Forum 50 YEARS+ EXTENDED CARE SERVICES

2020 MONTHLY WEBINAR SERIES

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Director, Marketing &

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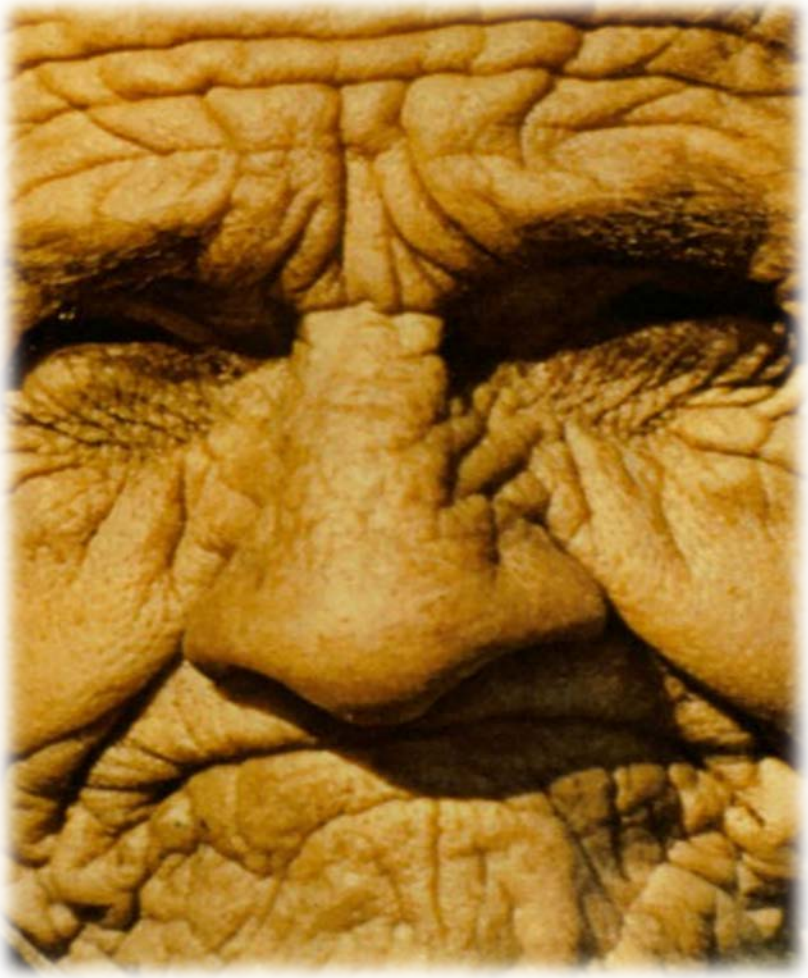
2020 WEBINAR SERIES

Practical Pearls for Geriatrics Assessment.

BARB BANCROFT, RN, MSN, NP

Geriatric Gems: Definitions of “age”…

- Stratification of the older patient population into 3 groups:
- “young old” – 65-74
- “old”—75 to 84
- “oldest-old”– over 85 – the fastest growing subgroup of older adults is those aged 85 and over…



When I was in Nursing School (between the two "F" words)—forty to fifty years ago…

- "Really" old was 65…
- *EWWWEEEEE, I have to take care of that really old man in room 106 …*
- *How old is he?*

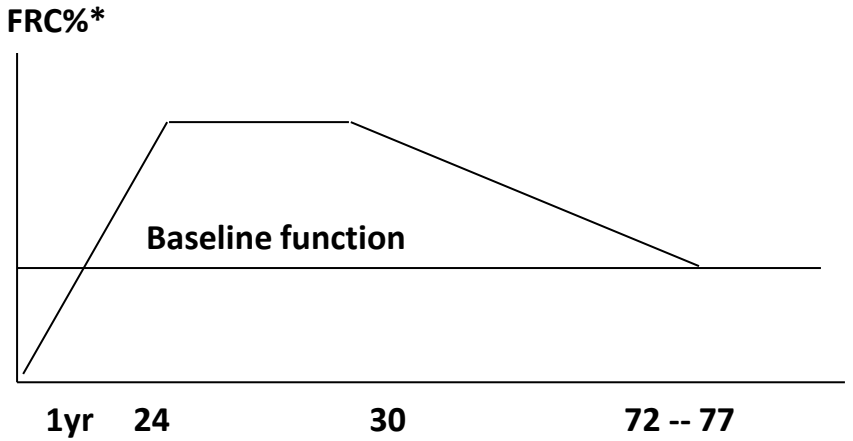
What is senescence??

- The rate of deterioration of the structure and function of body parts
- The **1%** rule in Geriatrics – your body parts decline by 1% per year starting at age 30-ish
- OH, but what's the good news, if there is any…????
- We have a lot of "extra" capacity to function in tissues…this is known as:
- Functional reserve capacity of tissues is 4-10 x greater than baseline (the amount needed just to function)
- We reach our peak functional reserve capacity at age 24
- And then we have 6 good years—from 24 to 30 and then?


The party’s over…

Senescence and normal aging...reaching baseline

- Peak functional reserve (FRC) capacity at 24, 6 good years, gradual decline to baseline between 72 and 77



Example of living at baseline… “livin’ on the edge…”

- Acetylcholine in the CNS is the neurotransmitter of cognition;
- As we age the blood-brain barrier becomes more lipid-soluble and drugs can enter the brain with greater ease
- Drugs with “anti-cholinergic” effects can cause confusion and memory loss

Use of anti-cholinergic drugs in older adults…

- *"The use of anti-cholinergic drugs has been strongly associated with adverse health outcomes, including cognitive impairment, dementia, falls, functional decline, hospitalization and mortality, especially in older adults."*
- *"The results of the present study showed that approximately half of the residents living in veteran's homes had exposure to anticholinergic drugs, and these residents had a significantly higher risk for short-term cognitive decline."*
- (*Geriatrics and Gerontology International.* April 17, 2017. Suppl. 1)

What are anti-cholinergic drugs prescribed for?

