

Your Healthy Heart

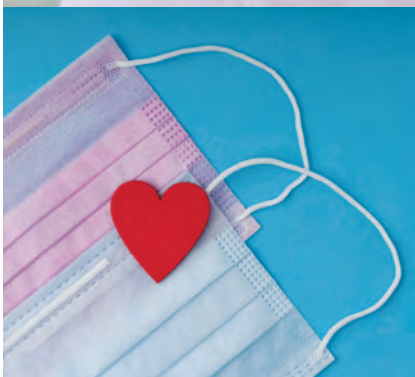
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A patient publication from the
Center for Prevention of Heart
and Vascular Disease

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Ask

Dr. Grossman



Dr. Grossman's responses to patient questions

A PATIENT ASKS: If one has a heart arrhythmia, what are the pros and cons of treatment with pharmaceuticals versus electrophysiology?

ANSWER: An important question, and one that remains controversial within the cardiology community. Your question is broad, since "arrhythmia" means any disturbance of the heart's rhythm and could refer to frequent extra beats, marked slowing or complete cessation of heart beats for a brief period, or even ventricular fibrillation with cardiac arrest. I have narrowed "arrhythmia" by focusing on only two arrhythmias, **atrial fibrillation and its cousin, atrial flutter**. Also, out of the many things that electrophysiologists can do, I will limit this discussion to ablation procedures. I will leave pacemakers, defibrillators, and other devices and procedures for another time.

Atrial fibrillation and atrial flutter are very common arrhythmias. An ablation procedure can be performed under partial anesthesia in the Electrophysiology Laboratory. This procedure is successful in eliminating atrial flutter in 95 to 98 percent of cases, but in patients with atrial fibrillation, it is less successful (75 to 85 percent). In atrial flutter, the ablation procedure can usually be carried out in only one small area of the **right side** of the heart, and has a very low risk of complications. By contrast, for atrial fibrillation the ablation procedure must be carried out in multiple sites in the **left side** of the heart, and has a higher risk of complications.

Therefore, my approach is to refer nearly all patients with pure atrial flutter to an electrophysiologist for an ablation procedure as the first option for treatment. For patients with

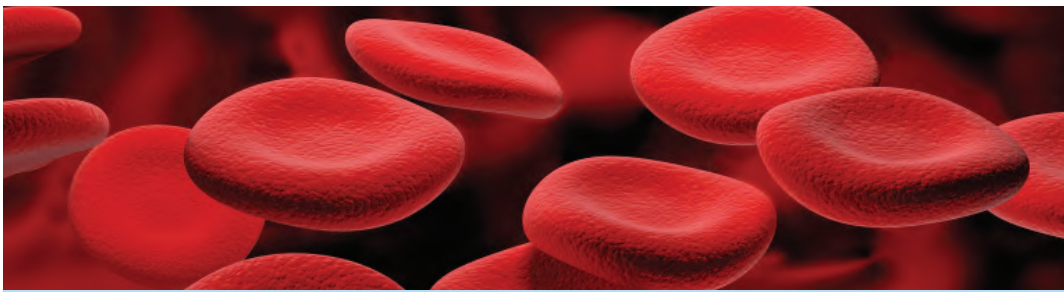
pure atrial fibrillation (AFib), or AFib mixed with some atrial flutter, I almost always start with medication, and only proceed to ablation if the medication fails, or if the patient has significant side effects. Even if an atrial fibrillation ablation is successful, patients may still need to be on some medications (e.g., a blood thinner such as Eliquis) for up to a year, or even indefinitely.

BOTTOM LINE: Ablation is usually my first recommendation for patients with pure atrial flutter, but a fallback option for my patients with AFib.



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A PATIENT ASKS: You might want to discuss soft plaque, often undetectable, which I have heard causes a major portion of fatal heart attacks when it breaks out.

ANSWER: Atherosclerosis is the process by which cholesterol and other fatty substances accumulate within the wall of our arteries, gradually narrowing the lumen (central channel for blood flow) and restricting delivery of oxygen and nutrients to the heart, brain and other organs. Initially the plaque just contains fat and is “soft.” But with time, calcium and fibrous tissue are deposited, making the plaque “hard,” or more like bone or tendon.

