Hepatitis C: An Overview

Florida Hepatitis C Testing Stakeholders Forum February 27, 2015

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Division of Viral Hepatitis



National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention

Division of Viral Hepatitis

Outline

Hepatitis C virus (HCV)

- Features and natural history of infection
- Modes of transmission
- Global Overview

HCV in the U.S.

- Prevalence and Burden
- Recommendations for testing
- Linkage to Care

Hepatitis C Virus

- Single-stranded RNA virus
- Family: Flaviviridae (includes yellow fever, dengue)

6 Genotypes

- **1**,2,3,4,5,6
- Geographic variation
- In US, genotype 1 (1a, 1b) most common

Quasispecies

- Minor genetic variations of virus within a person
- Result from spontaneous, ongoing mutation of virus

Natural History of HCV Infection



HIV, HBV, alcohol, and steatosis can accelerate disease progression

ESLD: End-stage liver disease. HCC: Hepatocellular cancer. HIV: Human immunodeficiency virus. HBV: Hepatitis B virus. Fattovich G, Gastroenterology 1997; NIH Consensus Statement. June 2002. http://www.who.int/hiv/pub/hepatitis/

4

Modes of HCV Transmission: Injection Drug Use

- Anti-HCV prevalence among PWID
 - overall: 30% -70%
 - Younger (18-29 yo): 10% -36%
- Anti-HCV incidence among PWID varies broadly:
 - ~5-42/100 person years
- Approximately half of people living with HCV in the US (1.5 million) associated with past or present IDU
- Globally, 10 million (of 17 million) PWID are living with HCV

Modes of HCV Transmission: Healthcare-associated

- Major contributor to transmission before HCV identified
- Prevention measures have reduced not eliminated transmission risk
- Total 18 outbreaks reported to CDC 2008-2013
 - 223 outbreak-associated cases
 - >90,550 at-risk persons notified for screening
 - Settings
 - Outpatient (e.g., surgical centers), dialysis
 - Hospitals
 - Long term care
 - Modes of transmission
 - Syringe reuse
 - Other poor infection control
 - Drug diversion

Modes of Transmission: Sexual

Heterosexual

Low risk among discordant couples- 0.07%/ 100 pyrs.

Men Who Have Sex With Men (MSM)

- Risks
 - Unprotected rectal intercourse
 - non injection drug use
 - Other STIs
- HIV-infected MSM have eight fold higher risk than HIV-noninfected MSM
 - Swiss Cohort Study- 4.1/100 person yrs.
 - U.S. cohort studies .26-.40/100 person yrs.
 - Boston clinic- 1.63/100 person yrs.; 70% non IDU

Modes of HCV Transmission: Perinatal

Transmission from HCV infected mothers

- Mono-infected: 6.5%
- HCV/HIV co-infected: 13.6%

Transmission risks

- HCV viral load
 - $o < 6 \log viral load: 3.9\%$
 - > 6 log viral load: 14.3%
- Prolonged rupture of membranes (> 6 hours; OR 9.3)
- Often cited but poor or no supportive data
 - Internal fetal monitoring
 - Vaginal versus cesarean delivery
- No risk from breast feeding
- No recommendations for maternal testing
- Role of new antivirals yet to defined

Other Exposures Associated with HCV Transmission

Non-injecting drug use- (e.g. cocaine); 0-17% HCV+

Household exposures: 9% HCV+

Unregulated tattooing: 2–3 times higher likelihood of HCV infection

Scheinmann, et al, *Drug and Alcohol Dependence, 2006;* Gough et al. BMC Public Health 2010, Marincovich B,. Sex Transm Infect. Apr 2003; Yaphe S; Sex Transm Inf 2012 Aug 3[:] Bottieau, et al Eurosurveillance 2010.) Ackerman Z, J Viral Hepat 2000. Waure C, et al J Epidemiol Community Health. 2010. Tohme RA, Clin Infect Dis. 2012.