- Digestive problems—irritable bowel syndrome, diverticulitis, diarrhea
- Overactive bladder and incontinence, motion sickness, dizziness, symptoms of Parkinson's disease and respiratory problems including asthma and COPD
- A myriad of drugs have anti-cholinergic properties—drugs for anxiety, depression, allergies, pain, hypertension, psychosis, heart failure and GERD

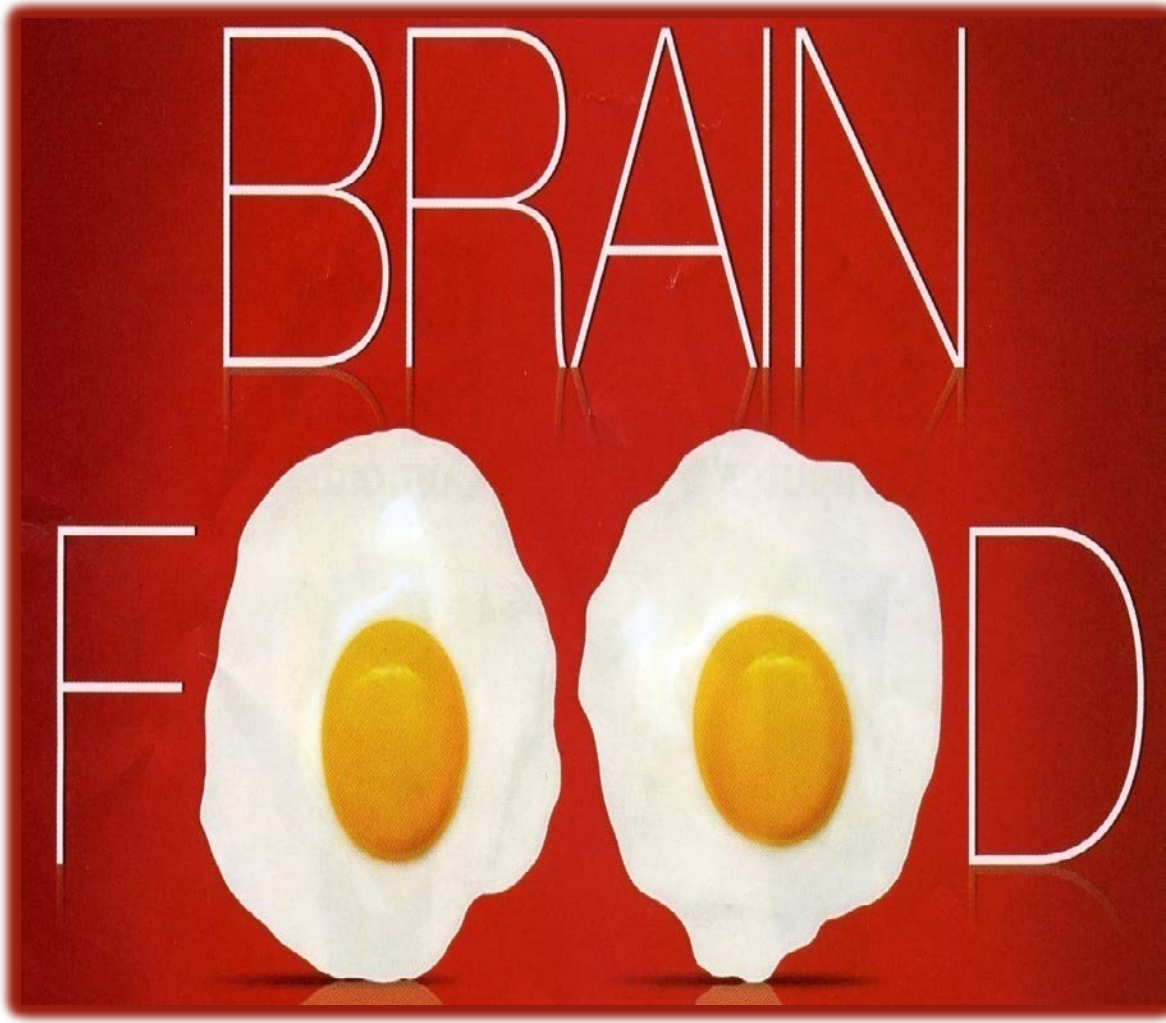
A 2019 study in JAMA Internal Medicine also highlighted risk of dementia with long-term use of anticholinergics in persons 55 years or older.

- 58,769 patients with a diagnosis of dementia and 225,574 control patients.
- The study examined prescription information for 56 drugs with strong anticholinergic properties. Researchers analyzed total anticholinergic exposure prescribed during the 11 years prior to the diagnosis of dementia. January 1, 2004, to January 31, 2016.
- Associations with dementia were significant for the anticholinergic antidepressants (nortiptyline (Pamelor), paroxetine (Paxil); bladder antimuscarinics (oxybutynin/Ditropan); tolterodine/Detrol); darafenicin (Enablex) and more; antivertigo drugs (cyclizine, promethazine); GI antispasmodics (cyclobenzaprine (Flexaril), dicyclomine, scopolamine); antimuscarinic bronchodilator drugs (ipratropium (Atrovent), glycopyrrolate), and two anticonvulsants—carbamazepine and oxcarbazepine).

- Coupland CA. **Anticholinergic Drug Exposure and the Risk of Dementia:** A Nested Case-Control Study *JAMA Intern Med.* 2019;179(8):1084-1093. doi:10.1001/jamainternmed.2019.0677

Brain food—the incredible, edible egg

- Eggs contain choline, a protein precursor to acetylcholine, the neurotransmitter of cognition (THINKING)



Multiple prescriptions from multiple MDs…

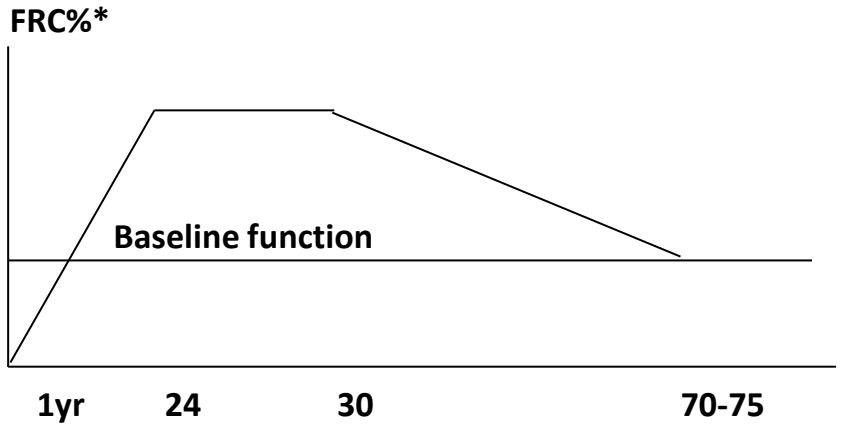
- Most geriatric patients see a cardiologist, dermatologist, gastroenterologist, neurologist, rheumatologist, pulmonologist, proctologist, etc etc etc…and everyone of them prescribes a drug or three…
- And don’t forget the OTC drugs they pick up on the way home from the above doctors (Tylenol PM!!)
- And the drugs they BORROW from friends!!
- Call your friendly pharmacist to go over the list of drugs frequently!