If the soft plaque develops rapidly enough, it may stretch the thin membrane that separates the arterial wall from the lumen and ultimately break or **rupture**, like a pimple or boil. This rupture exposes the fatty contents within the plaque to flowing blood within the artery’s central channel, leading to formation of a blood clot, or thrombus. If the artery is a coronary artery, the result is called “coronary thrombosis,” the cause of heart attacks. More recent evidence suggests that this can occur even if the process is much slower, giving the plaque a chance to harden with calcium and fibrous tissue. So, rupture of either soft or hard (calcified) plaque can cause a heart attack. Preventing plaque

formation is the same for both hard and soft plaques: lower the LDL cholesterol (diet, weight loss, statins) and raise the HDL (the protective molecule which is believed to remove cholesterol from the plaque) through exercise or weight loss.

BOTTOM LINE: Most patients with atherosclerosis have both hard and soft plaque, and it is rare for a person with no hard plaque and a zero calcium score of the heart (on CT testing) to have a heart attack. See your physician for a careful review of your risk factors, including family history, cholesterol levels, blood pressure and diabetes. If recommended, get on a good preventive program to prevent plaque formation!



A PATIENT ASKS: I have found, after age 90, loss of strength in my legs. Any remedy?

ANSWER: Unfortunately, loss of strength in the legs is common with aging, and may be due to the biologic process of aging through telomere shortening, as described by UCSF’s Elizabeth Blackburn (winner of the 2009 Nobel Prize in Physiology or Medicine). According to current evidence, throughout the human body cells divide to replace injured or dying cells, thus maintaining the strength and function of every tissue or organ. With each cell division, however, **telomeres** (little caps at the end of each chromosome,



Welcome

Drs. Long and Grossman

We hope your 2022 is proceeding well and it is our pleasure to welcome you to another edition of **Your Healthy Heart**, our free, community publication from the Center for Prevention of Heart and Vascular Disease, a part of UCSF Medical Center's Cardiology Care Clinic and the UCSF Division of Cardiology.

Undoubtedly over the past two years, we all have had to navigate considerable uncertainty and change due to the COVID-19 pandemic. This has certainly been true for us, practicing medical doctors, Carlin Long and Bill Grossman, co-directors of the Center for Prevention. As safety guidance and protocols have shifted here at UCSF and around the world, we have continued to see patients in clinic to ensure their cardiovascular care is managed with continuity.

In this issue, we will again look at the intersection of cardiovascular health and COVID-19. One of our fellow faculty members, Matthew S. Durstenfeld, MD, FACC, offers us a primer on how the virus can affect the heart in *How Does COVID affect the Heart?* (Page 6).

We also have brought back our two most popular features: Dr. Long's *Research In The News* and Dr. Grossman's *Ask Dr. Grossman* where we tackle a series of patient questions and research findings that touch upon a variety of diverse cardiovascular health topics.

We certainly want to express our gratitude and appreciation to all our colleagues, other providers, frontline responders, civic leaders, and community members who have collectively risen to the challenge of providing care and comfort to others in need.

And we want to express our gratitude to everyone who continues to support our Prevention Center. During these recent, trying times, our ability to remain focused and committed to delivering sustained medical care for our patients has been, and remains, our uncompromised mission.

Please contact us to share your feedback about **Your Healthy Heart** or our website at www.healthyheart.ucsf.edu. Email your comments to: healthyheart@ucsf.edu.

Best wishes for good health,



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How does COVID affect the Heart?

UCSF Clinician/investigator addresses cardiovascular issues related to COVID-19

By Dr. Matthew S. Durstenfeld, MD FACC

The COVID-19 pandemic is the public health crisis of our day, with over 400 million people infected so far. In this article, I will discuss how SARS-CoV-2, the virus that causes COVID-19, may affect the heart.

What happens to the heart if I catch the virus?

Injury or stress to the heart is probably not common among those who do not require hospitalization.^{1,2} In contrast, people hospitalized with severe COVID, especially those requiring intensive care, often have evidence that the heart is under stress. This includes elevated levels of troponin, a heart protein, in the blood. It can also be seen with abnormal heart function on echocardiograms (heart ultrasound).³ Those who have severe COVID pneumonia or who develop blood clots in their lungs can also stress the heart. Severe COVID also increases the risk of abnormal heart rhythms, especially atrial fibrillation,⁴ heart attacks and strokes. Myocarditis, or inflammation of the heart, is rare⁵ but significantly increased with COVID⁶ (much more by having COVID than by mRNA vaccines).

common that could be from the heart are fatigue and decreased exercise tolerance, but some people also have shortness of breath with exertion, chest pain, palpitations, or symptoms when they change positions. Brain fog and other neurologic symptoms can also occur and often overlap with possible cardiac symptoms. We and others have found that these symptoms do not appear to be caused by abnormal heart function.¹⁰

