



Hepatitis C

Prepared by

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Centers for Disease Control and Prevention



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Features of Hepatitis C Virus Infection

Incubation period	Average 6-7 weeks Range 2-26 weeks
Acute illness (jaundice)	Mild ($\leq 20\%$)
Case fatality rate	Low
Chronic infection	60%-85%
Chronic hepatitis	10%-70% (most asx)
Cirrhosis	<5%-20%
Mortality from CLD	1%-5%

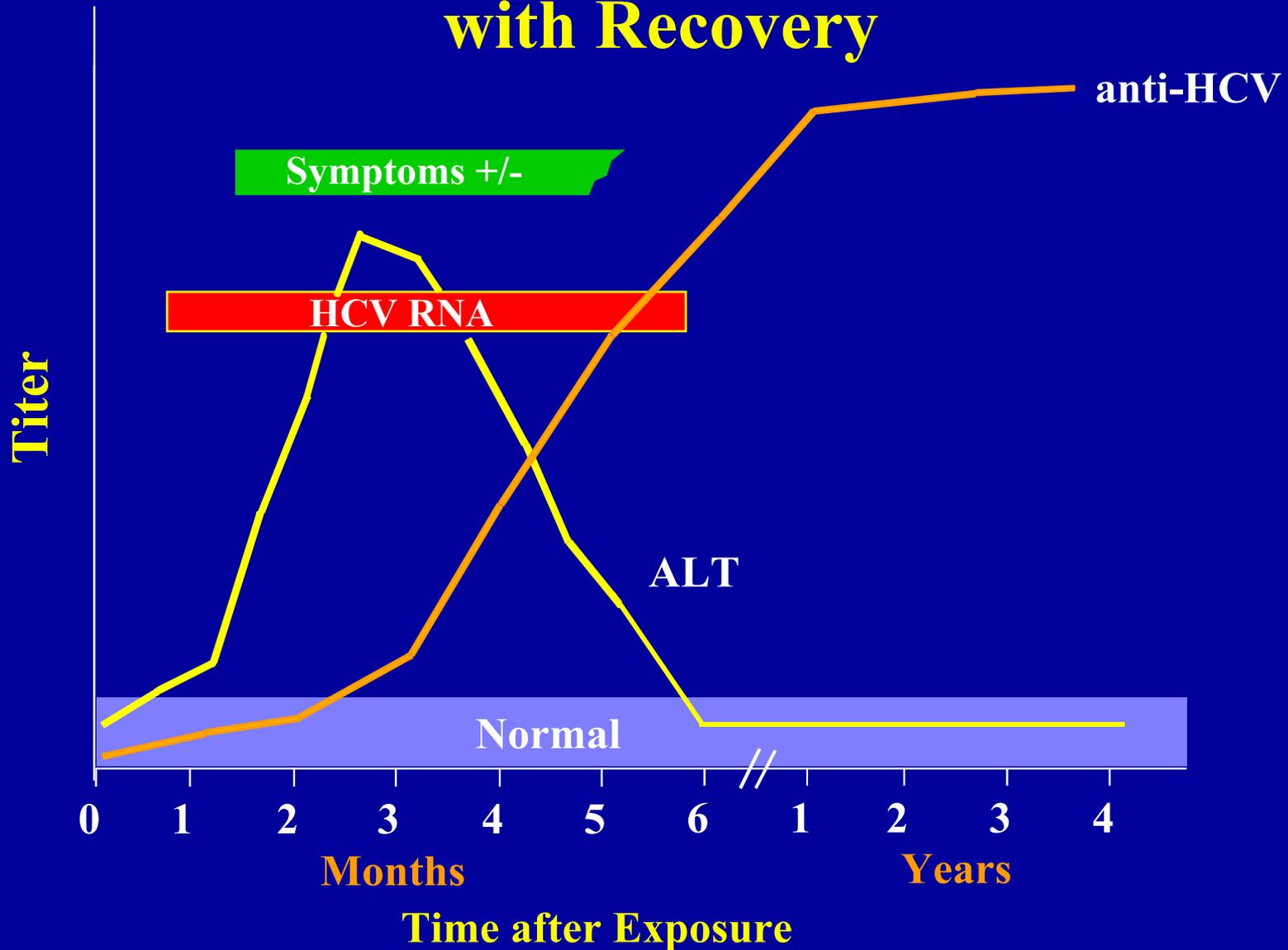
**Age-
related**

Chronic Hepatitis C

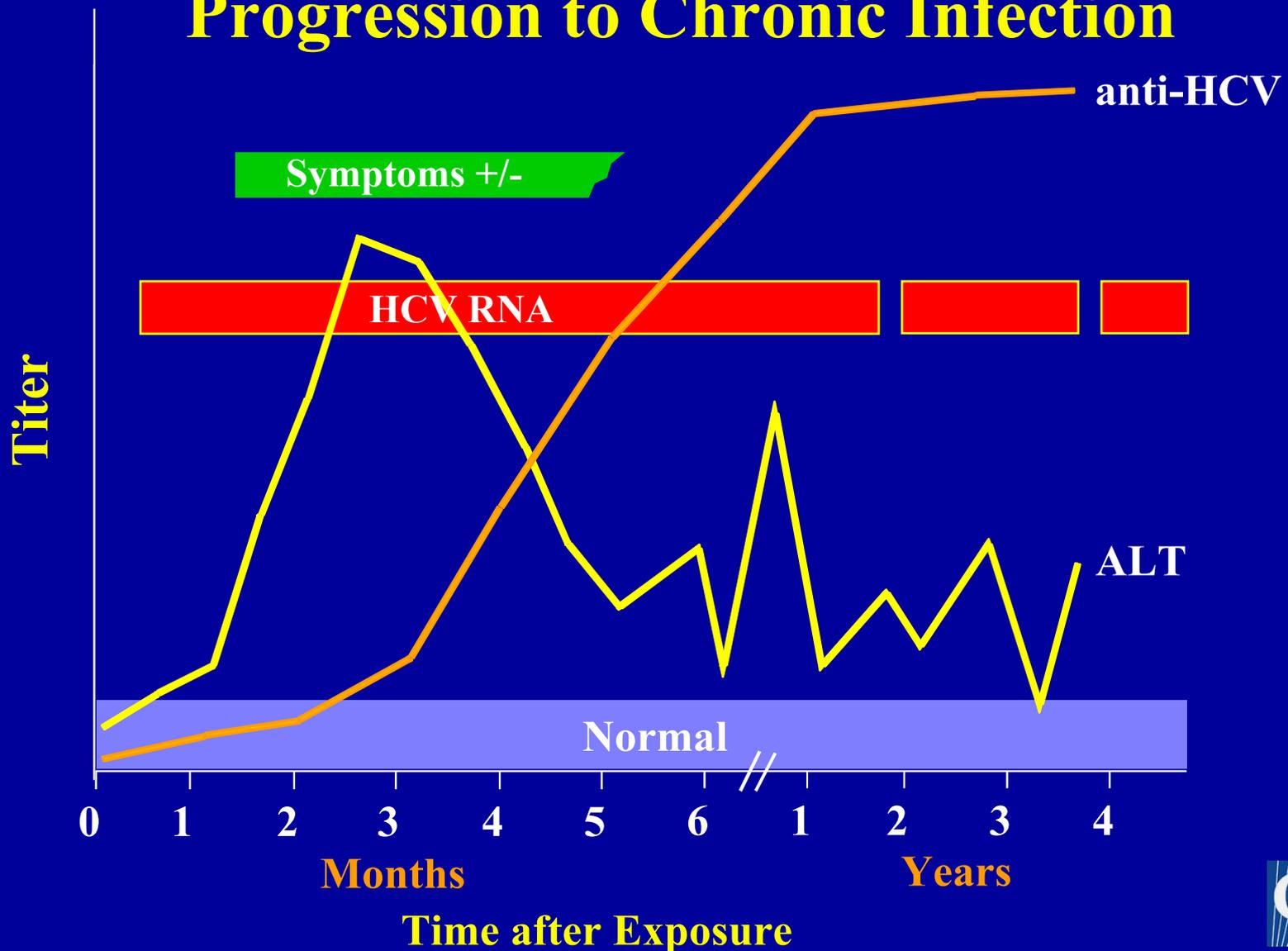
Factors Promoting Progression or Severity

- **Increased alcohol intake**
- **Age > 40 years at time of infection**
- **HIV co-infection**
- **Other**
 - **Male gender**
 - **Chronic HBV co-infection**

