

LOGBOOK

Questions we need to answer

What is hepatitis b

How to treat hepatitis/can it be

What is cancer

What specifically is Hepatocellular Cancers

Can you treat hepatocellular cancers

How is hepatitis b and hepatocellular cancers related

How can hepatitis b cause cancers that are not hepatocellular cancers

Why does it do this etc

Research

What Is Hepatitis B?

Hepatitis B is an infection that expands from your liver. Usually, this serious infection is short-term and doesn't last more than six months. You can also develop a chronic version of this infection, which becomes much more serious. If you have been chronically diagnosed with Hepatitis B, your liver can fail, you can develop hepatocellular cancers, and you can scar your liver (cirrhosis). According to the Hepatitis B Foundation, "more than 90% of infants that are infected will develop a chronic hepatitis B infection, up to 50% of young children between 1 and 5 years who are infected will develop a chronic hepatitis B infection, 5-10% of healthy adults 19 years and older who are infected will develop a chronic hepatitis B infection." This proves that the younger you are, the higher the risk you have of developing chronic Hepatitis B. This is why newborns get vaccinated 12-24 hours after birth. If you have chronic Hepatitis B, there is a high chance that you may never recover. Usually, this disease travels through the blood. To find out if you have Hepatitis B there are many ways you can get tested. For example, blood tests, liver ultrasounds and liver biopsies.

How Can You Treat Hepatitis B?

The symptoms of Hepatitis B are yellow skin or eyes, fever, fatigue, loss of appetite, nausea or vomiting and joint pain. There is no cure for acute Hepatitis B since most adults usually recover from this disease. However, there are antiviral drugs available if you have the chronic version of Hepatitis B. You may also be introduced to the interferon vaccine.

What Is Cancer?

According to the National Cancer Institute, “Cancer is a disease in which some of the body’s cells grow uncontrollably and spread to other parts of the body.” There are many types of cancers, such as Bone And Soft Tissue Cancer, Brain and Central Nervous System Cancer, Eye Cancer, Lung Cancer and many more. Cancer is extremely deadly and is one of the biggest reasons for death in the world. There is no cure for cancer. However, there are treatments available, such as chemotherapy.

What Are Hepatocellular Cancers?

Hepatocellular carcinoma is just another name for liver cancer. Hepatocellular carcinoma is when tumours end up growing on your liver. According to Mayo Clinic, “The risk of hepatocellular carcinoma, the most common type of liver cancer, is higher in people with long-term liver diseases. It's also higher if the liver is scarred by infection with hepatitis B or hepatitis C. Hepatocellular carcinoma is more common in people who drink large amounts of alcohol and who have an accumulation of fat in the liver.” This is one of the most dangerous cancers out there. Symptoms include weight loss, nausea/vomiting, fever and jaundice. If you think you may have hepatocellular carcinoma, you can go in for a screening after checking in with your local healthcare provider. After diagnosis, some treatments can help you with this cancer. These treatments include surgery, liver transplant surgery, ablation procedures, chemotherapy, radiation therapy, targeted drug therapy, immunotherapy and clinical trials.

The Connection Between Hepatocellular Cancers And Hepatitis B

Chronic Hepatitis B is one of the biggest causes of developing Hepatocellular Carcinoma. According to the National Library Of Medicine, “Individuals who are chronic carriers have a greater than 100-fold increased relative risk of developing the tumour.” Since liver cancer is one of the deadliest cancers out there, it is important to get vaccinated for Hepatitis B in order to protect yourself from this disease.

Can Hepatitis B Cause Cancers That Are Non-Hepatocellular Cancers?

Now off to the real question, Can Hepatitis B cause cancers that are not hepatocellular cancers? The answer is yes. If you are diagnosed with chronic Hepatitis B, you have a chance of developing bile duct cancer and non-Hodgkin lymphoma. Bile duct cancer is pretty rare and it starts in your bile ducts. Your bile helps break down your food and it's necessary for survival. However, your bile ducts connect to your liver, which can be connected to non-hepatocellular cancers. According to the National Cancer Institute, “Non-Hodgkin lymphoma is a type of cancer that forms in the lymph system. The lymph system is part of the immune system. It helps protect the body from infection and disease.” Hepatitis B can also lead to gastric cancer. Gastric cancer is just another word for stomach cancer. This cancer however has decreased significantly over the past few years. You can also develop neuroendocrine cancers which can develop anywhere in the human body. The tumours of this cancer can spread either very fast or very slowly. Lastly, you can also develop ovarian cancer, which is a cancer that forms in your ovaries. Again, this cancer is also pretty rare. Henry Ford Health sourced a saying from Dr, Lu. “The study found that, compared to the general U.S. population, patients with chronic hepatitis B were four and a half times more likely to develop bile duct cancer, similarly, patients with chronic hepatitis B were eight times more likely to develop

gastric cancer, six times more likely to develop a neuroendocrine cancer, three and a half times more likely to develop ovarian cancer and about two and a half times more likely to develop non-Hodgkin's lymphoma." These cancers may be rare, but not impossible. It is always better to get vaccinated and lower your chance of getting these cancers.

Acknowledgement

We would like to thank our CYSF coordinator, Mr Tackney for introducing us to this wonderful program. We would also like to thank the CYSF for creating a place for young minds to show what they are scientifically capable of while having a great time! Without the CYSF volunteers, none of this would be possible either! We would like to give an overall big thanks to the University Of Calgary for hosting this event!

