HCV Epidemiology, Screening and Natural History

BRUCE A. LUXON, MD, PHD, FACG
ANTON AND MARGARET FUISZ CHAIR IN MEDICINE
PROFESSOR AND CHAIRMAN
DEPARTMENT OF MEDICINE
GEORGETOWN UNIVERSITY

Hepatitis C In the U.S. Why Should You Care?

5.1 million estimated true prevalence
3.9 million CDC estimate
25% Diagnosed
Large reservoir of infected patients who are undiagnosed
And Untreated

Chak E, et al. Liv Int 2011;31:1090-1101
Theme for Today: Goats

**Typical DC teenager**

With fashion goat

---

**Natural History of HCV**

- **Acute Infection***
- **Chronic Infection 75%-85%**
- **Cirrhosis 10%-20% over 20 years**
- **HCC 1%-4% per year**
- ** Decompensated Cirrhosis 5-yr survival rate 50%**

- Most Americans infected >35y
- Additional impact of: Alcohol, Obesity, Older age
- *Most have minimal symptoms

---

Bruce A. Luxon, MD, PhD, FACG
Consequences of Under-Diagnosis of HCV Infection

33% of undiagnosed Americans have advanced fibrosis/cirrhosis

Now

Job Security


A Bipartisan View of Life in DC

Another DC teenager with her special goat
HCV is a Systemic Disease

Acute Infection* → Chronic Infection 75%-85% → Cirrhosis 10%-20% over 20 years → HCC 1%-4% per year → Decompensated Cirrhosis 5-yr survival rate 50%

Extra hepatic Manifestations

HCC

Extrahepatic Manifestations of HCV

Strongly associated
- Mixed cryoglobulinemia
- Sjögren (sicca) syndrome
- Lymphoproliferative disorders
- Porphyria cutanea tarda
- Neuropathy
- Membranoproliferative glomerulonephritis
- Cryoglobulinemic vasculitis

Possibly associated
- Corneal ulcers (Mooren ulcers)
- Thyroid disease
- Lichen planus
- Pulmonary fibrosis
- Type 2 diabetes
- Systemic vasculitis (polyarteritis nodosa, microscopic polyangiitis)
- Arthralgias, myalgias, inflammatory polyarthritis
- Autoimmune thrombocytopenia

HCV Infection Increases Risk of Chronic Kidney Disease – REVEAL-HCV Study

N=23,785; 1,313 seropositive for HCV

Lai TS, et al. AASLD 2014, Abstract #172

HCV Infection is Associated with Increased All Cause Mortality “Reveal-C”

Increasing Healthcare Costs Associated with the Aging HCV Population

Expensive to have end stage liver disease


We Can Make A Difference!

How to Distinguish Yourself

Be a Trendsetter

Screen for HCV and refer to “specialist”

How to Distinguish Yourself

Be a Trendsetter

Beware of copycats.... ahhh copy goats.... well you know what I mean
Goat Humor: a Jar Jar Binks Lookalike from Iowa

How Do You Get Hepatitis C?
1998 CDC Risk Based HCV Screening Recommendations

- Ever injected illegal drugs
- Received blood, organs, or clotting factors prior to 1992
- Have ever been on hemodialysis
- Have elevated ALT
- Born to HCV infected mothers
- Have HIV infection
- Percutaneous or mucosal exposure to HCV positive blood


Risk-Based Screening Does Not Work

- Primary care setting, U.S. – 2005-2010
- 17,464 tested for HCV
  - 6.4% positive
- Odds ratios for positive anti-HCV
  - IVDU: 6.3
  - 1945-1965 birth cohort: 4.4
  - Elevated ALT: 4.8
- Risk based screening missed 4 out of 5 HCV positive adults

Yartel AK, et al. AASLD 2013; abstract #24
HCV in the US – 2001-2010

Milliman Study: Based on NHANES and Claim Forms

82% aged 44-63 years

8,810 Americans with hepatitis C infection
Danville PA, Detroit MI, Portland OR, Honolulu HI

75% born between 1945-1964
Baby Boomer Epidemic

Anti-HCV Prevalence by Birth Year, NHANES 1999-2008

1945-1965: 3.6%
Others: 0.8%

Smith BD, et al. AASLD 2011, abstract 241

Birth Year 1945 – 1965
Baby Boomers

Woodstock Festival 1969
“Share Love and Hep C”
Not Only the Boomer’s Fault...

