

Cancer Association of South Africa (CANSA)



Research • Educate • Support

Nutritional Guidelines for Individuals Diagnosed with Liver Cancer

Introduction

The liver is one of the vital organs. It is located in the upper right quadrant of the abdomen, below the diaphragm.

[Picture Credit: Liver]

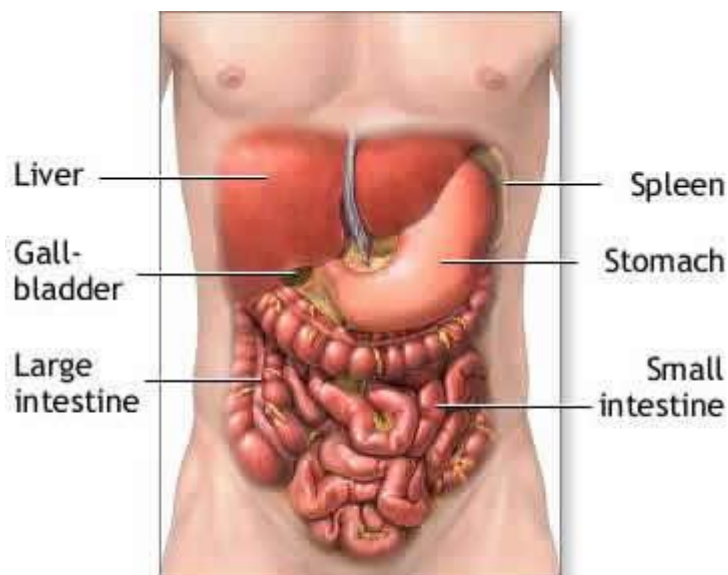
The liver is a gland that plays a major role in metabolism with numerous functions in the human body, including regulation of glycogen storage, decomposition of red blood cells, plasma protein synthesis, hormone production, and detoxification. It is an accessory digestive gland and produces bile, an alkaline compound which aids in digestion via the emulsification of lipids (fats). The gallbladder, a small pouch sits just under the liver – it stores bile produced

by the liver. The liver's highly specialised tissue consisting of mostly hepatocytes (liver cells) regulates a wide variety of high-volume biochemical reactions, including the synthesis and breakdown of small and complex molecules, many of which are necessary for normal vital functions.

Estimates regarding the liver's total number of functions vary, but textbooks generally cite it being around 500.

Terminology related to the liver often starts in *hepat-* from the Greek word for liver.

There is currently no way to compensate for the absence of liver function in the long term, although liver dialysis techniques can be used in the short term. Artificial livers are yet to be developed to promote long term replacement in the absence of the liver. As of now, liver transplantation is the only option for complete liver failure.



adam.com

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

October 2018

Page 1

Liver Cancer

Liver cancer is cancer that begins in the cells of one's liver. The liver is a football-sized organ that sits in the upper right portion of the abdomen, beneath the diaphragm and above the stomach.

Several types of cancer can form in the liver. The most common type of liver cancer is hepatocellular carcinoma, which begins in the main type of liver cell (hepatocyte). Other types of liver cancer, such as intrahepatic cholangiocarcinoma and hepatoblastoma, are much less common.

Not all cancers that affect the liver are considered liver cancer. Cancer that begins in another area of the body - such as the colon, lung or breast - and then spreads to the liver is called metastatic cancer rather than liver cancer. And this type of cancer is named after the organ in which it began - such as metastatic colon cancer to describe cancer that begins in the colon and spreads to the liver. Cancer that spreads to the liver is more common than cancer that begins in the liver cells.

The liver is a metabolically active organ responsible for many vital life functions. The primary functions of the liver are:

- Bile production and excretion
- Excretion of bilirubin, cholesterol, hormones, and drugs
- Metabolism of fats, proteins, and carbohydrates
- Enzyme activation
- Storage of glycogen, vitamins, and minerals
- Synthesis of plasma proteins, such as albumin, and clotting factors
- Blood detoxification and purification

Due to these important activities, the liver is exposed to a number of insults and is one of the body's organs most subject to injury.

In most cases, the cause of liver cancer is long-term damage and scarring of the liver (cirrhosis). Cirrhosis may be caused by:

- Excessive alcohol consumption
- Autoimmune diseases of the liver
- Hepatitis B or C virus infection
- Inflammation of the liver that is long-term (chronic)
- Iron overload in the body (haemochromatosis)

People with hepatitis B or C are at high risk of liver cancer, even if they do not develop cirrhosis.