Problem

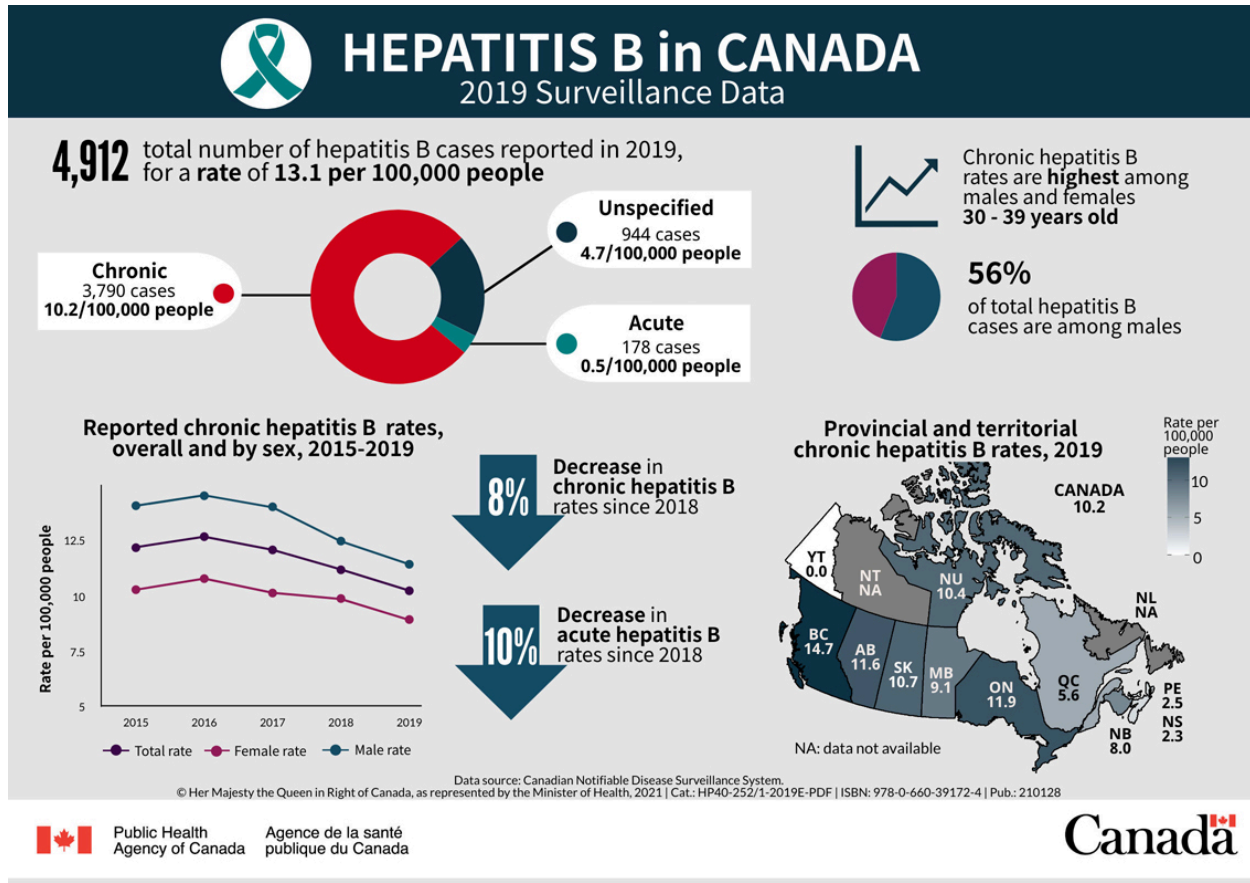
People diagnosed with Hepatitis B are usually unaware that they have this disease. For this reason, Hepatitis B has been given the name 'silent infection'. Those with the disease may be unaware for long periods of time and may unintentionally transmit it to someone else. For those who have a chronic infection, there is a large risk of developing severe liver conditions later in life. Symptoms for Hepatitis B are often scarce or non-existent. In addition, this disease can also be acute which means that it will only last for several weeks to six months.

Cancer can disrupt the delicate chemical equilibrium within your body, putting you at higher risk for severe complications. Some symptoms of chemical imbalances may be presented as increased thirst, frequent urination, constipation, and confusion. Cancer can also affect the way your brain functions and the nervous system. As a result of Tumors pressing against nearby nerves, you may be in pain and your body parts may lose their ability to function. When the brain gets involved with cancer it can cause many things like strokes, headaches and weakness on one side of the body. In conclusion, cancer can trigger a lot of responses from the immune system. These rare reactions are known as paraneoplastic syndromes and they occur when the immune system weekly attacks healthy cells in response to cancer. Various signs and symptoms may occur, including difficulty walking and seizures.

