Hepatitis C
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SLIDE 1: TITLE

SLIDE 2:

Hi, I'm Rob Pace, Adult Viral Hepatitis Prevention Coordinator for North Carolina. This module is about Hepatitis C, a disease that has been receiving a lot of attention recently.

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When you have completed this module, you should be able to investigate and correctly classify a physician reported case of acute hepatitis C, differentiate between laboratory tests used to detect HCV infection and know the responsibilities of the public health nurse to the client diagnosed with HCV.

SLIDE 4:

Hepatitis C is a contagious liver disease that results from infection with the hepatitis C virus. As you learned in the Hepatitis B module, hepatitis means inflammation of the liver, a vital organ. The Hepatitis C virus is an RNA virus unlike the Hepatitis B virus which is a DNA virus, the hepatitis C virus has the ability to mutate rapidly and has 6 different genotypes. The C virus lives outside the body for about 4 days but is probably not capable of infecting someone after 16 hours. It is approximately 10 times more infective than HIV, but 10 times less infective than Hepatitis B. Hepatitis C is most efficiently transmitted through percutaneous exposure. Persons infected with hepatitis C virus, similar to those infected with hepatitis B, can have an acute disease that resolves or a chronic life-long infection. Hepatitis C virus (HCV) infection is the most common chronic bloodborne infection in the United States with approximately 3.2 million persons chronically infected. The chronic infection is not reportable in North Carolina, only the acute infection is reportable.

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The Hepatitis C Acute Case Definition requires a discreet onset of symptoms. Because of the requirement for symptoms to meet case definition, laboratories are not required to report positive Hepatitis C labs to the state. Healthcare providers should report suspected cases of acute hepatitis C utilizing the CD report form. Besides the constitutional symptoms of fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain, a case must have either jaundice or an alanine aminotransferase (ALT) levels >400IU/L or both. Tests for both

hepatitis A and hepatitis B must be negative if done to meet the Hepatitis C case definition. Lab testing for Hepatitis C, while not as involved as Hepatitis B, is required to meet case definition. This is a stringent case definition and since many acute case symptoms may be mild or non-existent, or physicians may not order all the required laboratory tests, we recognize many cases go unreported.

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The gold standard for Hepatitis C testing is the RNA test. This test is a direct measurement of the hepatitis C RNA present and can be described qualitatively as reactive/nonreactive or quantitatively with the numbers of copies per milliliter or international units per ml. This test is relatively expensive, too expensive to be used for screening and is normally seen only in individuals known to have hepatitis C or those who screened positive with an antibody test.

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The other available, less expensive test used for screening, is a hepatitis C antibody test. This test produces a qualitative result of reactive or nonreactive. A reactive result indicates a current HCV infection, a past HCV infection that has resolved, or false positivity. CDC recommends that a person positive for anti-HCV be verified by a RNA test. This more specific, supplemental testing is necessary, particularly in populations with a lower prevalence of disease, to identify and exclude false positive screening test results. However, currently, the majority of laboratories report positive anti-HCV results based on a positive screening assay alone. The case definition includes an option that uses the signal-to-cut–off (s/co) ratios of screening-tests to provide more reliable results. A specific s/co ratio can be identified for each licensed test that would predict a true antibody-positive result (as defined by the results of supplemental testing) ≥95% of the time, regardless of the anti-HCV prevalence or characteristics of the population being tested. The s/co ratio is calculated for each FDA licensed assay on the CDC website and can be reached through a link in the case definition. If an anti-HCV test does not include a s/co ratio, it cannot be used to meet the case definition. There is currently a rapid test, OraQuick for anti-HCV which is licensed for screening but will not meet case definition requirements. The RIBA HCV test mentioned in the 2012 case definition has been discontinued by the manufacturer.

