HEALTH MAINTENANCE

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IM Clerkship

OBJECTIVES

- Identify guiding principles and organizations that provide the framework for routine health maintenance in Internal Medicine

- Understand the screening schedules for cancer, tobacco use, depression and osteoporosis

- Identify methods and tools used to screen for the above conditions

WHY SCREEN?

- Saves lives

- Decrease disease burden

- Saves money

- No evidence for routine physical exam

  - Having an established PCP increases likelihood of completing recommended screenings

RISKS OF SCREENING

- False Positives
  - Anxiety inducing
- Complications related to follow-up diagnostic tests
- Over diagnosis of conditions that would not have been clinically relevant
- Cost

CHALLENGES TO SCREENING

- Time
- Intricacies
- Large scope
- Insurance coverage
- Who do we listen to?

Adult Preventive Health Care Schedule: Recommendations from the USPSTF (as of April 5, 2016)

To be used in conjunction with USPSTF recommendation statements for additional details (see accompanying tables and references)

Only grade A/B recommendations are shown

USPSTF screening recommendations

Age	18	20	21	24	25	35	40	45	49	50	55	65	70	74	75	79	80
Alcohol misuse[1]	(B)																
Depression[2]	(B)																
Hypertension[3]	(A)																
Obesity[4]	(B)																
Tobacco use and cessation[5]	(A)																
HIV infection[6]	(A)											(A) **if at increased risk**					
Hepatitis B virus infection[7]	(B) **if at increased risk**																
Syphilis[8]	(A) **if at increased risk**																
BRCA gene screening[9]	(B) **if appropriate family history**																
Chlamydia and gonorrhea[10]	(B) if sexually active				(B) **if at increased risk**												
Intimate partner violence[11]	(B) childbearing-aged women																
Cervical cancer[12]			(A) Pap smear every 3 years, or every 5 years with human papillomavirus cotesting starting at age 30														
Lipid disorder[13]		(B) if increased CHD risk				(A)											
Lipid disorder[13]		(B) if increased CHD risk						(A) if increased CHD risk									
Abnormal glucose/diabetes[14]							(B) if overweight or obese										
Hepatitis C virus infection[15]	(B) **if at high risk**									(B) birth years 1945-1965		(B) **if at high risk**					
Colorectal cancer[16]										(A)							
Breast cancer[17]										(B) biennial screening							
Lung cancer[18]											(B) if 30 pack-years and current or former smoker (quit in past 15 years)						
Osteoporosis[19]										(B) if ≥ 9.3% 10-year fracture risk		(B)					
Abdominal aortic aneurysm[20]												(B) if an "ever smoker"					
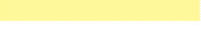
USPSTF preventive medications recommendations

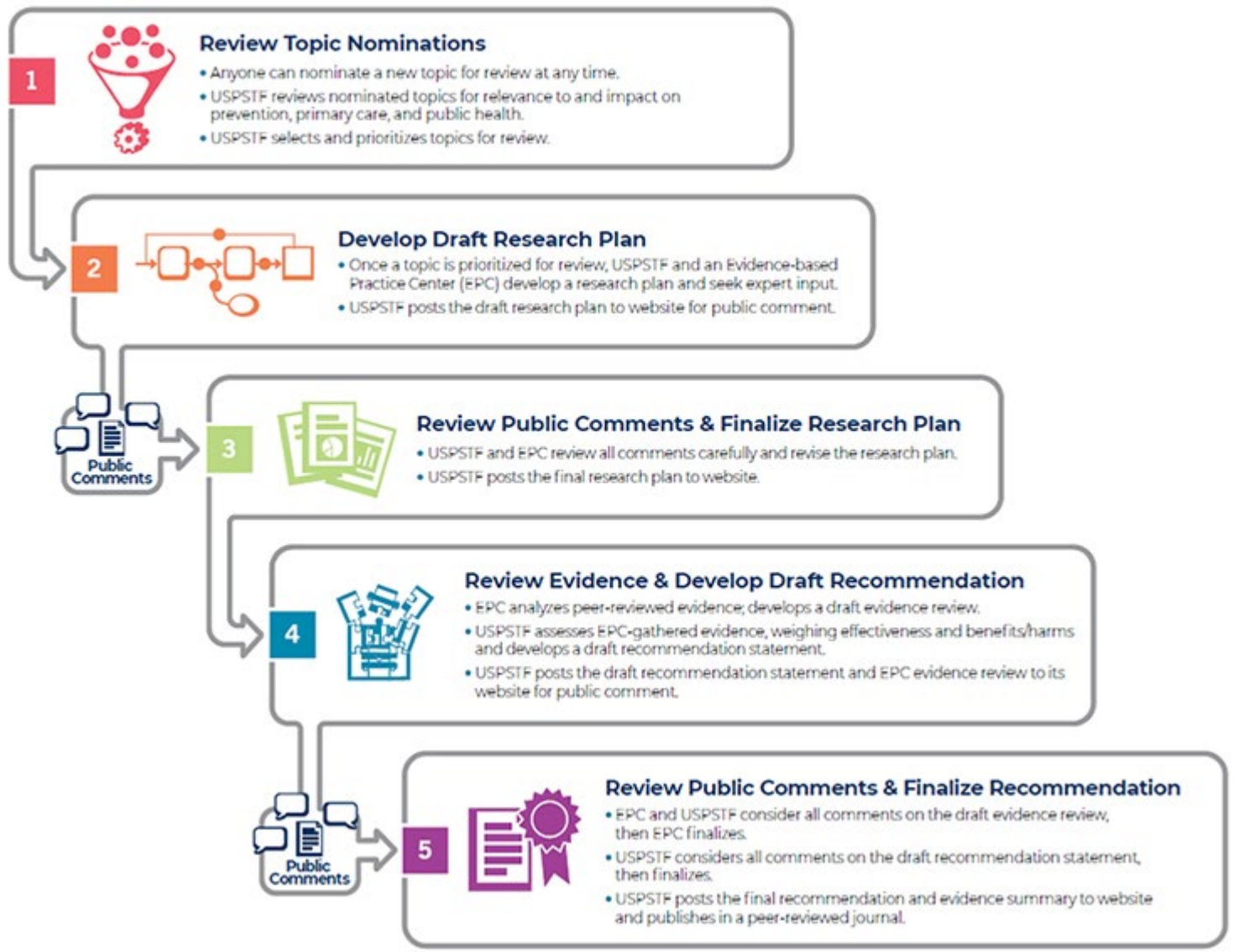| Recommendation	Normal risk	With specific risk factor
Primary prevention breast cancer[21]		(B) **if at increased risk** and only after shared decision making
Folic acid supplementation[22]	(A) if capable of conceiving	
Aspirin for cardiovascular risk[23]		(A) if benefit of aspirin > risk
		(A) if benefit of aspirin > risk
Fall prevention (vitamin D)[24]		(B) if community dwelling and increased fall risk

