



Colorectal Cancer (CRC)

Preventable! Beatable! Treatable!

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Balart, K. Couric, Schlossberg, E. Couric, and Johnson

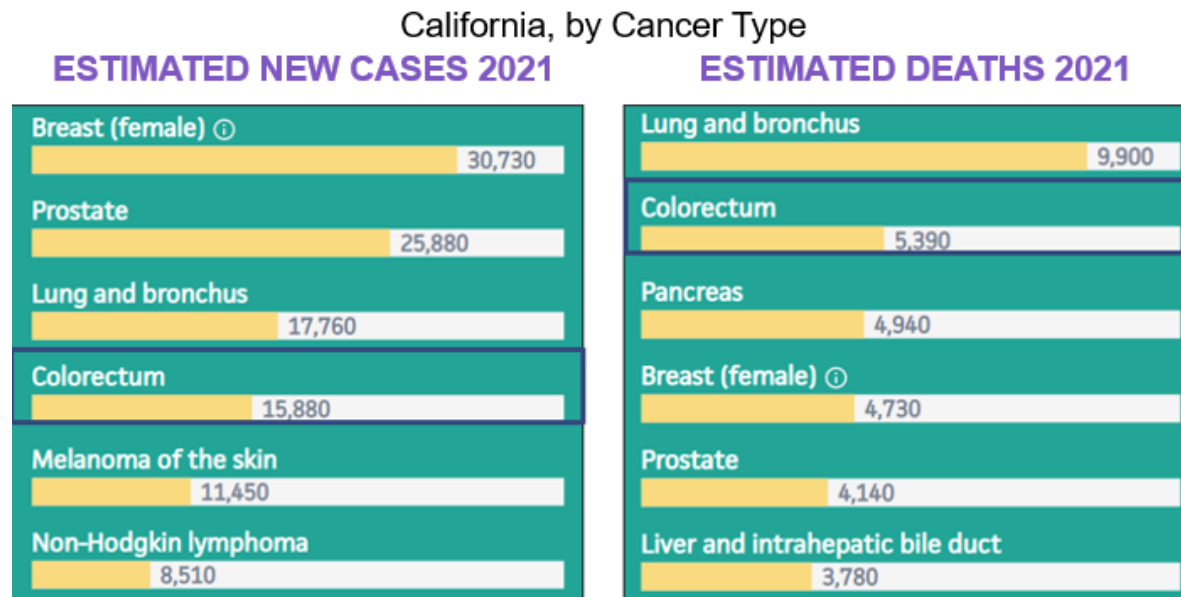
Virginia was the first state to mandate coverage for CRC screening by colonoscopy

Today's Presentation

1. Colon and CRC Facts
2. Importance of Screening
3. Human Microbiome and CRC
4. Final etc...

CRC: The Facts

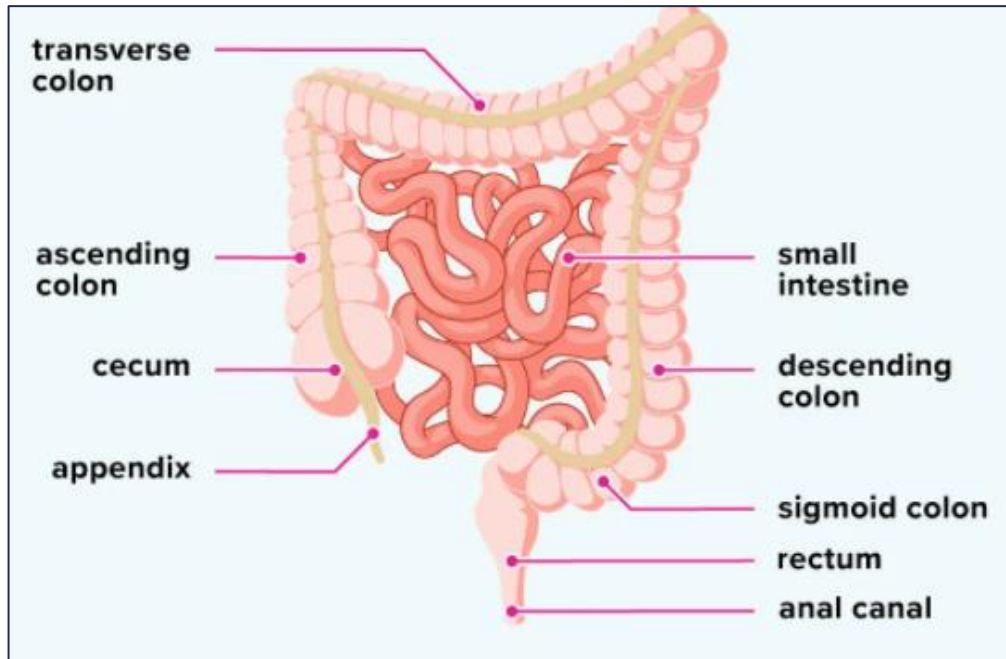
In 2021, estimated >15,000 Californians will receive CRC diagnosis, and estimated 5,300 will die from the disease, not including backlog Covid-19 screening.