Now that the brain is shot, let's take a look at renal function and senescence— 1% rule

- The majority of drugs are excreted by the kidney…the glomerular filtration rate (GFR) decreases by **1% per year** (starting at 30)
- Kidney function is best reflected by the GFR which is defined as the sum of the filtration rates of all functional nephrons
- The peak GFR is ~125 mL/min/1.73 m2 in **men between ages 24 and 30** and 100 mL/min/1.73 m2 in **women between ages 24 and 30**

Senescence and the Kidney

- Peak at 24, 6 good years, gradual decline to baseline;
- *FRC is functional reserve capacity (125 ml/min @ 30) in men; 100 ml/min @age 30 in women



Let's take a look…

- 80-year-old female = loss of 1 mL/minute x 50 years = 50 mL/minute;
- Peak GFR of 100 mL/minute minus 50 mL/minute = 50 mL/min in a HEALTHY 80-year-old female (not taking into account weight, ethnicity, diabetes, hypertension, smoking—all of which would accelerate renal senescence)
- Peak GFR of 100 mL/minute minus 50 mL/minute = 50 mL/min in a HEALTHY 80-year-old female (not taking into account weight, ethnicity, diabetes, hypertension, smoking—all of which would accelerate renal senescence)
- HUH? What does that mean?

This is where she fits in the Chronic Kidney Disease schedule?

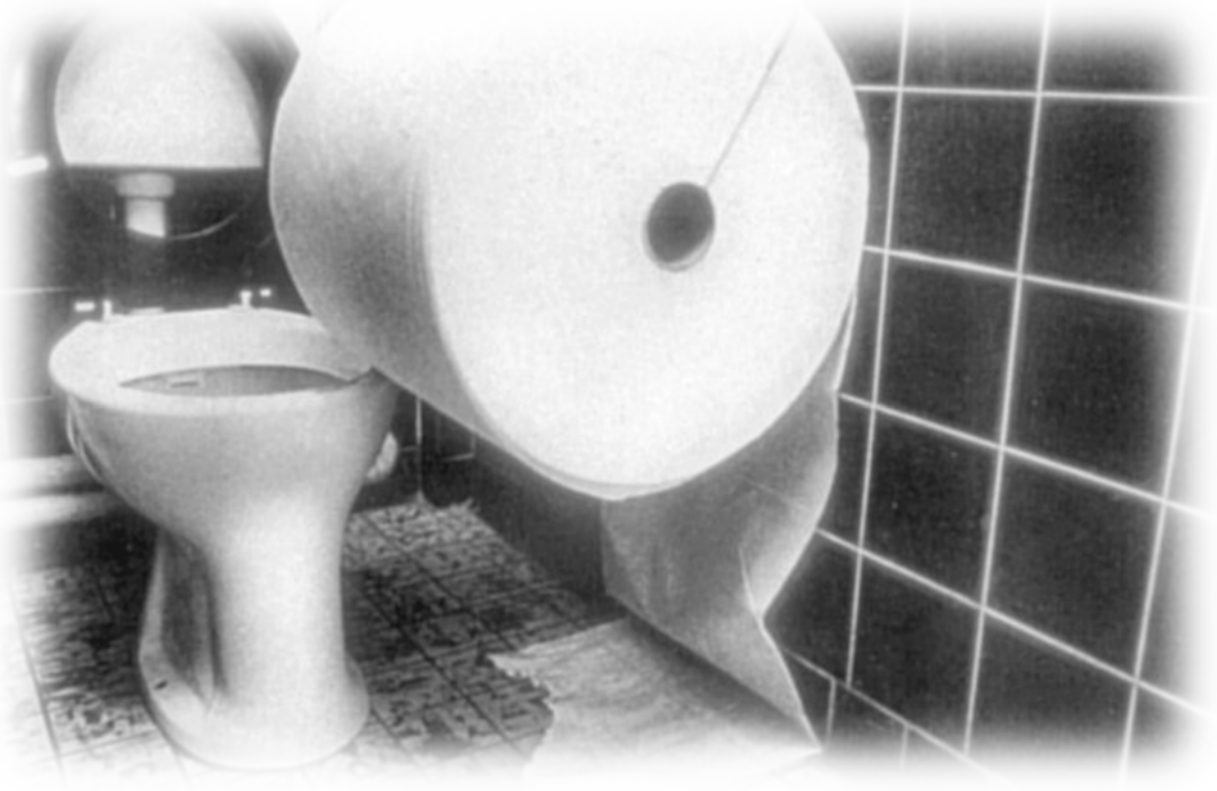
- CKD-1 = GFR>90 mL/min/1.73 m² or higher
- **CKD-2 = GFR 60-89 mL/min=mild renal insufficiency**
- CKD-3a = GFR 45-59 mL/min=mild to moderate renal insufficiency; a GFR of less than 60 mL/min/1.73 m2 **represents a loss of more than *half* of normal kidney function**
- CKD-3b = GFR 30-44 mL/min—moderate to severe
- CKD-4 = 16-29 mL/min =severe renal insufficiency
- CKD-5 = 0-15 mL/min = failure or ESRD (end-stage renal disease)—
- CKD-5D -- dialysis

Chronic kidney disease affects nearly 30% of all geriatric patients

- Compared with 30 years ago, today's older patients are subjected to more renal insults: 1) have a higher incidence of CV disease, HTN, and diabetes, 2) take **multiple** medications*, and 3) are exposed to more diagnostic and therapeutic tests using nephrotoxic contrast dyes (CT with contrast dye, cardiac caths with contrast dye)
- ***Drug-induced nephrotoxicity** may be as high as 66 %

Clinical significance of mild renal insufficiency?