The latest statistics reveal that cancer is now not only a leading cause of death worldwide, but that liver cancer is one of the deadliest forms. Indeed, liver cancer is a leading cause of death from cancer worldwide, and accounted for 746,000 deaths globally in 2012. One of the reasons for the poor survival rates is that liver cancer symptoms do not manifest in the early stages of the disease, which means that the cancer is generally advanced by the time it is diagnosed.

(Mayo Clinic; RNCeus.com; MedlinePlus; World Cancer Research Fund International).

Eating Tips Before, During and After Cancer Treatment

There is no way to know if one will have eating problems and, if so, how bad they will be. One may have just a few problems or none at all. In part, this depends on the type of cancer one has, where it is in one's body, what kind of treatment one has, how long treatment lasts, and the doses of treatment one receives.

Things to do and think about before starting cancer treatment

Until treatment starts one will not know what, if any, side effects or eating problems one may have. If you do have problems, they may be mild. Many side effects can be controlled. Many problems go away when cancer treatment ends.

- Think of the cancer treatment as a time to get well and focus just on self.
- Eat a healthy diet before treatment starts. This helps to stay strong during treatment and lowers one's risk of infection.
- Go to the Dentist. It is important to have a healthy mouth before starting cancer treatment.
- Ask the Doctor, Professional Nurse, or Registered Dietitian about medicine that can help with anticipated eating problems.
- Discuss fears and worries with the Doctor or Professional Nurse. He or she can discuss ways to manage and cope with these feelings.
- Learn about liver cancer and its treatment. Many people feel better when they know what to expect.

Ways to get ready to eat well

- Fill the refrigerator, cupboard, and freezer with healthy foods. Make sure to include items you can eat even when you feel sick.
- Stock up on foods that need little or no cooking, such as frozen dinners and ready-to-eat cooked foods.
- Cook some foods ahead of time and freeze in meal-sized portions.
- Ask friends or family to help you shop and cook during treatment. Maybe a friend can set up a schedule of the tasks that need to be done and the people who will do them.
- Talk with a Doctor, Professional Nurse, or Registered Dietitian about what to expect.

Ways to get the most from foods and drinks during cancer treatment

During treatment, one may have good days and bad days when it comes to food. Here are some ways to manage:

- Eat plenty of protein and calories when possible. This helps one keep up one's strength and helps rebuild tissues harmed by cancer treatment.
- Eat when one has the biggest appetite. For many people, this is in the morning. One might want to eat a bigger meal early in the day and drink liquid meal replacements later on.
- Eat those foods that one can, even if it is only one or two items.
- Stick with these foods until one is able to eat more.
- One might also drink liquid meal replacements for extra kilojoules and protein.
- One must not worry if one cannot eat at all some days. Spend this time finding other ways to feel better, and start eating when one can.

- Inform the treating doctor if unable to eat for more than 2 days.
- Drink plenty of liquids. It is even more important to get plenty to drink on days when not feeling like eating. Drinking a lot helps one's body get the liquid it needs.
- One should take between 30 and 35ml of fluid per kilogram of body weight per day. Environmental factors such as heat may affect the amount of fluid needed.

Taking special care with food to avoid infections

Some cancer treatments can make one more likely to get infections. When this happens, one needs to take special care in the way one handles and prepares food. Here are some ways:

- Keep hot foods hot and cold foods cold. Put leftovers in the refrigerator as soon as one has done eating.
- Scrub all raw fruits and vegetables before eating them.
- Do not eat foods (like raspberries) that cannot be washed well. One should scrub fruits and vegetable which have rough surfaces, such as melons, before cutting them.
- Wash hands, knives, and counter tops before and after preparing food. This is most important when preparing raw meat, chicken, turkey, and fish.
- Use a different cutting board for meat and one for fruits and vegetables.
- Thaw meat, chicken, turkey, and fish in the refrigerator or defrost them in the microwave immediately before preparing them. Do not leave them sitting out.
- Cook meat, chicken, turkey, and eggs thoroughly. Meats should not have any pink inside. Eggs should be hard, not runny.
- Do not eat raw fish or shellfish, such as sushi and uncooked oysters.
- Make sure that all of juices, milk products, and honey are pasteurised.
- Do not use foods or drinks that are past their freshness date.
- Do not buy foods from bulk bins.
- Do not eat at buffets, salad bars, or self-service restaurants.
- Do not eat foods that show signs of mould. This includes mouldy cheeses such as bleu cheese.

