

Antenatal Screening for Hepatitis C: Universal or Risk Factor Based?

VIRAL HEPATITIS PREVENTION BOARD MEETING
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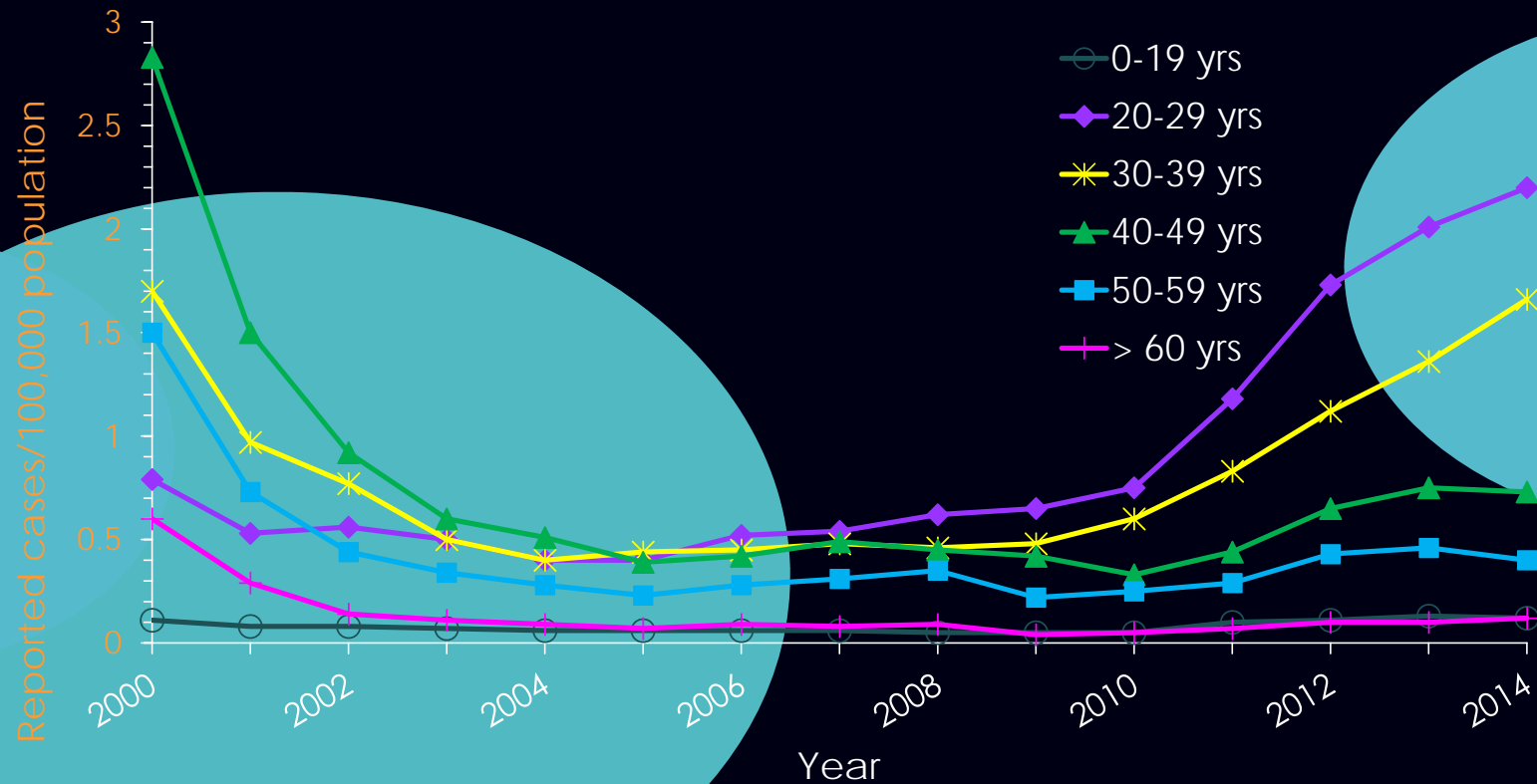
Why Antenatal HCV Screening?

