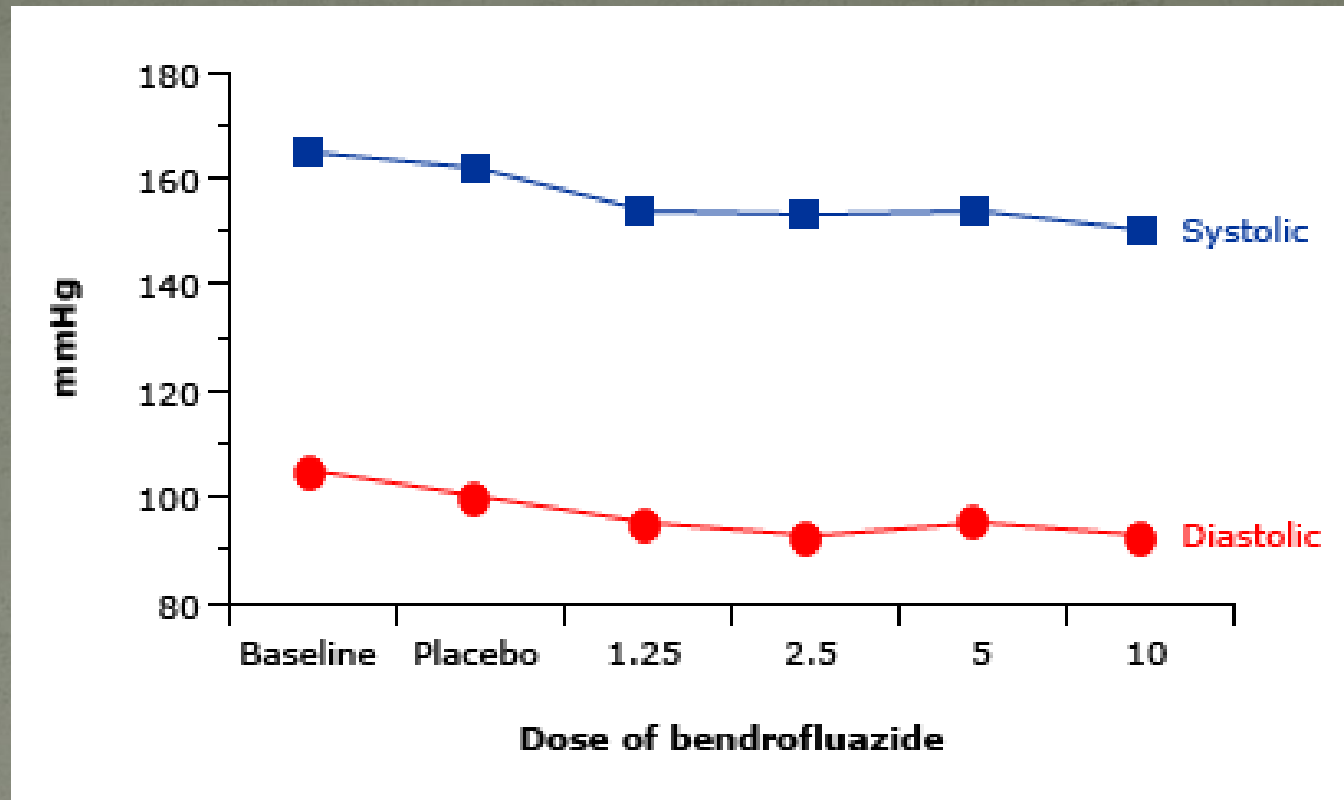
- This is my last lecture to the graduating seniors
- If I only have one more lecture to give, what would it be?
- It would be this one where I just give you a string of straight pearls for an hour, without any fluff on some of the most common conditions you treat

# Hypertension

- It's about the blood pressure control
- The blood pressure control is the major determinant of reduction in CV risk, not the choice of HTN drug
- For primary prevention, Thiazide diuretics, ACE/ARB or CCB (dihydropyridine)
- Keep in mind certain categories of patients that may benefit from specific meds or should avoid specific meds over others

# Dosing and Monotherapy vs Multiple meds

- For almost all HTN meds: Get most of the blood pressure lowering effect at the starting dose.
- The only exception is calcium channel blockers which have a more linear effect
- In general, the synergistic effect of combining several blood pressure meds work better than increasing the dose of one med
- Also potentially lower side effects using lower doses even when combining multiple meds



- Antihypertensive response to bendrofluazide in relation to daily dose (in mg, multiply by 10 to get approximate equivalent doses of hydrochlorothiazide).