Maguire FB, Movsisyan AS, Morris CR, Parikh-Patel A, Keegan, THM, Wun T, Kwong SL, Damesyn M. Cancer in California, 1988-2018: Assessing the Burden of Cancer among Californians. Sacramento, CA: California Department of Public Health, Chronic Disease Surveillance and Research Branch, June 2021.

American Cancer Society, 2021. website: American Cancer Society Guideline for Colorectal Cancer Screening, <https://www.cancer.org/cancer/colon-rectalcancer/detection-diagnosis-staging/acs-recommendations.html>.

Colon / Large Intestine / Bowel



- Absorbs water
- Eliminates waste
- Keeps you regular



CRC Risk Factors You Can't Control

- Age: ≥ 50 (average risk)
 - Recent years troubling rise in CRC rates among people as young as 20's and 30's
- Family history inherited disorders
 - Lynch Syndrome or Familial Adenomatous Polyposis
- Personal History CRC / polyps
- History Inflammatory Bowel Disease
 - Ulcerative colitis and Crohn's colitis
- Family History CRC
 - Close family member (parent or sibling had CRC <50)
 - Several blood relatives had CRC
 - Family pattern certain other cancers (including endometrial, ovarian gastric, urinary tract, brain and pancreatic cancers)

CRC Risk Factors You Can Control

- Lack of exercise.
- Obesity, particularly extra fat around the waist.
- Smoking (studies show that smokers are 30 to 40 percent more likely to die of CRC).
- Drinking too much alcohol.
- Diet high in red, processed, or charred meats.

Why is Screening Important?

- CRC is now more common
 - 2nd leading cause of cancer death in US and California.
 - 1 in 23 lifetime risk developing CRC for men and 1 in 25 lifetime risk in women.
 - 1 in 3 adults ages 50 – 75 NOT getting screened as recommended.
- New screening guidelines
 - GI societies and American Cancer Society now recommend start screening at age 45 for everyone at average risk (previously 50).
 - Certain factors warrant starting younger.
 - Genetics really matters...family history / personal history

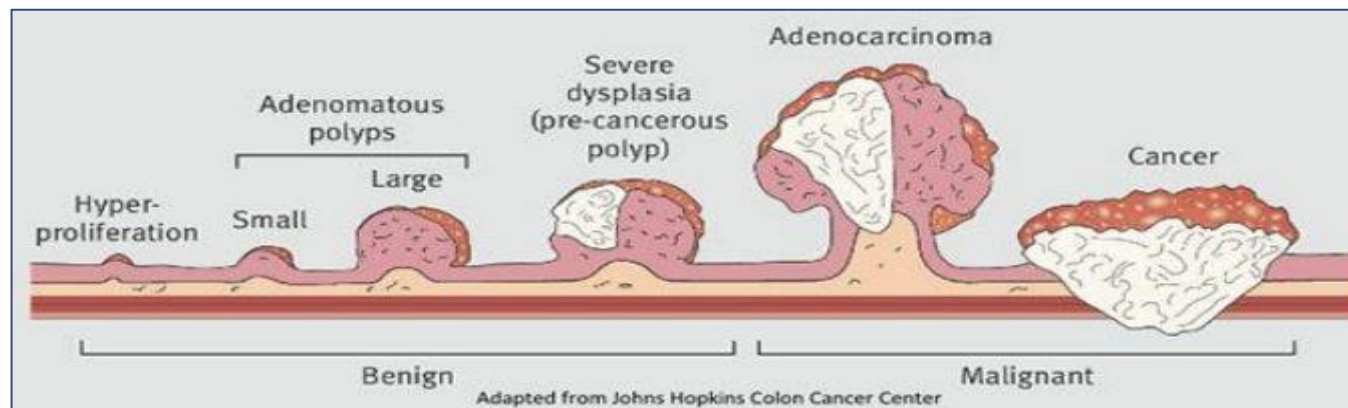
Curable 90% of time when caught early...drops to 10% if diagnosed later (after spread).