- Primarily has to do with drugs and the ability to excrete drugs
- The majority of drugs are excreted through the kidneys and need an adequate glomerular filtration rate to do so



Metformin, for example…

- Increased risk of lactic acidosis (albeit a low risk, but the risk is highest in the elderly with the lowest eGFRs)
- METFORMIN and CONTRAST DYE: Don’t forget to stop the metformin (Glucophage) for 48 hours after a radiocontrast dye
- WHY? Metformin competes with the contrast dye for excretion; the contrast dye wins and is excreted; metformin is retained, can accumulate and cause lactic acidosis

Metformin, dose adjustments and kidney disease

eGFR (mL/min)	Maximum daily dose	Recommended monitoring
≥60	2550 mg	Monitor renal function annually
45-59	2000 mg	Monitor renal function every 3 to 6 months
30-44	1000 mg	2-4 fold risk of lactic acidosis~10/100,000
<30	Do not use	6-7 fold risk of lactic acidosis in this group

Other drugs that can wreak havoc with RENAL FUNCTION in the elderly…

- Aminoglycoside antibiotics (Amikacin; gentamicin; tobramycin) alone can cause renal toxicity
- Add diabetes to the equation with the patient taking an ACE inhibitor (“pril”) and the risk of nephrotoxicity increases considerably
- Ears and kidneys—ototoxicity and renal toxicity

Drugs that are excreted by the kidneys and potentially retained in patients with a reduced GFR—retention = toxicity

- Gabapentin (Neurontin) and pregabalin (Lyrica) should not be used with eGFRs < 60 ml/min per 1.73 m^2 (increased CNS effects)
- empagliflozin, canagliflozin, and dapagliflozin should not be used in patients with an **eGFR** <45 ml/min per 1.73 m^2.
- OTC H2 blockers—cimetidine* (Tagamet), ranitidine (Zantac), famotidine (Pepcid) should not be used with GFRs < 50 ml/min per 1.73 m^2 (due to increased risk of CNS effects)
- *cimetidine should not be used at all in the elderly—potently anticholinergic and can cause 1st dose delirium

Drugs that are excreted by the kidneys and potentially retained in patients with a reduced GFR—retention = toxicity

- Fluoxetine –fluoxetine is metabolized by the liver to a more potent, longer-acting drug (norfluoxetine)…increasing it's half-life—1 to 3 days after acute administration and 4 to 6 days after chronic administration) and its active metabolite, norfluoxetine (elimination half-life of 4 to **16 days** after acute and chronic administration)
- add this to a kidney that's not filtering adequately due to age and fluoxetine can become toxic as the drug will be retained for longer periods of time...THE RULE IN GERIATRICS...

“Never give a drug with a half-life longer than their life…” ☺

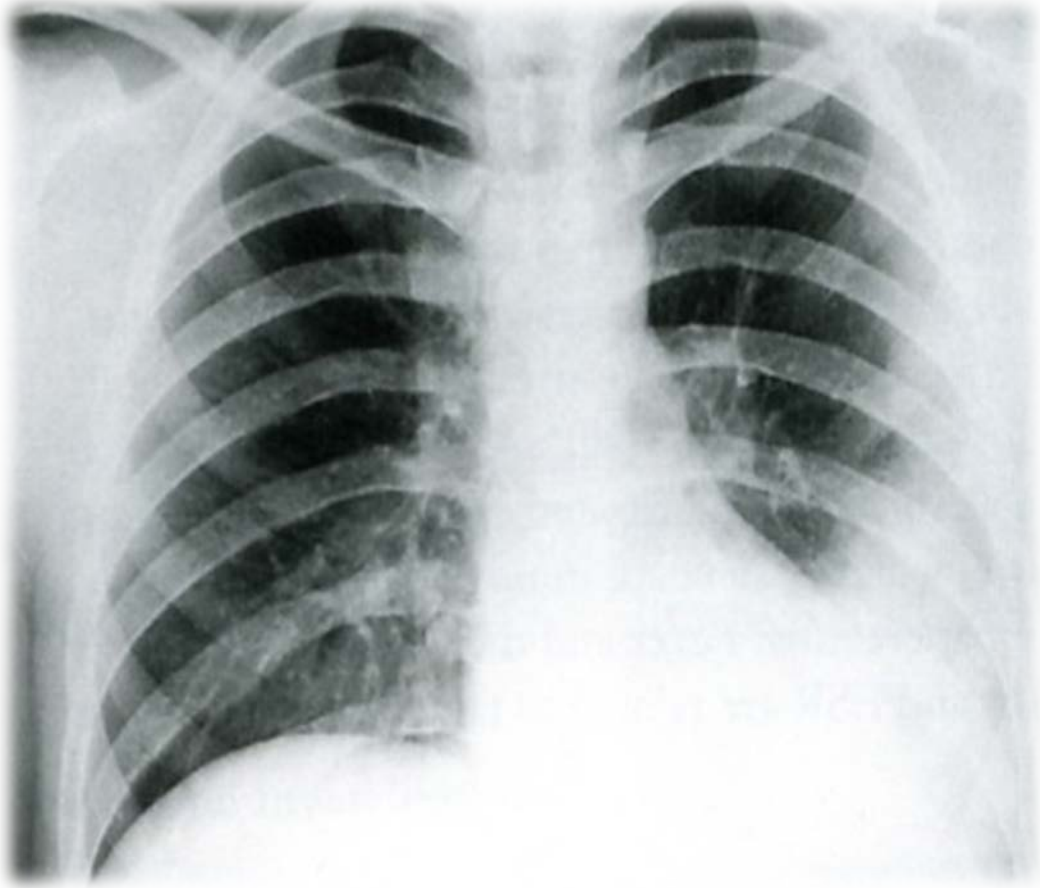
- Use sertraline (Zoloft) instead
- Average half-life is 26 hours

Lots and lots of drugs are excreted by the kidneys and potentially retained in the elderly

- **NEED DOSE ADJUSTMENTS**
- Methotrexate
- Penicillin
- Phenobarbital
- Procainamide
- Ramipril
- Ranitidine
- Spironolactone
- Trimethoprim/Sulfamethoxazole (**don't use DOUBLE STRENGTH -- 160 mg/800 mg – in the elderly)—that should be a no brainer…but it happens**