# Hypertension

- Always get a baseline BMP after diagnosis of HTN and before starting meds
- Three classes of meds that need to follow BMP more closely are: ACE, ARBs and Diuretics
- I typically check q6 months on these meds, otherwise yearly
- All patients with Hypertension should have a baseline EKG

## ACE/ARBs

- Check BMP before starting and ~2 weeks after starting either med
- Expect a little rise in Creatinine
- If huge rise in creatinine, look for renal artery stenosis
- Checking for hyperkalemia
- ARB's cause hyperkalemia also

# ACE/ARBs

- ACE vs ARB's
- Cough is common side effect to ACE
- Switch to ARB's when there is cough side effect, but can rarely occur with ARBs
- But what if got angioedema to ACE? Can you safely prescribe ARB?
- Big caution use in women of child-bearing age for both



# Thiazides

- Check BMP before starting med and 2 weeks after starting
- HCTZ vs. Chlorthalidone
- Chlorthalidone is more potent: Almost double the potency (1.5-2X) and has longer duration 24-72 hours vs. 6-12 hours.
- Chlorthalidone is better studied
- But Chlorthalidone has more hypokalemia
- Lowest dose tab for Chlorthalidone is 25mg so often have to cut in half
- HCTZ in fixed dose combo pills but not chlorthalidone
- Avoid thiazide diuretics when Cr. goes above 1.8 or GFR is <20
- Avoid in patients with Gout and \*\*\*Sulfa allergy

# Calcium Channel Blockers

- Dihydropyridines — amlodipine, nifedipine, felodipine, isradipine, nicardipine, nisoldipine, lacidipine, and levamlodipine are potent vasodilators that have little effect upon cardiac contractility or conduction. Generally better and safer for HTN
- Non-dihydropyridines — verapamil and diltiazem, used in the management of hypertension, chronic stable angina, cardiac arrhythmias, or for proteinuria reduction. Less potent vasodilators but they have a greater depressive effect on cardiac conduction and contractility.

# Calcium Channel Blockers

- The dihydropyridines adverse effects are headache, lightheadedness, flushing, and dose-dependent peripheral edema in as many as 20 to 30 percent of patients.
- The non-dihydropyridines are dose-dependent constipation up to 25 percent as well as bradycardia and worsening cardiac output. Are relatively contraindicated with beta blockers or those with heart failure with reduced ejection fraction (HFrEF), sick sinus syndrome, and second- or third-degree AV block.

# Beta Blockers

- Not as good for first line primary prevention
- Good for patients after MI, Systolic Heart failure, stable angina
- Use carvedilol or metoprolol succinate (extended release, Toprol XL)

# Metoprolol Tartrate vs. Succinate

heart failure. However, metoprolol succinate shouldn't be used to prevent heart attacks.

Used for	Lopressor Metoprolol tartrate	Toprol-XL Metoprolol succinate
High blood pressure	X	X
Chest pain related to heart disease	X	X
Heart attack prevention	X	
Unstable angina	X	
Arrhythmia	X	
Heart failure		X

Although they both treat high blood pressure and chest pain, these drugs aren't interchangeable. They're dosed differently.

# Different categories of patients:

- <50 yo males—consider ACE/ARB
- Women childbearing age—avoid ACE/ARB
- Black patients—thiazides or CCB
- >60yo—thiazides or CCB
- Diabetes—ACE/ARB
- Proteinuric CKD—ACE/ARB
- CHF—Beta blocker, ACE/ARB
- Prior MI—Beta blocker, ACE/ARB
- A. Fib.—Beta blocker, nondihydropyridine CCB
- BPH—alpha blockers (nonselective)
- Essential tremor—Beta blockers

# Different categories of patients:

- Migraineurs—beta blockers, CCB (Verapamil)
- Osteoporosis—thiazides
- Raynaud's—dihydropyridine CCB
- Gout—avoid diuretics
- Depression—avoid Beta blockers, central alpha-2 agonists
- Hyponatremia/hypokalemia--avoid diuretics
- Glucose intolerance—avoid diuretics
- Bronchospastic dz—avoid non-selective beta blocker
- Erectile dysfunction—avoid beta blockers
- Heart block—avoid beta blockers, nondihydropyridine CCB