USPSTF counseling recommendations

Recommendation	Normal risk	With specific risk factor
Sexually transmitted infection prevention[25]	(B) **if at increased risk**	
Diet/activity for CVD prevention[26]	(B) if overweight or obese and with **additional CVD risk**	
Skin cancer prevention[27]	(B) if fair skinned	

Legend

	Normal risk	With specific risk factor
Recommendation for men and women		
Recommendation for men only		
Recommendation for women only		

Recommendation grades

A Recommended (likely significant benefit)
B Recommended (likely moderate benefit)
C Do not use routinely (benefit is likely small)
D Recommended against (likely harm or no benefit)
I Insufficient evidence to recommend for or against

CHD = coronary heart disease; CVD = cardiovascular disease; HIV = human immunodeficiency virus; USPSTF = U.S. Preventive Services Task Force.

Visual adaptation from recommendation statements by Swenson PF, Lindberg C, Carrilo C, and Clutter J.

U.S. PREVENTIVE SERVICES TASK FORCE

- Volunteer task force of 16 appointed experts

  - IM, FM, OB/GYN, Pediatrics, Behavioral Health and nursing

- Evidence based development of clinical guidelines

- Reviews conditions that cause "a large burden of suffering to society" AND with "a potentially effective preventive service"

1 Review Topic Nominations

- Anyone can nominate a new topic for review at any time.
- USPSTF reviews nominated topics for relevance to and impact on prevention, primary care, and public health.
- USPSTF selects and prioritizes topics for review.

2 Develop Draft Research Plan

- Once a topic is prioritized for review, USPSTF and an Evidence-based Practice Center (EPC) develop a research plan and seek expert input.
- USPSTF posts the draft research plan to website for public comment.

Public Comments

3 Review Public Comments & Finalize Research Plan

- USPSTF and EPC review all comments carefully and revise the research plan.
- USPSTF posts the final research plan to website.

4 Review Evidence & Develop Draft Recommendation

- EPC analyzes peer-reviewed evidence; develops a draft evidence review.
- USPSTF assesses EPC-gathered evidence, weighing effectiveness and benefits/harms and develops a draft recommendation statement.
- USPSTF posts the draft recommendation statement and EPC evidence review to its website for public comment.

Public Comments

5 Review Public Comments & Finalize Recommendation

- EPC and USPSTF consider all comments on the draft evidence review, then EPC finalizes.
- USPSTF considers all comments on the draft recommendation statement, then finalizes.
- USPSTF posts the final recommendation and evidence summary to website and publishes in a peer-reviewed journal.

USPSTF GRADED RECOMMENDATIONS

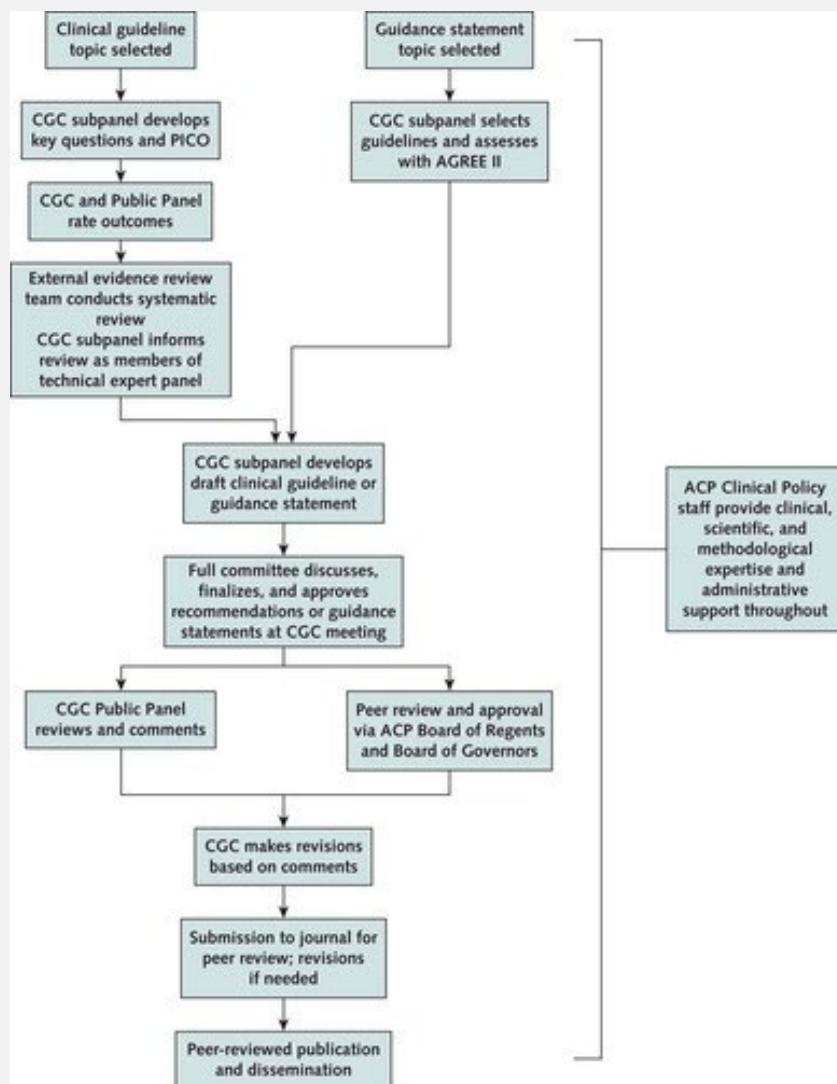| Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

Task Force Process Notes
The Task Force rates magnitude of net benefit as substantial, moderate, small, or ze[...]
"Substantial" net benefit indicates that the benefits substantially outweigh the har[...]
"zero/negative" net benefit indicates that the harms equal or outweigh the benefit[...]