Serologic Pattern of Acute HCV Infection with Recovery



Serologic Pattern of Acute HCV Infection with Progression to Chronic Infection

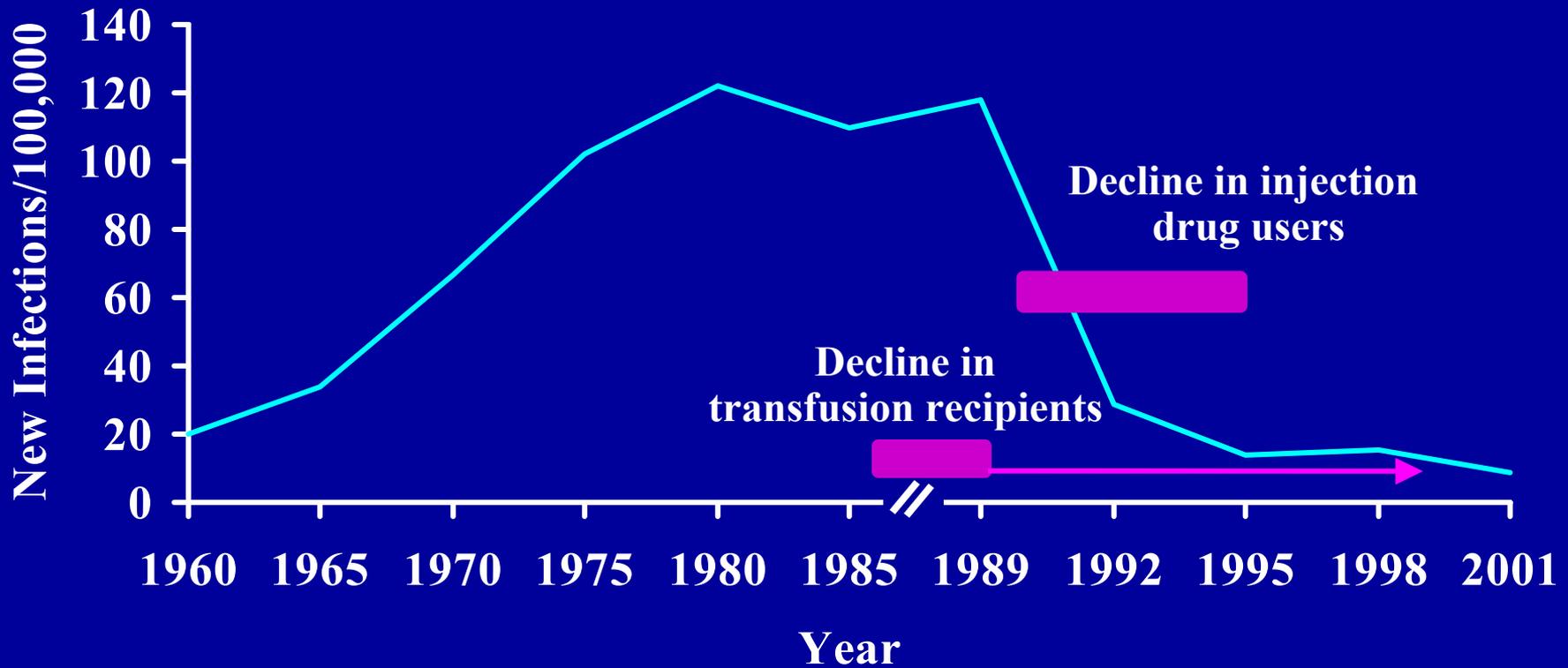


Hepatitis C Virus Infection, United States

New infections per year 1985-89	242,000
2001	25,000
Deaths from acute liver failure	Rare
Persons ever infected (1.8%)	3.9 million (3.1-4.8)*
Persons with chronic infection	2.7 million (2.4-3.0)*
HCV-related chronic liver disease	40% - 60%
Deaths from chronic disease/year	8,000-10,000

***95% Confidence Interval**

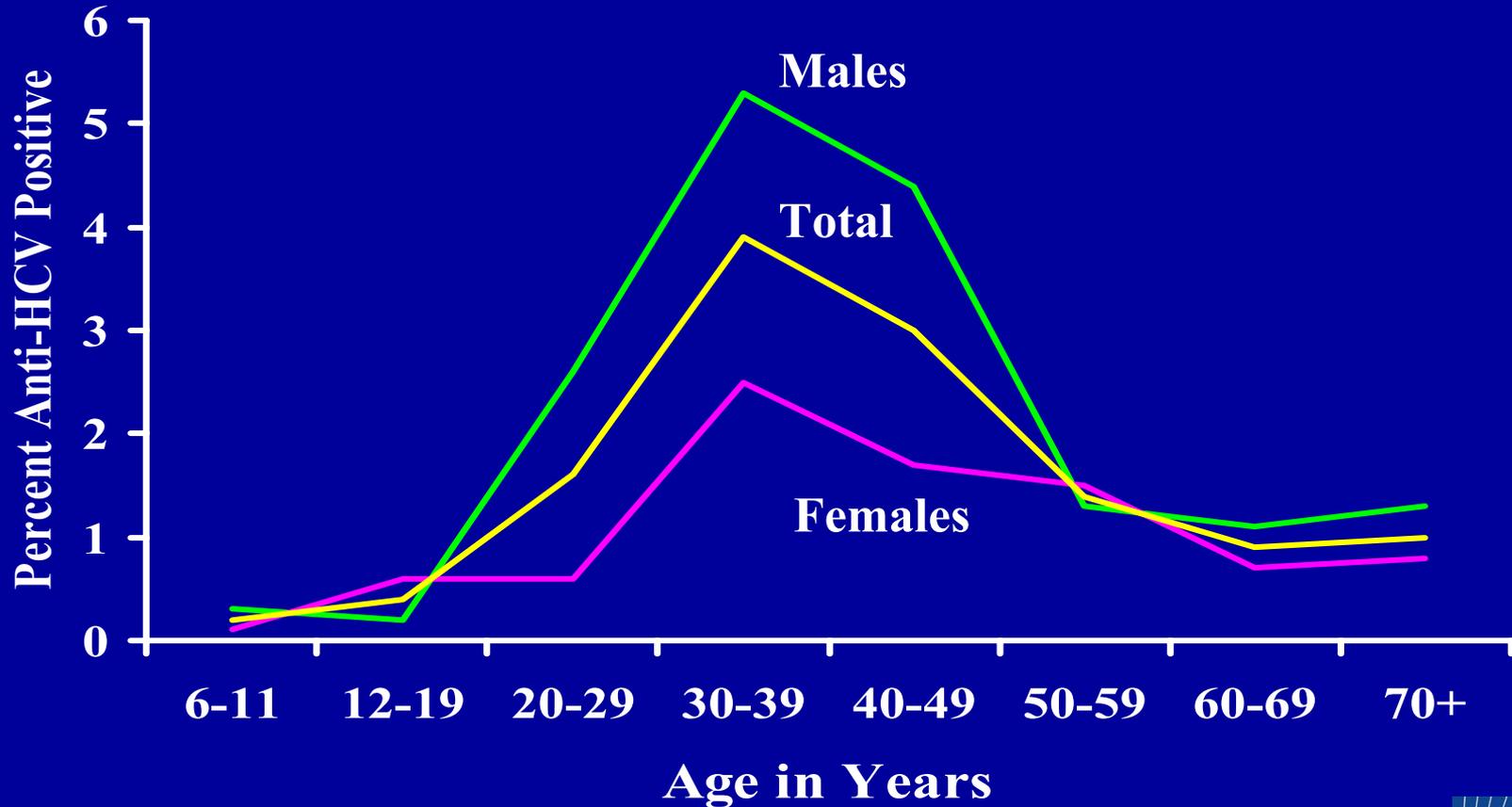
Estimated Incidence of Acute HCV Infection United States, 1960-2001



