VIRAL HEPATITIS C

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Features of Hepatitis C Virus Infection

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

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HEPATITIS C (Hepatitis C virus) – Case definition

Clinical Criteria

- Not relevant for surveillance purposes

Laboratory Criteria

- At least one of the following three:
- — Detection of hepatitis C virus nucleic acid (HCV RNA)
- — Detection of hepatitis C virus core antigen (HCV-core)
- — Hepatitis C virus specific antibody (anti-HCV) response confirmed by a confirmatory (e.g. immunoblot) antibody test in persons older than 18 months without evidence of resolved infection)

Epidemiological Criteria NA

Case Classification

- A. **Possible case** NA
- B. **Probable case** NA
- C. **Confirmed case**
- Any person meeting the laboratory criteria

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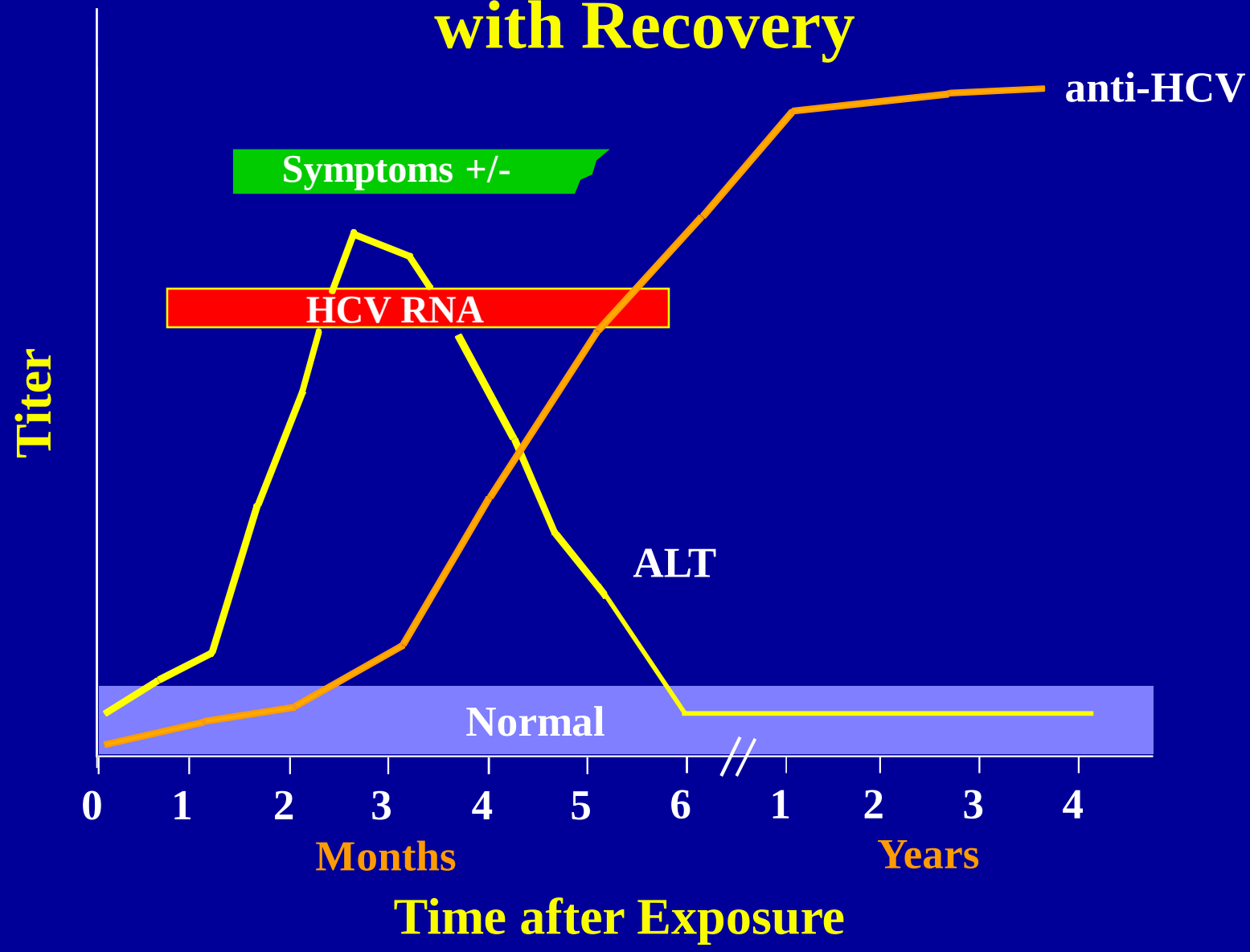
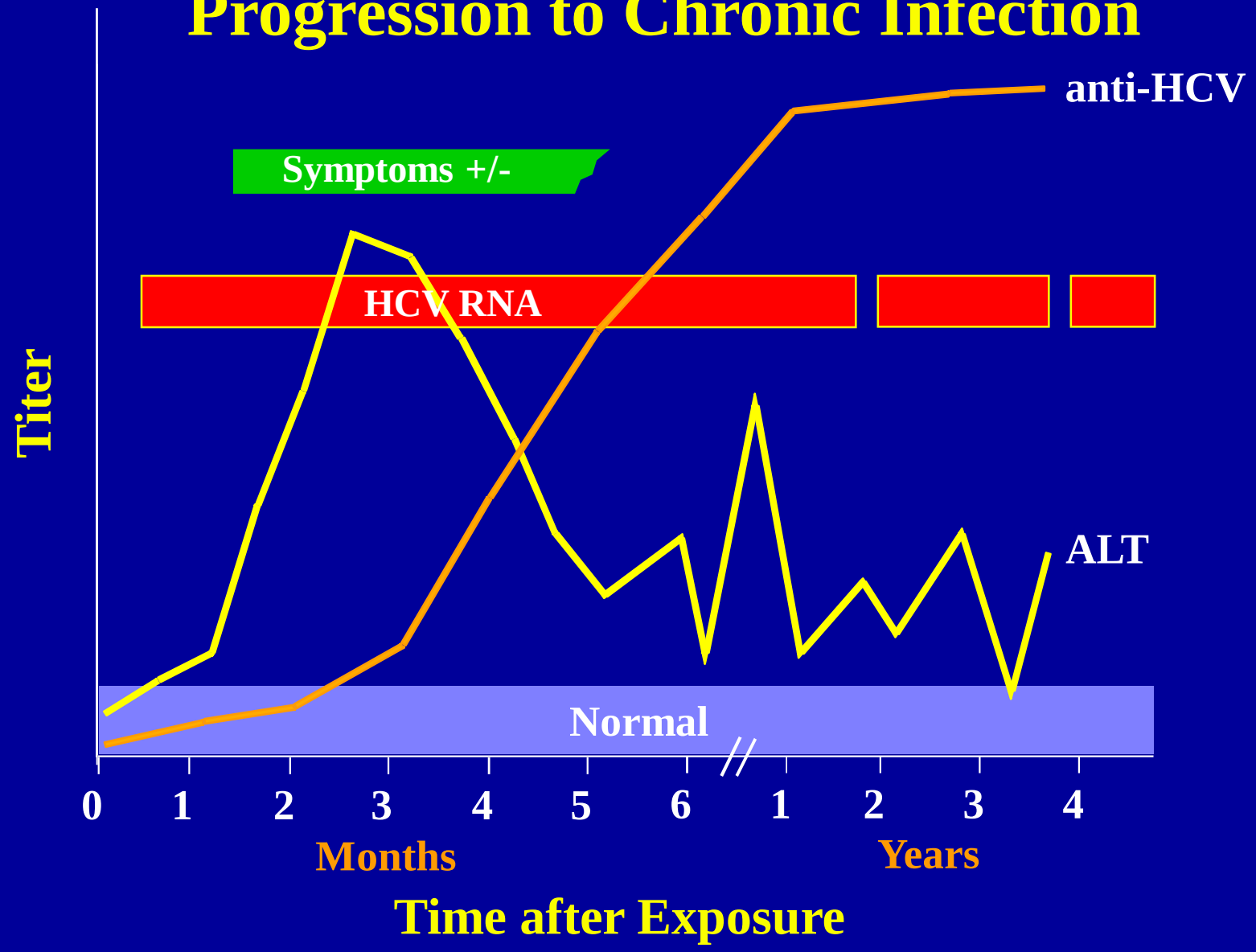
Chronic Hepatitis C
Factors Promoting Progression or Severity