From the beginning of the pandemic, UCSF has been leading the charge to understand post-acute COVID. Building on experience studying HIV, a team from UCSF led by Dr. Michael Peluso and Dr. Steve Deeks from the Division of HIV, Infectious Diseases, and Global Medicine, Zuckerberg San Francisco General Hospital and UCSF developed the LIINC (Long-term Infection with Novel Coronavirus) Covid Recovery Cohort (<https://liincstudy.org/>). Dr. Priscilla Hsue, Chief of Cardiology of the Division of Cardiology, Zuckerberg San Francisco General and I partnered with them to develop the LIINC Cardiovascular Study to study the impact of COVID on the heart.

Persistent Inflammation After COVID

People with Long COVID have elevated inflammatory markers in the blood and persistent activation of the immune system.^{11,12} Others have found inflammation in the brain, heart, lungs, and blood vessels. We do not know yet exactly why this occurs or how long this lasts. It may be that those who develop Long COVID had more severe inflammatory response to fight the virus during the initial illness, have persistent immune system activation (possibly from residual virus proteins in the body¹³), have an autoimmune reaction, or have ongoing local inflammation somewhere in the body. Along with Dr. Don Grandis from the UCSF Center for the Prevention of Heart and Vascular Disease and Dr. Yoojin Lee from UCSF Radiology, we have found that pericardial effusions, or fluid around the heart that could be a sign of inflammation, can occur after COVID.¹⁴

Autonomic Function and the Heart After COVID?

If it is not heart damage that causes symptoms, what could it be? One intriguing possibility is that COVID may affect the autonomic nervous system,¹⁵ which controls heart rate by balancing sympathetic (“Fight or Flight” response) and parasympathetic (“Rest

6 Although initial studies before vaccines were available suggested that people with pre-existing heart disease may be at increased risk of dying from COVID, subsequent studies have found that the risks are only slightly elevated for most people with heart disease.⁷ People with symptomatic heart failure or a weaker heart measured by reduced left ventricular ejection fraction on echocardiogram, or congenital heart disease with more advanced features (cyanosis or pulmonary hypertension) are at higher risk. Vaccines are the key tool to reduce this risk, along with physical distancing and masking. Secondly, it is likely that the newer treatments for COVID may further reduce the risk.

The good news for most people who survive acute COVID is that reductions in heart function in hospitalized patients generally resolve all on their own within a few weeks to months.⁸ Even in people hospitalized for COVID, permanent damage to the heart from COVID seems to be very rare. We do not know if COVID affects the risk of developing heart disease over the long term.

Symptoms that Persist After COVID

What about Long COVID or post-acute sequelae of COVID-19 (PASC)? Many people have symptoms that linger after COVID, and some people have symptoms that last longer than a year after COVID.⁹ The most

and Digest” response) signals. The virus could directly infect the autonomic nervous system’s control system in the brain. Or the virus could infect the peripheral autonomic nerves or affect the cells that respond to the signals from the autonomic nervous system. A third possibility is that chronic inflammation (which is increased) affects autonomic signaling.

We have begun doing cardiopulmonary exercise testing among people recovering from COVID in the LIINC study thanks to Dr. Carlin Long of the UCSF Center for the Prevention of Heart and Vascular Disease and Dr. Mandar Aras of the UCSF Division of Cardiology Advanced Heart Failure and Heart Transplant and Cardio-oncology and Immunology Sections. Volunteers ride a stationary bike and we measure how much exercise they can do as well as parameters that help us understand why people who can’t exercise are limited. So far, the main reason some people can’t exercise is because they could not increase their heart rate enough, which cardiologists call “chronotropic incompetence.”¹⁴ In a project led by UCSF Medical Student Christopher Hill, using heart rhythm monitors, we found heart rate during exercise correlates with changes in heart rates and heart rate variability that point to autonomic dysfunction. Lastly, autonomic dysfunction could also explain symptoms when people change position that some people experience after COVID (postural orthostatic tachycardia syndrome, or POTS).

Researchers are working hard to study COVID and the heart as we still have much we do not yet understand. One of the most promising initiatives to uncover answers is the National Institutes of Health’s RECOVER initiative (<https://recovercovid.org/>), of which UCSF is one of the sites led by Dr. Peluso and Dr. Deeks. Ultimately, as we discover how things go wrong in COVID, our goal is to develop treatments to help people suffering from Long COVID fully recover.