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This year CDC recommended that all baby boomers, individuals borne between 1945 and 1965 be tested for Hepatitis B at least once. This group is 5 times more likely to be infected and not know than the rest of the population. People in this group may have been exposed to Hepatitis C before wide spread testing of blood and biological products or by drug experimentation in their youth. Other persons recommended for testing have acknowledged risks such as sharing needles or transfusions prior to testing of the blood supply. Conspicuously absent from the list

are those with sexual exposures and those with tattoos or body piercings. Tattoos and body piercings from regulated sources have not been found to present an additional risk. Tattoos done in prison and in other unregulated sources where cleanliness, sterile supplies and good techniques are not used are a risk for any number of infections including hepatitis C.

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Case reporting for Hepatitis C must include symptoms, jaundice or ALT as well as other hepatitis A and B testing in the clinical package of the event. Laboratory testing with either a RNA or anti-HCV with a s/co ratio must be entered in the lab section. The gathering of case information and application of the case definition should be done independent of the clinical diagnosis.

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30 % of needle-sharing drug users will be infected with Hepatitis C within 3 years of starting use, more than half will be infected within 5 years of starting use. Needle sharing drug users co-infected with HIV have a 50 to 90 % HCV infection rate. Clearly, sharing needles is the most efficient way of transmitting the virus. That is why persons who shared a needle, even once, should be tested for HCV. Sexual transmission of the virus is less common and the risk of sexual transmission of HCV within heterosexual monogamous couples is so low CDC does not even recommend condom use. The risk of sexual transmission increases with number of partners, "rough" sex, anal sex, and sex with a partner infected with HIV. Prior to 1992 hepatitis C was commonly passed through transplants, transfusions and blood derived products. Now that testing is in place, the rate of transmission has dropped to near zero levels. The "other" category in this graph includes those infected through occupational exposure to blood and vertical transmission from mother to infant. Vertical transmission occurs in just over 4% of cases. The risk of vertical transmission increases dramatically in mothers co-infected with HIV. There appears to be no difference in transmission rates for natural births and cesarean births.

SLIDE 11:

Unlike Hepatitis B, there is no vaccine for Hepatitis C. The rapid mutation of the virus, 6 different genomes and technical issues around laboratory cultures for propagating the virus have thwarted vaccine development up to this point but development goes on. New hepatitis C vaccines are nearing or entering clinical trials. Avoidance of exposure is the only prevention method currently available. Like hepatitis B, the North Carolina Administrative Code contains control measures for persons infected with hepatitis C aimed at reducing exposure to other individuals. These control measures are to be to be provided by the attending physician.
Healthcare workers with potential exposure to blood should follow Universal Precautions. Persons should not share razors or toothbrushes which may be contaminated with blood.

There are other risk reduction strategies such as needle exchange programs which target behaviors such as needle sharing that result in transmission.

SLIDE 12:

Treatment of chronic hepatitis C has been available for years. Not everyone infected needs treatment and the decision to treat is based on individualized assessment. Combination therapy with pegylated interferon and ribavirin has been the treatment of choice for some time. The goal of treatment was a sustained virologic response (defined as undetectable HCV RNA in the patient's blood 24 weeks after the end of treatment). This treatment regime is difficult to endure with multiple; sometimes severe side effects and many patients leave treatment before completion. Even completing treatment, success was limited, somewhere around 50% depending on the genotype of the virus. Treatment success rates are now being improved with the addition of polymerase and protease inhibitors to standard pegylated interferon/ribavirin therapy. The FDA approved protease inhibitors boceprevir and telaprevir in 2011 for treatment of hepatitis C. Either of these agents is combined with peginterferon and ribavirin making therapy more effective. Additional Direct Acting Antivirals (DAAs) are in development and trials for treatment without interferon. Current trials are showing increased SVR rates, shortened durations of treatment, and acceptable adverse event profiles with better results using these drugs.

SLIDE 13:

Even individuals for whom treatment is not recommended or do not have the means of getting treated, there are steps that can be taken to reduce the probability of liver damage and preserve liver function. The most important measure is to avoid alcohol, as the graph shows, drinking alcohol increases the progression to cirrhosis. Medications and herbal remedies can also have a toxic effect on the liver and should be avoided unless cleared by their physician.
Finally to prevent infection with other hepatitis viruses, the person should be vaccinated for hepatitis A and B unless they have natural immunity or are currently infected.

SLIDE 14: Reference slide.