Data

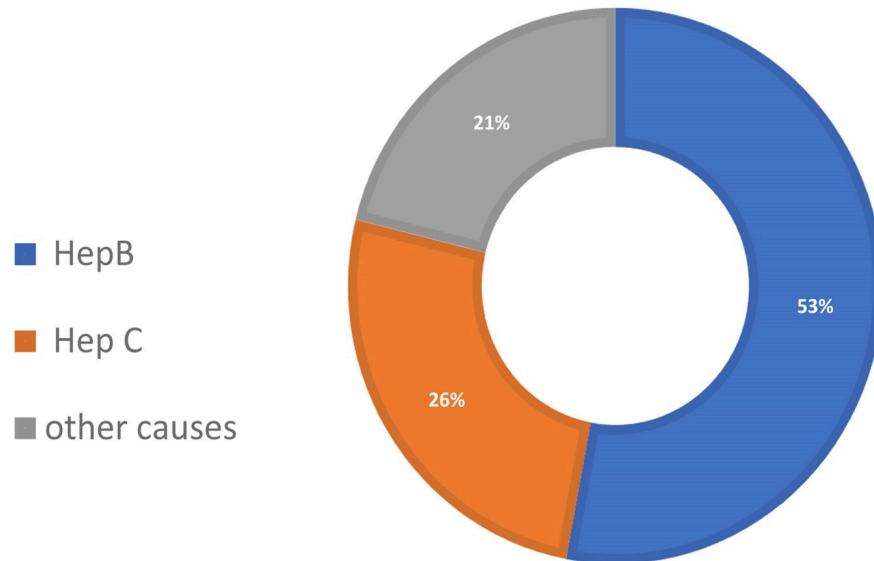
Here is an image made by the Government Of Canada.

This shows the statistics from 2019.



This image includes the number of Hepatitis B cases in 2019. It shows that it has a rate of 13.1 for every 100,00 people infected, which is 4912 people. Out of these numbers, 3790 people have developed the chronic version of this virus, 178 people have developed the acute version and 944 cases are unspecified. However, it is shown that numbers have decreased by 8 percent for chronic Hepatitis B since 2018, and it has decreased by 10 percent for acute Hepatitis B since 2018. You are also more likely to get Hepatitis B if you are between the ages between 30 and 39. If you are a male, you are more likely to get Hepatitis B since 56% of cases are among males. Based on the last image, British Columbia has the highest number of cases at 14.7 and Yukon has the lowest at 0.

ATTRIBUTABLE CAUSE FOR LIVER CANCER DEATHS, WESTERN PACIFIC REGION , 2019



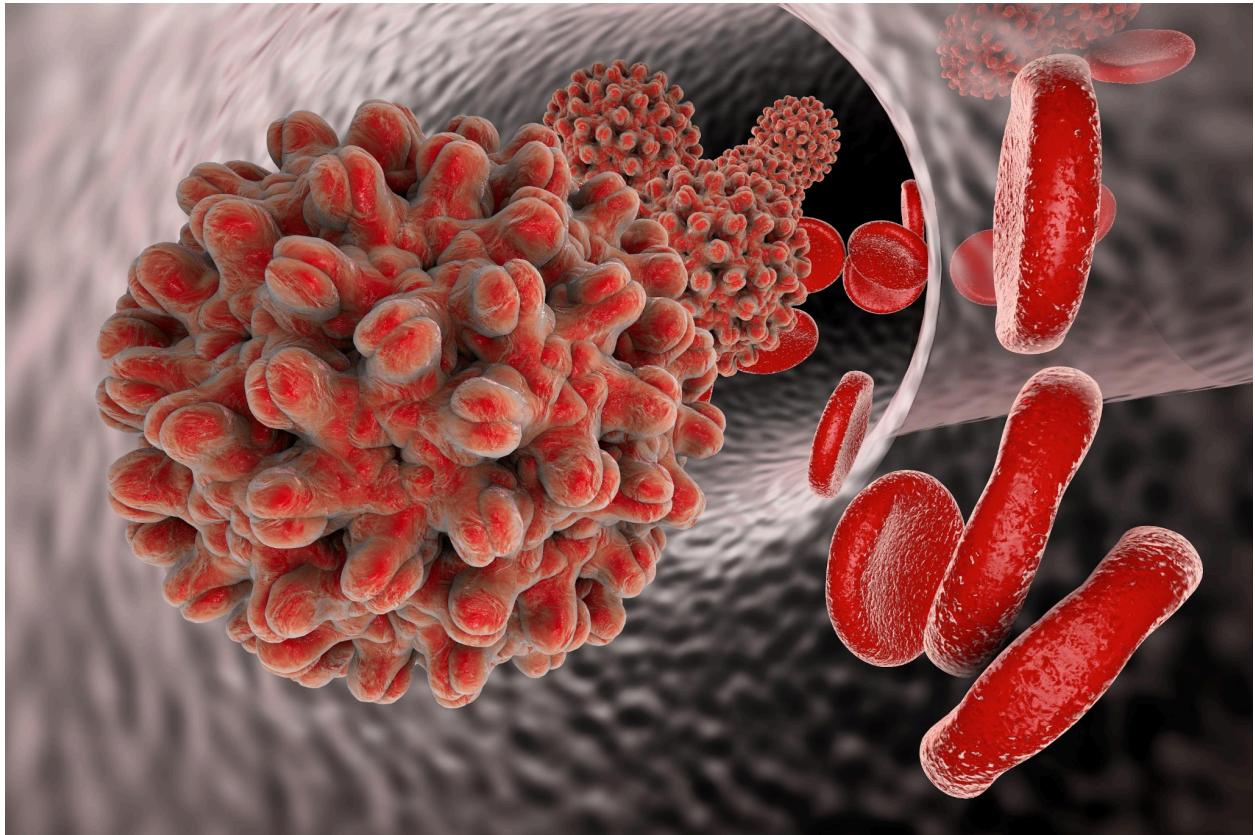
This chart shows the causes of liver cancer deaths. According to the World Health Organization, most of these deaths were caused by Hepatitis B at 53%.

