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30% of Americans Have Fatty Liver Disease

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In the U.S., an estimated 30% of adults have nonalcoholic fatty liver disease (NAFLD), the most common chronic liver disease.

In people with obesity, up to 90% have NAFLD, as do up to 75% of those who are overweight and 50% of people with diabetes.

Even 10% of U.S. children are suffering from NAFLD.

The high rates of NAFLD are likely related to the increased intake of toxic industrially processed seed oils and environmental pollutants like glyphosate and PFAS.

Lifestyle factors such as diet and exercise play important roles in exacerbating, as well as reducing, your chances of developing NAFLD.

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In the U.S., an estimated 30% of adults have nonalcoholic fatty liver disease (NAFLD), the most common chronic liver disease.[1] Globally, about 25% of adults are affected.[2] These numbers only account for the buildup of excess fat in your liver that is not related to heavy alcohol use. If alcoholic liver disease were also factored in, the prevalence would be even higher.

Further, in people with obesity, up to 90% have NAFLD, as do up to 75% of those who are

overweight[3] and 50% of people with diabetes.[4] Even 10% of U.S. children are suffering from NAFLD.[5]

Lifestyle factors such as diet, exercise, weight and smoking all play important roles in exacerbating (as well as reducing) your chances of developing some form of liver disease. Obesity and other signs of metabolic dysfunction, including high blood pressure, insulin resistance and elevated triglycerides, are also linked to NAFLD.[6]

Left unchecked, it's estimated that 100 million people in the U.S. alone will develop NAFLD by 2030.[7] There are many steps you can take to reduce your risk, however, so you don't end up as one of them.

What Is NAFLD?

NAFLD describes excess fat buildup in your liver. Without proper treatment, NAFLD can lead to serious liver problems including nonalcoholic steatohepatitis (NASH), which causes inflammation and fibrosis, or scarring of the liver. NASH may lead to cirrhosis, which increases the risk of liver cancer, and end-stage liver disease.[8]

However, NAFLD also increases the risk of other health conditions, including cardiovascular disease, which is the No. 1 cause of death in people with NAFLD.[9] NAFLD often has no symptoms, although it may cause fatigue, jaundice, swelling in the legs and abdomen, mental confusion and more.

Your liver, as the largest solid organ in your body, carries out more than 500 essential functions to your health.[10] This includes the production of bile, which breaks down fats and carries away waste, converting excess glucose into glycogen, and regulating amino acids in the blood. It's also important for detoxification, helping to clear your blood of toxins, and regulates blood clotting, among other functions.[11]

Fortunately, your liver, more than almost any other tissue in your body, has phenomenal regeneration capabilities. Even if 90% of it has been removed, it can regrow to its normal size.[12]Along these lines, NAFLD can often be reversed in its early stages via lifestyle changes, like healthy eating and exercising.

NAFLD's Dietary Connections

The high rates of NAFLD are most likely related to the increased intake of toxic industrially processed seed oils, often referred to as "vegetable oils." Examples of seed oils high in omega-6 polyunsaturated fatty acids (PUFAs) include soybean, cottonseed, sunflower, rapeseed (canola), corn and safflower.[13]

Eating seed oils high in the omega-6 PUFA linoleic acid (LA) contributes to low-grade inflammation, oxidative stress, endothelial dysfunction and atherosclerosis.[14] As researchers noted in the journal Nutrients, "In addition, a few studies suggested that omega-6 PUFA is related to chronic inflammatory diseases such as obesity, nonalcoholic fatty liver disease and cardiovascular disease."[15]

In order to avoid LA, you'll need to avoid eating processed foods, fast foods and most restaurant foods and focus on real food instead. Fatty liver can also be driven by excess sugar when, in addition to seed oils, you are consuming more than 35% of your calories as fat. This is likely why this condition is now found even in young children.

Choline's Role in NAFLD

Choline, an essential nutrient, is also important for normal liver function and liver health. Choline plays a role in maintaining membrane integrity and managing cholesterol metabolism, including low density lipoproteins (LDL) and very low-density lipoproteins (VLDL), helping to move fat out of your liver.[16,17]

By enhancing secretion of VLDL in your liver, required to safely transport fat out, choline may protect your liver health.[18] Further, choline deficiency may lead to abnormal fat deposits in your liver, causing NAFLD.[19]

An estimated 90% of the U.S. population is deficient in choline.[20] You can increase your intake by consuming more choline-rich foods, such as organic pastured egg yolks, grass fed beef liver, wild-caught Alaskan salmon and krill oil. Arugula is also an excellent source.

In fact, some experts believe NAFLD is largely the result of shunning choline-rich foods like liver and egg yolks, which is then worsened by consuming too much linoleic acid. As noted by Chris Masterjohn, who has a Ph.D. in nutritional science:[21]

> "After studying the relevant literature and tracing it much further back in time than anyone else ever bothers to, I've come to the conclusion that neither fat nor sugar nor booze are the master criminals here. Rather, these mischievous dudes are just the lackeys of the head honcho, choline deficiency. That's right, folks, it's the disappearance of liver and egg yolks from the American diet that takes most of the blame.
>
> More specifically, I currently believe that dietary fat, whether saturated or unsaturated, and anything that the liver likes to turn into fat, like fructose and ethanol, will promote the accumulation of fat as long as we don't get enough choline. Once that fat accumulates, the critical factor igniting an inflammatory fire to this fat is the consumption of too much PUFA (polyunsaturated fat from vegetable and perhaps fish oils)."