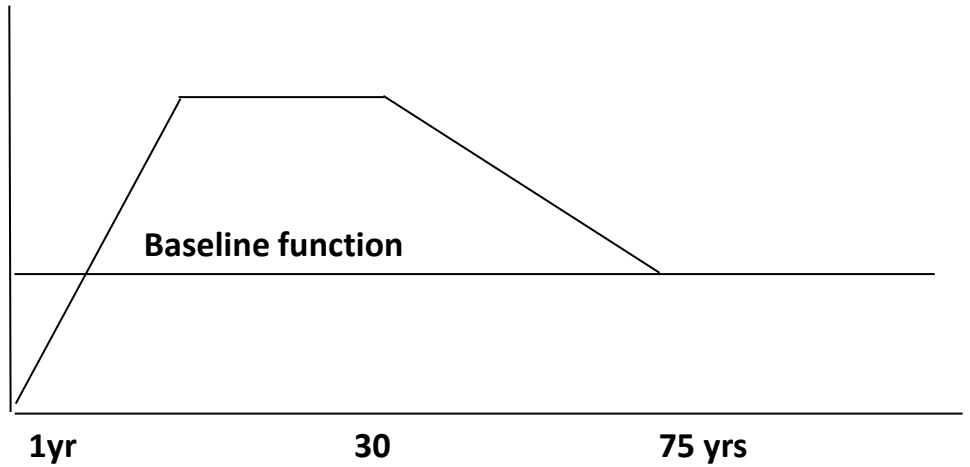
The 1% rule and cardiac output

- Cardiac output decreases by 1% per year
- Increased risk of heart failure with *any* increased workload—flu, pneumonia, COPD for examples
- Beta Blockers can precipitate heart failure (“olols, alols, ilols”)—metoprolol, carvedilol, bisoprolol



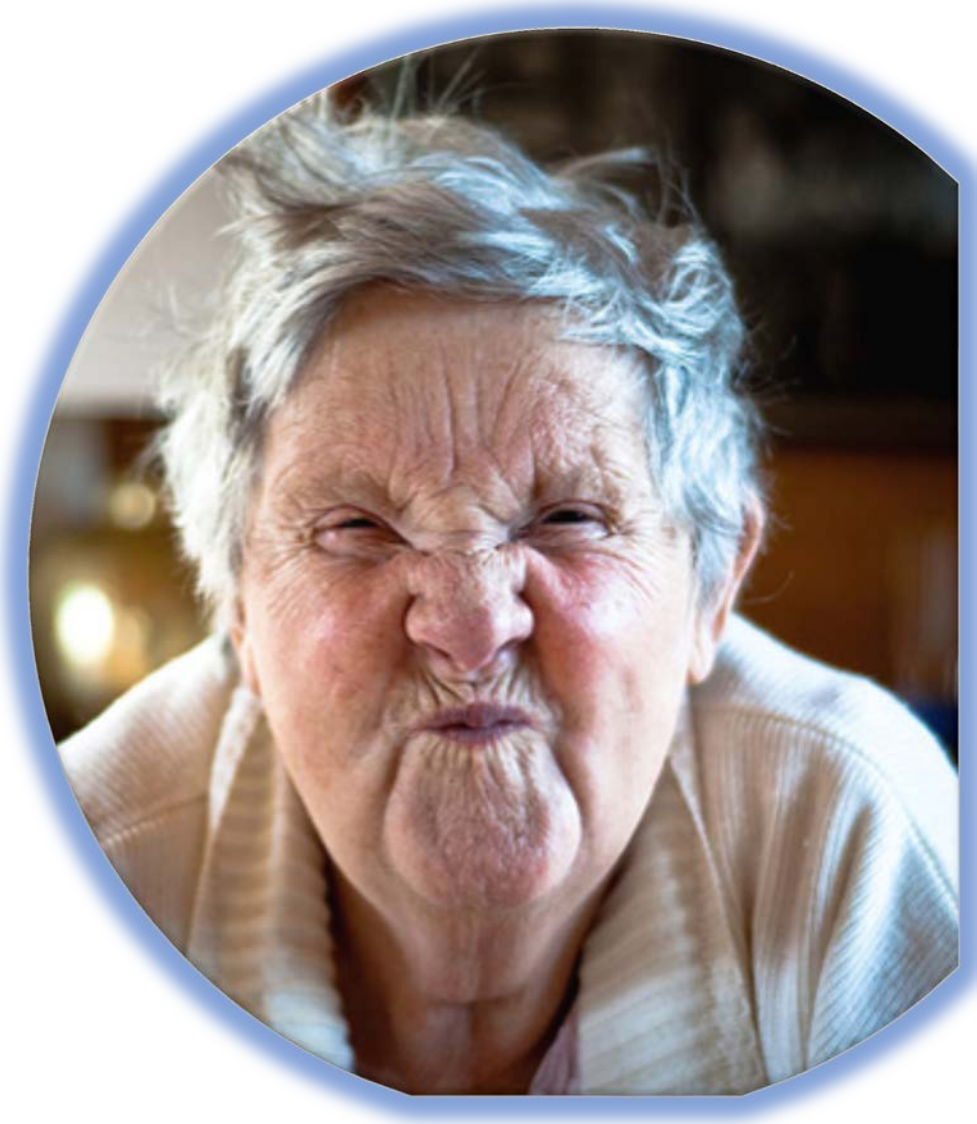
Senescence and chronic disease…reaching baseline earlier

- More rapid decline with chronic disease (DM, COPD)



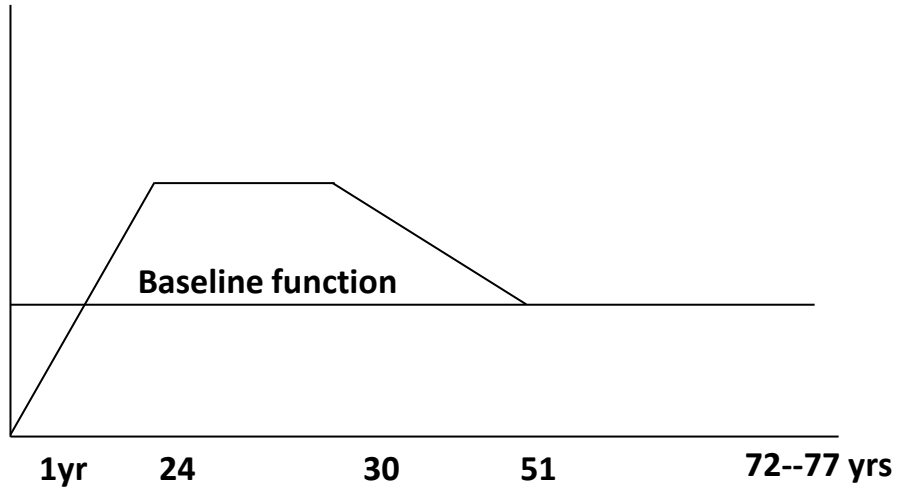
Diabetes accelerates aging

- A 65-year-old diabetic has a 75-year-old kidney
- A 50-year-old with COPD has accelerated aging due to lack of oxygen to the brain, heart, kidneys