- ▶ Pregnancy: Golden opportunity for HCV screening.
- ▶ Change in epidemiology of HCV with increase in HCV infection in women with childbearing age-U.S.
- ▶ Risk to the unborn child.
- ▶ Without identification of HCV in pregnant women, many babies will be undiagnosed → future pool of HCV in adults.
- ▶ Early intervention for treatment/ education of women decrease horizontal transmission.
- ▶ Pregnancy can be associated with HCV related morbidities in mothers and infants.
- ▶ Potent treatment options for moms and potentially infants with DAA .

Change in HCV Epidemiology in the United States- Increase Among Young Population

- ▶ 2.9 fold increase in cases of acute HCV infection :2010 - 2015.
- ▶ The highest rate and increase was among 20-29 years.
- ▶ Most new cases occur among young, white individuals residing in non-urban areas with history of IVDU(73%).
- ▶ Increase mostly in states in central Appalachia with increase in IVDU activity: Kentucky, Tennessee, Virginia, and West Virginia.

Incidence of acute hepatitis C by Age Group — United States, 2000–2014



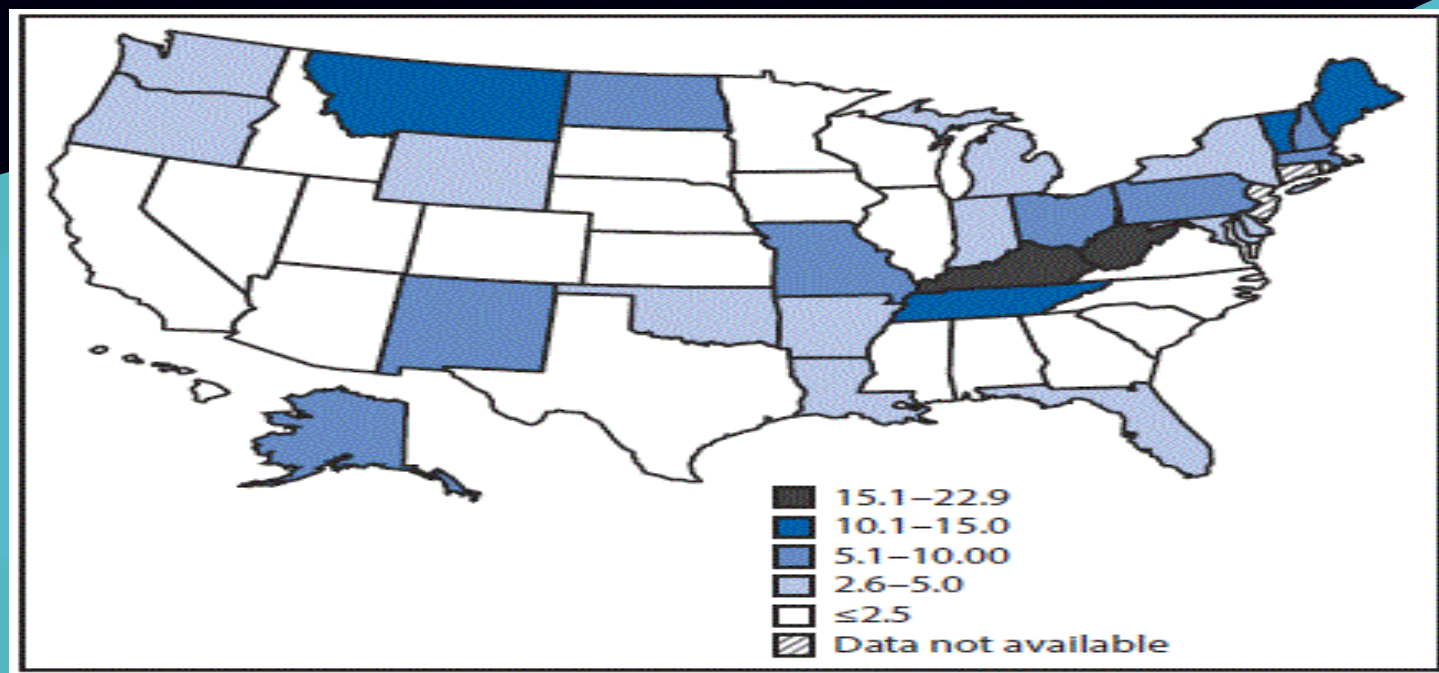
Source: CDC, National Notifiable Diseases Surveillance System (NNDSS)