Conclusion

In conclusion, we learned that Hepatitis B, a temporary yet contagious disease can lead to much bigger problems and can even be deadly. The answer to our question is yes, Hepatitis B can lead to non-hepatocellular cancers. These cancers include bile duct cancer, non-Hodgkin lymphoma, gastric cancer,

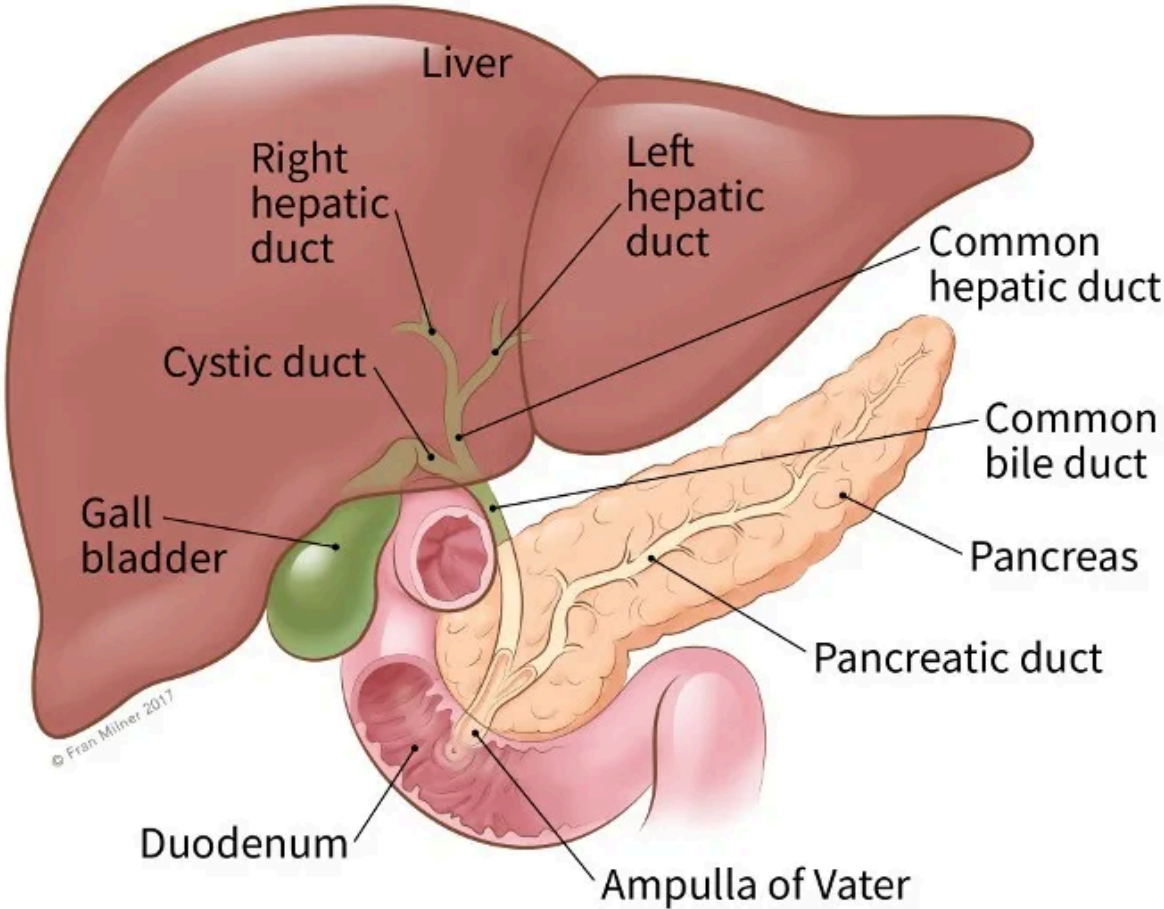
neuroendocrine cancers and finally ovarian cancers. This is why it is always best to get vaccinated for this disease and lower your chances of getting chronic Hepatitis B and possibly cancer. At the end of the day, it is always better to be safe than sorry.