Estimated HCV Prevalence for Populations at Risk for HCV Transmission and Disease



Smith BD. Ann Int Med. Dec 2012; Moyer. Ann Intern Med. Sept 2013; Finelli L. 2002; Semin Dial. 2005; Armstrong GL. Ann Int Med. 2006; Weinbaum CM. AIDS. 2005; Suppl 3; Ward JW. Top Antiviral Med. 2013;21(1):15-9. Chak E. Liver Int. 2011.

Global Hepatitis C



Leading Causes of Infectious Disease Deaths Worldwide, 2010

<u>Disease</u>

Lower respiratory tract infections HIV/AIDS Viral Hepatitis Diarrheal diseases Tuberculosis Malaria Meningitis Measles ~2.8 million ~1.5 million ~1.4 million ~1.4 million ~1.2 million ~1.2 million ~422,000 ~125,000

Est. Deaths per Year

Leading Causes of Infectious Disease Deaths Worldwide, 2010

<u>Disease</u>

Lower respiratory tract infections **HIV/AIDS Diarrheal diseases** Tuberculosis Malaria Hepatitis B Virus Hepatitis C Virus Meningitis Measles Hepatitis A Virus

Est. Deaths per Year

~2.8 million ~1.5 million ~1.4 million ~1.2 million ~1.2 million ~786,000 ~499,000 ~422,000 ~125,000 ~103,000

Global Burden of HCV

Global Hepatitis C

- 170 million with HCV antibody (3% of the world's population)
- For most countries, prevalence of HCV is < 3%. Prevalence is higher (up to 15%) in some countries in Africa and Asia, and highest (over 15%) in Egypt
- Liver disease
 - Cirrhosis- 27%
 - Hepatocellular Carcinoma 25%
- 499,000 deaths /year

Perz JF J Hepatology 2006; Lozano et al. Lancet. Vol 380. 2012

Global HCV-antibody Prevalence, 2005

Anti-HCV seroprevalence by GBD region, 2005



Source: Khayriyya, et al. Hepatology Volume 57, No. 4;1333-1342. 2013

Global HBV, HCV, and HIV Infection and Coinfection*



* For illustration only, not to scale

Hepatitis C in the U.S.

Impact of Prevention Measures on Hepatitis C Virus (HCV) Infection in U.S.



Prevalence of Current HCV Infection Among Persons in the United States

Prevalence Civilian, Non-Institutionalized Populations (NHANES)	2.7 million (2.2-3.2 million) 1.0% (0.8%-1.2%)
Estimated HCV Infection Among Homeless and Incarcerated Persons (Not Included in NHANES)	360,000-840,000 22%-52%

Two of Three Americans Living with HCV Were Born During 1945-1965

Reflects historical high HCV incidence before viral discovery in 1989

 Five-fold higher prevalence than other US adults (3.39% vs 0.55%)

- 81% of all HCV+ US adults
- Of all HCV-related mortality in US, 73% were born in this cohort



Adjusted Odds Ratios for the Presence of HCV RNA: NHANES 2003-2010

Age 20-59 **Characteristic** Odds Ratios **Age Categories** (20-39 referent) Age 40-49 6.0 (3.2-11.1) 9.5 (5.3-16.8) Age 50-59 **Race-Ethnicity** (all others referent) **Non-Hispanic Black** 1.6 (1.1-2.3) **High School Education** (high school or more referent) Less than High School/GED 2.0 (1.2-3.3) **Family Income** (>2.0 times poverty level referent) <2.0 times poverty level 3.7 (2.6-5.3)

Age ≥ 60	
Characteristic	Odds Ratios
Age Categories (≥ 70 referent)	
Age 60-69	6.0 (3.2-11.1)
Race-Ethnicity (all others referent)	
Non-Hispanic Black	10.0 (4.9-20.1)

Denniston M, Ann Int Med 2014

The Growing Burden of Hepatitis C in the United States

Of 2.7 million HCV-infected persons in primary care

- 1.47 million will develop cirrhosis
- 350,000 will develop hepatocellular carcinoma (HCC)
- 897,000 will die from HCV-related complications