HCV Infection Among Women in Reproductive Age 15–44 years and Pregnant Women in the United States, 2006–2014 NNDSS and Quest laboratory Data

- ▶ Women in reproductive age constituted 40% of all women with HCV infection reported to the NNDSS from 2006 to 2014.
- ▶ Acute HCV infections doubled from 2006 to 2014.
- ▶ 0.73% of all pregnant women tested were HCV infected. Suggesting ~ 29,000 HCV infected moms annually giving birth.
- ▶ Large gap between number of reported infants with perinatal HCV infection vs. projected : 200 reported vs. 1700 projected → need for more testing among pregnant mothers and their infants.

Ly KN, Jiles RB, Teshale EH, Foster MA, Pesano RL, Holmberg SD. Hepatitis C Virus Infection Among Reproductive-Aged Women and Children in the United States, 2006 to 2014. *Ann Intern Med*. [Epub ahead of print 9 May 2017]. doi: 10.7326/M16-2350

Increase in Hepatitis C Virus Infection Among Women Giving Birth in the U.S. 2009-2014 : 89% Increase From States reporting HCV status on the birth certificate



Patrick SW, Bauer AM, Warren MD, Jones TF, Wester C. Hepatitis C Virus Infection Among Women Giving Birth — Tennessee and United States, 2009–2014. *MMWR Morb Mortal Wkly Rep* 2017;66:470–473. DOI: <http://dx.doi.org/10.15585/mmwr.mm6618a3>

Pregnancy Complications and Neonatal Outcomes Associated with Maternal HCV Infection

- ▶ Association with PROM, gestational diabetes (if excess weight gain). As well as neonatal morbidities: NICU admissions, need for assisted ventilation, LBW, IUGR

Steven A. PERGAM, MD¹, Chia C. WANG, MD, Pregnancy Complications Associated with Hepatitis C: Data from a 2003–2005 Washington State Birth Cohort, Am J Obstet Gynecol. 2008 July ; 199(1): 38.e1–38.e9

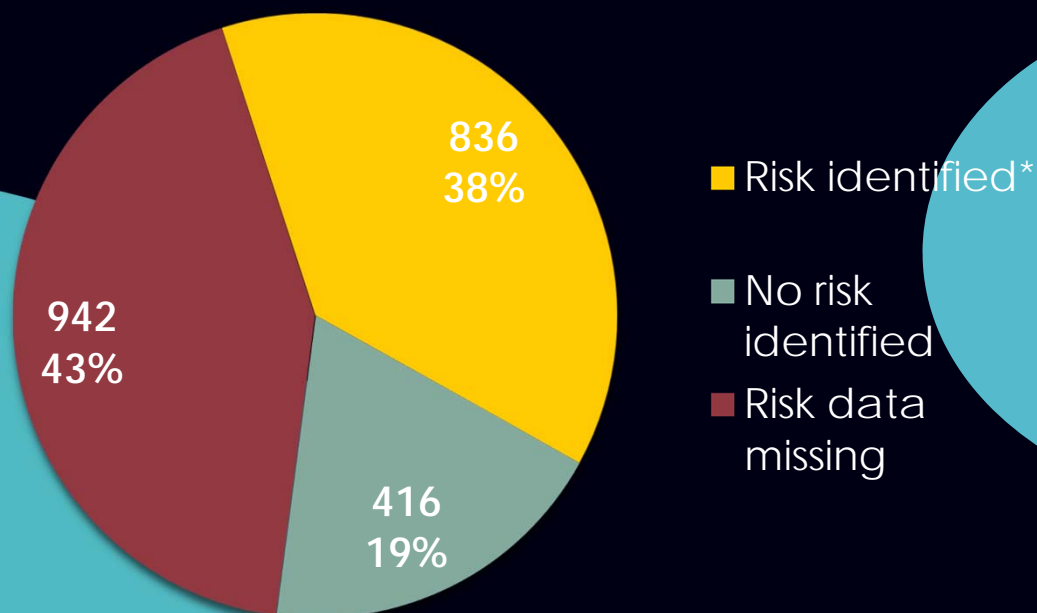
- ▶ HCV infection in pregnancy is associated with IUGR and LBW in infants