Grade	Definition
A	The USPSTF recommends the service. There is a high certainty the net benefit is substantial.
B	The USPSTF recommends the service. There is a high certainty the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.
C	The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least a moderate certainty that the net benefit is small.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, or poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

AMERICAN COLLEGE OF PHYSICIANS

- Clinical Guideline Committee – 12 IM physicians + 2 public members

- "rigorous standards to ensure…trustworthy, high-quality, and useful products"

- Clinical Practice Guidelines are based on systematic review of evidence

- High Value Care Task Force – focus on value/cost

Clinical guideline topic selected

↓

CGC subpanel develops key questions and PICO

↓

CGC and Public Panel rate outcomes

↓

External evidence review team conducts systematic review
CGC subpanel informs review as members of technical expert panel

Guidance statement topic selected

↓

CGC subpanel selects guidelines and assesses with AGREE II

↓

CGC subpanel develops draft clinical guideline or guidance statement

↓

Full committee discusses, finalizes, and approves recommendations or guidance statements at CGC meeting

↓

CGC Public Panel reviews and comments

Peer review and approval via ACP Board of Regents and Board of Governors

↓

CGC makes revisions based on comments

↓

Submission to journal for peer review; revisions if needed

↓

Peer-reviewed publication and dissemination

ACP Clinical Policy staff provide clinical, scientific, and methodological expertise and administrative support throughout

Grading Certainty of Evidence	
High	Confident that the true effect is close to the estimated effect.
Moderate	Moderately confident in the effect estimate: The true effect is likely close to the estimated effect, but there is a sizable possibility that it is substantially different.
Low	Confidence in the effect estimate is limited: The true effect may be substantially different from the estimated effect.

Grading Recommendations				
Strength	Certainty of Evidence	Balance of Benefits and Harms	Applicable Patient Population	Policy Implication
Strong	High or moderate Low only in very rare circumstances	Confidence that benefits clearly outweigh risks and burden or vice versa.	Applies to most patients in most circumstances.	Only strong recommendations could be considered for use as performance measures.

Example from ACP's guideline on treatment of major depressive disorder: "ACP recommends that clinicians select between either cognitive behavioral therapy or second-generation antidepressants to treat patients with major depressive disorder after discussing treatment effects, adverse effect profiles, cost, accessibility, and preferences with the patient (Grade: strong recommendation, moderate-quality evidence)" (7).

| Conditional | High, moderate, or low | Benefits probably outweigh risks and burden, or vice versa, but there is appreciable uncertainty. | Applies to many patients but may differ depending on circumstances or patients' values and preferences. | Policymaking will require substantial debates and involvement of many stakeholders. Policies are also more likely to vary between regions. Performance indicators would have to focus on the fact that adequate deliberation about the management options has taken place. |

Example from ACP's guideline on noninvasive treatments of acute, subacute, and chronic low back pain: "In patients with chronic low back pain who have had an inadequate response to nonpharmacologic therapy, clinicians and patients should consider pharmacologic treatment with nonsteroidal anti-inflammatory drugs as first-line therapy, or tramadol or duloxetine as second-line therapy. Clinicians should only consider opioids as an option in patients who have failed the aforementioned treatments and only if the potential benefits outweigh the risks for individual patients and after a discussion of known risks and realistic benefits with patients. (Grade: weak recommendation, moderate-quality evidence)" (8).

19 year old female presenting for annual physical.

Recently became sexually active with her boyfriend. She heard she should come in for a for gyne exam.
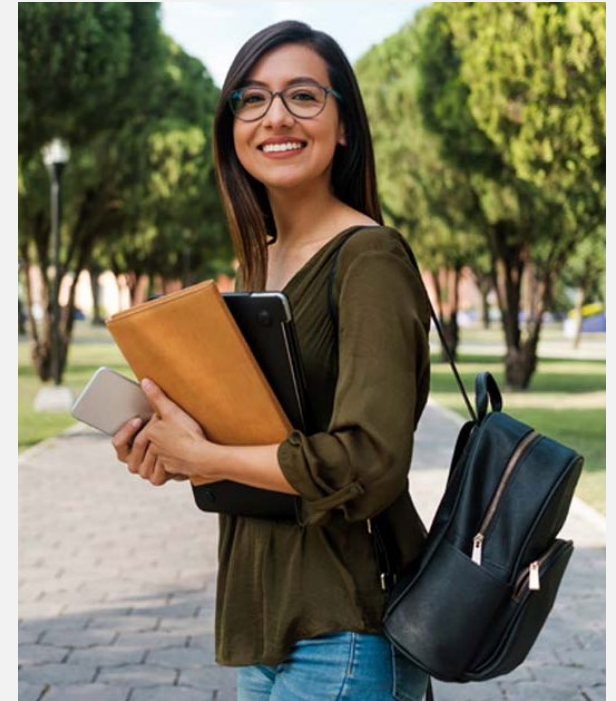
ROS: unremarkable

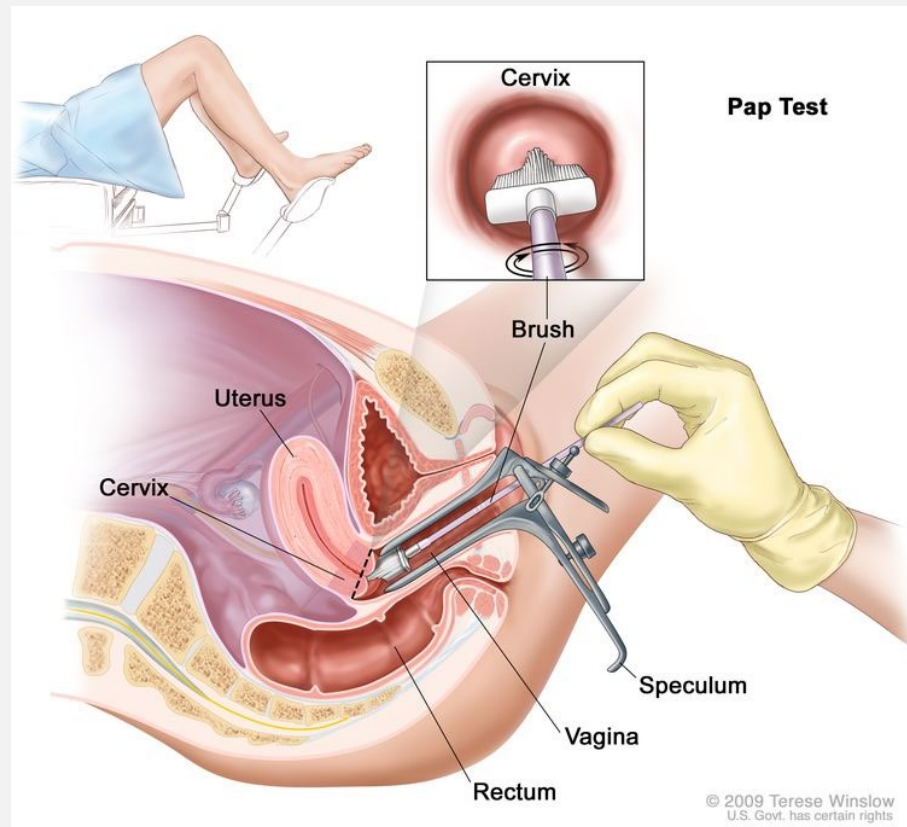PMH / PSH: unremarkable and she is up to date on all vaccines