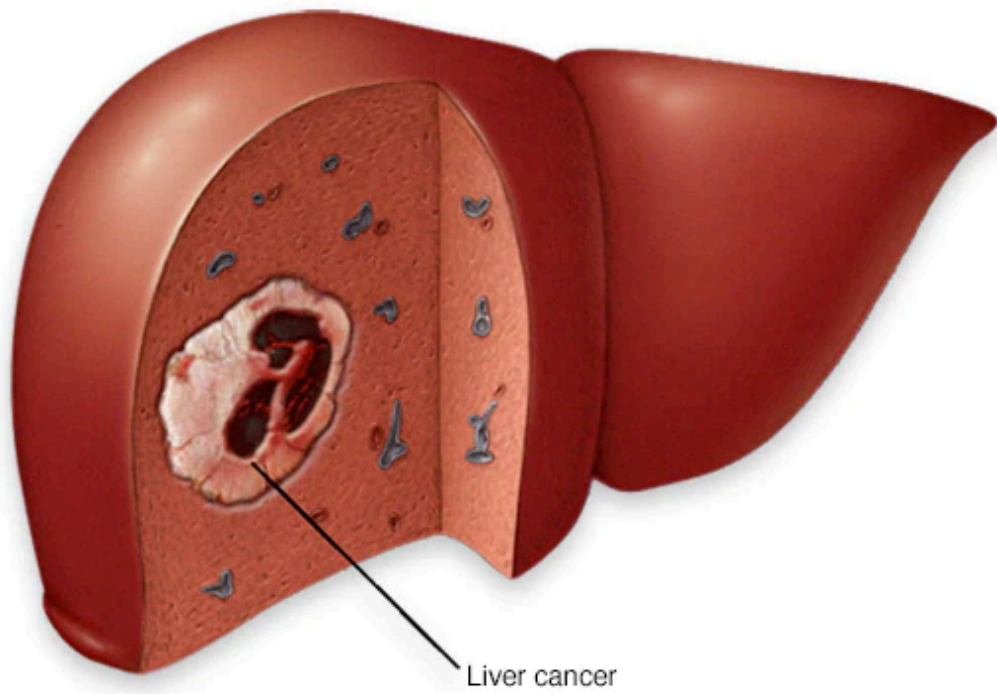
Pictures



Hepatitis B

Bile duct cancer



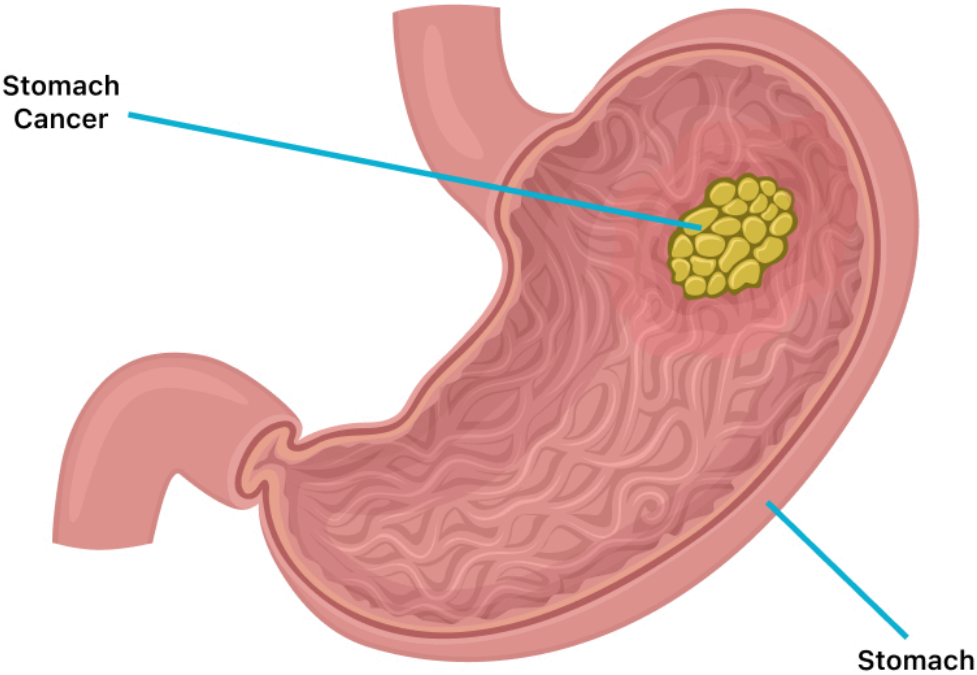


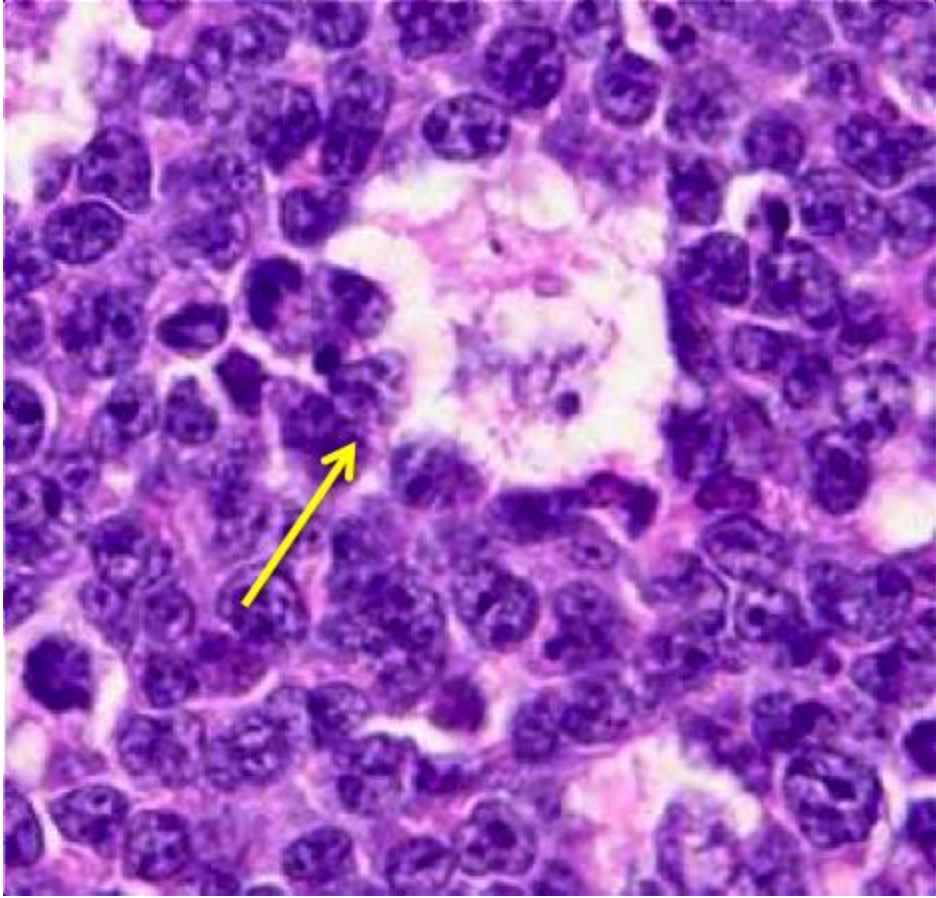
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Hepatocellular Cancers