Year

HIV and HCV-associated Mortality United States

-- Hepatitis C -- HIV



Year

Ly KN, et al Clin Infect Dis. 2014

Rate per 100,000 Persons

Advances in HCV Therapy



Adapted from Strader DB, et al. *Hepatology.* 2004;39:1147-71

HCV Deaths Averted with Birth Cohort Testing Using Different Treatments



PR = Pegylated Interferon plus Ribavirin for all genotypes, PRPI; PR = PR plus a protease inhibitor for genotype 1, PR for genotypes 2/3; PRS/SR = pegylated interferon, ribaviron, and sofosbuvir for genotype 1, and sofosbuvir plus ribavirin for genotypes 2 and 3; SS/SR = Sofosbuvir and Simeprevir for genotype 1, and sofosbuvir and ribavirin for genotypes 2 and 3.

Risk-based Recommendations for HCV Screening

Since 1998, CDC recommendations included riskbased screening

- Injection drug use
- Blood transfusion before 1992 and other blood exposures
- HIV infected persons

45%-85% of infected persons remained unidentified

Barriers to testing

- Lack of clinician awareness of HCV testing guidelines
- Clinician reluctance to ask about risks
- Patient reluctance to disclose or failure to recall risks

MMWR 1998;47 (No. RR-19); Roblin, et al.. Am J Man Care 2011. Spradling, et al., Hepatology, 2012. Southern, et al., J Viral Hepat, Shehab TM, et al. Hepatology, 1999.; Shehab TM. J Viral Hepat, 2001.; Shehab TM, et al. Am J Gastroenterol, 2002.; Serrante JM, et al. Fam Med, 2008.

Broader HCV Testing Recommendation in 2012 One time Test for Persons Born 1945 –1965

- Represent 81% of adult chronic infections and 73% HCV deaths
- Prevalence ~6 times higher than other ages (3.29% vs 0.55%)
- No reported risk factors: 44%
- Benefit of treatment, with SVR reducing
 - Liver cancer risk: 70%
 - All-cause mortality: 50%



Morbidity and Mortality Weekly Report August 17, 2012

Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965



CDC and USPSTF Updated Recommendations for HCV Testing

One time screening test for persons born 1945-1965

- Major risk
 - Past or present injection drug use

Other risks

- Received blood/organs prior to June 1992
- Received blood products made prior to 1987
- Ever on chronic hemodialysis
- Infants born to HCV infected mothers
- Intranasal drug use
- Unregulated tattoo
- History of incarceration
- Medical
 - Persistently elevated ALT
 - HIV (annual testing)



Combined Birth-cohort and Risk-based Testing Effectively Identify HCV-infected Patients



HCV Testing Linked to Care and Treatment Yields Health Benefits

- The goal of HCV therapy is a sustained virologic response (SVR)
- SVR is the suppression of HCV to undetectable levels in the blood usually determined 12 weeks after the end of treatment
- SVR represents a cure of HCV infection
- Reduces risks of liver cancer and mortality
 - 70% reduction in hepatocellular carcinoma
 - 90% reduction in liver related mortality
 - 50% reduction in all cause mortality

Rein D, Ann Int Med 2012, Eckman , CID, 2013,;McEwan, Hepatology2013,;McGarry, Hepatology 2012, Liu S, Plos One 2013

Potential Impact on Future Burden of Hepatitis C Related Mortality in the US



*Assuming ≥90% cure rate; Rein, DB. (2014). The Costs and Benefits of HCV Testing and Treatment in Perspective. Presented at 'A National Summit to Improve Access to HCV Testing, Treatment, and Cure', Atlanta, Georgia. June 17, 2014 communication

HCV Test, Care, and Cure Continuum, United States



Holmberg S, et al, NEJM, 2013 (Note: analysis based on *data from NHANES* [30,000 adults osurveyed during 2001-2008,]. and chronic hepatitis cohort study [1.2 million persons seen at four large health care organization in 4 US cities during 2006-2008]) 32