Special diets, vitamins, minerals and supplements

- Talk with the treating Doctor, Professional Nurse, or Registered Dietitian before going on a special diet or taking any vitamins, minerals or supplements.
- To avoid problems, be sure to follow their advice.

(National Cancer Institute).

Diet and Nutritional Guidelines for Individuals Diagnosed with Cancer of the Liver

Good nutrition is important - especially if one has cancer. Treatment for cancer, and cancer itself, can affect one's appetite and how the body digests, absorbs and uses food. Cancer-related malnutrition can make one tired, weak and unable to receive the treatments one needs to get better.

Avoid all alcoholic beverages - Alcohol is a Group 1 cancer causing agent according the International Agency for Research on Cancer (IARC) and is best avoided.

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

October 2018

Smoking - Smoking increases the risk of liver cancer generally, but there is a further increase in risk among smokers who also have a hepatitis B or hepatitis C virus infection and also among smokers who consume large amounts of alcohol. Individuals who smoke should seek assistance and join a smoking cessation programme to assist them to quit.

Eat 5-6 small meals or snacks throughout the day - Smaller amounts of food are easier for the body to digest and absorb. It will also help to minimise nausea. Make sure that meals and snacks are balanced, nutritious and include a source of protein. Eat the largest meal when feeling the most hungry. Avoid eating too close to bedtime.

Eat foods that contain healthy fats - Avoid fried, greasy and fatty foods. These foods are hard to digest with an altered pancreas. Choose baked, broiled, or grilled foods instead. Healthy fats include monounsaturated and polyunsaturated fats such as canola oil, olive oil, nuts, and nut butters. Avoid fatty meats, such as beef, lamb, and pork - opt for fish, beans, or poultry.

Yogurt - scientists have found that the active culture of bacteria in yogurt, which is called *Lactobacillus*, actually helps to fortify the immune system. Studies have shown that the use of yogurt in the diet triples the internal production of interferon which the immune system uses against tumour cells. Yogurt has also been shown to raise the level of natural killer cells. Yogurt has also been proven to slow down the growth of tumour cells in the GI tract and is able to improve the immune system's ability to destroy active tumour cells. Choose brands that state "contains live and active cultures" on the package. Avoid sweetened yogurt due to the high sugar content.

Garlic – freshly crushed garlic has been found to stimulate natural protection against tumour cells. It has been discovered that garlic is toxic to invading pathogens and tumour cells; however, it is harmless to normal, healthy cells.

Carotenoids - carotenoids and bioflavonoids absorb dangerous particles. They have the potential to stimulate the immune system. There is some evidence that both of these may be toxic to tumour cells. Carotenoids can be found in green and orange fruits and vegetables. Bioflavonoids are found in citrus, whole grains, honey and other plant foods.

Eat as healthy as possible as allowed by the digestive system - Fruits, vegetables, lean protein, and whole grains are all nutrient dense foods. Nutrient dense foods are foods that contain protein, complex carbohydrates, healthy fat, vitamins, and minerals all needed by the body to function optimally. Consult a registered dietitian for specific recommendations based on one's level of food tolerance.

No single food will supply all the nutrients a body needs, so good nutrition means eating a variety of foods. It is important to eat foods from each group at each meal every day.

Foods are divided into five main groups:

- Fruits and vegetables (oranges, apples, bananas, carrots, and spinach)

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

October 2018

- Whole grains, cereals, and bread (wheat, rice, oats, bran and barley)
- Dairy products (milk, cheese, and yogurt)
- Meats and meat substitutes (fish, poultry, eggs, dried beans, and nuts)
- Fats and oils (oil, butter, and margarine)

It is important to eat foods from each food group at each meal every day. Meals and snacks should include starch/grains, protein, dairy, fruits, vegetables and fats. By eating foods from each food group at each meal, an individual ensures that the body has a proper balance of all nutrients it needs to function. Eating meals and snacks at regular times is also necessary for controlling blood sugar levels.