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Research In The News

Commentary from Dr. Carlin Long on selected media coverage of medical research

Can my smart phone disrupt my pacemaker?

I wanted to include an important report that made it into *HealthDay* in August 2021 which generated a lot of calls from patients with pacemakers and other implanted devices. The article referenced a publication entitled “Static magnetic field measurements of smart phones and watches and applicability to triggering magnet modes in implantable pacemakers and implantable cardioverter-defibrillators.” This is an extremely important but somewhat overblown report, similar to the microwave reports of a few decades ago.

The investigators wanted to understand whether the newer, more potent magnets in today’s smartphones, watches and tablets might trigger interference with implanted devices, even while in airplane mode. Indeed, they found the possibility of interference, although this was observed only under very specific circumstances, namely when these devices were held in close proximity (within 6 inches) of the probe. In reality, this is not likely to cause an issue for the vast majority of patients with these devices. However, patients with pacemakers or defibrillators should avoid carrying their phones, smart watches or tablets in shirt or coat pockets where there could be less than 6 inches between their implanted medical devices and consumer electronic devices. Talk to your doctor if you have any symptoms or questions.

Don't Forget to Brush

In 2016, a *Circulation* article reported on the Periodontitis and Its Relation to Coronary Artery Disease (PAROKRANK) study in Sweden, which found a significantly increased risk of a first heart attack in patients with periodontitis, or gum disease. This past August at the European Society of Cardiology, the researchers reported on a follow-up study investigating whether the presence of gum disease, both in heart attack patients and

their healthy peers, was related to an increased risk of new cardiovascular events over time. More than 1,500 participants with an average age of 62 years underwent a dental examination between 2010 and 2014: 985 were classified as healthy, 489 had moderate periodontitis, and 113 had severe periodontitis.

Participants were followed for the occurrence of cardiovascular events and death. The primary endpoint was a composite of all-cause death, non-fatal heart attack or stroke, or severe heart failure. Follow-up data were collected until the end of 2018 from Swedish national death and patient registries. During an average follow-up of 6.2 years, there were 205 primary endpoint events. In the overall cohort, participants with periodontitis at baseline had 49% higher odds of experiencing one of these bad cardiovascular outcomes compared to those with healthy gums. The probability of these unfavorable outcomes rose with increasing severity of gum disease. While the exact reasons for this relationship are still under debate, my advice is simple: brushing, flossing and consistent dental care will help keep both your teeth and your heart healthy.

“Sometimes You Feel Like a Nut”

Two recent studies will hearten you nut (and baseball) fans out there! A *Circulation* research letter published in September entitled “Effects of Walnut Consumption for 2 Years on Lipoprotein Subclasses Among Healthy Elders” reported on the WAHA (Walnuts and Healthy Aging) study. That was a two-year randomized trial conducted at centers in Spain and California testing the effects of walnut-supplemented diets (roughly 10-20 walnuts per day) in healthy individuals between the ages of 63 and 79. The study’s major focus was cognitive decline, but another pre-specified endpoint was changes in lipoprotein levels. About 65 percent of participants were women, about 55 percent had high blood pressure and similar numbers had diabetes. There were no differences in statin usage among groups during the trial. Unfortunately, there was no apparent benefit in the measures of cognitive decline, but there was a





fairly dramatic and positive reduction of total cholesterol, and particularly of LDL (the “bad” cholesterol) (See Figure 1.)

A similar *Stroke* article was also published in September, entitled “Peanut Consumption and Risk of Stroke and Ischemic Heart Disease in Japanese Men and Women.” It was a 15-year study which reported reduced rate of stroke, but unfortunately not of heart disease, in men and women with the highest consumption of peanuts (roughly 10-12 per day) compared to those in the lowest group. Both of these amounts are quite easy to achieve in the diet and are one of the components of the Mediterranean diet that we have generally emphasized in the Prevention Center.

More on Vitamin D

Don’t throw away that Vitamin D supplement quite yet! As many of you know, this topic has been a bit controversial in the past several years. Both Dr. Grossman and I generally want to see Vitamin D levels in the normal 30-50 ng/mL range, but struggle

to find benefit in a number of large clinical trials published over the past few years. So I was interested to read an article entitled “Effects of Vitamin D Supplementation and 25-Hydroxyvitamin D Levels on the Risk of Myocardial Infarction and Mortality,” published in the *Journal of the Endocrine Society* in October.