FH: breast cancer in mother (diagnosed at 45yo)

Social Hx:

- No tobacco/nicotine
- Has tried marijuana and has a few sips of alcohol at parties
- Sexually active with one male partner – using condoms
- Sophomore at University of IL, studying engineering

CERVICAL CANCER SCREENING

- Fourth most common cancer among women
- 4,000 deaths annually in U.S.
- Almost all cervical cancer is caused by HPV infection
- High Risk HPV (hrHPV)
  - 15 types can lead to cervical cancer
  - 16, 18, 31, 33, 35, 45, 52, 58 are most common
  - 71% of cases are from 16 (50%) & 18
- Up to 93% of cervical cancer is preventable by screening and HPV vaccine

Missed opportunities for cervical cancer screening

In 2012, **8 million women** were not screened in the last **5 years.**
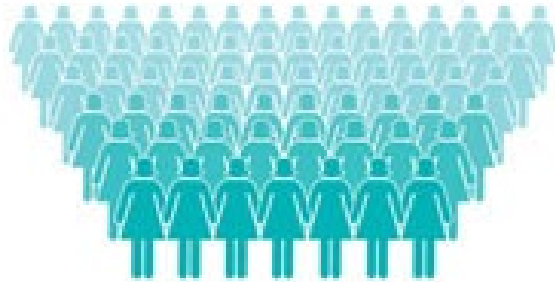
7 out of 10 women who were not screened had a regular doctor and health insurance.

SOURCE: Behavioral Risk Factor Surveillance System, 2012.

How HPV infection can lead to cervical cancer

It could take years to decades

Normal cervical cells

HPV infection
(Most infections do not turn into precancers)

Precancers
(May still go back to normal)

Cervical cancer

Vaccination opportunity
11-12 years old

Screening opportunities
21-65 years old

SOURCE: American Journal of Clinical Pathology, 2012.

No woman should die of cervical cancer
Screening leads to fewer deaths

Cervical cancer deaths per 100,000 women

We can do better.

SOURCE: National Cancer Institute, 2014

USPSTF RECOMMENDATIONS

Population	Women aged 21 to 29 years	Women aged 30 to 65 years	Women younger than 21 years, women older than 65 years with adequate prior screening, and women who have had a hysterectomy
Recommendation	Screen for cervical cancer every 3 years with cytology alone. Grade: A	Screen for cervical cancer every 3 years with cytology alone, every 5 years with hrHPV testing alone, or every 5 years with cotesting. Grade: A	Do not screen for cervical cancer. Grade: D
Risk Assessment	All women aged 21 to 65 years are at risk for cervical cancer because of potential exposure to high-risk HPV types (hrHPV) through sexual intercourse and should be screened. Certain risk factors further increase risk for cervical cancer, including HIV infection, a compromised immune system, in utero exposure to diethylstilbestrol, and previous treatment of a high-grade precancerous lesion or cervical cancer. Women with these risk factors should receive individualized follow-up.		
Screening Tests	Screening with cervical cytology alone, primary testing for hrHPV alone, or both at the same time (cotesting) can detect high-grade precancerous cervical lesions and cervical cancer. Clinicians should focus on ensuring that women receive adequate screening, appropriate evaluation of abnormal results, and indicated treatment, regardless of which screening strategy is used.		
Treatments and Interventions	High-grade cervical lesions may be treated with excisional and ablative therapies. Early-stage cervical cancer may be treated with surgery (hysterectomy) or chemotherapy.		

BREAST CANCER SCREENING

- 2D digital mammo (xrays from 2 main planes)
- DBT (digital breast tomosynthesis/3D mammo)
  - increased detection of low grade cancers
  - moving xray source to turn 2d pics into 3d reconstructed images
- Clinical breast exam
- Ultrasound
- MRI

DENSE BREAST TISSUE

- Increased risk of breast cancer and decreased sensitivity of mammogram

- Majority of women with dense breasts will NOT develop breast cancer

- IL law requires women to be notified of dense tissue on mammogram

- 3D mammo may have fewer false positives, but has 2X higher radiation than regular mammogram

- USPSTF - Grade I - insufficient evidence to recommend DBT or adjunctive MRI or US

Population	Women aged 40 to 49 y	Women aged 50 to 74 y	Women aged ≥75 y
Recommendation	The decision to start screening should be an individual one. Grade: C	Screen every 2 years. Grade: B	No recommendation. Grade: I statement (insufficient evidence)

Risk Assessment	These recommendations apply to asymptomatic women aged ≥40 y who do not have preexisting breast cancer or a previously diagnosed high-risk breast lesion and who are not at high risk for breast cancer because of a known underlying genetic mutation (such as a *BRCA1* or *BRCA2* gene mutation or other familial breast cancer syndrome) or a history of chest radiation at a young age. Increasing age is the most important risk factor for most women.		
Screening Tests	Conventional digital mammography has essentially replaced film mammography as the primary method for breast cancer screening in the United States. Conventional digital screening mammography has about the same diagnostic accuracy as film overall, although digital screening seems to have comparatively higher sensitivity but the same or lower specificity in women age <50 y.		
Starting and Stopping Ages	For women who are at average risk for breast cancer, most of the benefit of mammography results from biennial screening during ages 50 to 74 y. While screening mammography in women aged 40 to 49 y may reduce the risk for breast cancer death, the number of deaths averted is smaller than that in older women and the number of false-positive results and unnecessary biopsies is larger. The balance of benefits and harms is likely to improve as women move from their early to late 40s.		
Screening Interval	For most women, biennial mammography screening provides the best overall balance of benefit and harms.		
Balance of Benefits and Harms	The net benefit of screening mammography in women aged 40 to 49 y, while positive, is small.	The net benefit of screening mammography in women aged 50 to 74 y is moderate.	Evidence on mammography screening in women aged ≥75 y is insufficient, and the balance of benefits and harms cannot be determined.
Other Relevant USPSTF Recommendations	The USPSTF has made recommendations about the use of medications to reduce women's risk for breast cancer, as well as risk assessment, genetic counseling, and genetic testing for *BRCA1*- or *BRCA2*-related cancer (including breast cancer). These recommendations are available on the USPSTF Web site (www.uspreventiveservicestaskforce.org).		