Health Care Reform Impact on Viral Hepatitis Prevention

- Insurance coverage for those with preexisting, chronic disease
- Testing covered as a non-copay preventive service
- Incentive for adoption of health information technology to care for patients
- Emphasis on quality of provider care: use of performance measures
- Forcing a reinvention of public health surveillance, prevention research, and service delivery

Know More Hepatitis National Multi-Media Campaign

Goals:

- Increase awareness of hepatitis C
- Encourage testing of those born 1945-1965

Campaign Implementation:

- Phase I August 2012
- Phase II January 2015

Audiences:

- Primary Care Providers
- Consumers (Born from 1945 to 1965)



Mutli-Media Approach to Educating People Born 1945-1965 FIND OUT IF YOU HAVE



KNOW

Why should baby boomers get tested for Hepatitis C? While anyone can get Hepatitis C, more than 75% of adults infected are baby boomers, people born from 1945 through 1965. Most people with Hepatitis C

Liver disease, liver cancer, and

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ody and prevent liver damage en liver cancer.



CDC





* For persons who might have been exposed to HCV within the past 6 months, testing for HCV RNA or follow-up testing for HCV antibody is recommended. For persons who are immunocompromised, testing for HCV RNA can be considered.

[†] To differentiate past, resolved HCV infection from biologic false positivity for HCV antibody, testing with another HCV antibody assay can be considered. Repeat HCV RNA testing if the person tested is suspected to have had HCV exposure within the past 6 months or has clinical evidence of HCV disease, or if there is concern regarding the handling or storage of the test specimen.
1945-1965 Birth Cohort Testing* & Linkage to Care Oct 2012 - Sept 2014 No. Tested = 43,068



*Venues Include: Health Departments; Hospitals; Corrections; Shelters Prevention and Public Health Funding and Secretary's Discretionary Funding

HCV Testing of Persons Born 1945-1965 in Two University Medical Center Emergency Departments

HCV "Baby Boomer" Antibody Prevalence by Site



HCV Testing & Linkage Serving PWID October 2012—September 2014*

Location	Persons Tested	% anti-HCV Positive	% RNA Tested	% RNA Positive	% Referred to Care	% Attended First Appt.			
Arizona	1242	17	34	81	86	20			
Chicago	1809	20	41	81	15	33			
Los Angeles	2934	9	40	100	97				
Maine	1153	29	48	62	83	20			
New York City	4107	25	40	73	55	34			
Oakland, CA	1137	33	17	83	100	43			
Seattle, WA	809	51	38	68	79	6			
Virginia	1516	35	86	78	80	4			
Wisconsin	2285	17	67	77	62	6			
Total	16992	23	47	76	69	16			

Venues Include: Syringe Exchange Programs; Drug Treatment Centers; Health Departments; Methadone Clinics; Shelters *Prevention and Public Health Funding and Secretary's Discretionary Funding

IDSA* & AASLD** Updated Recommendations: HCV Testing, Management, & Treatment

- Web-based with updates (www.hcvguidelines.org)
- Three options for GT 1
 - Ledipasvir/sofosbuvir daily fixed dose
 - Paritaprevir/ritonavir/ombita svir plus dasabuvir and RBV
 - Sofosbuvir /Simeprevir +/-RBV
- Implementation challenges
 - Cost and reimbursement
 - Access to specialty care



IDSA/AASLD Guidance: When and In Whom To Initiate Therapy *

Highest Priority (Highest Risk for Severe Complications)

- Advanced fibrosis (Metavir F3) or compensated cirrhosis (Metavir F4)
- Organ transplant
- Type 2 or 3 essential mixed cryoglobulinemia with end-organ manifestations
- Proteinuria, nephrotic syndrome, or membranoproliferative glomerulonephritis

High Priority (High Risk for Complications)

- Coinfection: HIV, HBV
- Other coexistent liver disease (eg, NASH)
- Debilitating fatigue
- Type 2 Diabetes mellitus (insulin resistant)
- Porphyria cutanea tarda

U.S. HCV Treatment (Sofosbuvir) – Criteria for Authorization under State Medicaid Programs, Nov 2014

Minimum fibrosis score

Prescription by specialist



Barriers to treatment: for those in more rural areas finding a specialist can be difficult, as can be finding a fibroscan machine. Some states require biopsies for fibrosis scoring, a barrier on its own.