Huang Q, Hang L, Zhong M, Gao Y, Luo M, Yu Y. Maternal HCV infection is associated with intrauterine fetal growth disturbance: A meta-analysis of observational studies. Harris. KR, ed. Medicine. 2016;95(35):e4777. doi:10.1097/MD.0000000000004777.

Current Recommendations for Antenatal HCV Screening

- ▶ ACOG recommends routine screening of Hepatitis B, HIV, Syphilis, Gonorrhea, Chlamydia- not for HCV
- ▶ ACOG and CDC recommend HCV risk-factor based screening in pregnant women.
- ▶ CDC recommended universal HCV screening for individuals born: 1945-1965, but not pregnant women.

Availability of Risk Exposures/Behaviors Associated with Acute Hepatitis C — United States, 2014



Source: CDC, National Notifiable Diseases Surveillance System (NNDSS)

*Includes case reports indicating the presence of at least one of the following risks 2 weeks to 6 months prior to onset of acute, symptomatic hepatitis C: 1) using injection drugs; 2) having sexual contact with suspected/confirmed hepatitis C patient; 3) being a man who has sex with men; 4) having multiple sex partners concurrently; 5) having household contact with suspected/confirmed hepatitis C patient; 6) having had occupational exposure to blood; 7) being a hemodialysis patient; 8) having received a blood transfusion; 9) having sustained a percutaneous injury; and 10) having undergone surgery.

HCV infected pregnant women vs HCV negative: MHMC 1993-2001-2008

	HCV positive N=126	HCV negative N=252
Caucasian*	86 (68.3%)	79 (31.3%)
Age*	30.0 +/- 6.5	25.5 +/- 5.9
Married	25/119 (21%)	69/252 (27.4%)
Parity*	2 (0, 3.25)	1 (0,2)
OB Questionnaire*	52/126 (41.3%)	67/252 (26.6%)

*p<0.05

Abughali N, Edwards A, Risk Factors Associated with Hepatitis C Virus (HCV) Infection Among Pregnant Women and the Value of Obstetric Risk Assessment Questionnaire in Screening for HCV :Retrospective study HCV positive pregnant women Poster presentation at IDSA 2010 in Vancouver

Non-Injection Drug Use Associated With HCV Transmission: Snorting of Drugs-

- ▶ Prospective cohort of 189 HCV positive pregnant women
 - 72% ever IVDU
 - 94% ever snorted
 - 87% Shared straws
 - 15% only snorted and shared straws

Noelle Fernandez; Craig V. Towers; Lynlee Wolfe; Sharing of Snorting Straws and Hepatitis C Virus Infection in Pregnant Women. Obstetrics & Gynecology. 128(2):234-237, AUG 2016, DOI: 10.1097/AOG.0000000000001507

HCV Knowledge among Pregnant Women and their Willingness to be Tested and Endorsement of Universal HCV Antenatal Screening

(June - September) 2011: Cross-sectional study, 302 pregnant women participated in the HCV survey

- ▶ 28.1% (84/302) had no knowledge of HCV transmission.
- ▶ 60% not aware of the risk of HCV MTCT.
- ▶ 94% not aware of the long term morbidities of HCV infection
- ▶ 60% were willing to be tested and 65% accepted universal testing.
- ▶ Strong correlation between willingness to be tested and acceptance of universal HCV test and HCV knowledge.