Reasons to do Colonoscopy

- Screening
 - $\frac{3}{4}$ CRC cases occur in people with no known medical risk factors
- Ongoing surveillance at recommended intervals
- Red flag symptoms
 - Rectal bleeding
 - New onset progressing constipation
 - Change in stool caliber
 - Unintentional weight loss
 - Iron deficiency anemia

What is a Polyp?

- Small clump of cells that grow on the lining of the colon.
- Different types of polyps...many are harmless.
- It takes years for your body to grow polyps and additional years for some polyps to grow into cancer.
- During screening colonoscopy, all visible polyps are removed.
- Size and pathology determine recommendation for when to repeat next colonoscopy.

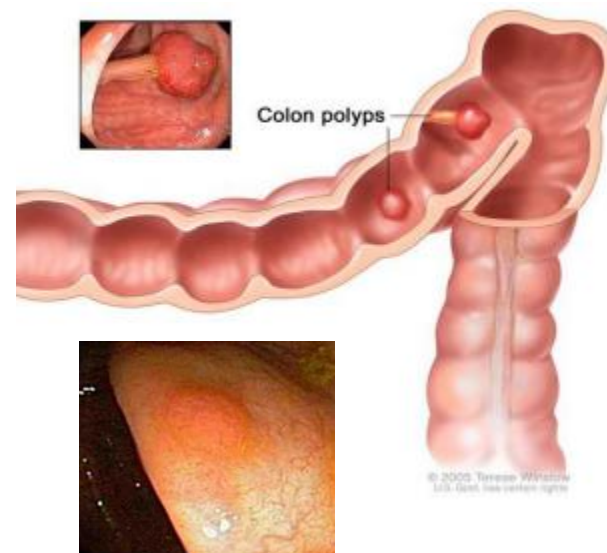


More on Polyps

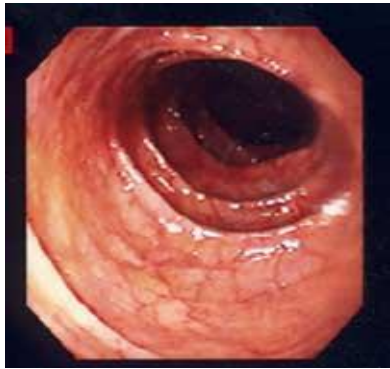
- Not uncommon. Nationally, 1:5 women and 1:4 men will have polyps on colonoscopy.
- Some providers say this number is even higher.
- Remember NOT all polyps are precancerous.
- Advanced polyps warrant more frequent screening colonoscopies
 - Villous component (high risk of turning cancerous)
 - High grade dysplasia (cells look abnormal but have not become cancer)
 - >10mm

Polyps From the Inside

- Polyps come in different shapes and may be hard to see.
- Because colon polyps do not usually cause symptoms, it is important to have regular CRC screenings, such as colonoscopy.