Source: Hepatology 2000;31:777-82; Hepatology 1997;26:62S-65S;
CDC, unpublished data



Prevalence of HCV Infection by Age and Gender, United States, 1988-1994



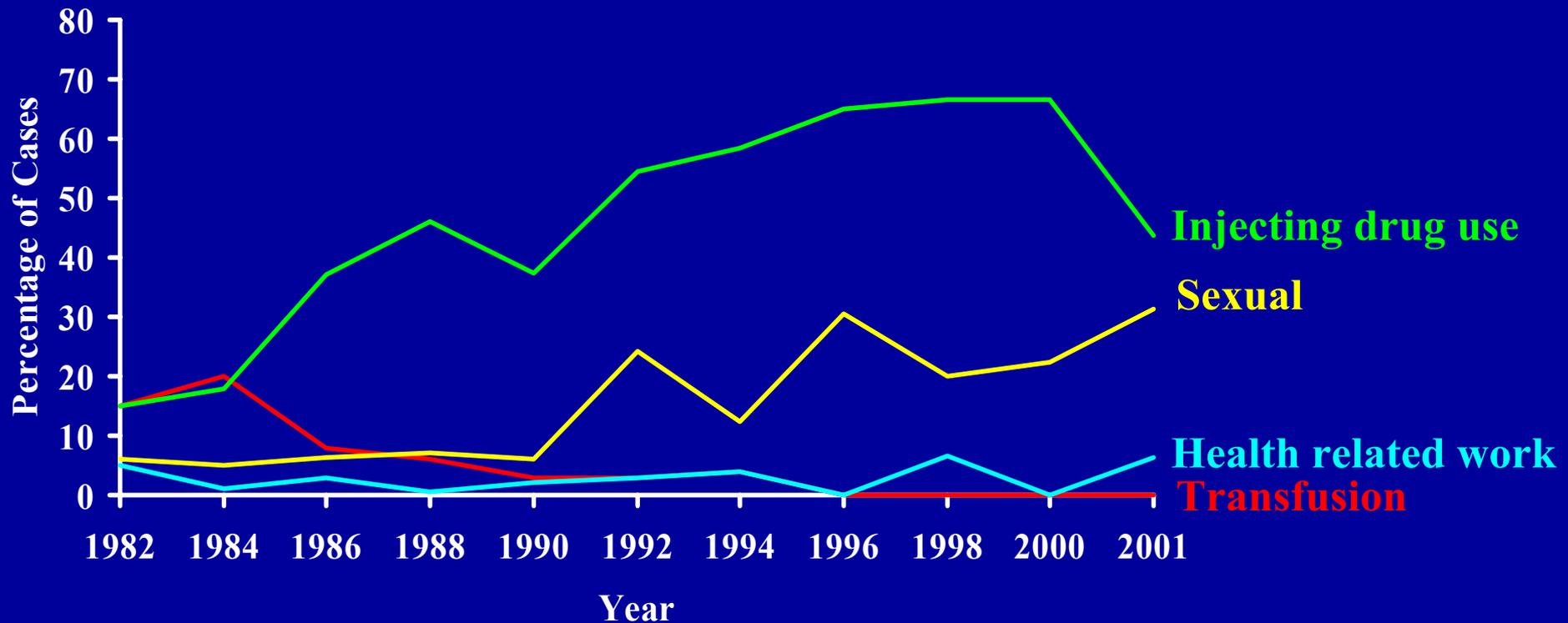
Source: CDC, NHANES III, NEJM 1999



Exposures Known to Be Associated With HCV Infection in the United States

- **Injecting drug use**
- **Transfusion, transplant from infected donor**
- **Occupational exposure to blood**
 - **Mostly needle sticks**
- **Iatrogenic (unsafe injections)**
- **Birth to HCV-infected mother**
- **Sex with infected partner**
 - **Multiple sex partners**

Reported Cases of Acute Hepatitis C by Selected Risk Factors, United States, 1982-2001*