# Home Blood Pressure Monitor

- Make a chart with 3 columns
- Date / Time / BP Reading
- Check variable times
- Bring in the chart and the monitor to confirm accuracy





# Dyslipidemia

- While all lipid meds can improve your lipid profile in variable ways, only statins have proven clinical efficacy that matters.
- Some of it could be due to regression of plaque, but regression only occurs in a minority and it takes a while.
- Statins confer an antioxidant/anti-inflammatory effect on the vascular leading to plaque stabilization, reversal of endothelial dysfunction, and decreased thrombogenicity.
- Thus, the benefit is over and above the lipid improving effect

# Statins

- The starting dose of statin will achieve 75% of the lipid lowering effect
- With every doubling of the dose, will see 7-8% more improvement.
- Example, Atorvastatin:
  - 10 mg: 35-39%
  - 20 mg: 43%
  - 40 mg: 50%
  - 80 mg: 55-60%

# Dyslipidemia

- You make most of your cholesterol at night, thus theoretically better to take your statins in the evening.
- The statins with longer half-lives (atorvastatin and rosuvastatin ) can be taken in the morning
- Lovastatin better absorbed with food so take with dinner, but if Rx >20mg, then go to BID with food

# Statins

- Before starting statins: In addition to lipid panel, I check baseline AST/ALT, TSH, and BMP.
- I warn of potential liver toxicity (extremely rare) and myalgias (most common SE), and caution in women of childbearing age (pregnancy category X)
- I also inquire about their grapefruit/juice intake
- CKD—consider atorvastatin or fluvastatin as do not require dose adjustment (probably don't have to worry about dose adjustment until get to CKD<sub>4</sub>)
- Will see the full effect of statin after a month of taking med, so can check lipids anytime after that
- While no need to monitor LFT's anymore, I still check at least once after starting statins

# Myalgias

- Myalgias—up to 11% of patients
- More common in patients with CKD, liver disease and hypothyroidism (another reason to check BMP and TSH before starting statins)
- Typically bilateral (thighs, shoulders, back, calves)
- Can have myalgias without elevated CK

# Myalgias

- What can you do?
- Stop the statin and check CK, BMP, TSH
- If patient in rhabo, then unless we have another etiology, ARF, hypothyroid, 2 hour spin class, then probably should never take statins again
- Vast majority though, the CK will be fine and can then do the following:
- There is a remarkable number of people whose myalgias don't go away. (so it wasn't the statin after all and can restart the statin)

# Myalgias

- If taking fibrates or niacin, stop those
- Be aware of many drug interactions: Notably, Ca<sup>+</sup> Channel blockers, HIV/HCV Protease inhibitors, Cyclosporine, Amiodarone, Grapefruit [juice]
- Switch to a different statin and start low and go up slowly
- Lower the dose of the statin or go to every other day
- Switch to pravastatin or fluvastatin (have less intrinsic muscle toxicity)
- Check Vit. D level, if deficient, treat and then restart statin (low evidence).
- Stop statin and restart after taking CoQ<sub>10</sub> (150-200mg) day and then reinstitute same or different statin (low evidence)

# ePrescribing tip

Reference 1. Micromedex

Links:

Product: LISINOPRIL 40 MG PO TABS [View Available Strengths](#)

Sig Method: **Specify Dose, Route, Frequency** Use Free Text Taper/Ramp Combination Dosage

Dose: 40 mg 20 mg **40 mg**

Prescribed Dose: 40 mg

Prescribed Amount: 1 tablet

Route: Oral **Oral**

Frequency: Daily **Daily**

Duration: **Days**

Starting: 5/29/2020 Ending:

Dispense: Days/Fill: Full (0 Days) 30 Days 90 Days

Quantity: 90 tablet Refill: 3

Total Supply: 360 Days

Dispense As Written

Mark long-term:  LISINOPRIL (ACE INHIBITORS)

Patient Sig: **Take 1 tablet (40 mg total) by mouth daily.**  
[+ Add additional information to the patient sig](#)