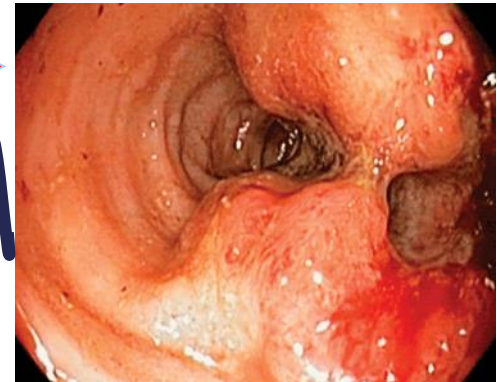
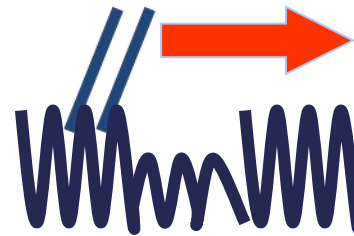
Colonoscopy and Polypectomy



Normal Colon



Advanced Adenoma



Other Options Besides Colonoscopy

- Non-invasive

As of 10/1/2021, eligible Californians have increased access to CRC screening. AB 342, a new state law removes out-of-pocket costs for patients needing colonoscopies after positive non-invasive CRC screening tests, such as stool DNA or FIT. This makes California the latest of eight states to remove this financial barrier to lifesaving screening.

...near polyps 39%

...ance of false positive may increase with advancing age

...age risk patient

...gative test...repeat screening in 3 years

...currently the only FDA-approved mtsDNA is Cologuard®

Other Options Besides Colonoscopy

- For individuals unwilling or unable to undergo colonoscopy or FIT, provided that the tests are locally available and reimbursed by insurers for screening.
- Barium Enema
 - Information about structure
 - 70% accuracy of identifying lesions
 - 40-50% accuracy in identifying polyps
- CT enterography (virtual colonoscopy)
 - Requires full bowel prep
 - 90% accuracy of identifying polyps >9mm, 60% for polyps <6mm
 - Test only done at UCSF
- Colon capsule
 - Requires full bowel prep
 - FDA approved for patients who are not candidates for colonoscopy

Family History and Genetics

- + family history of precancerous colon polyp(s) in 1st degree relative before age 60, recommend 1st colonoscopy at 40.
- + family history of CRC in 1st degree relative, recommend screening colonoscopy 10 years prior to diagnosis age of the family member.
- Same applies to two 2nd degree relatives (2 grandparents + history CRC).
- Family history can increase personal risk of developing CRC by 3x.
- Any patient with family history of CRC (defined above), family history of precancerous polyp(s), or personal history of precancerous polyp(s) should have colonoscopy every 5 years (possibly more frequent) regardless of how normal their most frequent colonoscopy was because of GENETICS.

Screening Recommendations from the American College of Gastroenterology

- Recommended screening schedules for individuals at average risks for CRC:
 - Colonoscopy: every 10 years
 - FIT: every one year
 - Multitarget stool DNA test: every 3 years
 - Flexible sigmoidoscopy: every 5 – 10 years
 - CT colonography: every 5 years
 - Colon Capsule: every 5 years
 - Suggest against Septin9 (blood-based test) for CRC screening

Screening Recommendations from the American College of Gastroenterology

- Age 45 – 75: Recommend CRC screening in average risk individuals (example, no family history and / or personal history of CRC or polyps) to reduce pre-cancerous growths called advanced adenomas, reduce CRC and reduce death from CRC.
- Age 75+: Suggest that a decision to continue screening should be personalized.
- Recommend colonoscopy and FIT as the primary methods for CRC screening.
- Suggest considering Flexible sigmoidoscopy, Multitarget Stool DNA test, CT Colonography, or Colon Capsule for individuals unable or unwilling to undergo a colonoscopy or FIT test.