Senescence and gender differences…

Gender differences—the ovary (51.3 +/- 2.7)



Gender-specific reproductive changes

A major reproductive difference…

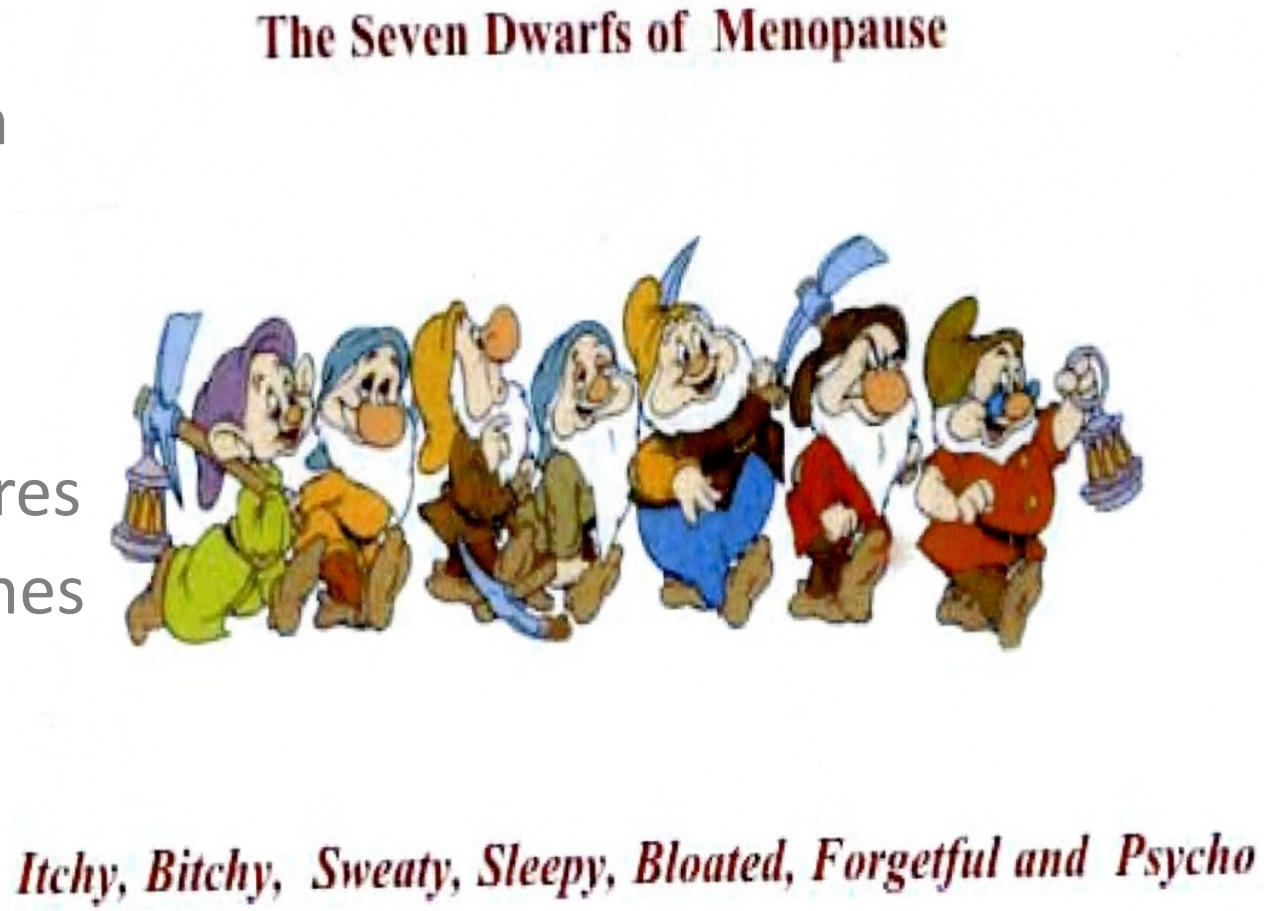
- Women get all the eggs they are ever going to have prior to birth (not exactly, but almost--)
- However, our ovaries die at 51.3 +- 2.7 years

HOW MANY EGGS/FOLLICLES* DO WE GET?
*follicles produce estrogen

- At 6 months gestation _____
- At birth _____
- At age 30 _____
- At age 50 __
- The age of an egg is YOUR age!
- Could you possibly get pregnant at 50?

Gender-specific aging changes

- Estrogen has over **300** functions in the body
- Skin integrity—less wrinkles
- Boosts HDLs, decreases LDLs
- Builds bone—strong/reduce fractures
- Calms the hypothalamus—hot flashes
- GU—prevents UTIs, vaginal yeast infections



So, what should a postmenopausal female do about hormone therapy (HT)?