Class: Normal **Normal** Full Phone In Sample No Print

Next Required

Accept

Start Review

+ ADD ORDER



# ePrescribing tip

Product: **LISINOPRIL 40 MG PO TABS** [View Available Strengths](#)

Sig Method: **Specify Dose, Route, Frequency** [Use Free Text](#) [Taper/Ramp](#) [Combination Dosage](#)

Dose:  mg

Prescribed Dose: 40 mg  
Prescribed Amount: 1 tablet

Route:

Frequency:

Duration:

Starting:  Ending:

Dispense: Days/Fill:

Quantity:  tablet Refill:

Total Supply: 360 Days  
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Windows Taskbar:

# ePrescribing tip

Links:

Product:

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[View Available Strengths](#)

Sig Method:

**Specify Dose, Route, Frequency**

[Use Free Text](#)

[Taper/Ramp](#)

[Combination Dosage](#)

Dose:

**40**

mg

[20 mg](#)

**40 mg**

Prescribed Dose: 40 mg

Prescribed Amount: 1 tablet

Route:

Oral

**Oral**

Frequency:

Daily

**Daily**

Duration:

[Doses](#)

**Days**

Starting: 5/29/2020

Ending:

Dispense:

Days/Fill:

[Full \(0 Days\)](#)

[30 Days](#)

[90 Days](#)

Quantity: 90

tablet


Refill: 3

Total Supply: 360 Days

Dispense As Written


Mark long-term:


LISINOPRIL (ACE INHIBITORS)

 Patient Sig:

Take 1 tablet (40 mg total) by mouth daily For blood pressure..

[Edit the additional information appended to the patient sig](#)

 The sig contains both discrete and free text elements. Please review the final sig above.

 Next Required

Accept  S

Review

**+ ADD ORDER**



# Diabetes

- **Metformin:** First line because does a lot of things right.
- Decreases hepatic glucose production and output
- Increases insulin-mediated glucose utilization in peripheral tissues such as the liver and muscle.
- Slightly improves the lipid profile.
- Practically no hypoglycemic events from Metformin alone.
- Weight neutral or some can lose weight likely due to the GI symptoms: including a metallic taste in the mouth, mild anorexia, nausea, abdominal discomfort, and soft bowel movements or diarrhea

# Metformin

- Contraindications: Avoid in patients at higher risk to develop lactic acidosis
  - 1) CKD<sub>4</sub> GFR <30 ml/min (GFR <45—max dose 1 gram/day)
  - 2) Active or progressive liver disease
  - 3) Current alcohol abuse
  - 4) Unstable or acute heart failure at risk of hypoperfusion
  - 5) Past history of lactic acidosis during metformin therapy
- Decreased tissue perfusion or hemodynamic instability due to infection or other causes

# Metformin

- Dosing: Mitigate the side effects by starting low and increase relatively slowly.
- Start 500mg with evening meal and then go up 500mg weekly by adding 500mg with breakfast and continue to increase weekly to desired dose.
- Max dose is 2,550 mg (can take 850TID w/meals or BID with 1,000 at breakfast and 1,500mg w/dinner)
- Only marginally better glycemic control at 2.5 grams
- Consider Metformin XR with evening meal if increased GI symptoms with IR or adherence an issue
- The GI symptoms can improve with time as they get used to the med

# Metformin

- Lab monitoring:
- Follow HA<sub>1</sub>C q3-6 months and BMP the same or at least yearly
- Also check various B vitamin levels yearly
- Metformin reduces Vit B<sub>12</sub> absorption in up to 30% of patients and almost 20% of patients have been found to have B<sub>12</sub> deficiency after 5 years on metformin
- I check Vit B<sub>12</sub>, Folate, and Vit B<sub>6</sub> yearly if patient has been on metformin over 2 years

# Diabetes

• HA <sub>1</sub> C	Average Glucose
• 5	90
• 6	120
• 7	150
• 8	180
• 9	210
• 10	240
• 11	270
• 12	300

# What med to add next?

- Sulfonylurea/glinide
- Alpha-glucosidase inhibitor
- Thiazolidinedione
- DPP-4 inhibitor
- GLP-1 receptor agonist
  - CVD, obese
- SGLT2 inhibitor
  - Heart failure, CKD but GFR >30
- Insulin