Gastric Cancer

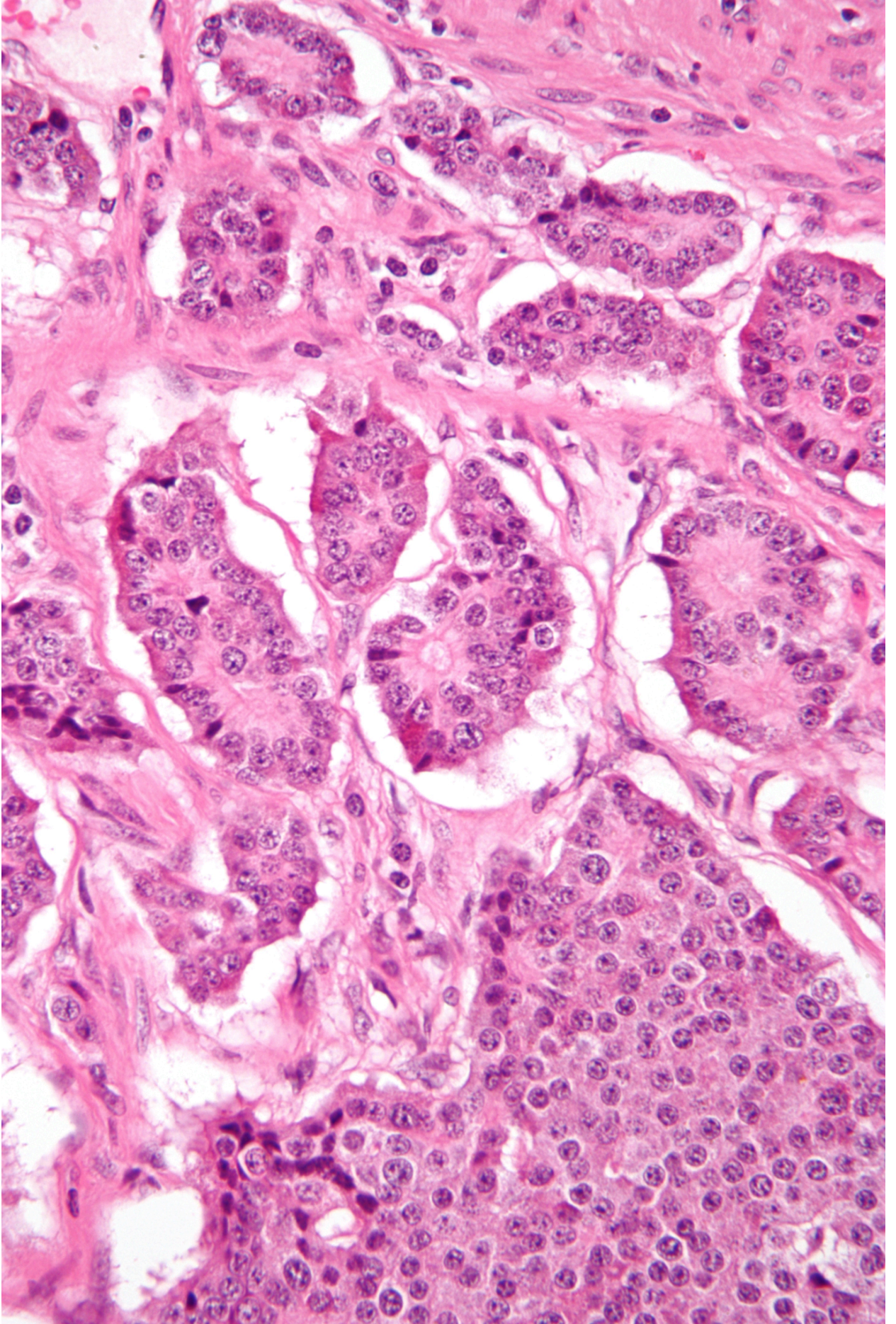
Stomach Cancer



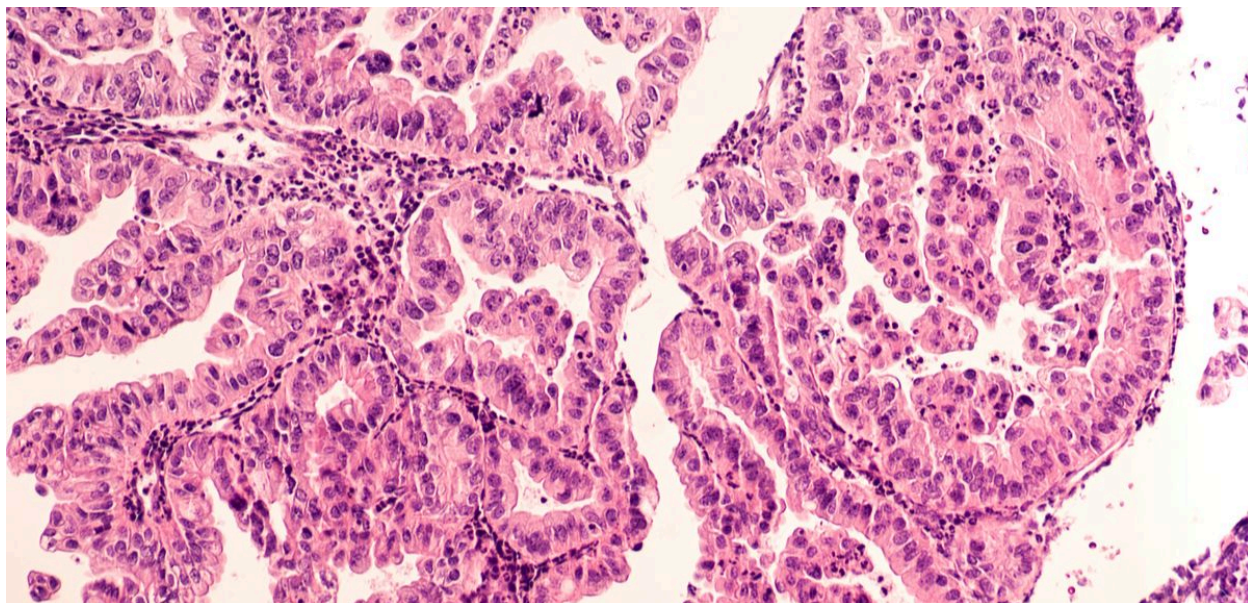