Screening Recommendations from the American College of Gastroenterology

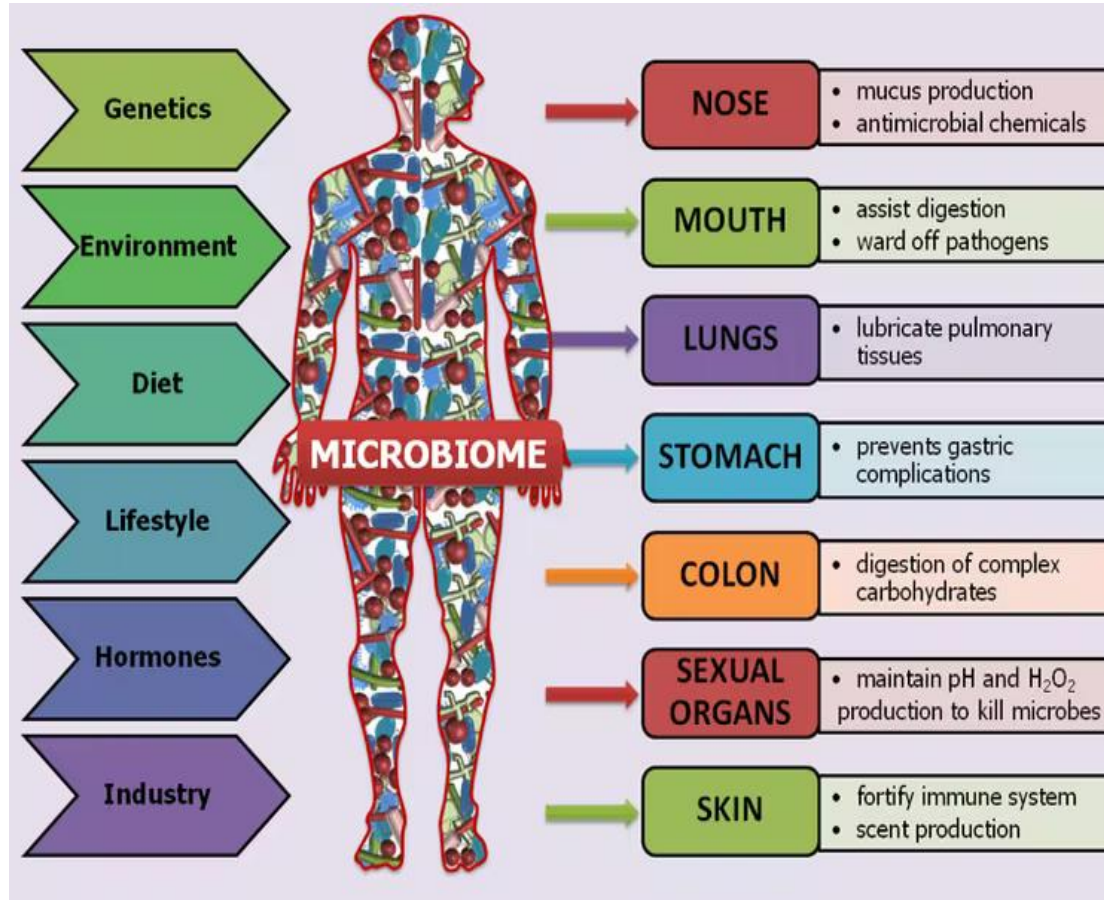
- Screening for Patients with Family History of CRC or Polyps:
 - If you have a family history of CRC, you may need to talk to your health care provider to see if earlier and more frequent colonoscopy is required.
 - Sometimes genetic testing may be required to determine your risk of CRC if you have a strong family history, especially with younger age of affected relatives.

Take Away Points

- Purpose of screening colonoscopy is to PREVENT CRC.
- When detected early CRC is TREATABLE.
- New guidelines recommend to start screening at age 45 for average risk.
- When to start screening and how frequent depends on both family history and personal history of prior polyp(s).
- If colonoscopy is normal, but risk factors are present, the genetics don't change.
- Follow recommended screening intervals.



Human Microbiome



Human Microbiome

- Invisible organ modulated by factors including parental genetics, geography, food and lifestyle.
- Trillions of tiny organisms / microbes / bugs mainly in the gut make up microbiome.
 - Bacteria, Fungi (including yeasts), viruses, protozoa
- Ecosystem
 - One species' waste is another species' dinner.
 - Increasing / decreasing population of one species may affect many others.
- Small alterations can have massive effects on the ecosystem.
- Disruption of its cellular components can trigger a range of ailments like obesity, irritable bowel syndrome, dermatitis and neurological imbalance.
- Some of these diseases can be cured using probiotics and prebiotics designed to adjust microbial imbalance.