Information obtained through publically accessible information on state Medicaid websites and direct communication with Medicaid offices as of November, 2014

U.S. HCV Treatment (Sofosbuvir) – Criteria for Authorization under State Medicaid Programs, Nov 2014

Alcohol abstinence before treatment



Illicit drug abstinence before treatment

No requirement

Must abstain from IDU Must abstain from any illicit

Must abstain from any illicit drug use 📃 No information

No requirement Must abstain from alcohol abuse

Must abstain from any alcohol use No information

Barriers to treatment: some states require blood/urine tests, others allow for physician judgment. Some states will not provide to patients who test positive for methadone, marijuana, and some licit drugs

Base Case Analysis of 55 yo Male with with \$100,000 HCV Treatment Regimen

F stage	ICER/Cost per QALY gained
F2	\$37,300 (vs.F3)
F1	\$174,100
F0	\$242,900

Leidner AJ, et al. Cost-effectiveness of hepatitis C treatment for patients in early stages of liver disease. Hepatology 2015

Value of HCV Treatment

New Lower Prices for Gilead Hepatitis C Drugs Reach CTAF Threshold for High Health System Value

San Francisco, Calif., February 17, 2015 - Gilead Sciences, the maker of Sovaldi® and Harvoni®, two of the highlyeffective but expensive new drugs for hepatitis C infection, recently announced that in 2015 it expects to give an average discount of 46% off the original list prices of these drugs. This discount would produce an average price of approximately \$40,000 for a course of treatment with Harvoni, assuming two-thirds of patients can benefit from a shorter 8-week regimen. At this price, not only does Harvoni (or comparable treatment options) represent a high value in the care of individual patients, but its likely budget impact across broader patient populations will meet the threshold at which the California Technology Assessment Forum (CTAF) would identify it as a "high value" for most health care systems.

Hepatitis C treatment costs that yield costeffectiveness thresholds stratified by fibrosis level

Treatment scenario	\$0/QALY Cost-saving	\$50,000/QALY	\$100,000/QALY				
All patients	2000	22200	42400				
F2 or higher	14900	128800	242800				
F3 or higher	84200	713600	1,343000				

Leidner AJ, et al. Cost-effectiveness of hepatitis C treatment for patients in early stages of liver disease. Hepatology 2015

Epidemiologic Profiles Project

Building state health department capacity

Epi profiles document, interpret, and frame viral hepatitis burden in local terms to heighten awareness and drive decision making

- States used novel data sources
- States engaged critical stakeholders
- States maximized dissemination opportunities

 Pilot project with three states - Arkansas, Oregon, Wisconsin

- www.dhs.wisconsin.gov/publications/P0/p00860.pdf
- http://www.healthy.arkansas.gov/programsServices/infectiousDis ease/hivStdHepatitisC/Documents/HepC/HCVEpidemiologicProfi le.pdf

Number of Persons Tested Monthly for HCV Antibody Conducted by Quest Diagnostics Laboratories by Birth Cohort, United States, Mar 2012- Mar 2014

Feedback of Testing Data to Health Departments

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	#АЬ+	2	12	12	11	7	17	12 11	16	100	~																	

National Acute HCV Cases (2006—2013)

30 states reported increases between 2007 and 2012 15 states had > 200% increase 50% of cases < age 30 years

Suryaprasad et al., 2014, Clin Infect Dis

Hepatitis C Incidence by Urbanicity and Year of Diagnosis

Risk Factors for Acute HCV Infection Among Persons 18-29 Years of Age

1202 cases of acute HCV investigated (2011-2012)

- 52% female
- 85% white
- 77% injected drugs
 - 57% shared needles/syringes
 - 82% shared equipment

Percent use and mean age of drug use initiation

- Powder cocaine: 71%,: 17.4 yrs.
- Prescription opioids 76% : 17.9 yrs.
- Heroin: 61%: 19.7 yrs.