Table. Summary of Included Recommendations in Assessed Guidelines for Breast Cancer Screening of Average-Risk Women

Guideline, Year (Reference)	CBE	Age to Start Screening Mammography or Initiate Discussions About Screening	Age to Stop Screening Mammography	Screening Interval
ACOG, 2017 (8)	Recommend doing CBE	40 y (discuss; offer if chosen by SDM) 50 y (start screening if not previously started)	≥75 y	Annual or biennial
ACR, 2017 (9)	No recommendation	40 y (start screening)	None	Annual
ACS, 2015 (4)	Recommend against CBE	40–44 y (discuss; offer if chosen by SDM) 45 y (start screening)	Life expectancy <10 y	Annual for age 45-54 y Biennial for age ≥55 y
CTFPHC, 2018 (7)	Recommend against CBE	50 y (start screening)	No recommendation*	Every 2–3 y
NCCN, 2018 (10)	Recommend doing CBE	40 y (start screening)	None	Annual
USPSTF, 2016 (5)	No recommendation†	40–49 y (discuss; offer if chosen by SDM) 50 y (start screening)	75 y	Biennial
WHO, 2014 (6)	Recommend doing CBE (low-resource settings only)	50 y (start screening)	75 y	Biennial

ACOG = American College of Obstetricians and Gynecologists; ACR = American College of Radiology; ACS = American Cancer Society; CBE = clinical breast examination; CTFPHC = Canadian Task Force on Preventive Health Care; NCCN = National Comprehensive Cancer Network; SDM = shared decision making; USPSTF = U.S. Preventive Services Task Force; WHO = World Health Organization.
* The CTFPHC guideline addressed only women aged 40-74 y.
† The 2009 USPSTF guideline, which the authors did not formally assess for this paper, addressed and found insufficient evidence for CBE (11).

https://www.acpjournals.org/doi/10.7326/M18-2147?_ga=2.229390616.541363294.1626908743-1682196985.1626908743&

Appendix Table 1. Scaled AGREE II Domain Scores for Each Guideline and Overall Assessment

Variable	ACOG	ACR	ACS	CTFPHC	NCCN	USPSTF	WHO
Scaled domain score, %*							
Scope and purpose	82	54	96	92	52	88	92
Stakeholder involvement	36	32	83	73	46	79	70
Rigor of development	33	17	73	81	20	88	83
Clarity of presentation	79	58	88	88	52	87	82
Applicability	19	4	28	70	12	39	68
Editorial independence	23	13	62	87	33	75	77
Overall guideline assessment							
Average overall quality rating (out of 7)†	3.6	2.4	6.0	6.0	2.6	6.0	5.5
Response (number of reviewers) to the question, "Would you recommend this guideline for use?"	No (3) Yes with modifications (2)‡	No (4) Yes with modifications (1)§	Yes (2) Yes with modifications (3)‖	Yes (4) Yes with modifications (1)¶	No (5)	Yes (3) Yes with modifications (2)**	Yes (3) Yes with modifications (2)††

ACOG = American College of Obstetricians and Gynecologists; ACR = American College of Radiology; ACS = American Cancer Society; AGREE II = Appraisal of Guidelines for Research and Evaluation II; CTFPHC = Canadian Task Force on Preventive Health Care; NCCN = National Comprehensive Cancer Network; USPSTF = U.S. Preventive Services Task Force; WHO = World Health Organization.
* The scaled domain score is calculated as follows: (obtained score − minimum possible score) ÷ (maximum possible score − minimum possible score).
† Final overall assessment questions on AGREE II.
‡ Reviewers suggested a need for more clarity about systematic review methods, a list of individuals involved in guideline development, and more clarity on how and where they are getting their data. This is a review of guidelines, not an original guideline.
§ Reviewers suggested a need for introductory paragraphs about methodology of literature review and explanations on guideline implementation.
‖ Reviewers suggested a need for more clarity around weighting of balance of benefits and harms, specifically around exact age to start and intervals of screening; needs clearer age group divisions and upper age limit; and needs to address limited life expectancy. Reviewers disagreed with recommended start age of 40 y when the benefits are at age 45 y.
¶ Reviewers disagreed with recommendation against screening women aged 40–49 y.
** Reviewers suggested a need for a section discussing the methods for developing the guideline (including decision models and voting procedures). Use the "clinical considerations" sections to target women in order to avoid unnecessary and/or harmful screening in older women, those with comorbidities, and those in whom the magnitude of benefit does not appear to outweigh harms, and inform them that it may reduce breast cancer mortality in a very few but will not increase length of life and has harms.
†† Reviewers had concerns about applicability for U.S. population, and screening women aged 40–49 y and ≥75 y should be addressed. Benefit is not clear for different resource settings.

You are about to walk out of the room when you remember to glance at the patient's PHQ9 Depression Screen and see that her score is 10. On further discussion, you find:

- School has been very challenging

- Difficult course work, some difficulty concentrating

- Not getting along well with roommates

- Takes her 1-2 hours to fall asleep most nights. She does not want to wake up in the morning and sometimes misses her morning classes.

- Decreased appetite, has a pit in her stomach most of the day

- No suicidal or homicidal ideation

DEPRESSION SCREENING

- USPSTF
  - Screen for depression in all adults 18 years and older
  - Need adequate systems in place for adequate diagnosis, treatment and follow up
  - Grade B

- Most patients with depression are more likely to visit PCP than Psychiatrist

RISKS

- Family history

- Women

- Young and middle-aged adults

- Non-white ethnicity

- Undereducated

- Unemployed

- Previously married

- Elderly patients with poor health status, disability or loneliness

RISKS

- Underlying medical conditions
  - Hypothyroidism
  - Anemia
  - Hypercortisolism
  - Adrenal Insufficiency
  - Parkinson's Disease
  - Obstructive Sleep Apnea

- Substance Use or Withdrawal
- Medications
  - Beta blockers
  - Opiates
  - Steroids
  - Barbiturates
  - Chemotherapy agents

EVALUATION

- Consider for new onset, worsening or severe depression

- Focused labs if concern for underlying medical condition based on H&P

- Imaging typically not indicated

- Blood: CBC, CMP, TSH, RPR

- Urine: UA, pregnancy, toxicology screen

SCREE

- S - Sleep
- I – Interest deficit / anhedonia
- G – guilt / worthlessness / hopelessness
- E – energy deficit
- C – concentration deficit
- A – appetite disorder
- P – psychomotor retardation or agitation
- S – suicidal ideation

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

NAME: _____ DATE: _____

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?
(use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3

add columns: _____ + _____ + _____

(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card.) TOTAL: _____

10. If you checked off *any* problems, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all _____
Somewhat difficult _____
Very difficult _____
Extremely difficult _____

PHQ-9 score	Severity/provisional diagnosis	Treatment recommendations
<5	Community norm	No action recommended
5-9	Mild symptoms	Watchful waiting, self-management education, periodic rescreening
10-14	Major depression, mild	Pharmacotherapy or psychotherapy, creation of a treatment and follow-up plan, education, reevaluation
15-19	Major depression, moderately severe	Immediate institution of treatment (pharmacotherapy and/or psychotherapy)
≥20	Major depression, severe	Pharmacotherapy AND psychotherapy, referral

Adapted from MacArthur Initiative on Depression and Primary Care,[13] with permission.