Microbiome: Fun Facts

- 300 times more bacteria in your gut than there are stars in the Milky Way galaxy.
- 100 trillion bacteria in and on your body.
 - 90% in large intestine
 - Bacterial cells outnumber human cells 1- to 1...You are 90% bacteria!
- 10,000 species of bacteria in your body.
 - 1,000 species of bacteria in your gut
- All the bacteria in your body weigh a total of 2 – 6 pounds.

Gut Microbiome

- Digestion complex carbohydrates and extraction nutrients from foods we eat.
- Fermentation indigestible food (fiber).
- Production vitamins like B12 (pivotal for metabolic activity, hormones, neurotransmitters).
- Prevents growth of harmful microorganisms.

Changing Gut Microbiome May Predict How Well You Age



- As people age, composition of gut microbiome tends to change.
- A gut microbiome that continually transforms as you get older is a sign of healthy aging.... bugs are adjusting appropriately to an aging body.
- People 65 and older who are relatively lean and physically active have a higher abundance of certain microbes in their guts compared to seniors who are less fit and healthy. People who develop early signs of frailty also have less microbial diversity in their guts.
- People with most changes in microbial compositions tended to have better health and longer life spans.
 - Higher vitamin D levels
 - Lower levels LDL cholesterol and triglycerides
 - Needed fewer medications
 - Better physical health, with faster walking speeds and greater mobility

Role of Diet on the Gut Microbiome

- Diet has a large influence on the composition of the gut microbiome.
- High levels of specific bacteria in the microbiome are associated with CRC risk.
- Diets with greater amounts of certain foods, such as refined carbohydrates, processed sugar, and red meat, have a higher potential to increase inflammation and are associated with increased CRC risk.

Whole Grains / Fibers

- Highly plausible that dietary fiber decreases risk CRC.
 - Higher stool volume and faster transit time = less exposure to carcinogens
 - Study results remain inconclusive and protective associations are weak.
- Evidence for whole grains stronger than for overall fiber.
- Overall health benefit of a diet high in whole grains is clear.
- American Cancer Society and World Cancer Research Fund advocate a diet high in plant foods, including whole grains, fruits, and vegetables for the prevention of cancer and other diseases.

Dietary Calcium / Folate

- Most studies find that calcium consumption from dairy foods and/or supplements is associated with decreased risk of developing adenomas and CRC, although the mechanism remains unclear.
- Whether or not folic acid (synthetic form of folate) and/or high folate intake, consumed through diet or supplements, can prevent or promote the development of CRC remains highly controversial, complex and an unresolved issue.

Fruits and Vegetables

- Inconsistent results from numerous studies specifically evaluating the association between fruit and vegetable intake and CRC risk.
- Any protective effect appears to be for moderate compared to low consumption, with high consumption providing little additional benefit.

Red and Processed Meat

- Consumption of red and/or processed meat increases CRC risk with a stronger association for colon cancer than rectal cancer and for processed meat than red meat.
- A recent synthesis of evidence for World Cancer Research Fund found 18% increased CRC risk for every 50 grams/day of processed meat (approximately 2 slices of lunchmeat) and 12% increase for every 100 grams/day of red meat (marginally significant).
- In 2015, the International Agency for Research on Cancer classified processed meat as “carcinogenic to humans” and red meat as “probably carcinogenic to humans,” largely based on the evidence related to CRC risk.
 - May be related to constituents of meat and/or to carcinogens that form during high-temperature cooking, curing, and/ or smoking.

Artificial Sweeteners

- May cause alterations in the microbiome that lead to glucose intolerance and metabolic dysfunction.
- Growing body of research shows association between ingesting processed sugary beverages, typically containing high fructose corn syrup, and advanced colon polyps and CRC.
- In an animal model, mice that ingested high fructose corn syrup rapidly developed larger and more aggressive colon tumors than mice that just got water.
- The finding is significant because this amount of corn syrup is equivalent to about 1 soda per day.

