Hello, my name is Milena Gould Suarez, and today I will present "Prevent Hepatocellular Carcinoma through Screening, Vaccination, and Treatment of Viral Hepatitis." The presentation and content is courtesy of Dr. Maya Balakrishnan.

This project is funded by [the] Cancer Prevention and Research Institute of Texas.
Summary of Goals

1. Reduce the burden of liver cancer in Harris County, Texas.
2. Identify Harris Health patients who are infected with viral hepatitis.
3. Vaccinate against hepatitis B.
4. Link patients infected with viral hepatitis to treatment and care.
5. Educate providers and patients about the current guidelines for screening, vaccination, and treatment of hepatitis B (HBV) and hepatitis C (HCV).

The goals of the project are 1) to reduce the burden of liver cancer in Harris County, Texas; 2) to identify Harris Health patients who are infected with viral hepatitis; 3) to vaccinate against hepatitis B; 4) to link patients infected with viral hepatitis to treatment and care; and finally, 5) to educate providers and patients about the current guidelines for screening, vaccination, and treatment of hepatitis B (also known as HBV), and hepatitis C (also known as HCV).

Hepatocellular Carcinoma Is Common and Lethal

- Hepatocellular carcinoma (HCC) is projected to surpass breast and colorectal cancer to become the 3rd leading cause of cancer-related death in the United States by 2030.¹
- In the United States, the age-adjusted HCC incidence has increased from 4 in 100,000 to 7 in 100,000 people.²
- The fastest increase in HCC incidence has been among adults aged 55–64 years, particularly those born between 1945 and 1965.
- Among racial and ethnic groups, Hispanics now have the highest incidence of HCC, while the incidence rate has dropped among Asians.

Hepatocellular carcinoma is common and lethal. Hepatocellular carcinoma (also known as HCC) is projected to surpass breast and colorectal cancer to become the third leading cause of cancer-related death in the United States by the year 2030. In the United States, the age-adjusted HCC incidence has increased from 4 in 100,000 to 7 in 100,000 people. The fastest increase in HCC incidence has been among adults aged 55 to 64 years old, particularly those born between 1945 and 1965. Among racial and ethnic groups, Hispanics now have the highest incidence of HCC, while the incidence rate has dropped among Asians.

Source: Baylor College of Medicine
Page 2 of 10
Texas has the highest HCC incidence and mortality rates in the United States. This map shows the incidence rates for [the] United States from 2007 to 2011. You can see that Texas is in the red and falls into [the] quantile interval of 7.8 to 11.7 cases per 100,000.

Harris County has the largest burden of HCC in Texas. Out of 246 counties in Texas, Harris County ranks 17th for HCC incidence. Because of its large population of 4.5 million (July 2016 U.S. Census Bureau estimate), Harris County has the greatest number of new HCC cases in the state annually. In addition, Harris County has a socioeconomic composition that renders its residents particularly vulnerable to negative health outcomes:

- 42% are Hispanic (higher risk of HCC).
- 20% live in poverty.
- 22% are uninsured.

Harris County has the largest burden of HCC in Texas. Out of [the] 246 counties in Texas, Harris County ranked 17th for HCC incidence. Because of its large population of 4.5 million, Harris County has the greatest number of new cases in the state annually. In addition, Harris County has a socioeconomic composition that renders its residents particularly vulnerable to negative health outcomes. Forty-two percent are Hispanic, with Hispanics carrying a higher risk of HCC; 20 percent live in poverty; and 22 percent are uninsured.
**Viral Hepatitis Is the Main Cause of HCC**

- Chronic infection with hepatitis B virus (HBV) and/or hepatitis C virus (HCV) accounts for 80% of HCC cases.
- HCC is preventable. Prevention and therapy of viral hepatitis are associated with reduction of HCC risk.
- However, many patients diagnosed with HCC are unaware of or are untreated for their viral hepatitis.
- Viral hepatitis screening occurs at an insufficient frequency in the general primary care setting for a variety of reasons.


[Viral] hepatitis is the main cause of HCC. Chronic infection with hepatitis B virus (also known as HBV) and/or hepatitis C virus (also known as HCV) accounts for 80 percent of HCC cases. HCC is preventable. Prevention and therapy of viral hepatitis are associated with the reduction of HCC risk. However, many patients diagnosed with HCC are unaware of or are not treated for their viral hepatitis. All hepatitis screening occurs at an insufficient frequency in [the] general primary care setting for a variety of reasons.

**PREVENT HCC through SVT**

- Prevent Hepatocellular Carcinoma through Screening, Vaccination, and Treatment of Viral Hepatitis\(^1\) is a public health program designed to reduce the burden of HCC in Harris County and disparities in treatment of the disease.
- The intervention entails:
  - **Screening** for hepatitis B and C
  - **Vaccination** against hepatitis B
  - **Treating** hepatitis B and C
- The intervention is based on U.S. Preventive Services Task Force recommendations for viral hepatitis screening and prevention.\(^2\)


\(^2\) The U.S. Preventive Services Task Force recommendations are available at [https://www.uspreventiveservicestaskforce.org](https://www.uspreventiveservicestaskforce.org).

Prevent HCC through Screening, Vaccination, and Treatment is a public health program designed to reduce the burden of HCC in Harris County and disparities in treatment of the disease. The intervention entails screening for hepatitis B and C, vaccination against hepatitis B, and treatment of hepatitis B and C. This intervention is based on U.S. Preventive Services Task Force recommendations for viral hepatitis screening and prevention.