In summary:

- Pap smear - start at 21 years old
  - Screen for STI's and encourage safe sex practices
- Breast Cancer Screening - start at 35 years old with at least annual mammogram
  - Further screenings pending mom's BRCA status and further risk assessment
- Depression - mild
  - She would like to work on exercise, meditation and seeing a therapist
  - Discussed possibility for medications, but she declines today
  - Will follow up in 1 month

42 year old male with hypertension. Dad (65yo) was just diagnosed with colon cancer and patient wants to be checked for everything.

He overall feels well. He strictly adheres to his regimen of daily Lisinopril. Denies any blood in the stool, abdominal discomfort or change in bowel habits.

ROS: unremarkable

PMH: HTN

PSH: no past surgeries

FH: dad with colon cancer; paternal grandfather also with h/o colon cancer

Social Hx:

- No tobacco or drug use
- 2 beers on Friday after work
- Generally healthy, well balanced diet; runs 5 days a week for exercise
- Work is sedentary - accountant

COLON CANCER

- #2 cause of cancer mortality in men and women in the U.S.
- Rates of screening increase with counseling from a healthcare provider
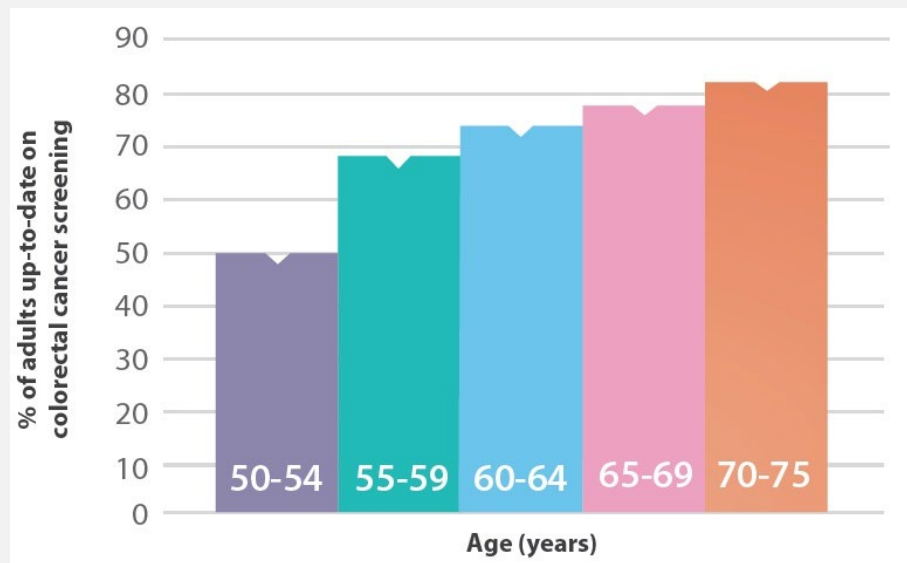
SCREENING

- USPSTF - updated 2021
  - Screen everyone 45yo - 75yo
  - Start at 45yo (grade B)
  - Start at 50yo (grade A)
  - 76-85 yo - consider based on perceived risk vs benefit

- ACP – updated 2016
  - screen all adults 50-75

HOW TO SCREEN

- High-sensitivity guaiac fecal occult blood test (HSgFOBT) or fecal immunochemical test (FIT) every year

- Stool DNA-FIT every 1 to 3 years

- Computed tomography colonography every 5 years

- Flexible sigmoidoscopy - every 5 years

- Flexible sigmoidoscopy - every 10 years + annual FIT

- Colonoscopy - every 10 years

STOOL TESTS

- High sensitivity guaiac fecal occult blood test

  - Hemoccult SENSA - Sensitivity 50-75%, Specificity 96-98%

  - Avoid NSAIDs, red meat and Vit C 3-7 days prior

  - 3 stool samples - colonoscopy if any are abnormal

  - In office DRE with one time hemoccult is NOT sufficient testing

- FIT (fecal immunochemical testing)

  - No dietary or medication restrictions

  - Easier, one time sample collection

  - OC Sensor tests (Polymedco) – Sensitivity 74%, Specificity 94%

STOOL DNA-FIT TEST / COLOGUARD

- Looks for abnormal DNA found in colon cancer / cancerous polyps AND occult blood

- Every 3 years

- Sensitivity 93%

- Specificity 85%

COLONOSCOPY

- Direct visualization with colonoscope

- Immediate intervention – biopsy or polyp removal

- For adenomas $\geq$ 10mm

  - Sensitivity 89-95%; Specificity 89%

- Adenomas $\geq$ 6mm

  - Sensitivity 75-93%; Specificity 94%

- Cons: Bowel prep, sedation

- Risks: perforation and bleeding - increase with age

FLEXIBLE SIGMOIDOSCOPY

- 10-20 minutes

- In-office procedure

- No sedation required; prep not as extensive

- 41-45% of colon cancers are in the right side of the colon (UTD)
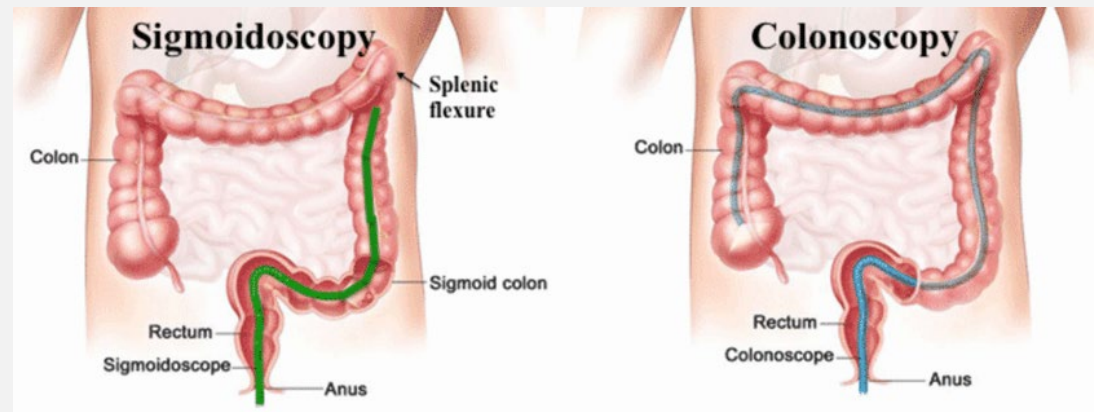
CT COLONOGRAPHY