Choose protein-rich foods - protein helps the body to repair cells and tissues. It also helps the immune system recover from illness. Make sure to include a source of lean protein at all meals and snacks. Good sources of lean protein include:

- Lean meats such as chicken, fish, or turkey
- Eggs
- Low fat dairy products such as milk, yogurt, and cheese or dairy substitutes
- Nuts and nut butters
- Beans
- Soy foods

Eat whole grain foods when possible - Cereals, breads, brown rice, whole wheat pasta, and crackers are good whole grain choices. Whole grain foods will have “whole grain flour,” “whole wheat flour,” or “oats” as one of the first 3 ingredients. If diarrhoea is an issue, one may need to avoid whole grains due to their higher fibre content. A registered dietitian can provide guidelines for following a low residue diet for diarrhoea.

Avoid excess sugar and sweets - Since the pancreas plays a key role in the digestion of sugar, there is an increased chance that one will not digest overly sweet foods well. These foods also tend to provide the body with kilojoules but few nutrients.

If excessive weight loss becomes an issue, one’s body may need more kilojoules and it is fine if some of them come from sugar as long as one is able to tolerate sweet foods.

Try to eat with others when possible - Typically this makes meal times more enjoyable and may encourage one to eat more than eating alone.

Eat slowly and chew food really well - Digestion begins in the mouth. Smaller food particles are much easier to digest and are less likely to cause discomfort during the digestion process.

Sit up after eating - Wait at least 1 hour before lying down. Lying down after eating encourages acid to flow from the stomach back into the oesophagus leading to symptoms of heartburn. Stay in an upright position while food digests. This will keep the acid from the stomach in the stomach. It is not uncommon for pancreatic cancer patients to have heartburn, gas, bloating, and belching. Ask a registered dietitian for guidance on which foods to avoid when experiencing heartburn, gas, bloating, and belching.

Be as active as possible - Exercise may help to stimulate appetite and endorphin production. Being able to eat more and having an enhanced feeling of wellbeing will make one's treatments more bearable.

Drink sufficient fluids to avoid dehydration - Choose beverages that contain nutrients and kilojoules. A good starting point is to strive for several glasses of nutritious beverages per day. Only take small sips with meals to avoid excessive bloating, gas or feeling too full to eat. The best time to drink fluids is an hour before or after a meal. Choose beverages that contain kilojoules and nutrients such as juices, smoothies, and liquid nutrition supplements.

A registered dietitian can provide recommendations regarding liquid nutrition supplements and how much is best.

Keep a journal - Record eating times, foods consumed, and any effects to track and determine which foods are best tolerated.

Be observant of changes in bowel habits - One may experience symptoms of fat malabsorption which can be determined by the frequency of bowel movements and the appearance of stools. Fat containing stools are often bulky, frequent, foul smelling, and have an oily appearance. These symptoms warrant the need for vitamin A, D, E, and K supplements as well as a multivitamin. One may also need a calcium supplement. One's healthcare team can advise on choosing these as well as the correct dosage. Ask the treating oncologist about vitamin B₁₂ injections and iron to avoid becoming anaemic.

Take medication as prescribed – it is important to take all prescribed medicines regularly. Talk to the healthcare team before taking any vitamins or supplements. Some vitamins and supplements may interact with the cancer treatment. Choose food first as the main source for nutrients.

Maintain a good mass (weight) - It is normal to lose some weight after being diagnosed with liver cancer and beginning on treatment. If losing more than ½ to 1Kg per week continuously, consult a registered dietitian immediately for recommendations on increasing kilojoule intake.

Practice good food safety - wash hands often while preparing food. Use different knives and cutting boards for raw meat and raw vegetables. Be sure to cook all foods to their proper temperature and refrigerate leftovers right away.

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

October 2018

Page 7

Know that your cancer journey and treatment is unique - one may experience side effects that affect one's ability to follow these suggestions. If struggling with any side effects, such as loss of appetite, nausea, diarrhoea, vomiting, or any other nutrition concerns, one's needs may be different to those of others. A registered dietitian can suggest nutrition guidelines that will be appropriate for a specific cancer journey.

If there are any specific questions regarding any of the guidelines, please contact a registered dietitian.

(Liver Cancer Center; Cancer Treatment Centers of America; World Cancer Research Fund International; Sarah Cannon Fighting Cancer Together).