Age Distribution of Confirmed Hepatitis C Cases- Massachusetts, 2002- 2008

HCV: The Next Generation

MMWR 2011:60(17);537-541

Incident HCV Infection: Summary of the Evidence

- IDU is the current driver of the HCV epidemic in the United States
- Seems to be a "constant" number of acute cases still occurring in urban predominantly heroin users
- New phenomenon of young, white nonurban IDU who start on oral prescription opioids and progress to injection.

Scaling up Treatment Rates to Reduce HCV Prevalence Among Persons Who Inject Drugs

- Realistic scenario: new Direct Acting Antivirals with SVR of 90%, 12 weeks of treatment
- Treatment Rate needed annually to decrease prevalence by 25%, 50% or 75% in 15 years
- Can the HIV model of "Treatment as Prevention" be applied to HCV?

Viral Hepatitis Detection, Monitoring, and Prevention FY 2016 President's Budget Request: \$62.8 Million

Expand viral hepatitis detection, monitoring, and prevention programs to stop transmission and prevent related illness and death:

- Increase hepatitis testing, linkage to care, treatment and cure
- Improve the quality of hepatitis prevention and care efforts
- Reduce new hepatitis C virus infections
- Advance strategies to eliminate hepatitis A and hepatitis B

To Reduce and Perhaps Eliminate HCV

- Increase priority widen public recognition of urgency of action
- Increase screening follow USPSTF recommended screening
- Improve testing algorithm simplify HCV screening and diagnosis
- Enhance surveillance change policies to improve utility of data
- Expand clinical workforce allow for primary care management
- Increase treatment availability modify treatment regimens
- Reduce payer restrictions increase number of affordable therapeutics

Extra slides

Features of HCV Infection

Incubation period

0 – 6 months

Symptomatic (eg jaundice) 20%–30%

Persistent infection

75%-85%

Immunity

No protective antibody response identified

6(

Risk of Infection Following a Needle Stick Injury From an Infected Source

HIV/HCV Co-infection Globally

- Estimated 20% 30% of HIV-infected persons are coinfected with HCV globally (7 – 10 million)
- High risk of HIV/HCV co-infection (N America, Europe, Asia):
 - people who inject drugs (PWID); range 60 90%
 - transfusion recipients
 - recent outbreaks among MSM
- Poorly described in Sub-Sahara Africa

Source: Ocama P. Curr Opinion HIV AIDS 2011. Nelson PK. Lancet 2011; Sulkowski. J Hepatol 2008; Amin J. HIV Med 2004; Staples. Clin Infect Dis 1999; Soriano V, Vispo E, Labarga P, Medrano J, Barreiro P.Viral hepatitis and HIV co-infection. Antiviral Res. 2010 Jan; 85(1):303-15 Urbanus et al. Hepatitis C virus infections among HIV-infected men who have sex with men: an expanding epidemic. AIDS. 2009 Jul; 23(12): F1-7

Potential Reduction in HCV-Related Liver Deaths by Treatment Strategy based on Liver Fibrosis

Coffin, CID 2012 (modified for novel Direct--Acting Agents)

HCV Testing Cost Effectiveness With New HCV Therapies

*CDC unpublished data. TVR: Telapravir.

http://www.prevent.org/National-Commission-on-Prevention-Priorities/Rankings-of-Preventive-Services-for-the-US-Population.aspx Rein D, Ann Int. Med 2012.

Health Impact of Birth Cohort Recommendations

Outcome

Birth Cohort Testing with Therapy

	PegIFN-Riba + Telapravir
Additional identified cases	809,000
Cirrhosis cases averted	203,000
Decompensated cirrhosis cases averted	74,000
Hepatocellular carcinoma cases averted	47,000
Transplants averted	15,000
Deaths from hepatitis C virus averted	121,000
Medical costs averted	\$2.5B
Cost/QALY gained	\$35.700

Defining Clinical Cases of Acute Hepatitis C: Primarily "a diagnosis of exclusion"

