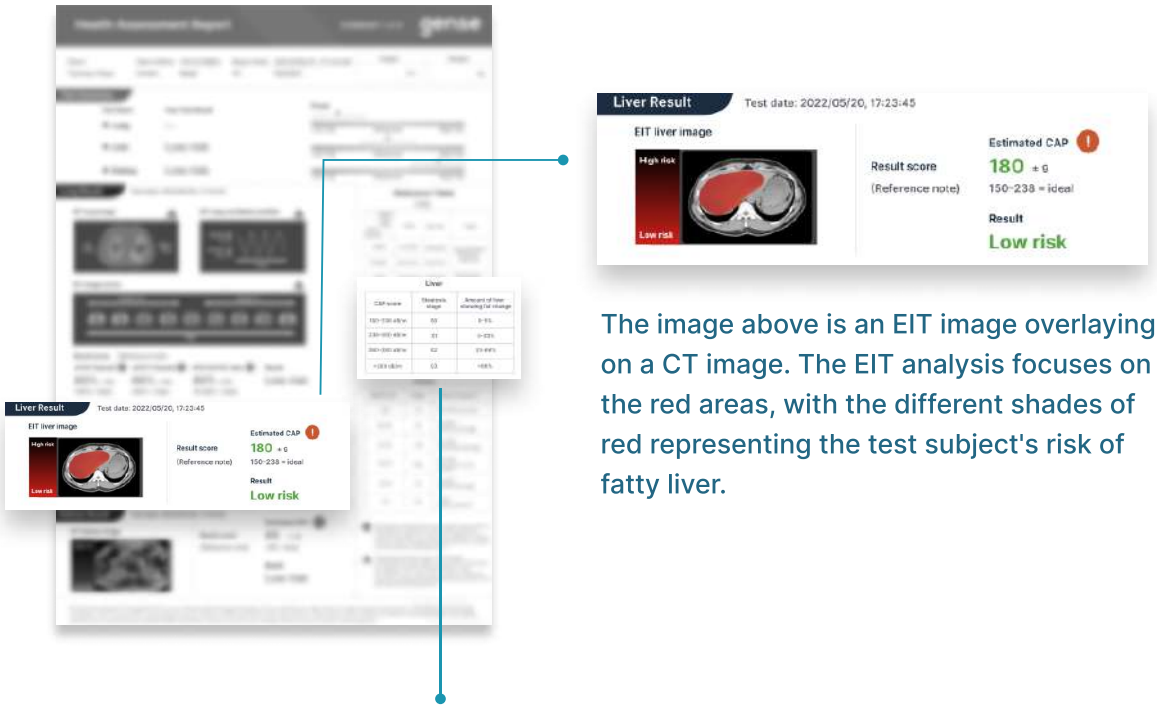
Your Level of Fatty Liver: High

The test results show that some of your scores are below the ideal values, but please do not panic. These results are only applicable for assessing your physical condition and not for diagnosis. Please improve your lifestyle habits appropriately, such as getting adequate amount of sleep and avoiding alcohol; you can also consume more liver-beneficial foods such as fresh fruits and vegetables, unsalted nuts, and fish, meat, eggs, and dairy.
Additionally, we recommend you use Mediscan regularly to check for fatty liver, to prevent the condition from worsening and to help monitor your physical condition after improving your lifestyle habits, and to assist with adjusting your treatment plan.

01 Understanding Personal Health Reports

Sample



The image above is an EIT image overlaying on a CT image. The EIT analysis focuses on the red areas, with the different shades of red representing the test subject's risk of fatty liver.

NAFLD risk level	CAP scores	Steatosis Stages	Amount of Liver Showing Fat Change
Low risk	150-238 dB/m	S0	0-5%
Moderate	238-260 dB/m	S1	5-33%
	260-280 dB/m	S2	33-66%
High risk	>280 dB/m	S3	>66%

Explanation

The CAP (Controlled Attenuation Parameter) index reflects the degree and stage of steatosis in the liver, and it can show the extent to which the liver is affected by fat accumulation[1]. We can understand our liver health status through the estimated controlled attenuation parameter (eCAP) score from your report, which reflects the stage of fatty liver degeneration and indicates the degree to which the liver is affected by fat accumulation[2].

For example, a score of 150-238 dB/m indicates that the liver is less affected by fat accumulation and is in good health. If the CAP score is higher, it indicates a greater risk to liver health, and it should be taken seriously and lifestyle adjustments should be made. However, as time passes and habits change, the stage of fatty liver degeneration can also change accordingly.