This was a retrospective review of over 20,000 patients treated within the Veterans Health Administration from 1999 to 2018, investigating whether there were any differences in the incidence of first heart attack according to Vitamin D levels, with and without supplementation. Patients were divided into three groups: Group A (untreated, levels ≤ 20 ng/mL), Group B (treated, levels 21-29 ng/mL), and Group C (treated, levels ≥ 30 ng/mL). The study found that Group C had a lower incidence of heart attack, and Groups B and C had lower incidence of death from any cause. While a large randomized controlled trial of these different Vitamin D supplement levels would help to shed further light on this question, I will certainly take these latest findings into consideration when advising my patients.

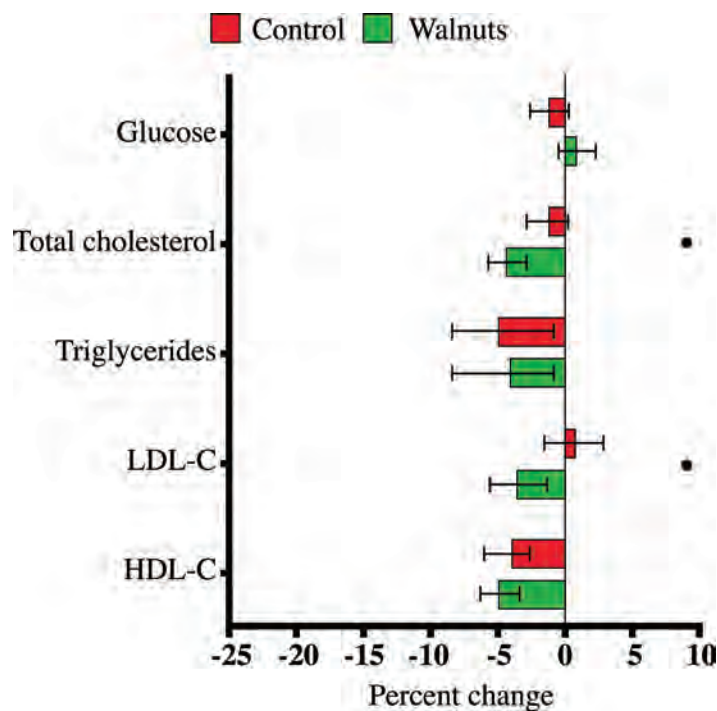


Figure 1

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Ask

Dr. Grossman



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Dr. Grossman's responses to patient questions

like the plastic tips on shoe laces) shorten. When they finally shorten below a critical minimum length, the cells can no longer divide. At that point, injured or dying cells cannot be replaced, and that part of your body becomes progressively weaker. I suggest listening to Dr. Blackburn's TED Talk (tinyurl.com/TEDTelomere).

Since we don't have proven methods to safely lengthen our telomeres, my suggestion is to walk every day, around the house or outdoors, counting steps using an iPhone, Apple Watch or Fitbit. Find out what you can do comfortably. If it's 3,000 steps per day, set a goal to double this over the next

six months. Simple math tells you that each month you need to increase your daily walk by 500 steps to get to 6,000 steps per day in six months. This process will tell you whether your legs can be strengthened or made more efficient, or whether you have just reached the end of your telomeres and are not going to show improvement. Some people try other methods to strengthen their muscles, such as injections of stem cells, testosterone, or other chemicals or hormones. I am skeptical about these modalities, and worry about adverse effects (such as activating latent prostate cancer) that could make things a lot worse. There's still a lot of research to do on the aging process!



