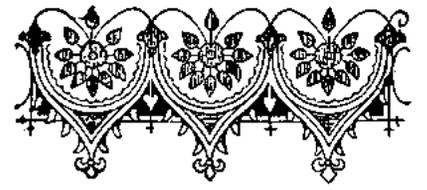


# Health & Medicine



## The Fatty Liver Epidemic: The Body's Response to 21st Century Living



Dr. Kate Thomsen and Silky

Poor diet, lack of sleep, high stress, little exercise and lots of toxic exposures have put stress on our genetic makeup to give us a multitude of chronic inflammatory diseases. The silent epidemic of Fatty Liver Disease is one of them.

The liver is the largest of the internal organs. It has many functions including major roles in the metabolism of proteins, sugars, and fats, as well as the production of blood clotting factors and bile. One of its most well known and important functions is detoxification. The liver clears environmental toxins, pharmaceutical drugs, and excess hormones and growth factors from the body by making them water soluble if necessary, and directing them towards the intestines for removal with the stool. With all these important jobs, it's no wonder Mother Nature gave the liver the capacity to regenerate. As little as 25% of a liver can compensate function for the whole through increased demand on the remaining liver cells. Even with that capacity, our modern lifestyle has put stresses on our livers that will be our undoing.

Diseases of the liver include hepatitis, alcoholic liver disease, fatty liver, and liver cancer. We used to believe that fatty liver was the earliest manifestation of liver disease seen in alcoholism but in the past ten years we have begun to recognize a new variation of fatty liver called, Non-Alcoholic Fatty Liver Disease or NAFLD. Current estimates of NAFLD prevalence range from 20% to 30% of the general population!! In obese persons, the prevalence is from 67% – 75%!! Obesity, diabetes, and the metabolic syndrome are the biggest risk factors but genetics plays a role as well. Children and non-obese

persons can have NAFLD; African Americans are less likely to have it.

So what is NAFLD? The normal liver contains fat but when the weight of the liver is comprised of more than 5 – 10% fat it is called fatty liver. This can occur with chronic alcohol consumption, but in NAFLD, alcohol is not the cause. Insulin resistance, pre-diabetes and type 2 diabetes are strongly associated with NAFLD. Why might this be? Normally, after a meal, sugars from the digested foods are absorbed in to the blood and the blood glucose (sugar) will rise. This causes the pancreas to release insulin. Insulin assists cells in absorbing glucose, particularly in liver, muscle and fat. As glucose enters the cells, the amount of glucose in the blood lowers. Insulin also stimulates the liver and muscles to store excess glucose and reduces the liver production of glucose. In this way, blood glucose levels are balanced by the body and stay in a normal range. In insulin resistance, the muscle, fat, and liver cells do not respond properly to the signal from insulin and glucose is not able to enter the cells. The glucose level in the blood rises and the pancreas produces more insulin to help get it into the cells. Because the body cells cannot use insulin effectively, high blood glucose levels are the result. Eventually this leads to pre-diabetes and diabetes – conditions of high blood sugar.

Insulin resistance may be caused by our high saturated fat, high refined carbohydrate diet. Our body cells are capable of burning both glucose and fats for energy – depending on availability. Glucose is the fuel burned after a meal and fats are burned during exercise or at night or other times of fasting. High saturated fat meals may be jamming the system with the wrong fuel when the cell furnaces (the mitochondria) are switched to burn glucose. Unable to burn these fats, the cells just accumulate them and this eventually impairs insulin signalling. So after we eat our Big Mac, Fries, Chocolate Shake and DQ Sundae we are in metabolic chaos!!!! This type of diet causes obesity, diabetes and

fat to accumulate inside our cells (called steatosis) resulting in fatty muscles and fatty liver (and fatty blood vessels).

So what if you have fatty liver? It should be a big wake up call. Overall, about 40% of people with NAFLD will progress to having Non-Alcoholic SteatoHepatitis (NASH). People with NAFLD and diabetes have a 50% chance of progression to NASH. About 15% of persons with NASH will develop cirrhosis and a significant percent will develop liver cancer. It is estimated that NASH will surpass hepatitis C as the leading cause for liver transplantation in the next 10 – 20 years.

The progression from NAFLD to NASH presumably occurs due to oxidative stress (free radical damage). When the mitochondria are burning fat as fuel, they create by-product free radicals from hydrogen peroxide. Antioxidants in the liver (glutathione, Vitamin E, beta-carotene, Vitamin C) should neutralize these but when the fat content is too high, the antioxidants can't keep up with all the by-products. The free radicals win causing cell death, damage and scarring of the tissue called fibrosis. This becomes a feed forward cycle with escalating inflammation – further damage. Research studies have been evaluating antioxidants as potential treatments for NASH.

Risk factors for NAFLD include: obesity, type 2 diabetes, metabolic syndrome, insulin resistance, polycystic ovarian syndrome, high cholesterol, high triglycerides, exposure to toxins and chemicals (such as pesticides), malnutrition, rapid weight loss, gastric bypass surgery, certain medications, Wilson's disease, among others. NAFLD does not cause symptoms but it may be an incidental diagnosis found when liver enzymes (ALT, AST) are elevated. There are other causes of elevated liver enzymes and the diagnosis of NAFLD is made by an ultrasound of the liver. NAFLD can exist without elevating the liver enzymes and that makes the condition difficult to diagnose until it has become NASH. At this stage there may be symptoms such as: fatigue, weight loss, pain

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**Lifestyle Modifications  
To Prevent Fatty Liver**

- \* Weight Loss
- \* Weight loss of 7 – 10% has been linked with ~ 50% drop in liver fat levels in persons with NAFLD
- \* Exercise and Be More Active
- \* Get at least 30 minutes of exercise on most days. It helps regulate blood sugar
- \* Choose a Healthy Diet
- \* Think vegetables, low glycemic fruits, lean meats, unsaturated fats (seed, nut and fish oils)
- \* Decrease Exposure
- \* Avoid excessive: alcohol, medications, and exposures to "new to nature" molecules
- \* Control your blood sugar if you have diabetes or pre-diabetes
- \* Control your cholesterol or triglycerides if you have high levels

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in the right upper quadrant of the abdomen, itching, lack of appetite, nausea, and jaundice. There still may be no symptoms for some time. The only way to diagnose NASH is by liver biopsy. Since none of this sounds like fun, it makes sense to prevent the formation of NAFLD - take control of what you can - NOW!

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