# Insulin

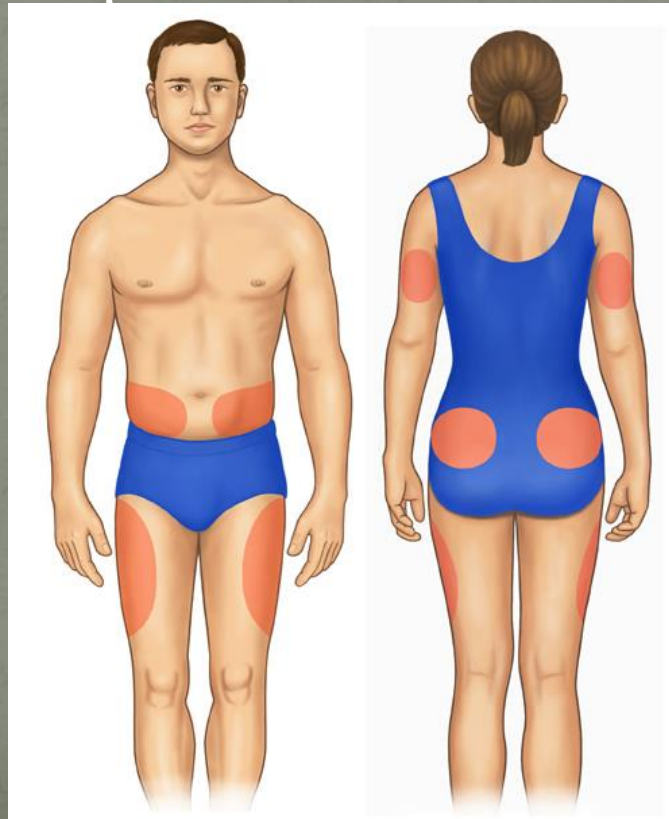
- Glargine (Lantus) or Detemir (Levemir)
- Start at 10 units qHS
- Check fasting BS.
- Increase by 2-4 units every 3 days until AM fasting is at goal (<130 mg/dl)
- Generally avoid sulfonylureas with insulin

# Insulin

- Store insulin in the refrigerator if not going to use for awhile
- Once the insulin vial is used, it is good for one month at room temperature
- Sunlight and heat and freezing will destroy insulin
- Shaking vial will also denature the proteins (roll insulin vial to mix).
- Thus, do not store insulin in the door of the refrigerator, or purse, or car, etc.

# Diabetes

- The shaded areas may be used for insulin injections.
- Insulin is absorbed more rapidly when injected into the abdomen, as compared to the arms or legs.



# Diabetes

- Massage, local heat application, Exercise, especially of that body part, will speed insulin absorption
- When lantus is give more than 40 units, better to split the dosage to two shots in different locations

# Diabetes

- Immunizations:
  - Influenza
  - Pneumovax if 19-64 yo
  - Pevnar after 65yo (Shared decision making:  
I recommend giving)
  - Then Pneumovax again 1 year after Pevnar and 5  
years separation from the previous Pneumovax
  - Hepatitis B series

# Pill Boxes



# Dermatology

- Steroids are classified from Class 1 to Class 7
- Class 1 is the strongest and Class 7 is the weakest
- Topical steroids come in a variety of forms:
- Creams
- Ointment
- Lotion
- Foam
- Solution
- Tape
- Gel
- Spray
- Paste



# Dermatology

- Creams vs ointments
- Ointments are made with petroleum and are less irritating, more soothing and more potent because more occlusive
- Creams are made to vanish but have more irritating chemicals
- General rule: Use higher potency early on. “Hit is hard and hit it fast” Then drop down to lower potency.