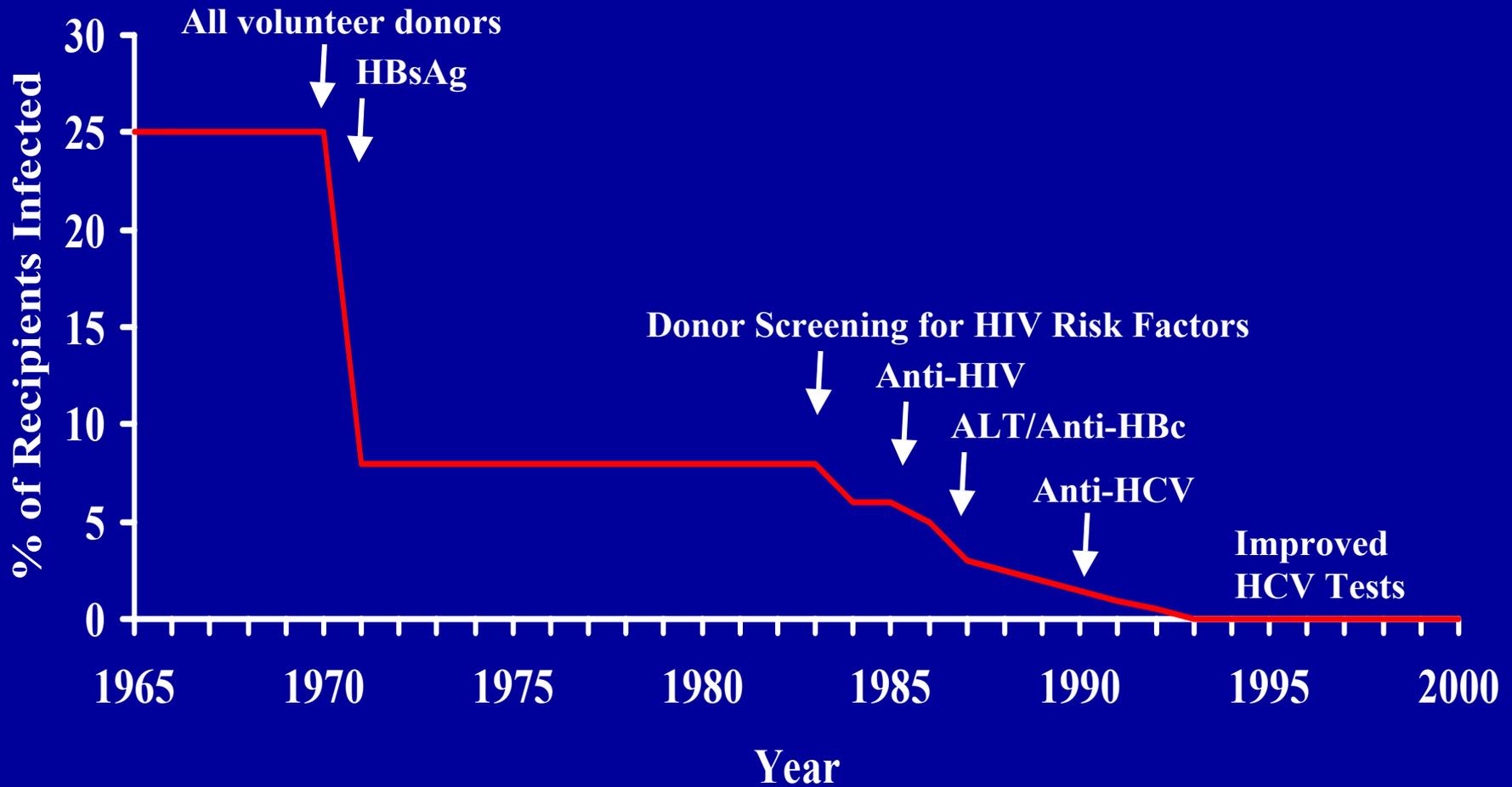
* 1982-1990 based on non-A, non-B hepatitis



Injecting Drug Use and HCV Transmission

- **Highly efficient**
 - Contamination of drug paraphernalia, not just needles and syringes
- **Rapidly acquired after initiation**
 - 30% prevalence after 3 years
 - >50% after 5 years
- **Four times more common than HIV**

Posttransfusion Hepatitis C



Adapted from HJ Alter and Tobler and Busch, Clin Chem 1997



Occupational Transmission of HCV

- **Inefficient by occupational exposures**
- **Average incidence 1.8% following needle stick from HCV-positive source**
 - Associated with hollow-bore needles
- **Case reports of transmission from blood splash to eye; one from exposure to non-intact skin**
- **Prevalence 1-2% among health care workers**
 - Lower than adults in the general population
 - 10 times lower than for HBV infection

HCV Related to Health Care Procedures United States

- **Recognized primarily in context of outbreaks**
 - Chronic hemodialysis
 - Hospital inpatient setting
 - Private practice setting
 - Home therapy
- **Unsafe injection practices**
 - Reuse of syringes and needles
 - Contaminated multiple dose medication vials

HCW to Patient Transmission of HCV

- **Rare**
 - In U.S., none related to performing invasive procedures
- **Most appear related to HCW substance abuse**
 - Reuse of needles or sharing narcotics used for self-injection
- **No restrictions routinely recommended for HCV-infected HCWs**

Perinatal Transmission of HCV

- **Transmission only from women HCV-RNA positive at delivery**
 - Average rate of infection 6%
 - Higher (17%) if woman co-infected with HIV
 - Role of viral titer unclear
- **No association with**
 - Delivery method
 - Breastfeeding
- **Infected infants do well**
 - Severe hepatitis is rare

Sexual Transmission of HCV

- **Case-control, cross sectional studies**
 - Infected partner, multiple partners, early sex, non-use of condoms, other STDs, sex with trauma, **BUT**
 - MSM no higher risk than heterosexuals
- **Partner studies**
 - Low prevalence (1.5%) among long-term partners
 - infections might be due to common percutaneous exposures (e.g., drug use), **BUT**
 - Male to female transmission more efficient
 - more indicative of sexual transmission

Sexual Transmission of HCV

- **Occurs, but efficiency is low**
 - Rare between long-term steady partners
 - Factors that facilitate transmission between partners unknown (e.g., viral titer)
- **Accounts for 15-20% of acute and chronic infections in the United States**
 - Sex is a common behavior
 - Large chronic reservoir provides multiple opportunities for exposure to potentially infectious partners