Clinical criteria

 An acute illness with discrete onset of symptoms consistent with acute viral hepatitis, usually jaundice or elevated serum aminotransferase (ALT/AST) levels (>400 IU/L)

Laboratory criteria

- Serum alanine aminotransferase (ALT) levels >400 IU/L, and
- IgM anti-HAV negative, and
- IgM anti-HBc negative and
- Anti-HCV positive (repeat reactive) by EIA,
 - verified by an additional more specific assay (e.g. RIBA[™] for anti-HCV or nucleic acid testing for HCV RNA) OR Anti-HCV positive (repeat reactive) by screening immunoassay with a signal to cut-off ratio predictive of a true positive as determined for the particular assay (e.g., >3.8 for enzyme immunoassay).

Natural History of Hepatitis C

Acute HCV infection

- ~30% symptomatic
- ~75% develop chronic infection

Chronic HCV infection

- Risk of cirrhosis
 - 25-30 years
 15-35%1
 - >40 years up to 60% 2
- Risk of Hepatocellular Carcinoma (HCC)
 - >30 years 1-3%3
 - After cirrhosis 1-4% per year
 - HCV infection increases HCC risk 17 x 1
 - In US 31-61% of HCC cases associated with HCV 2

1Freeman AJ et al, Hepatology 2001;2Hassan MM, et al. J Clin, Gastroenterol 2002; 3Norderstedt, et al. Dig Liv Dis 2010; 4Donato, et al, Am J Epidemiology 2002; 5Perz et al, J Hepatology 2006;

Proportion of HCV infected Persons by Year of Birth- 15 countries

Homie Razavi, et al, unpublished data

HCV Among People Who Inject Drugs (PWID)

Nelson, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. The Lancet Volume 378, Issue 9791 2011 571 - 583

Community-based Programs to Test and Cure Hepatitis C: Package of Services

- Goal: Annual increase in testing, diagnosis, and cure by of ≥ 50%
- Identify and educate target population
- Incorporate HCV testing among in PCP practices
- Regular consultation of PCP with HCV specialists
- Develop data system from population level data sources to monitor outcome and community impact
- Leverage ACA : free testing, insurance enrollment, quality of care measures via EMR
- Three sites: Baltimore, Chicago, Seattle

Study of Young Persons Who Inject Drugs in Non-Urban Areas

- Identify HCV infected PWID
- Study drug use behaviors and social networks
- Link to harm reduction and drug treatment services
- Link to HCV care and treatment
- Two sites: Albuquerque, Cincinnati

Viral Hepatitis Prevention in the United States

- Improve primary prevention- harm reduction, patent safety
- Strengthen the continuum of HBV and HCV testing, care, and treatment
- Enhance surveillance to detect and interrupt transmission
- Build evidence base for policy development and to guide interventions
- Grow commitments for the long term to prevention/elimination goals
HHS Viral Hepatitis Action Plan Public Health Goals

- Increase the proportion of persons who are aware of their hepatitis B virus infection, from 33% to 66%
- Increase the proportion of persons who are aware of their hepatitis C virus infection, from 45% to 66%
- Reduce by 25% HCV incidence
- Eliminate mother-to-child transmission of HBV

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Action Plan for the Prevention, Care, & Treatment of Viral Hepatitis

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HCV Testing & Linkage Serving Birth Cohort October 2012—September 2014*

Location	Persons Tested	% anti- HCV Positive	% RNA Tested	% RNA Positive	% Referred to Care	% Attended First Appt.
Rochester, NY	4802	4	90	70	98	66
Denver, CO	2781	12	94	72	86	86
New York City	4736	14	87	63	89	71
Washington DC	2147	35	19	92	99	69
South Carolina	1745	6	69	80	76	55
Philadelphia, PA	4692	11	90	71	86	63
San Diego, CA	8165	3	93	91	92	54
Atlanta, GA	4902	8	76	69	90	67
San Juan, PR	2639	6	96	72	24	61
Washington DC	1874	8	86	63	95	83
San Antonio, TX	4585	7	91	61	86	77
Total	43068	9	77	71	81	59