- Hepatitis C was not on the radar
- Blood supply was contaminated
- No universal precautions in healthcare settings
- No way to screen organs or blood products

2012 CDC Recommendations for Birth Cohort Screening (1945 - 1965)

**Recommendation #1**
- Adults born from 1945-1965 should receive one-time testing for HCV.

**Recommendation #2**
- HCV (+) individuals
  - Brief alcohol screening and intervention
  - Referral to appropriate care for HCV

2013 USPSTF HCV Screening Recommendations

1. Those at high risk for HCV infection
2. Those born from 1945 to 1965
   - Grade B recommendation – high certainty that the net benefit is moderate to substantial

The Affordable Care Act
- Requires insurance plans to provide Grade A or B recommendations without cost sharing

USPSTF = United States Preventive Services Task Force

Moyer VA - on behalf of the USPSTF. Ann Intern Med 2013;159:349-357

Is it Effective?
3 Randomized Controlled Trials

Compared to “standard of care”
- Testing for HCV in persons born 1945-1965 with no prior testing
- Was 5 times more effective in identifying persons with current or prior infection

Smith BD, et al. AASLD 2014, Abstract #194
For “Non-Baby Boomers”

Risk based screening
- IVDU – single or multiple
- Intranasal cocaine use
- Getting an unregulated tattoo and other percutaneous exposures
- Blood or blood product transfusion before 1992
- Born to an HCV-infected mother
- Incarceration

Moyer VA - on behalf of the USPSTF. Ann Intern Med 2013;159:349-357

Transmission of HCV

<table>
<thead>
<tr>
<th>Route</th>
<th>Hepatitis C</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV drug use</td>
<td><img src="image" alt="Common" /></td>
</tr>
<tr>
<td>Transfusion</td>
<td><img src="image" alt="Common" /></td>
</tr>
<tr>
<td>Hemodialysis</td>
<td><img src="image" alt="Common" /></td>
</tr>
<tr>
<td>Intra-institutional</td>
<td><img src="image" alt="Common" /></td>
</tr>
<tr>
<td>Sexual</td>
<td><img src="image" alt="Infrequent" /></td>
</tr>
<tr>
<td>Household</td>
<td><img src="image" alt="Infrequent" /></td>
</tr>
<tr>
<td>Mother-to-newborn</td>
<td><img src="image" alt="Infrequent" /></td>
</tr>
<tr>
<td>Oral-oral contact</td>
<td><img src="image" alt="Never" /></td>
</tr>
<tr>
<td>Food-borne</td>
<td><img src="image" alt="Never" /></td>
</tr>
<tr>
<td>Fecal (oral)</td>
<td><img src="image" alt="Never" /></td>
</tr>
<tr>
<td>Water-borne</td>
<td><img src="image" alt="Never" /></td>
</tr>
<tr>
<td>Raw shellfish</td>
<td><img src="image" alt="Never" /></td>
</tr>
</tbody>
</table>

Generates Questions in my Clinic
HCV Is Not Going Away!

You Want Your Doctor to Avoid These Mistakes

“Liver tests are normal, not much can be going on.”

“Hepatitis C does not damage the liver unless alcohol is involved.”

“I discussed vaccinating patient vs. HCV & patient declined.”

“There is nothing to do about treating hepatitis C.”

“Treatment of hepatitis C is worse than the disease.”
**Reported number of acute hepatitis C cases — United States, 2000 – 2012**

![Graph showing the reported number of acute hepatitis C cases from 2000 to 2012.](image)

Source: National Notifiable Diseases Surveillance System (NNDSS)

**HISTOLOGIC STAGING**

- **Stage 0**: No fibrosis
- **Stage 1**: Portal fibrosis
- **Stage 2**: Few septa
- **Stage 3**: Numerous septa
- **Stage 4**: Cirrhosis

STOP Before Here

ACG 2015 Nashville Hepatitis School
Copyright 2015 American College of Gastroenterology
Importance of Confirming Viremia

- Anti-HCV Antibody Positive
- HCV RNA Positive
- HCV Genotype
  - Consider Liver Biopsy
  - Vaccinate for HAV / HBV*

- Anti-HCV Antibody Negative
- No Further Testing

- HCV RNA Negative
- No Active Disease

This is *Not* Magic

Why Diagnose?
## Benefits of Diagnosis

<table>
<thead>
<tr>
<th>PREVENT TRANSMISSION</th>
<th>OTHER RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Avoid sharing objects with blood</td>
<td>✓ Avoid alcohol consumption</td>
</tr>
<tr>
<td>✓ Stop illicit drugs or sharing needles</td>
<td>✓ Discuss available treatments</td>
</tr>
<tr>
<td>✓ Discuss risk of sexual transmission with “unsafe sex”</td>
<td>✓ Vaccinate for hepatitis A and B</td>
</tr>
<tr>
<td></td>
<td>✓ Test for HBV, HIV</td>
</tr>
<tr>
<td></td>
<td>✓ Consider family member screening</td>
</tr>
</tbody>
</table>

---

I Know It Sounds Unbelievable -- It Will Only Get Better
I Know It Sounds Unbelievable
It Will Only Get Better

HCV Epidemiology, Screening and Natural History - Summary

1. Most HCV patients remain undiagnosed
2. 75% of them were born from 1945-1965
3. 33% of them have advanced fibrosis
   - “ticking time bombs” waiting to explode (bleed) on a Friday at midnight when you are on call
4. Therapy is more effective and safer
5. It’s time to incorporate screening into your practice!
Thank You