- Still requires prep

- Uses air enema during CT scan for optimal images

- Radiation exposure

- Adenomas $\geq$ 10mm

  - Sensitivity 89%; Specificity 94%

- Adenomas $\geq$ 6mm

  - Sensitivity 86%; Specificity 88%

COST

Table 3. Summary of Costs Associated With CRC Screening Tests in the United States

Screening Strategy	Unit Cost, $	Frequency	10-Year Cost, $*
gFOBT†	6-28	Annual	60-280
gFOBT†	6-28	Every 2 y	30-140
FIT‡	20	Annual	200
FIT‡	20	Every 2 y	100
Sigmoidoscopy† without biopsy	715-3384	Every 5 y	1430-6768
Colonoscopy (screening)†	911-6946+	Every 10 y	911-6946+
CT colonography (no contrast)†	337-1538+	Every 5 y	674-3076+
sDNA‡	509	Every 3 y	1527 (3 screenings)

CRC = colorectal cancer; CT = computed tomography; FIT = fecal immunochemical test; gFOBT = guaiac-based fecal occult blood test; sDNA = stool DNA panel.
* For the screening test only; does not account for follow-up testing after a positive initial result.
† From reference 25, for ZIP code 19106. Bluebook reports that its costs are paid insurance claims for the locality. Minimum and maximum payments are provided. For some maximum values, Bluebook adds a "+", suggesting that some payments exceed the maximum value provided.
‡ From reference 26.

AVERAGE RISK

- Asymptomatic
- No family history of adenomas or CRC in 1 first degree relative or 2 second degree relatives
  - Start at 40 yo or 10 years prior to diagnosis of family member - whichever comes first
- No personal history of adenomas
  - Every 1-5 years
- No genetic polyposis syndrome
  - Annually
- No IBD
  - Every 1-3 years

PROSTATE CANCER

- USPSTF
  - Discuss with men 55-69yo (grade C)
  - Shared decision making based on risks/benefits and patient preference
  - No screening in men over 70yo
  - Screening is with a PSA blood test

- AUA
  - Shared decision making with men 55-69yo (Grade B)
  - Consider every 2 years to balance risks/benefits (Grade C)
  - No screening for men under 40yo or over 70yo with less than 10 yr life expectancy
  - Consider screening for high risk men 40-55yo

RISK FACTORS

- Age
  - 55-74 years old - 71% of cases in this age group
- African American Men
  - Highest incidence and mortality
- First degree relative with prostate cancer
  - Especially if developed at a younger age or spanning multiple generations
- Family Hx metastatic or lethal adenocarcinomas
  - (prostate, breast, ovarian or pancreatic cancer)

BENEFITS OF SCREENING

- Disease Burden
  - Most commonly diagnosed cancer in US men
  - Second leading cause of cancer death in US men
  - 2.5% in general population
  - 4.2% in African American population
  - 5 year survival almost 100% in localized disease

RISKS OF SCREENING

- Overdiagnosis

- Overtreatment

- Erectile dysfunction

- Urinary complications

- False positives (Sens 21%, spec 91% for cutoff >4)

- Slow progression with minimal clinical significance for most prostate cancers

- 59% of men who die of other causes have been found to have clinically insignificant prostate cancer

PSA

- False elevations:
  - Prostatitis
  - Acute urinary retention
  - Recent catheterization
  - Recent prostate biopsy
  - Recent DRE causes only minimal transient elevation
- Frequency - every 1-2 years
- Correct for age
- Correct for 5-alpha reductase inhibitors (finasteride or dutasteride) - concerning if increasing levels while taking these medicines
- Monitor trends

DIGITAL RECTAL EXAM

- Low sensitivity (51%) and specificity (59%) for detecting prostate cancer
- Low interrater agreement for detecting abnormalities, even among Urologists
- Only detects posterior and lateral abnormalities
- A third are clinically advanced when detected this way
- Does not provide significant additional information to an abnormal PSA

65 year old male with hypertension, hyperlipidemia and diabetes mellitus presenting for a wellness exam. He is recently retired and would like to focus on becoming healthier. While waiting for you in the exam room, he noticed on the BMI chart hanging on the wall that he is in the obese range with a BMI of 31. He feels he really started gaining weight after cutting down on smoking this past year.

ROS: unremarkable; feels overall well

PMH: HTN, HL, DM2
PSH: none
FH: obesity, diabetes and hypertension in both parents and 2 sisters
Social Hx:

- Still smokes about 2 cigarettes per day

- Had a busy, sedentary job as an accountant prior to retirement

- Happily married, 2 children, 1 grandson on the way

SCREENING FOR TOBACCO USE

- USPSTF
  - All adults should be asked about tobacco use, advised to stop using and provided with **behavioral interventions and pharmacotherapy** for cessation

- Tobacco smoking is the leading preventable cause of disease, disability and death in the United States

SCREENING METHODS

- 5 A's
  - Ask, Advise, Assess, Assist, Arrange Follow Up

- Fagerstrom Test for Nicotine Dependence
  - Can help determine appropriate intervention

1. How soon after you wake up do you smoke your first cigarette?

   Within 5 minutes   (3 points)
   5 to 30 minutes   (2 points)
   31 to 60 minutes   (1 point)
   After 60 minutes   (0 points)

2. Do you find it difficult not to smoke in places where you shouldn't, such as in church or school, in a movie, at the library, on a bus, in court or in a hospital?

   Yes   (1 point)
   No   (0 points)

3. Which cigarette would you most hate to give up; which cigarette do you treasure the most?

   The first one in the morning   (1 point)
   Any other one   (0 points)

4. How many cigarettes do you smoke each day?

   10 or fewer   (0 points)
   11 to 20   (1 point)
   21 to 30   (2 points)
   31 or more   (3 points)

5. Do you smoke more during the first few hours after waking up than during the rest of the day?

   Yes   (1 point)
   No   (0 points)

6. Do you still smoke if you are so sick that you are in bed most of the day, or if you have a cold or the flu and have trouble breathing?