Probiotics and Gut Health

- Probiotics

- Help balance the live or “Good” or “helpful” bacteria and yeasts that keep your body working the way it should.
 - When you lose "good" bacteria in your body, e.g. after you take antibiotics, probiotics can help replace them.
- Help send food through your gut by affecting nerves that control gut movement.
- Found in some foods and supplements.



Reduce
Bloating



Improve
Gut Health



End
Constipation



Increase
Energy

Types of Probiotics

- Lactobacillus
 - Most common probiotic
 - Found in yogurt and other fermented foods
 - Different strains can help with diarrhea and may help people who can't digest lactose (sugar in milk)
- Bifidobacterium
 - Found in some dairy products
 - May ease symptoms of IBS
- *Saccharomyces boulardii* is a yeast found in probiotics.
 - Yeast found in probiotics
 - Appears helpful fighting diarrhea and other digestive problems.

Can I Get Probiotics Thru Food?

- Yes! Certain foods contain probiotics and can benefit the health of your microbiome.
- Check the food label for “live and active cultures.”
 - Yogurt, buttermilk, sourdough bread, cottage cheese, kombucha, tempeh, fermented pickles, fermented sauerkraut, kimchi, miso soup
- Caution: adding too much of just one food prevents your body from reaping the benefits of other food groups.

Probiotic Supplements

- Generally considered safe and are often “given a try” to see if they could help with various medical conditions.
- Some people with immune system problems or other serious health conditions shouldn't take them.
- In some cases, mild side effects, e.g. upset stomach, diarrhea, gas, and bloating for the first couple of days.
- May also trigger allergic reactions.
- Remember, unlike medications, dietary supplements do not need to be approved by the FDA. Manufacturers can sell supplements simply with “claims” of safety and effectiveness.
- Always talk with healthcare provider before taking a supplement.
- Supplements might interfere with medicines you may be taking.

Final Etc....

New legislation 2021, requires
with patients.

- History and Physical
- Progress notes
- Consultation notes
- Procedure notes
- Discharge summary notes
- Imaging narratives
- Laboratory report narratives
- Pathology report narratives

What to do when reading your medical notes

Patients typically have the option to access and read their medical notes through a patient portal to their electronic health record.



✓ Review the care plan (sometimes called an “assessment and plan”) for any medication changes and new orders made by your doctor. Use this to make a “to-do” list for yourself prior to your next appointment (such as blood work, imaging, vaccinations, and referrals to specialists).

✓ Wait for your doctor to contact you regarding laboratory results, imaging results, or pathology results before becoming worried about any measurements or findings. Sometimes these reports may automatically be made available to you before your doctor has had a chance to review them.

✓ Review your medication list to make sure it is accurate and up to date.

✓ Let your health care team know about any major errors or missing information (such as allergies).

✓ Share your medical notes with people close to you who are involved in your health care.

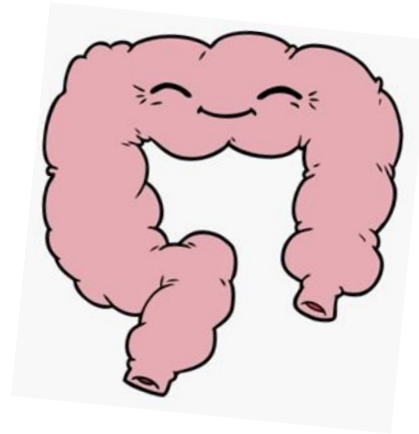
✗ Do not get caught up in medical jargon, terminology, or abbreviations. If you have a question about the meaning of a word or sentence, ask someone on your health care team to explain.

✗ Do not feel that all the language in the notes is directed at you personally. The purpose of medical notes is to provide succinct and straightforward documentation and communication between doctors. The notes do not reflect how doctors would actually speak to you, or their colleagues, in person.

✗ Do not attempt to interpret the details of procedure notes, pathology reports, laboratory reports, or imaging reports without talking to your doctor. These notes can be even more technical and confusing for those without a medical background than other types of notes. They will be interpreted by your doctor and incorporated into your care plan.

Thank you

Questions?



CRC: Preventable! Beatable! Treatable!