Source: Baylor College of Medicine
The goals are automatic screening for HBV and HCV infection among high-risk groups, systematic HBV vaccination, and patient navigator-assisted linkage to treatment for patients who screen positive for HBV or HCV infection. Current practice is ad hoc screening for chronic HBV and HCV infection typically among patients with abnormal liver enzyme levels or cirrhosis.

**Screening for Hepatitis B and C**

- High-risk individuals should be screened for HBV and HCV.
- **Goal:** We plan to develop automatic EPIC-triggered screening of high-risk individuals. Patient Navigators will follow up on all testing.
- **Current Practice:** Patient navigators review all HBV/HCV testing performed within the Harris Health System on a monthly basis. Based on testing results, patients are identified as requiring either vaccination or treatment.

[When] screening for hepatitis B and C, high-risk individuals should be screened for HBV and HCV. Our goal is to develop automatic EPIC-triggered screening of high-risk individuals; patient navigators will follow up on all testing. Current practice is that patient navigators review all HBV/HCV testing performed within the Harris Health System on a monthly basis. Based on testing results, patients are identified as requiring either vaccination or treatment.
Hepatitis C risk factors include: Baby Boomers (those people born between 1945 and 1965); intravenous drug users, either past or current; people who received blood transfusions before 1992; people who have had long-term hemodialysis; people born to an HCV-infected mother; people with a history of incarceration; intranasal drug users, either past or current; people with an unregulated tattoo; people who engage in high-risk sexual behavior; [and] people with other percutaneous exposures.

Hepatitis B risk factors include: people born in high-prevalence regions; U.S.-born [individuals] not vaccinated as infants whose parents were born in high-prevalence regions; people with HIV infection; intravenous drug users; people who have household contact with HBV; sexual partners of people with HBV infection; and men who have sex with men.
Here, we review the HCV testing algorithm. If [screening] is positive, an HCV PCR [polymerase chain reaction] is performed and if positive, the patient is infected. The other laboratory [test] requirements are [a] CBC [complete blood count], [a] CMP [comprehensive metabolic panel], and [an] INR [international normalized ratio] with a write-up for [an right upper] quadrant ultrasound, HCV genotyping, and HCV PCR. These [laboratory tests] should all be available within [one] year, and the patient can be referred directly to [a] GI/hepatology clinic.

If HCV PCR is negative, this means that there is no active infection and no further action is required. If [screening] is negative to start, no further action is required.

Now for the HBV testing algorithm. [If a] patient is hepatitis B surface antigen positive, hepatitis B surface antibody negative, and hepatitis B core antibody positive, [he or she] is HBV infected. Obtain HBV DNA,
hepatitis Be antigen, [a] CMP, CBC, write-up for quadrant ultrasound and these results should be from the past year and then the patient can be referred to GI hepatology clinic.

Moving on to [the] next column. [If a] patient is hepatitis B surface antigen negative, hepatitis B surface antibody positive, and [is] anti-hepatitis B core negative, this means that [he or she has] immunity from prior vaccination, [and] no further action is required. If [the patient is] anti-B hepatitis B core positive, this means [he or she has] natural immunity from [a] prior infection and, again, no further action is required.

Moving on to the last column. [If a] patient [is] hepatitis B surface antigen negative, hepatitis B surface antibody negative, and anti-hepatitis B core negative, you would vaccinate this patient. [If an] anti-hepatitis B core is positive, check [whether] the HBV DNA [test is] positive and refer [the patient] to [a] hepatology clinic.

Vaccinating Against Hepatitis B

- HBV vaccine programs are the primary prevention strategy for HCC and are associated with significant reductions in HCC incidence.
- **Goal:** The patient navigator routes patients without HBV immunity to vaccination.
- **Current Practice:** The patient navigator will flag the primary medical doctor if a patient meets the criteria for HBV vaccination.

HBV vaccine programs are the primary prevention strategy for HCC and are associated with significant reductions in HCC incidence. [Our] goal [is to have] the patient navigator route patients with HBV immunity to vaccination. [In] our current practice, the patient navigator flags the primary medical doctor if a patient meets the criteria for HBV vaccination.

Source: Baylor College of Medicine
In the treatment of viral hepatitis, antiviral therapy is the main secondary HCC-prevention strategy and is associated with significant reductions in HCC risk among people infected with HBV or HCV. [Our] Goal is to have the patient navigator link patients with evidence of HBV or HCV infection to GI/Hepatology and Infectious Disease clinics. [In our] current practice, the patient navigator flags the primary medical doctor if a patient meets the criteria for viral hepatitis treatment [if a referral request has not already been placed]. If a referral request has already been placed but is on hold because of missing referral requirements, the patient navigator will issue a reminder.

Thank you very much for your attention. This project, "Prevent Hepatocellular Carcinoma through Screening, Vaccination, and Treatment of Viral Hepatitis," is an interdisciplinary and cross-institutional effort, and we appreciate your involvement in this project.

Source: Baylor College of Medicine
Members from Baylor College of Medicine include: Dr. Aaron Thrift, principal investigator; Dr. Hashim El-Serag, co-principal investigator; Dr. Maya Balakrishnan, co-investigator; Dr. Tom Giordano, co-investigator; and myself, Milena Gould Suarez, co-investigator. Members from other institutions include: Dr. Kathryn Tracy, co-investigator from the University of Texas School of Public Health; and Loretta Hanser, co-investigator from the Harris Health System. The project contact is Jonathan Kole, research coordinator; he can be reached at J-K-O-L-E@bcm.edu. Thank you again.