Household Transmission of HCV

- **Rare but not absent**
- **Could occur through percutaneous/mucosal exposures to blood**
 - **Contaminated equipment used for home therapies**
 - **IV therapy, injections**
 - **Theoretically through sharing of contaminated personal articles (razors, toothbrushes)**

Other Potential Exposures to Blood

- **No or insufficient data showing increased risk**
 - intranasal cocaine use, tattooing, body piercing, acupuncture, military service
- **No associations in acute case-control or population-based studies**
- **Cross-sectional studies in highly selected groups with inconsistent results**
 - Temporal relationship between exposure and infection usually unknown
 - Biologically plausible, but association or causal relationship not established

Sources of Infection for Persons With Hepatitis C

Injecting drug use 60%

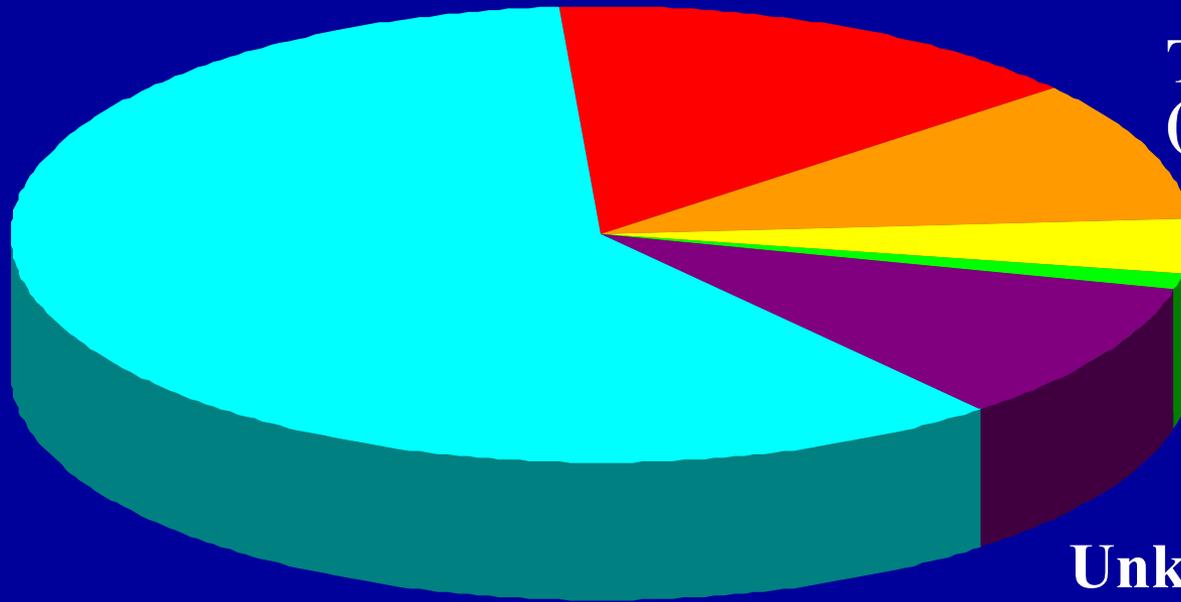
Sexual 15%

Transfusion 10%
(before screening)