   Yes   (1 point)
   No   (0 points)

Scoring: 7 to 10 points = highly dependent; 4 to 6 points = moderately dependent; less than 4 points = minimally dependent.

BEHAVIORAL INTERVENTIONS

- Self-help materials (videos, written materials, etc)

- Quit-lines

- Brief provider interventions (from MD or nurse)

- Intensive counseling – individual or group

- Behavioral counseling

  - 4+ behavioral counseling sessions with 90-300 total minutes of contact time

PHARMACOTHERAPY

- Nicotine Replacement Therapy (NRT)

    - Patches, lozenges and gum – OTC

    - Inhaler and nasal spray (Nicotrol) – prescription

- Bupropion SR (Zyban)

- Varenicline (Chantix)

    - Partial agonist for nicotinic receptor and decreases cravings, withdrawal and rewarding aspects of smoking

ELECTRONIC CIGARETTES

- Benefits

  - Nicotine Replacement

  - Similar sensory aspects as conventional cigarettes

  - Possible superiority to other NRT, though not sufficient data

- Risks

  - Potential pathway to nicotine addiction and tobacco smoking for non-smokers

  - Appeal to adolescents

  - Pathway to relapse for former smokers

  - Potential health harms – many still unknown

  - Toxic to children

  - Inhalation of other toxic substances

    - EVALI with vit E acetate from THC

  - Long term data is lacking

RISKS FOR RELAPSE

- Early withdrawal symptoms

- Higher nicotine dependence severity

- Daily smoking onset at younger age

- Increased quit attempts

- Women

- Psychiatric symptoms – depression and anxiety

- Higher BMI

LUNG CANCER SCREENING

- Low dose CT scan annually

- 50 - 80 years old

- At least 20 pack year smoking history

- Quit less than 15 years ago or still smoking

- Stop screening if

  - Over 15 years since quit date and/or

  - Medical condition that limits life expectancy or ability to have treatment/surgery

74 year old woman presenting for a check-up. She does not like doctors' offices and has not been to a doctor for many years, but her daughter convinced her to come in today. For the past 3 months, she has been feeling more nervous. She has also noticed that her heart sometimes races, her hair seems thinner and her bowel movements are more frequent and loose.

ROS: unremarkable except as listed in HPI
PMH: none

PSH: none

Medications: none

Social Hx:

- Lives alone; husband died 5 years ago

- 2 daughters live close by and she spends a lot of time visiting with friends and family

- Smokes a half pack per day for the past 60 years

- Drinks 1 glass of wine on special occasions; no drug use

She does not want any cancer screenings and says, "cancer does not run in my family. When it's my time, I am ready." She does agree to checking some blood work today and checking her bone density, since she remembers her mother had osteoporosis and broke a hip when she was in her 70's.

CBC, CMP: normal

TSH <0.03 uIU/mL, free T4 1.7 ng/dL

DEXA: Osteoporosis

      T score left femoral neck: -2.9

      T score left total hip: -3.7

      T score lumbar spine: -3.3

OSTEOPOROSIS

- Low bone density that predisposes someone to increased fracture risk

- 2 million fragility fractures annually in the US

  - Vertebral fractures are most common —> kyphosis, loss of height

- 50% of people with hip fractures will never walk without assistance again

- Mortality rate increases by 20% in the 5 years after a hip or vertebral
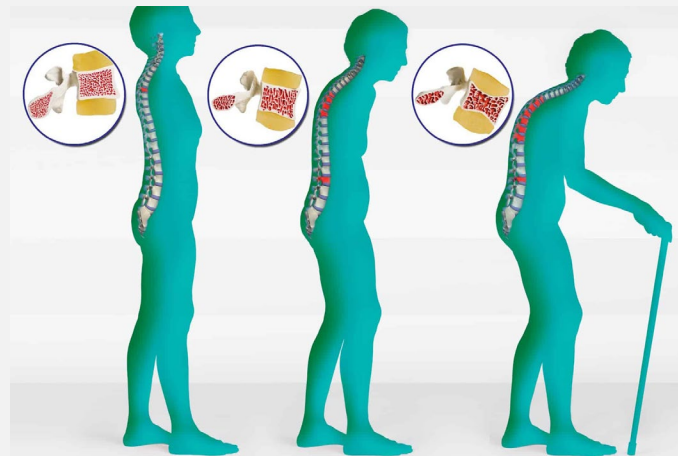
SCREENING RECOMMENDATIONS

USPSTF

- Postmenopausal women 65 years and older (Grade B)
- Postmenopausal women under 65 years old with risk factors (Grade B)
  - First degree relative with hip fracture
  - Tobacco use
  - Low body weight
  - Excess alcohol consumption
  - Consider using a risk assessment tool, such as FRAX
- Insufficient Evidence to make recommendations for screening in men

DEXA SCAN

- Dual Energy Xray Absorptiometry

- Measures bone strength with bone mineral density (BMD)

- Minimal radiation

- Scoring

  - T score - compares BMD to average 30 year old woman

    - Osteopenia: -1 — -2.5

    - Osteoporosis: < -2.5

  - Z score - compares BMD to average person of same age and gender

FRAX

DIAGNOSIS

- Fragility Fracture

- T-score $\leq$ -2.5 at femoral neck or spine without a secondary cause

- T-score -1.0 — -2.5 and a 10 year probability of

  - Hip fracture $\geq$ 3%

  - Major fracture $\geq$ 20%

- Z-scores should be used for men under 50yo and premenopausal women

EVALUATION

- CBC, CMP, TSH, PTH, 25-OH Vitamin D
  - Consider urine calcium, phos, Celiac Panel, SPEP, urine cortisol
  - Other tests based on exam findings

- Consider underlying diagnoses:
  - Cushing's, Hyperthyroidism, Celiac Disease, Myeloma, Hypercalciuria
  - Malignancy, Inflammatory Bowel Disease

TREATMENT

- Treat any underlying etiology

- 1200mg calcium - best absorbed through diet

- At least 800 IU vitamin D

- Exercise

- Smoking cessation

- Antiresorptive Therapy (inhibits osteoclasts from breaking down bone)

  - Bisphosphonates

- Consider DEXA scan every 2-5 years (ACP 5 years)

Back to our patient…

- Treat hyperthyroidism

- Consider bisphosphonate therapy

- Consider Endocrinology referral