- 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



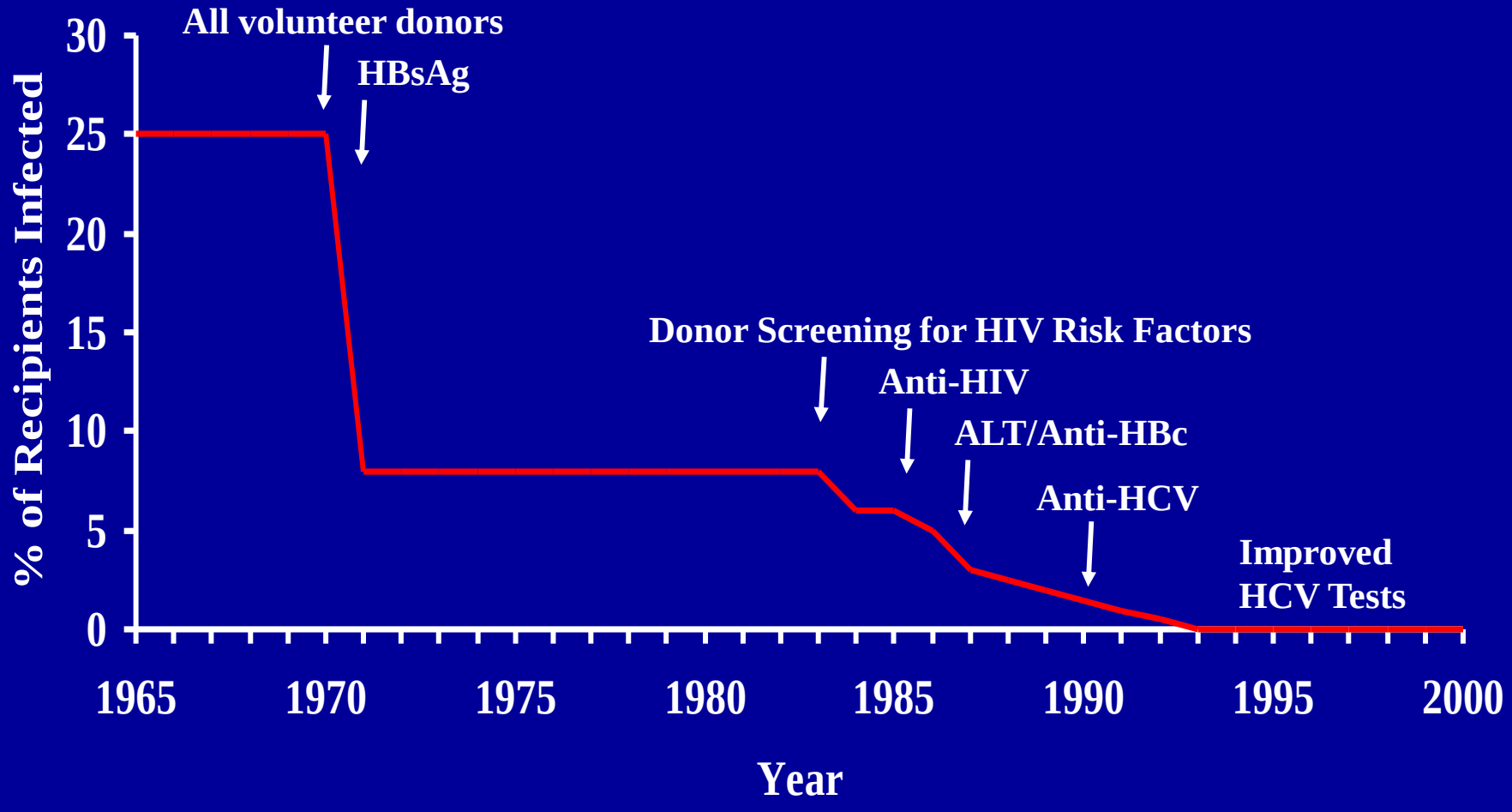
Exposures Known to Be Associated With HCV Infection in the United States