Reasons for Increased Risk of NAFLD

Obesity

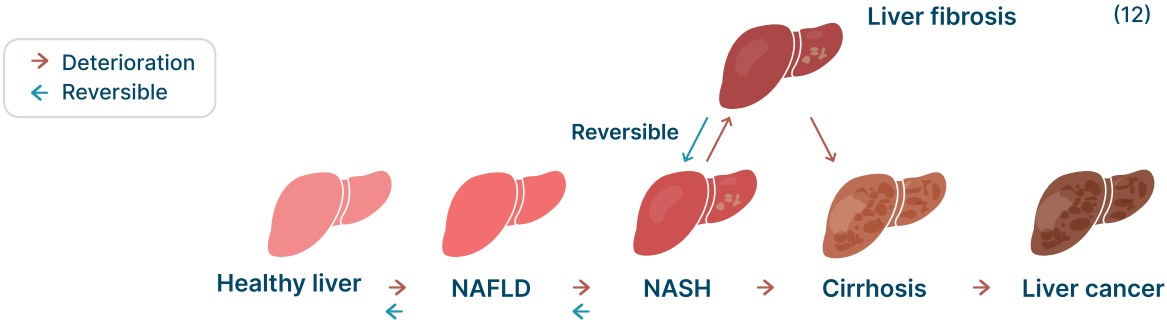
Adult men with a waist circumference of 81 cm or more and adult women with a waist circumference of 78.5cm or more are at greater risk of developing fatty liver disease[13]. Although obesity is one of the major risk factors for NAFLD, people with a slim body shape may also develop NAFLD, and in some developing countries, such as India, 54% of patients are neither overweight nor have abdominal obesity[14].

High blood pressure

There is a strong association between high blood pressure and NAFLD. Blood pressure above 140/90 mm Hg increases the risk of developing NAFLD[15]. New epidemiological evidence shows that about 49.5% of patients with hypertension have NAFLD, and the prevalence of hypertension is significantly higher in patients with NAFLD than in the general population.[16]

Higher than normal blood sugar levels or a diagnosis of type II diabetes

Type II diabetes mellitus coexists frequently with NAFLD. The prevalence of NAFLD in people with type II diabetes is 70%~75%[17]. Type II diabetes accounts for more than 90% of the diabetic patients in Hong Kong, and patients are usually middle-aged and elderly, but in recent years there is a trend of younger people[18].



Consequences of Failing to Detect Lung Disease in Time

Early stages of Non-Alcoholic Fatty Liver Disease (NAFLD) may not necessarily cause significant harm to the body. If left untreated, NAFLD can progress to simple steatosis[19], non-alcoholic steatohepatitis, liver fibrosis, cirrhosis, and liver cancer, severely affecting quality of life and increasing the risk of death[20]. Early stages of NAFLD are reversible, but when it worsens to later stages such as cirrhosis or liver cancer, patients might require liver transplantation surgery or other treatments to improve the condition[21].

NAFLD is one of the main factors leading to cirrhosis and liver cancer. Without early detection of NAFLD, risk of complications, including death, increases with disease progression[22]. Liver cancer ranks 3rd among fatal cancers in Hong Kong[23].

NAFLD is strongly associated with type II diabetes and metabolic syndrome, and patients also face a higher risk of developing coronary heart disease and stroke[24].

Regular testing with mediscan to check your liver health can help individuals to be more aware their health and make timely adjustments to their lifestyle habits and healthcare plans. We also encourage people without liver problems to use mediscan for regular checkups if they are at risk for obesity and/or diabetes to detect potential health problems for early detection in order to take preventive measures.

04 Daily Prevention

Protective Diet for Liver

Catechins (Green tea)

Catechins have been shown to reduce body weight, fat tissue deposition, and food intake[25]. They play an important role in regulating fat and glucose metabolism, as well as participating in gene expression related to fat synthesis[25]. Catechins also have positive effects on oxidative stress, neutralizing pro-inflammatory responses leading to liver damage[25]. A study has shown that the daily intake of 300-600 milligrams of catechins for at least 12 weeks has significant benefits in observed fat spectra, oxidative status, and liver damage markers. 250 ml of brewed green tea (the weight of a packet) contains 50 - 100 mg of catechins[25]. However, the concentration of bioactive compounds in green tea does vary depending on the preparation method, such as different brewing times or water temperatures. In addition, it is recommended to consume green tea in moderation on a daily basis, as excessive intake may cause heart palpitations, hand tremors, and headaches[26].

Glutathione (Coffee)

Glutathione plays an important role in antioxidant defense, nutrient metabolism, and regulating cellular activity, including DNA and protein synthesis, cell proliferation and apoptosis, and immune response[27]. Glutathione deficiency can lead to oxidative stress, which is associated with aging and many diseases, including epilepsy, Alzheimer's disease, Parkinson's disease, liver disease, and others[27].
A study has shown that drinking coffee may help increase glutathione levels[28].

The US Food and Drug Administration (FDA) states that the upper limit for caffeine intake for healthy adults is 400 mg (approx. 4~5 cups of coffee) per day, and estimates that rapid ingestion of around 1,200 mg (approx. 12 cups of coffee)of caffeine may result in toxic effects, such as seizures. However, the effects of excessive caffeine intake vary from person to person[29].