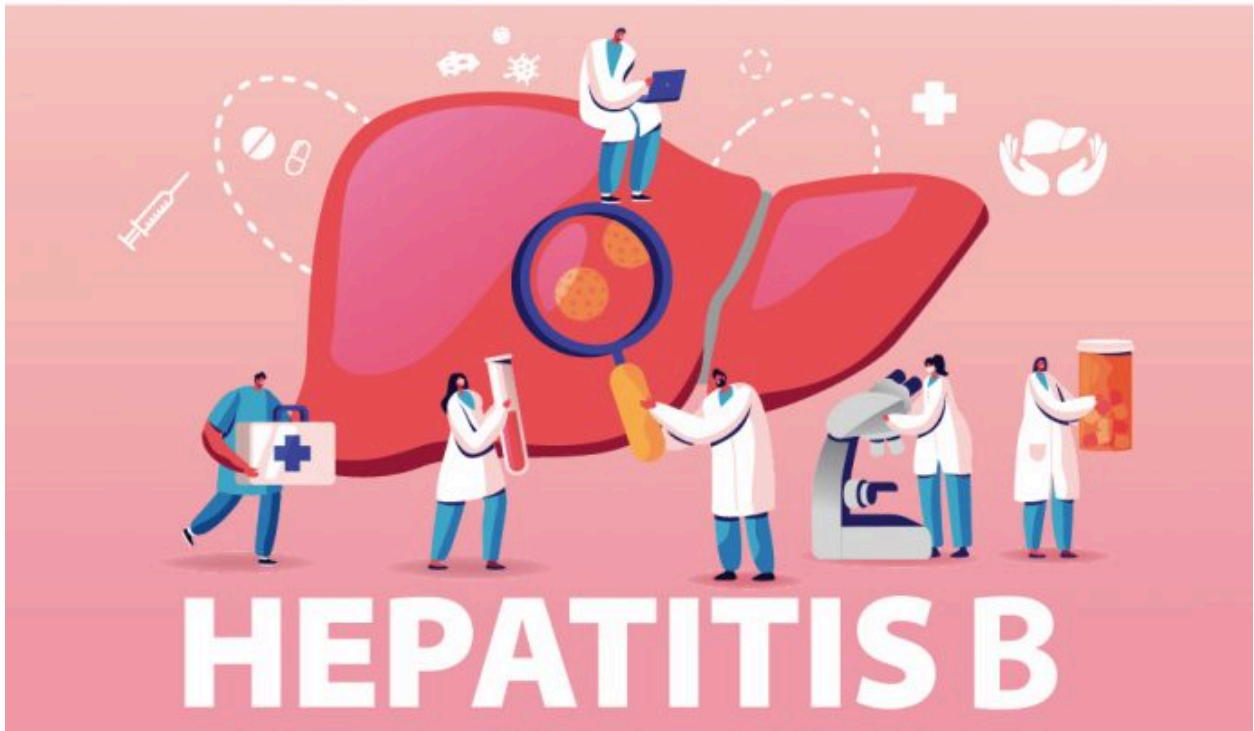
Non-Hodgkin Lymphoma

neuroendocrine cancers

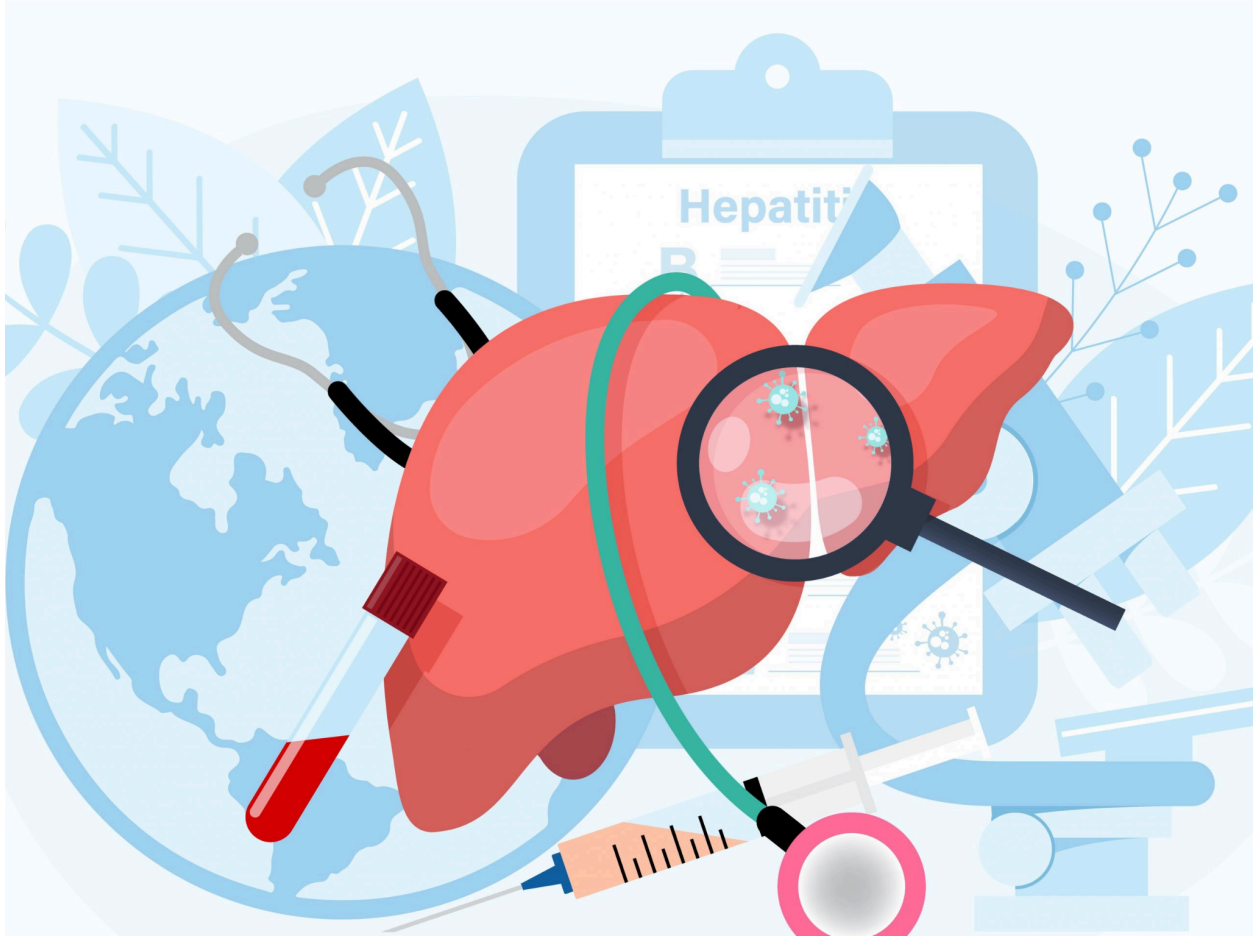