- 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

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

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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

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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

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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

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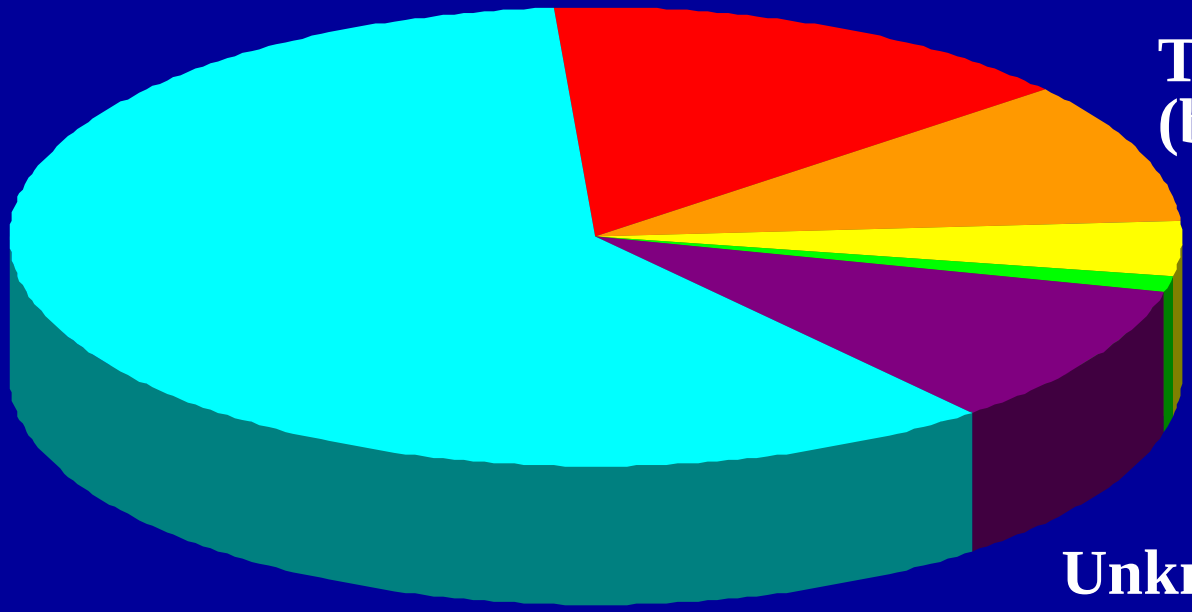
Sources of Infection for Persons With Hepatitis C



* Nosocomial; iatrogenic; perinatal

Source: Centers for Disease Control and Prevention

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

MMWR 1998;47 (No. RR-19)

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)

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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

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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

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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