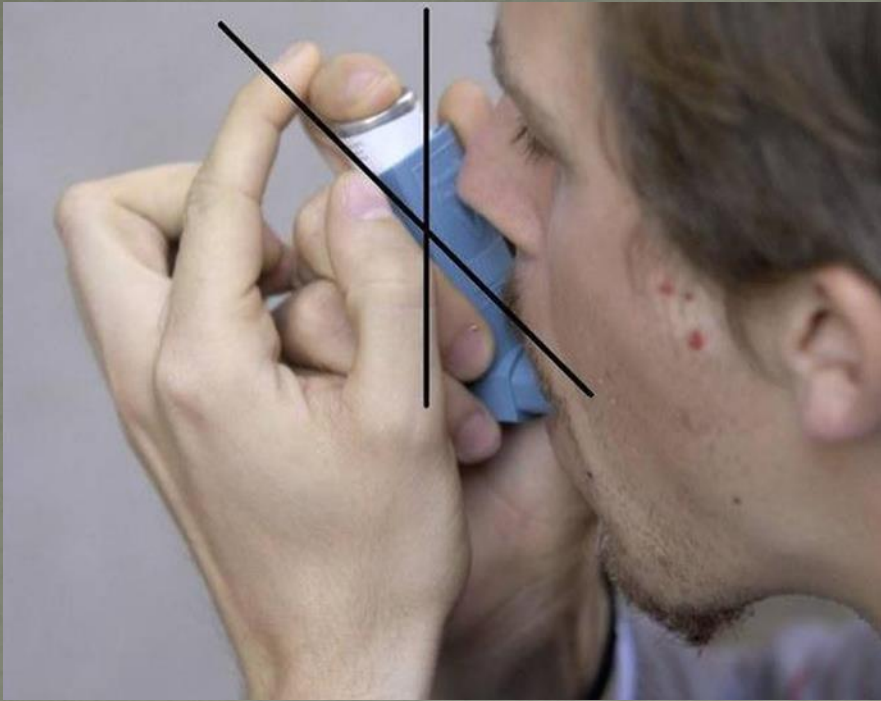
# Asthma/COPD

- Many reasons patients don't do as well with their asthma and/or COPD.
- One significant reason is their improper inhaler technique
- Use spacer--easier to coordinate and gets more medicine into the lungs. Helpful for children.
- Bill for teaching inhaler technique with CPT code 94664

# Asthma/COPD

- I have asked over 1,000 patients and only about 2 people have demonstrated really good technique





















# Asthma/COPD



# Asthma/COPD

- Inhalers go stale after awhile.
- Ventolin HFA (200 inhalations): six months;
- Ventolin HFA (60 inhalations): 12 months;
- Symbicort: 90 days;
- Serevent Diskus: six weeks;
- Advair Diskus: one month;
- Asmanex Twisthaler: 45 days;
- Foradil: four months;
- Flovent Diskus 50 mcg: six weeks;
- Flovent Diskus 100 mcg: two months;
- Flovent Diskus 250 mcg: two months

# Asthma/COPD



# GI: GERD/Gastritis/Dyspepsia/PUD

- Use of PPI's and H<sub>2</sub>-Blockers:
- It takes at least several days of PPI usage before acid reduction begins and it take about 5 days to get to optimal acid production—about 66% acid reduction out of the typical PPI.
- This is why PPI's don't work well for prn dosing unless one is taking the PPI's on a prn basis a lot
- H<sub>2</sub>-Blockers can be used for prn because they can work quickly.

# GI: GERD/Gastritis/Dyspepsia/PUD

- Both work better when taken before meals
- To fully maximize acid suppression, can take both PPI's and H<sub>2</sub>-Blockers, but they need to be taken separately as far apart as possible.
- Should not take them together because they counteract each other.
- To maximize acid suppression, take PPI's in the morning before breakfast and H<sub>2</sub>-blockers at night before bed. To go all out on acid suppression, take PPI before breakfast and before dinner, then H<sub>2</sub>-blocker qHS.

# GI: GERD/Gastritis/Dyspepsia/PUD

- H<sub>2</sub>-blockers when taken regularly, can develop tachyphylaxis. Thus, H<sub>2</sub>-blockers are not good for long-term usage in general.
- Typically don't develop tachyphylaxis to PPI's.
- Both can develop rebound hypersecretion after stopping med if had been taken regularly.
- Usually occurs if taken greater than 2-3 months or more and can occur in 60-90% of people
- Mitigate against rebound hypersecretion by tapering the PPI over several weeks and/or adding H<sub>2</sub>-Blocker



# GI: GERD/Gastritis/Dyspepsia/PUD

- Avoid cimetidine (Tagamet). It is the least effective and has the most drug interactions and most side effects.
- While PPI's were thought to be safe for awhile, there are more and more safety concerns regarding PPI's.
- There are certain people who really need to take PPI's long-term and this is indicated for them.
- But in general, try to get people off PPI's in a reasonable time period if they don't really need it.