Occupational 4%

Other 1%*

Unknown 10%



* Nosocomial; iatrogenic; perinatal



Reduce or Eliminate Risks for Acquiring HCV Infection

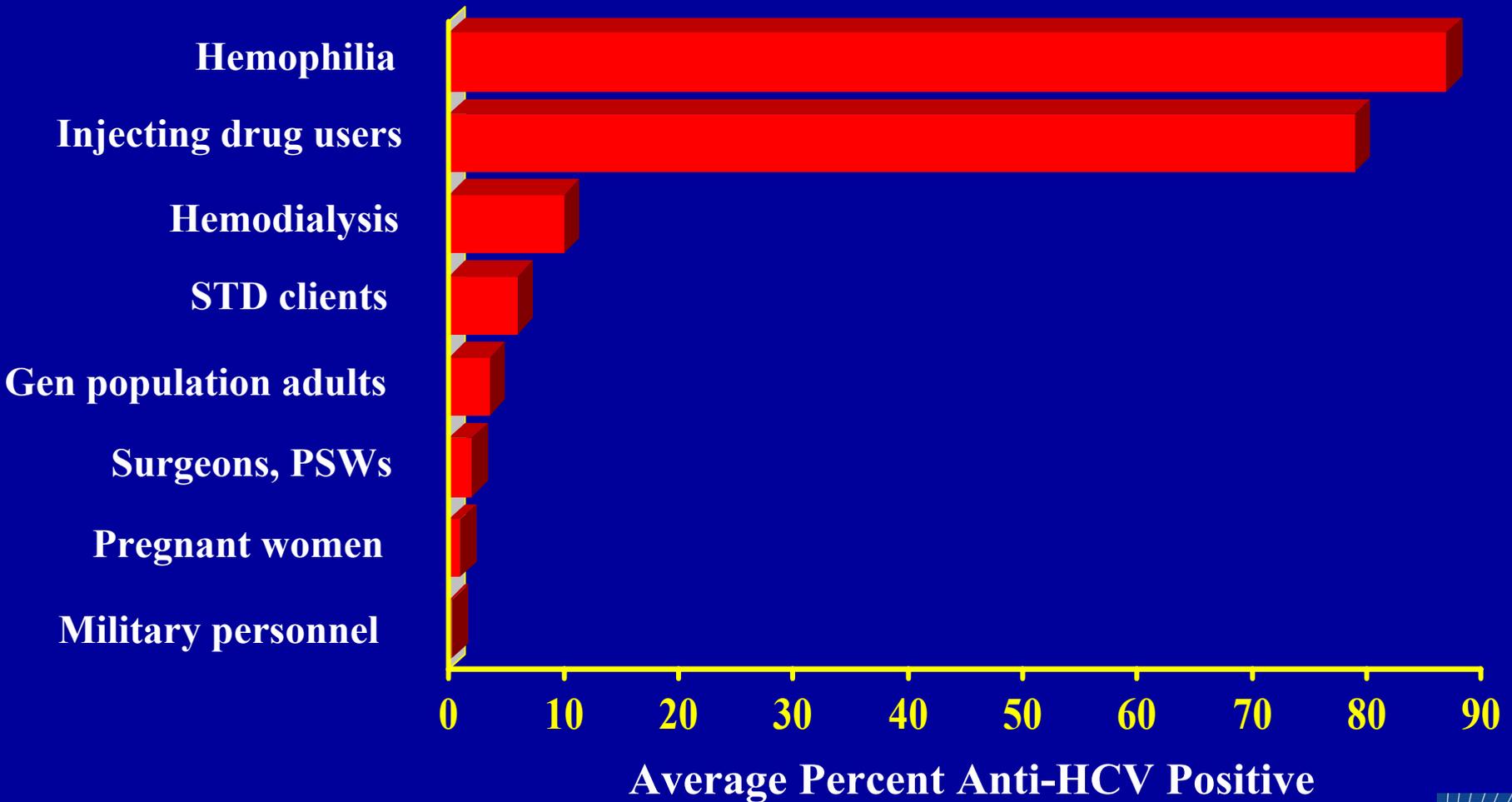
- **Screen and test donors**
- **Virus inactivation of plasma-derived products**
- **Risk-reduction counseling and services**
 - Obtain history of high-risk drug and sex behaviors
 - Provide information on minimizing risky behavior, including referral to other services
 - Vaccinate against hepatitis A and/or hepatitis B
- **Safe injection and infection control practices**

Reduce Risks for Disease Progression and Further Transmission

- **Identify persons at risk for HCV and test to determine infection status**
 - Routinely identify at risk persons through history, record review
- **Provide HCV-positive persons**
 - Medical evaluation and management
 - Counseling
 - Prevent further liver damage
 - Prevent transmission to others

MMWR 1998;47 (No. RR-19)

HCV Prevalence by Selected Groups United States



HCV Testing Routinely Recommended

Based on increased risk for infection

- Ever injected illegal drugs
- Received clotting factors made before 1987
- Received blood/organs before July 1992
- Ever on chronic hemodialysis
- Evidence of liver disease

Based on need for exposure management

- Healthcare, emergency, public safety workers after needle stick/mucosal exposures to HCV-positive blood
- Children born to HCV-positive women

Postexposure Management for HCV

- **IG, antivirals not recommended for prophylaxis**
- **Follow-up after needlesticks, sharps, or mucosal exposures to HCV-positive blood**
 - Test source for anti-HCV
 - Test worker if source anti-HCV positive
 - Anti-HCV and ALT at baseline and 4-6 months later
 - For earlier diagnosis, HCV RNA at 4-6 weeks
 - Confirm all anti-HCV results with RIBA
- **Refer infected worker to specialist for medical evaluation and management**

Routine HCV Testing Not Recommended (Unless Risk Factor Identified)

- **Health-care, emergency medical, and public safety workers**
- **Pregnant women**
- **Household (non-sexual) contacts of HCV-positive persons**
- **General population**