Medical Disclaimer

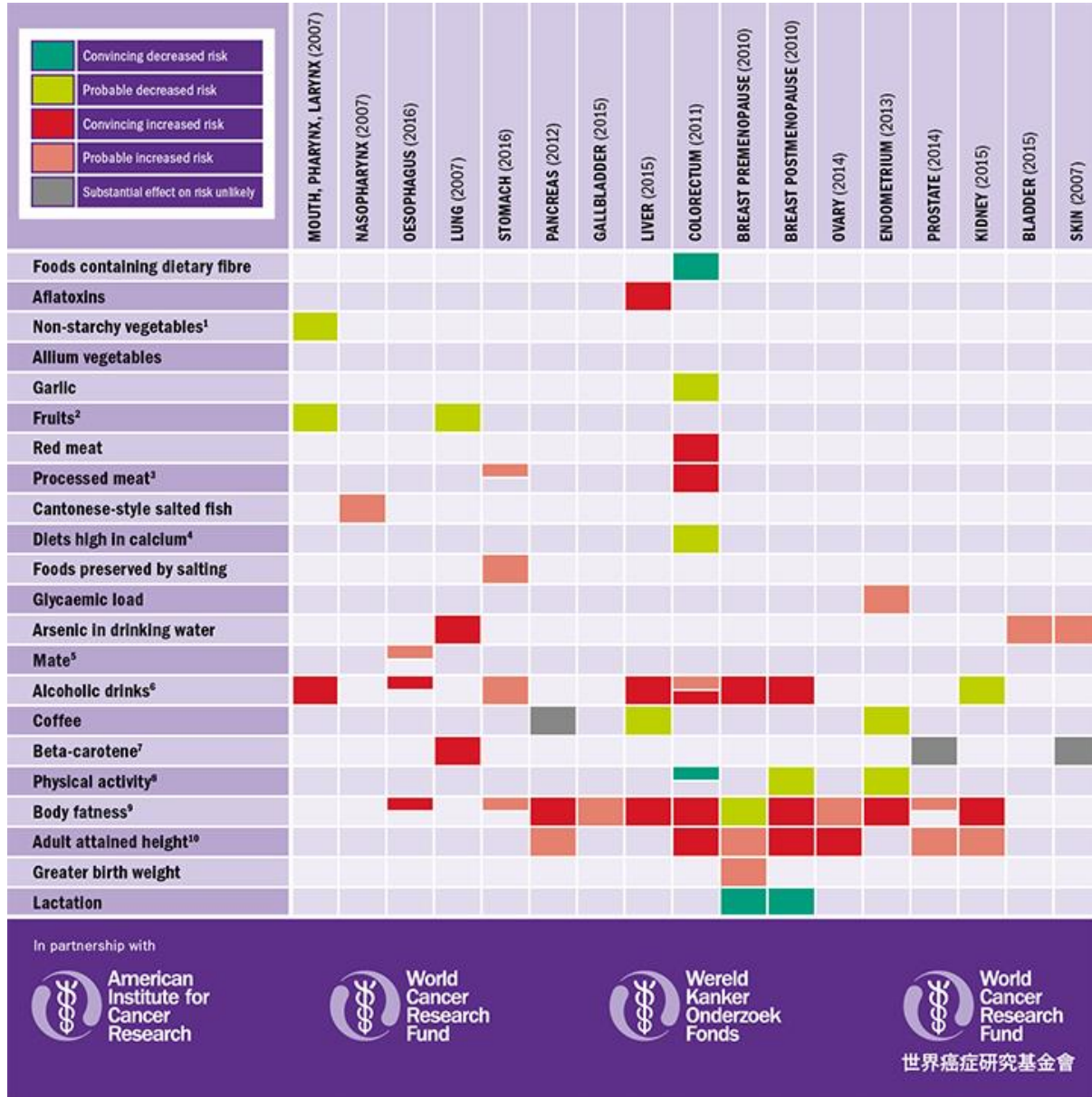
These Nutritional Guidelines are intended to provide general information only and, as such, should not be considered as a substitute for advice, medically or otherwise, covering any specific situation. Users should seek appropriate advice before taking or refraining from taking any action in reliance on any information contained in these Guidelines. So far as permissible by law, the Cancer Association of South Africa (CANSAs) does not accept any liability to any person (or his/her dependants/estate/heirs) relating to the use of any information contained in these Guidelines.

Whilst CANSAs has taken every precaution in compiling these Guidelines, neither it, nor any contributor(s) to these Guidelines can be held responsible for any action (or the lack thereof) taken by any person or organisation wherever they shall be based, as a result, direct or otherwise, of information contained in, or accessed through, these Guidelines.