Vitamin E (Nuts)

Vitamin E has antioxidant properties and also helps the liver absorb fatty acids to maintain liver integrity. The recommended daily intake for adults is 15 mg of vitamin E[30]. Studies have shown that the prevalence of NAFLD is lower in both men and women when nut intake is 15-30 g/day (about the size of a hand)[31]. Wheat germ oil, sunflower oil, safflower oil, as well as some nuts (such as peanuts, hazelnuts, and especially almonds) and seeds (such as sunflower seeds) are the best sources of vitamin E[32]. Some nuts available in the market may be seasoned with salt or other flavorings during processing. We recommend to pay attention to the amount of nuts consumed or choose plain nuts to avoid excessive intake of salt.

Omega-3 Fatty Acids (Salmon)

Deep-sea fish such as salmon and tuna are rich in Omega-3 fatty acids, which can help fight inflammation and increase respiratory resistance[33]. Adult men are advised to consume 1.6 grams of Omega-3 per day, while women are advised to consume 1.1 grams per day[34]. A 3-ounce (85-gram) serving of wild salmon contains approximately 1.57 grams of Omega-3, while a 3-ounce (85-gram) serving of farmed salmon contains approximately 1.83 grams of Omega-3[34]. (The weight of a salmon fillet is around 200 grams.)

*1 teaspoon = 5cc

Healthy habits for liver protection

Regular Exercise

The prevalence of non alcohol fatty liver disease (NAFLD) has increased on a yearly basis due to a combination of high calorie diets and lack of exercise. Daily aerobic exercise can help prevent or improve fatty liver. Studies have shown that a 7-10% reduction in body weight can significantly improve the extent of fatty liver and reduce liver fibrosis in overweight or obese patients[35]. The NHS recommends at least 2.5 hours of moderate aerobic exercise per week, such as climbing, cycling[36] and resistance training two days a week, a set of training is usually under 20 minutes. It is advisable to start with a 10-minute daily exercise cycle. Instead of forcing yourself to do longer or more intense exercises, choose the intensity of exercise based on your current physical condition and increase accordingly with time[36].

Increase Physical Activity

Physical activity refers to activities that require more energy from the body during rest, such as walking, household chores, and gardening. Research has shown that patients with non-alcoholic fatty liver disease generally have lower level of physical activity than healthy individuals[37]. If it is difficult to find time for exercise, you can try brisk walking and aim to complete 1.6 kilometers within 15-30 minutes while making it a habit. This has long-term benefits for the body[38].

Get Enough Sleep

Insufficient sleep (less than 7 hours of sleep per day) and poor sleep quality in middle-aged individuals are associated with an increased risk of developing non-alcoholic fatty liver disease[39, 40]. Experts from the US National Institutes of Health (NIH) recommend that adults should aim for 7 to 9 hours of sleep per night[41]. Additionally, a study of 2,172 Japanese individuals revealed that the lowest proportion of non-alcoholic fatty liver disease was found in the group with 6 to 7 hours of sleep, while the highest proportion was found in those who slept less than 6 hours or more than 8 hours[42]. If adults cannot obtain sufficient sleep on workdays, sleeping for more than 7 hours on weekends may help reduce the risk of developing non-alcoholic fatty liver disease[43].

Eating habits that hurt your liver

Excessive Consumption of Sweets

A high-sugar diet (from cane sugar and/or high-fructose corn syrup (HFCS) increases the risk of developing non-alcoholic fatty liver(NAFLD) and non-alcoholic steatohepatitis. The human body produces uric acid during the metabolism of fructose, which increases damage to the gut, bacterial complications, and mitochondria, resulting in the formation of fat in the liver. The intake of sugary drinks is closely related to NAFLD, and reducing sugar intake may have significant benefits in improving disease[44]. Dietary guidelines published by the US Department of Health and Human Services recommend that individuals aged 2 or above limit their intake of added sugars to less than 10% of their daily total calorie intake. For example, for a 2000-calorie diet, the amount of added sugar should not exceed 200 calories (about 12 teaspoons)[45]. When calculating the sugar content of a cup of bubble tea, which is about 520 grams, the sugar content per 100 grams of serving is about 5 grams[46].

Consumption of high-fat foods

Consuming excessive amounts of high-fat foods can cause fat accumulation in the body, with enlargement of fat cells and fibrosis resulting in the buildup of free fatty acids in the liver and leading to hepatic steatosis [47]. The liver may become enlarged, and over time, fat accumulation can cause liver tissue to harden and develop scarring. Excess consumption of foods high in saturated fat can also increase cholesterol in the blood, increasing the risk of cardiovascular disease and stroke[48]. Therefore, it is recommended that adult men consume no more than 30 grams (approx. 6 tea spoons*) of saturated fat per day, while adult women should consume no more than 20 grams (approx. 4 tea spoons*) of saturated fat per day [40]. In addition, the World Health Organization recommends limiting the consumption of trans fats (found in processed foods and foods cooked at high temperatures) to less than 1% of total energy intake, which means that in a 2000 calorie diet, the consumption of trans fats should be less than 2.2 grams per day[49].

*1 teaspoon = 5cc