Routine HCV Testing of Uncertain Need

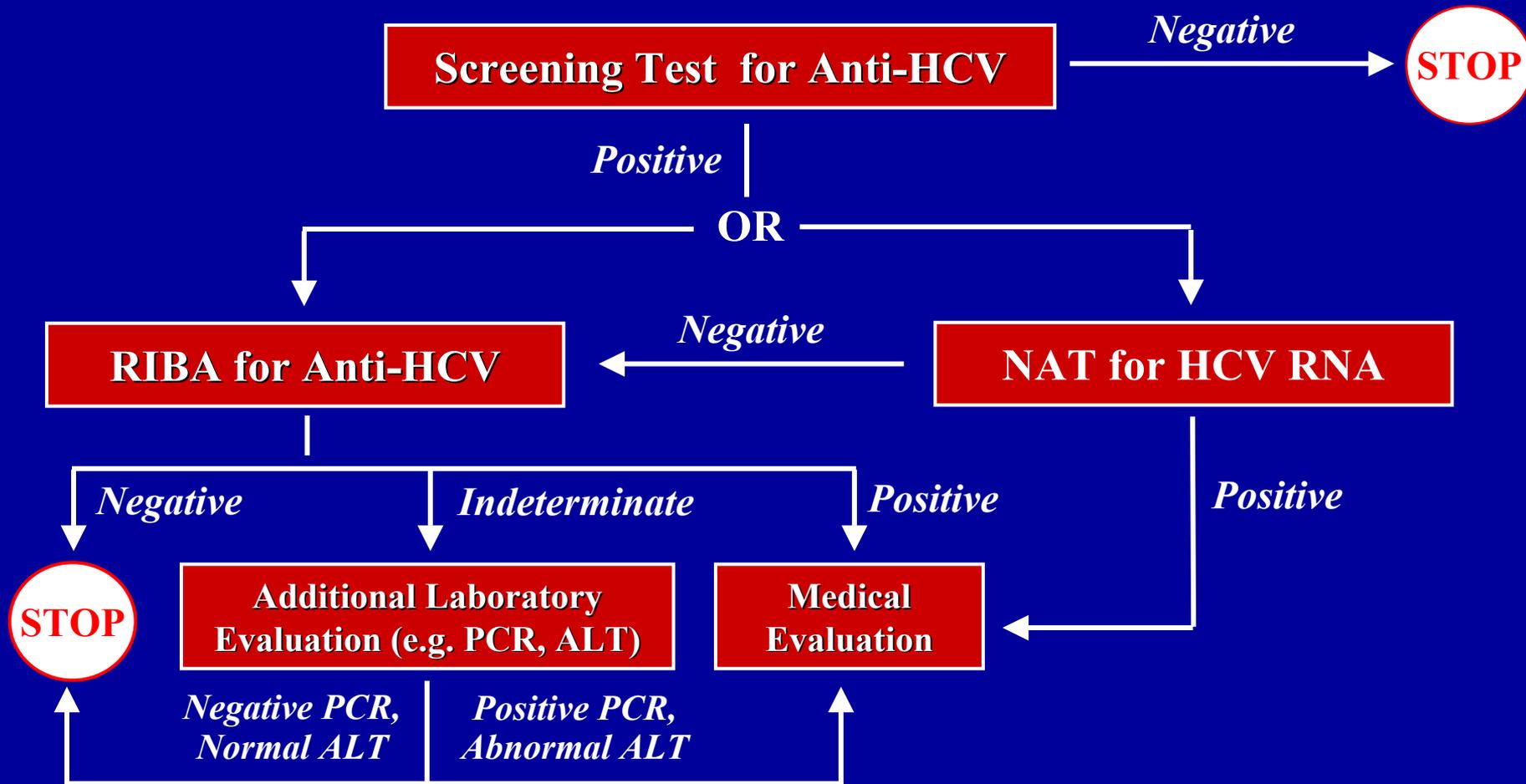
Not confirmed as risk factor/prevalence low or unknown

- Recipients of transplanted tissue
- Intranasal cocaine or other non-injecting illegal drug users
- History of tattooing, body piercing

Confirmed risk factor but prevalence of infection low

- History of STDs or multiple sex partners
- Long-term steady sex partners of HCV-positive persons

HCV Infection Testing Algorithm for Diagnosis of Asymptomatic Persons



Medical Evaluation and Management for Chronic HCV Infection

- **Assess for biochemical evidence of CLD**
- **Assess for severity of disease and possible treatment, according to current practice guidelines**
 - 40-50% sustained response to antiviral combination therapy (peg interferon, ribavirin)
 - Vaccinate against hepatitis A
- **Counsel to reduce further harm to liver**
 - Limit or abstain from alcohol

HCV Counseling

- **Prevent transmission to others**
 - Direct exposure to blood
 - Perinatal exposure
 - Sexual exposure
- **Refer to support group**

Preventing HCV Transmission to Others

Avoid Direct Exposure to Blood

- **Do not donate blood, body organs, other tissue or semen**
- **Do not share items that might have blood on them**
 - personal care (e.g., razor, toothbrush)
 - home therapy (e.g., needles)
- **Cover cuts and sores on the skin**

Persons Using Illegal Drugs

- **Provide risk reduction counseling, education**
 - **Stop using and injecting**
 - **Refer to substance abuse treatment program**
 - **If continuing to inject**
 - **Never reuse or share syringes, needles, or drug preparation equipment**
 - **Vaccinate against hepatitis B and hepatitis A**
 - **Refer to community-based risk reduction programs**

Mother-to-Infant Transmission of HCV

- **Postexposure prophylaxis not available**
- **No need to avoid pregnancy or breastfeeding**
 - Consider bottle feeding if nipples cracked/bleeding
- **No need to determine mode of delivery based on HCV infection status**
- **Test infants born to HCV-positive women**
 - >15-18 months old
 - Consider testing any children born since woman became infected
 - Evaluate infected children for CLD

Sexual Transmission of HCV

Persons with One Long-Term Steady Sex Partner

- **Do not need to change their sexual practices**
- **Should discuss with their partner**
 - Risk (low but not absent) of sexual transmission
 - Counseling and testing of partner should be individualized
 - May provide couple with reassurance
 - Some couples might decide to use barrier precautions to lower limited risk further

Sexual Transmission of HCV

Persons with High-Risk Sexual Behaviors

- **At risk for sexually transmitted diseases, e.g., HIV, HBV, gonorrhea, chlamydia, etc.**
- **Reduce risk**
 - **Limit number of partners**
 - **Use latex condoms**
 - **Get vaccinated against hepatitis B**
 - **MSMs also get vaccinated against hepatitis A**

Other Transmission Issues

- **HCV not spread by kissing, hugging, sneezing, coughing, food or water, sharing eating utensils or drinking glasses, or casual contact**
- **Do not exclude from work, school, play, child-care or other settings based on HCV infection status**