ADDITIONAL SUPPORT

For individualised nutritional advice, consult a registered dietitian in your area by visiting:

<http://www.adsa.org.za/Public/FindARegisteredDietitian.aspx>



1 Includes evidence on foods containing carotenoids for mouth, pharynx, larynx. 2 Includes evidence on foods containing carotenoids for mouth, pharynx, larynx and lung.
 3 For stomach, probable increased risk of non-cardia cancer only. 4 For colorectum, evidence is from milk and studies using supplements.
 5 Probable increased risk for oesophageal squamous cell carcinoma only.
 6 For oesophagus, convincing increased risk for oesophageal squamous cell carcinoma only. For liver and stomach, based on evidence for alcohol intakes above around 45 grams per day (about 3 drinks a day). For colorectum, convincing increased risk for men and probable increased risk for women. For kidney, based on evidence for alcohol intakes up to 30 grams per day (about 2 drinks a day).
 7 For lung, evidence is from studies using high-dose supplements in smokers. 8 Convincing decreased risk for colon not rectum.
 9 For oesophagus, convincing increased risk for adenocarcinoma only. For stomach, probable increased risk of cardia cancer only. For prostate, probable increased risk for advanced prostate cancer only.
 10 Adult attained height is unlikely to directly influence the risk of cancer. It is a marker for genetic, environmental, hormonal and nutritional factors affecting growth during the period from preconception to completion of linear growth.

(World Cancer Research Fund International).

The Continuous Update Project (CUP) Panel of the World Cancer Research Fund International judges as follows:

- Aflatoxins: Higher exposure to aflatoxins and consumption of aflatoxin-contaminated foods are convincing causes of liver cancer.
- Alcoholic drinks: Consumption of alcoholic drinks is a convincing cause of liver cancer.
- Body fatness: Greater body fatness (marked by BMI) is a convincing cause of liver cancer.
- Coffee: Higher consumption of coffee probably protects against liver cancer.
- Fish: The evidence suggesting that a higher consumption of fish decreases the risk of liver cancer is limited.
- Physical activity: The evidence suggesting that higher levels of physical activity decrease the risk of liver cancer is limited.
(World Cancer Research Fund International/American Institute for Cancer Research).



Sources and References Consulted or Utilised

Cancer Treatment Centers of America

<http://www.cancercenter.com/community/nutritional-support/tab/benefits-of-good-nutrition/>
<http://www.cancercenter.com/community/nutritional-support/super-foods/>

Liver

www.ehow.com/about_4795077_liver-functions-human-body.html

Liver Cancer Center

<http://www.everydayhealth.com/liver-cancer/diet-for-liver-cancer-patients.aspx>

Mayo Clinic

<http://www.mayoclinic.org/diseases-conditions/liver-cancer/home/ovc-20198165>

MedlinePlus

<https://www.nlm.nih.gov/medlineplus/ency/article/000280.htm>

National Cancer Institute

Eating Hints: Before, During and After Cancer Treatment. US Department of Health and Human Services. National Institutes of Health. National Cancer Institute. January, 2011.

RNCeaus.com

<http://www.rnceaus.com/lf/lffx.html>

Sarah Cannon Fighting Cancer Together

<http://sarahcannon.com/for-patients/learn-about-cancer/hepatobiliary-cancer/nutrition.dot>

Researched and Authored by Prof Michael C Herbst

[D Litt et Phil (Health Studies); D N Ed; M Art et Scien; B A Cur; Dip Occupational Health; Dip Genetic Counselling; Diagnostic Radiographer; Dip Audiometry and Noise Measurement; Medical Ethicist]

Approved by Ms Elize Joubert, Chief Executive Officer [BA Social Work (cum laude); MA Social Work]

October 2018

Wikipedia

<https://en.wikipedia.org/wiki/Liver>

World Cancer Research Fund International

wcrf.org/sites/default/files/Liver-Cancer-2015-Report.pdf

<http://www.wcrf.org/int/research-we-fund/continuous-update-project-findings-reports/continuous-update-project-cup-matrix>

World Cancer Research Fund International/American Institute for Cancer Research.

Continuous Update Project Report: Diet, Nutrition, Physical Activity and Liver Cancer.

2015. Available at:

wcrf.org/sites/default/files/Liver-Cancer-2015-Report.pdf