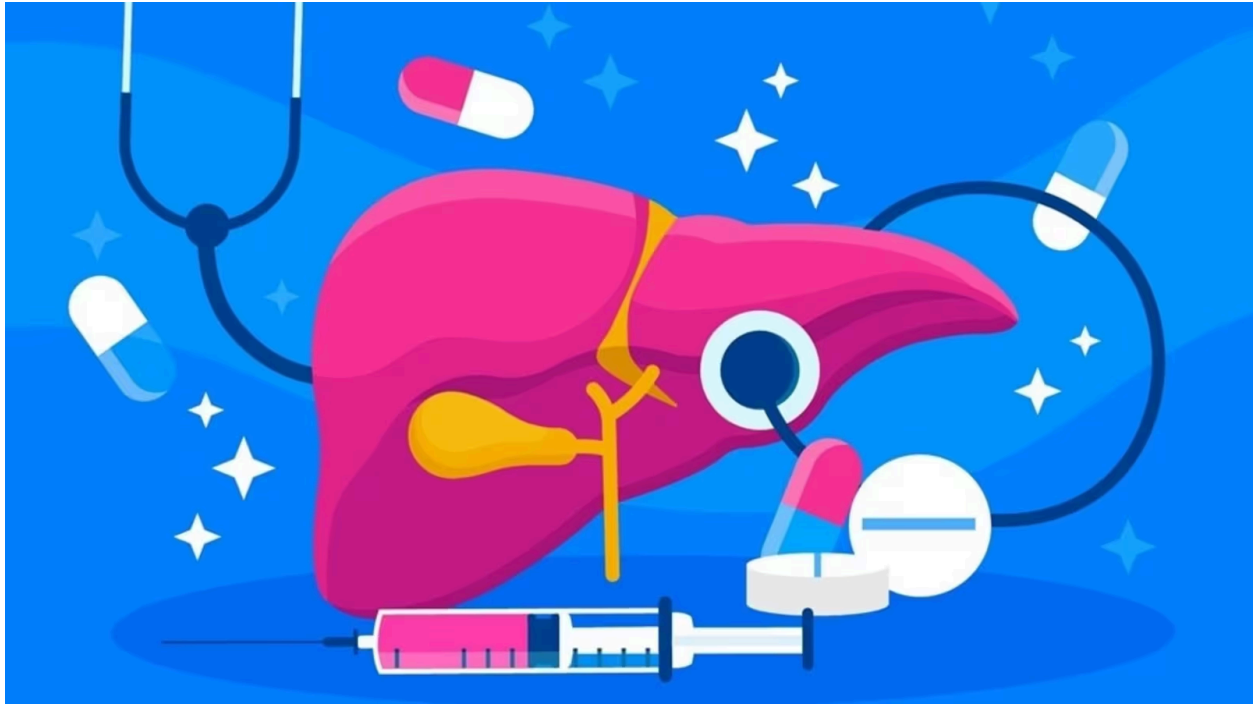
ovarian cancers





HEPATITIS B





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