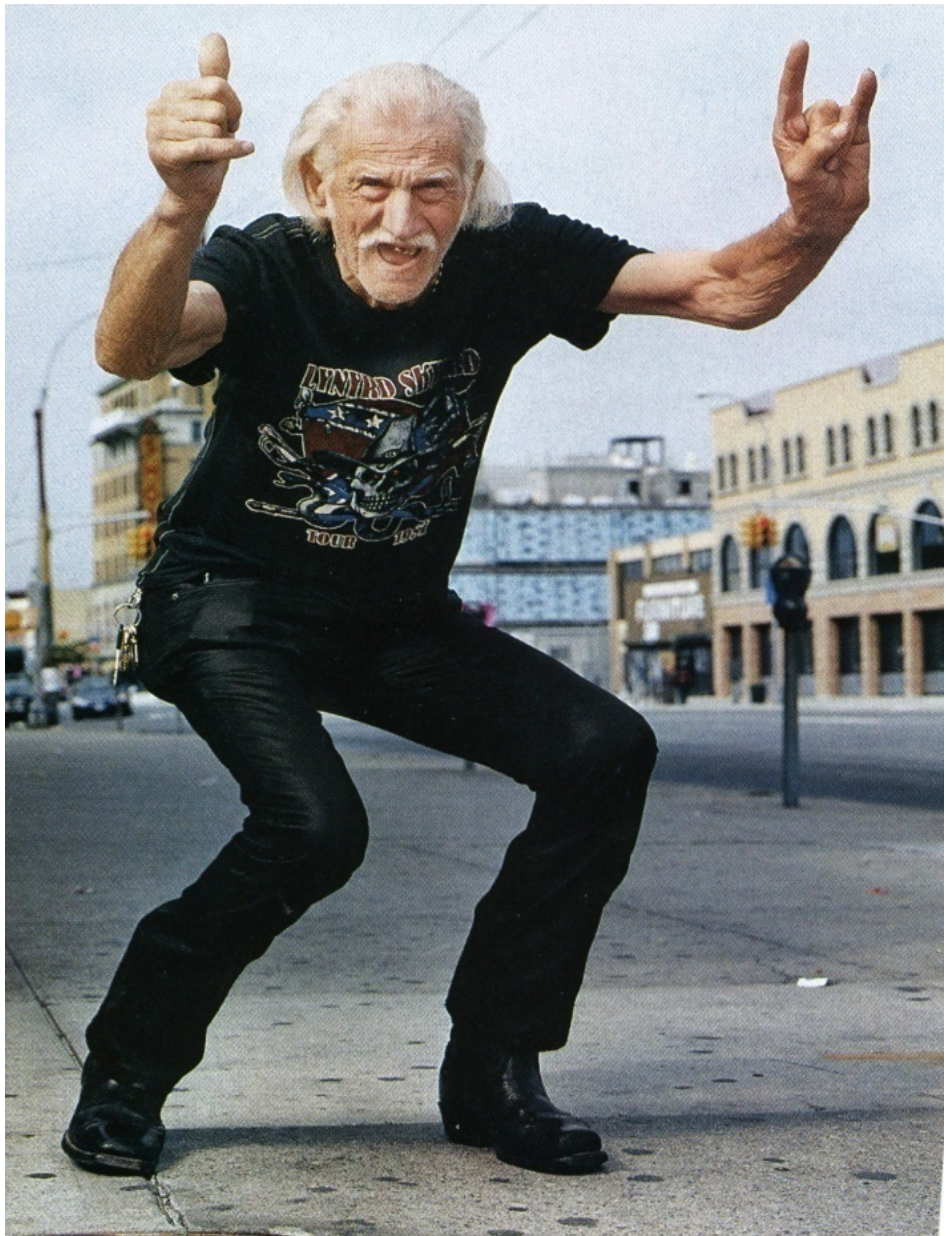
- **"The decision to continue HT should be individualized and be based on a woman's symptoms and risk-benefit ratio, regardless of age. Because some women ages 65 and older may continue to need systemic HT for the management of vasomotor symptoms, ACOG recommends against routine discontinuation at age 65.** As with younger women, use of HT and estrogen therapy should be individualized based on each woman's risk-benefit ratio and clinical presentation.." **2014 Practice Bulletin from the American College of OBGYN**
- **And, one more thing…hormone therapy should start immediately…don't wait a few years.**

What about guys? Do guys get all the sperm they're going to get at birth?

- Noooooooooooo…
- Men produce sperm PRN until the day they die
- Sperm is only 75-90 days old when freshly ejaculated
- However, there are some interesting sperm issues…

Geriatric Gents

- The sperm of a 20-year-old is quite eager to swim up the 5” Fallopian tube
- The sperm of an 80-year-old…not so much
- How long does it take to swim up the FT?
- Testosterone levels decline
- Atherosclerosis fills the arteries supplying the “privates”
- ED is common due to lack of blood flow
- ED drugs to the rescue!



The “afils”—the Pfizer Riser aka sildenafil (Viagra) and friends, for erectile dysfunction

- Prior to November 1998
- What are the causes of ED?
- Athero, neuro, drugs, ↓testo, psychological (the stamp test)
- Sildenafil (Viagra)
- Vardenafil (Levitra)
- Tadalafil (Cialis)—the “weekend warrior”
- PDE5 inhibitors which in a round about way boost nitric oxide—potent vasodilator primarily below the belt; EXCEPTION: pulmonary vasculature
- Can also use in patients with stable CHD

Sarcopenia

- 1% per year—age-related loss of lean muscle mass, strength and functionality
- Leads to falls-- Most common cause of injury among elderly
- 1/3 of seniors suffer a fall every year
- PREVENTION is the best medicine
- Weight training—maintains strength and preserves muscle mass; promotes mobility, enhances fitness
- Increased protein in the diet
- (JAMA Internal Medicine January 19, 2015)

Changing gears with the 1% rule: some body functions/parts "increase" with senescence instead of decrease…

1

Increase in FAT TISSUE—**RUDE**…

2

Increase in the SIZE of the PROSTATE---**ANNOYING**

3

Increase in clotting factors—**DANGEROUS**

1% rule—an increase in body fat

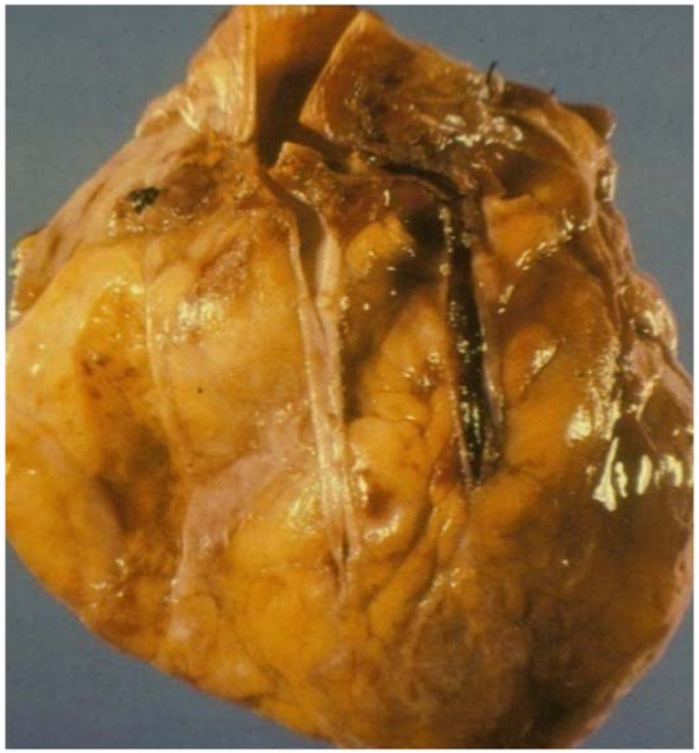
- UGH.
- Body fat increases as muscle mass decreases
- Retention of lipid-soluble drugs—any drugs that cross the blood brain barrier, including general anesthetics (longer recovery time)
- Half-life (T1/2) of diazepam (Valium) is the patient's "age, in hours"