Waruingi, W, Abughali, N: Does Knowledge Influence Reporting Practices when Screening for Hepatitis C in Pregnant Women. Presented IDSA October 2013, San Francisco CA.

Hepatitis C Virus universal screening versus risk based selective screening during pregnancy

Waruingi W, Mhanna MJ, Kumar D, Abughali N. J Neonatal Perinatal Med. 2015;8(4):371-8.

- ▶ Prospective observational study in the immediate postpartum period: January-March 2013
- ▶ Objective: Compare HCV risk-based selective screening to universal screening among postpartum women in our hospital.
 - ▶ Low risk: women who were not tested by OB, based on risk assessment questionnaire.
 - ▶ High risk: women who were HCV tested by OB based in the questionnaire.
- ▶ 419 women delivered: 39 were in the high risk group and 48%(183/380) were included in the low risk group.

Hepatitis C Virus (HCV) universal screening versus risk based selective screening during pregnancy

Waruingi W, Mhanna MJ, Kumar D, Abughali N.J Neonatal Perinatal Med. 2015;8(4):371-8

- ▶ Universal HCV testing resulted in the diagnosis of 3 additional HCV infected women
- ▶ 14%(25/183) of the “low-risk” women had documented HCV risk factors in their medical chart but did not trigger testing by OB.
- ▶ 43% (79/183) of the “low risk” women had identified risks but not recorded and were not tested by OB.
- ▶ 24% (9/37) of the high risk women had no documented risk factors , but still tested by OB.

Hepatitis C Virus (HCV) universal screening versus risk based selective screening during pregnancy

- ▶ HCV prevalence in pregnant women was 4/419 (0.95 %) based on the current practice of selective screening and increased to 7/220 (3.18%) with universal HCV screening.
- ▶ The screening questionnaire had a sensitivity of 0.85 (0.42-0.99) and specificity of 0.52 (0.45-0.58) in all women who had HCV antibody testing and questionnaire screening.
- ▶ Limitations:
 - Small sample size, inner city population.
 - captured only 48% of the low risk women.
 - lack of confirmation with PCR

Why Not Yet Universal Antenatal HCV Screening ?

- ▶ Absence of HCV vaccine or immunotherapy.
- ▶ No approved therapy during pregnancy.
- ▶ Low vertical transmission rate of 3–5%
- ▶ High rate of spontaneous HCV clearance in infants (25–50%)
- ▶ Lack of approved treatment for young infants
- ▶ Delayed morbidity in HCV infected children and adults.
- ▶ Prohibitive cost.....

Universal Antenatal HCV Screening: Cost-Effectiveness

- ▶ Compared with no HCV screening: cost of screening, treatment, and cesarean delivery → was not cost effective

Plunkett BA, Grobman WA. Routine hepatitis C virus screening in pregnancy: a cost-effectiveness analysis. Am J Obstet Gynecol 2005; 192:1153-61

- ▶ 10 years study in London center: 2003-2013, universal HCV screening in pregnancy: 136/35355 HCV+ women: 19 women were treated → screening and treatment was cost effective

Is antenatal screening for hepatitis C virus cost-effective? A decade's experience at a London centre, Nowlan Selvapatt, Thomas Ward, Journal of Hepatology, 2015-10-01, Volume 63, Issue 4, Pages 797-804

What is needed?

- ▶ Promote HCV awareness among patients and providers.
- ▶ Advocate for universal antenatal HCV screening, specially in countries/selected areas with either high HCV prevalence or high rates of HCV associated social determinants.
- ▶ Collaborative efforts to decrease cost of testing in pregnancy and HCV therapy.
- ▶ Clinical trials for treatment during or immediately after pregnancy.