# GI: GERD/Gastritis/Dyspepsia/PUD

- PPI's and clopidogrel. The thought is the PPI cause drug interaction and decrease activation of the clopidogrel.
- The jury is still out on this
- Try to avoid omeprazole (Prilosec, Zegerid) or esomeprazole (Nexium), which may have the most untoward drug interaction.

# GI: GERD/Gastritis/Dyspepsia/PUD

- There is concern that PPIs increase fracture risk in both men and women.
- Definite association of long-term PPI usage and increased fractures
- Don't know if it is a direct correlation or indirect association
- One proposed mechanism is the decreased acid results in decreased absorption of calcium
- Thus, many propose supplementing with calcium citrate instead of calcium carbonate because the citrate can be absorbed more readily in higher pH

# GI: GERD/Gastritis/Dyspepsia/PUD

- Magnesium, B<sub>12</sub>, and iron absorption (latter typically not clinically significant) are compromised with patients on long-term PPI's.
- Consider checking Mg, B<sub>12</sub> and CBC levels in these patients
- Check Mg levels twice a year and B<sub>12</sub> and CBC yearly

# GI: GERD/Gastritis/Dyspepsia/PUD

- PPI's increase pH, which may allow more bacterial growth.
- Thus, potentially more at risk for pneumonias
- And higher incidences of C. diff diarrhea

# Hypothyroidism

- See full effect of thyroid replacement med after 6-8 weeks of taking it
- The various levothyroxine preparations are all effective, but the difference is the bioavailability can be different from one brand to another or one generic to another
- Thus, stick to one brand name for better consistency.
- Generic levothyroxine is fine, but generics can change without you knowing it

# Hypothyroidism

- Meds containing T<sub>3</sub> like Cytomel (T<sub>3</sub> alone), or Thyrolar (T<sub>4</sub>-T<sub>3</sub> combo), or Armour thyroid (mixture of T<sub>3</sub> and T<sub>4</sub> made from porcine thyroid glands) are generally not recommended
- The bioavailability is more widely variable, due to concentration of drug is more variable, has rapid GI absorption and has short half-life (one day) as opposed to T<sub>4</sub> which has a 7 day half-life.

# Hypothyroidism

- Unless the patient is floridly hypothyroid and/or is very large, start low like 50mcg and increase from there
- If the patient is very elderly, start 25mcg
- Prefer if you write in mcg as opposed to mg. It is less likely to get mixed up since one will be dealing with whole numbers
- Shoot for TSH around 1-2.5 in younger patients. In the elderly >70, shoot for TSH 3-5 or even up to 10
- In patients who had thyroid cancer in the past, shoot for low TSH



# Hypothyroidism

- Levothyroxine is better taken in the morning on an empty stomach 30-60 min. before eating anything.
- Caffeine, Coffee, PPI's, H2-Blockers, Calcium, Ferrous sulfate, Aluminum hydroxide gels, Sertraline, Bisphosphonates, Sucralfate, Cholestyramine all decrease the absorption of levothyroxine
- Can take at other times, e.g., bedtime.
- The key is consistency and adjust the dosage around their habits
- Check TSH 2 months after starting any med that can affect thyroid levels and/or interact with thyroid medication

# Hypothyroidism

- 50-85% of pregnant women with pre-existing hypothyroidism need more T<sub>4</sub> during pregnancy. Dose requirements may increase by 50% starting as early as the 5<sup>th</sup> week of gestation.
- UTD recommends immediately increasing levothyroxine dose by about 30% by doubling the dose 2x a week.
- An alternative to preemptively increasing the dose is to measure serum TSH as soon as pregnancy is confirmed, then again four weeks later, four weeks after any change in the dose of T<sub>4</sub>, and at least once each trimester.
- Maintain TSH in the trimester-specific reference range (0.1 to 2.5 mU/L, 0.2 to 3 mU/L, and 0.3 to 3 mU/L for the first, second, and third trimesters, respectively)

Congratulations Senior Residents!!!!

We will miss you greatly !!!!



2020

Class

OF



*congratulations*

# QUESTIONS?