Research In The News

Commentary from Dr. Carlin Long on selected media coverage of medical research

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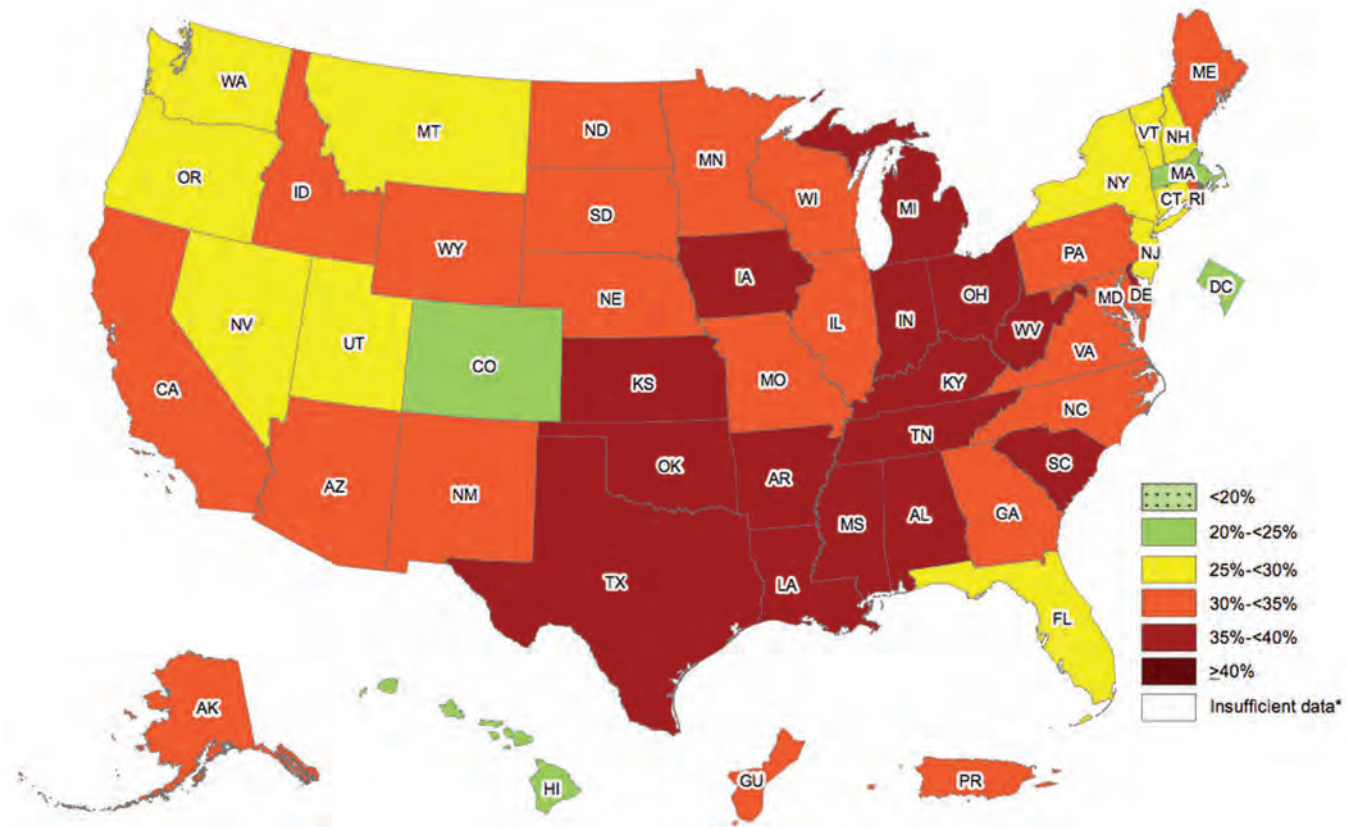
Obesity on the Rise

USA Today reported on September 15 that the Centers for Disease Control and Prevention (CDC) released an update stating that in 2020, at least 35 percent of adults were obese in 16 states. These included Alabama, Arkansas, Delaware, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Ohio, Oklahoma, South Carolina, Tennessee, Texas, and West Virginia, and represented an increase from nine states in 2018 and 12 states in 2019 (See Figure 2.) In California, 30 percent of adults are obese. Just two decades ago, no state had an adult obesity rate above 25 percent.

This is obviously an alarming trend, because obesity is linked to type 2 diabetes, heart disease, stroke and many types of cancer. It also increases health spending by \$149

billion a year and raises the risk of COVID-19 hospitalization and death, according to the Trust for America's Health, which released a report analyzing the CDC figures. I know that for many people, the challenges of the COVID-19 pandemic have made it more difficult to exercise and eat a healthy diet. But if your weight is creeping up, you can decide at any time to work towards positive changes. Your cardiologist or primary care physician would be delighted to work with you, and here at the UCSF Center for Prevention of Heart and Vascular Disease (<https://healthyheart.ucsf.edu/>), we are lucky enough to have an amazing, professional dietitian, Angie Fong (angie.fong@ucsf.edu). Contact her to discuss your goals and whether she can assist or refer you.

Prevalence of Self-Reported Obesity by State and Territory, BRFSS, 2020



<https://www.cdc.gov/obesity/data/prevalence-maps.html>

Figure 2



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The New “Endemic Phase” and a Vaccine Update
Moderated by Bob Wachter


The Downslope of the Omicron Surge, and What to Do as We Turn the Corner
Moderated by Bob Wachter


The Omicron Whirlwind: A Conversation with Eric Topol about the Current and Future State of the Pandemic
Moderated by Bob Wachter

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