Environmental Pollution Plays a Role

Exposure to pollutants that act as endocrine and metabolic disruptors is another contributing factor in rising rates of NAFLD. Persistent organic pollutants (POPs), endocrine-disrupting chemicals (EDCs), heavy metals, and micro- and nanoplastics have all been implicated in both the development and progression of NAFLD.[22]

Glyphosate, the active ingredient in Roundup herbicide, is one particularly pernicious toxin to your liver. As more and more glyphosate has been sprayed on agricultural lands, parks and backyards, entering our food and water supplies, NAFLD rates have trended upward.[23]

Further, when researchers from the University of California (UC) San Diego School of Medicine analyzed urine samples from 93 patients who had been diagnosed with NAFLD, those with the more severe form, NASH, had significantly higher residues of glyphosate in their urine.[24] This association held true regardless of other factors in liver health, such as body mass index, diabetes status, age or race.

In a UC San Diego news release, lead study author Paul J. Mills, Ph.D., explained "There have been a handful of studies, all of which we cited in our paper, where animals either were or weren't fed Roundup or glyphosate directly, and they all point to the same thing: the development of liver pathology … The increasing levels [of glyphosate] in people's urine very much correlates to the consumption of Roundup-treated crops into our diet."[25]

Researchers from King's College London also showed an "ultra-low dose" of glyphosate-based herbicides was damaging.[26] After a two-year period, female rats showed signs of liver damage, specifically NAFLD and progression to NASH. The authors noted that glyphosate may bring about toxic effects via different mechanisms, depending on the level of exposure, including possibly mimicking estrogen and interfering with mitochondrial and enzyme function.

PFAS Linked to Fatty Liver

PFAS are endocrine-disrupting chemicals that accumulate in body tissues, such as the liver, and are also known to accelerate metabolic changes that lead to fatty liver. "This bioaccumulation," researchers wrote in Environmental Health Perspectives, "coupled with the long half-lives of many PFAS, leads to concern about the potential for PFAS to disrupt liver homeostasis should they continue to accumulate in human tissue even if industrial use is abated."[27]

The researchers, from the Keck School of Medicine of USC, conducted a systematic review and meta-analysis, yielding 85 rodent studies and 24 epidemiological studies. Four types of PFAS — PFOS, PFOA, perfluorohexanesulfonic acid (PFHxS) and perfluorononanoic acid (PFNA) — accounted for most known human exposure.

The study compared PFAS exposure to indicators of liver injury including serum alanine aminotransferase (ALT), NAFLD, NASH or steatosis, a buildup of fat in the liver. Meta-analysis from the human studies showed that higher ALT levels were associated with exposure to PFOA, PFOS and PFNA.

In addition to promoting liver inflammation and the accumulation of triglycerides, exposure to PFAS may also lead to reduced bioavailability of choline, triggering steatosis due to choline deficiency.[28]Grease-resistant to-go containers, papers and wrappers often contain PFAS; this includes fast food containers and wrappers, microwave popcorn bags, pizza boxes and candy wrappers.

You can also be exposed to PFAS via contaminated drinking water and soil, as well as via exposure to consumer products that contain PFAS, including nonstick cookware, stain resistant clothing and upholstery, cleaning products and personal care products.

Tips for Liver Health

The single most important step to protecting your liver health is lowering your seed oil content as much as possible. Please review the comprehensive article and video on LA I posted earlier this year. Limiting alcohol and environmental pollutants like glyphosate and PFAS are also important, but be sure to add in choline-rich foods like pastured egg yolks, which are known to support liver health.

Vitamin B12 and folic acid may also be protective and have been found to decrease the progression of NASH.[29] Niacinamide, also known as nicotinamide (NAM), is another option. It's a precursor to nicotinamide adenine dinucleotide (NAD+), a vital signaling molecule that's believed to play an important role in longevity. However, supplementation with NAM has also been found to decrease oxidative stress and prevent fatty liver.[30]

N-acetylcysteine (NAC), a precursor needed for glutathione biosynthesis, is another liver-supportive agent to be aware of. NAC is used as an antidote for acetaminophen toxicity,[31] which causes liver damage by depleting glutathione. Research published in Hepatitis Monthly has shown NAC supplementation helps improve liver function in patients with NAFLD.[32] Adding 5 to 15 grams per day of the amino acid glycine would also be useful.

Another option is milk thistle, which contains silymarin and silybin, antioxidants that are known to help protect your liver from toxins and even help regenerate liver cells.[33] Supplements should always be used in combination with living a healthy lifestyle, including eating right and exercising. If you're overweight, losing 7% to 10% of your body weight can improve NAFLD, including lowering liver fat content, liver inflammation and fibrosis.[34]

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Notes

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