  25-year old = 25 hours

  75-year old = 75 hours
- If, necessary to use a benzodiazepine in the elderly, use shorter-acting benzodiazepines should be used in the elderly (Restoril (temazepam), Serax (oxazepam), Ativan (lorazepam), Xanax (alprazolam), Halcion (triazolam)

INCREASE by 1% per year of clotting factors

- Who clots more? An 80-year-old or an 8-year-old
- DVTs are most common in elderly; High risk group due to more sedentary, more hip and prostate surgeries; chronic diseases; more cancer
- TIMING: 7:30 a.m. for PE symptoms
- ACS (acute coronary syndromes) are more common in the elderly; 7-10 a.m. for MI presentation
- “Wake up” strokes
- SARS-CoV-2 (COVID-19) triggers the clotting system
- Anti-coagulants are very popular drugs in the elderly!



Treatment of acute coronary syndromes—anti-platelet therapy--ASPIRIN

- Chew an aspirin immediately!! Inhibit platelet aggregation—Aspirin 325 mg—reduces 35-day mortality rate by 20%
- Chewed aspirin takes five minutes to reduce TXA2 (thromboxane A2) concentrations by 50%; a swallowed tablet takes 12 minutes.
- it takes ***14*** minutes for the chewed tablet to produce **maximal** platelet inhibition; and the swallowed tablet ***26*** minutes
- Long-term therapy—LD-aspirin (81 mg) daily continued indefinitely for all patients with documented CAD (see next slide for weight and ASA daily dose)
- Enteric coated w/ a GI history and add a PPI (Esomeprazole/Nexium) or OTC famotidine/Pepcid with LD-aspirin

ASPIRIN ALERT! Does the patient's weight make a difference when prescribing low-dose aspirin?

- Daily, low-dose aspirin (75-100 mg) = reduced risk in patients weighing less than 70 kg (154 lbs),
- No significant effect for heavier patients. 80% of the men in the trials weighed over 70 kg (154 lbs) and nearly half of the women weighed more than 70 kg (154 lbs). Uh-oh.
- In the heavier group, low-dose aspirin may be even less effective in smokers and in those who take enteric-coated aspirin.
- Bottom line? High-dose aspirin (300-325 or 500 mg) was effective in reducing primary cardiovascular events only in patients weighing 70 kg (154 lbs) or more.
- Explanation? Yes. People with a higher body mass may have more esterases, which clear aspirin quicker and would subsequently reduce the bioavailability of the drug. (Rothwell, PM, et al. Lancet, July, 2018)

Anti-platelet therapy

- $P2Y_{12}$ blockers—a different MOA than aspirin
- Clopidogrel (Plavix)— post-stent surgery; reduced effectiveness with esomeprazole (Nexium) or omeprazole (Prilosec)
- prasugrel (Effient)—more effective (and more expensive) than Plavix; BUT, more bleeding
- ticagrelor (Brilinta)—BID; More effective than clopidogrel with similar risk of bleeding; only take with low-dose (81 mg aspirin); faster onset and elimination; also binds platelets irreversibly

Dual anti-platelet therapy (DAPT)—new guidelines (AHA/ACC—2016)

- Overall, DAPT—aspirin + P2Y12 receptor inhibitor such as clopidogrel/Plavix, prasugrel/Effient, or ticagrelor/Brilinta—should be given for a minimal period of time—usually 6-12 months
- Longer treatment with patients with higher ischemic risk but lower bleeding risk—example, patients with ACS + stent—treat for full 12 months
- Shorter Rx duration for higher bleeding risk patients—patients taking oral anticoagulants

Anti-coagulation is popular in the geriatric patient

- Anticoagulation with warfarin/Coumadin
- INR monitoring with warfarin– maintain INR between 2-3; mitral valve disease or mechanical prosthetic valves—INR 2.5 to 3.5
- Dietary considerations are important as are numerous drug interactions
- Steady diet of greens and alcohol—
- Not as popular to use warfarin these days…

Enter the DOACs (direct oral anticoagulants)

- Work as well as warfarin, faster than warfarin, less likely to cause major bleeding in most situations; do not need overlap with injectable anticoagulants

FACTOR Xa inhibitors—the "abans"

- Api**xa**ban (Eliquis) (less strokes, less bleeding)
- Rivaro**xa**ban (Xarelto)
- Edo**xa**ban (Savaysa)
- Andexxa (adexanet alfa)—the antidote for the "abans" was approved in March, 2017. It is a genetically modified variant of human factor Xa. It acts as a decoy, binding to the factor Xa inhibitors (the "abans") and neutralizing their effects. Anti-factor Xa activity isreduced within 2-5 minutes by 94% a 400-mg IV bolus.

DIRECT THROMBIN INHIBITOR

- Dabagatran (Pradaxa)—direct thrombin inhibitor—antidote—PRAXBIND; two intravenous bolus doses of idarucizumab (2.5 g) no more than 15 minutes apart.

1% rule and the INCREASE in size of the prostate gland with aging=BPH

- Benign prostatic hypertrophy—alpha one receptors on the smooth muscle of the prostate; smooth muscle enlarges with aging; testosterone and growth of prostate
- Frequent urination; urinary retention
- Treatment of BPH—alpha one blockers—tamsulosin (Flomax), + generic; silodosin (Rapaflo), doxazosin ER (Cardura XL)
- The “sterides” block testosterone– finasteride (Proscar), dutasteride (Avodart)
- Prostate cancer—risk increases with age
- Protect that prostate!
- Vitamin D and prostate protection

Get that prostate out in the sun!

Thank you.

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Q & A

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