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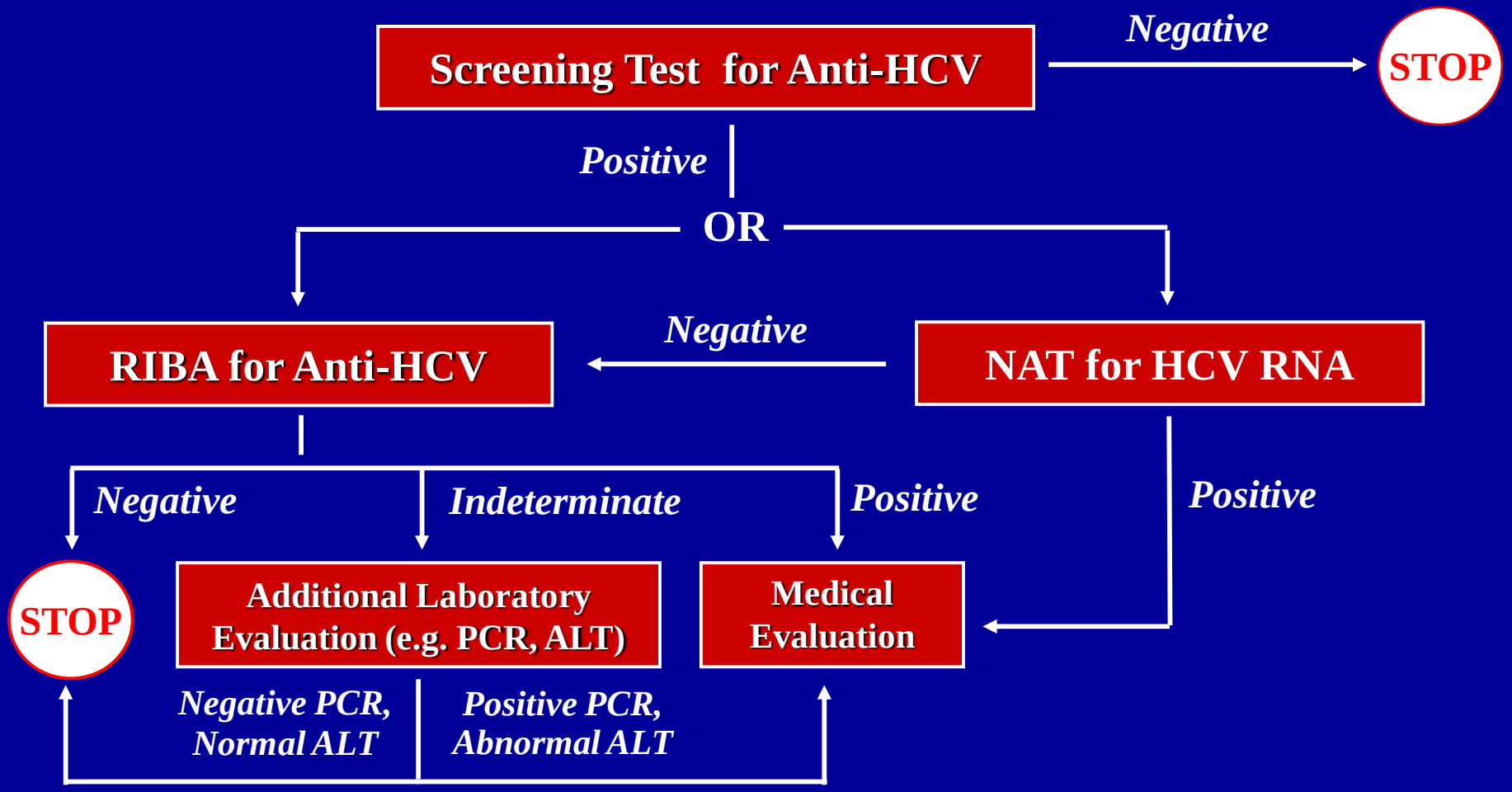
HCV Infection Testing Algorithm for Diagnosis of Asymptomatic Persons



Source: MMWR 1998;47 (No. RR 19)

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

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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

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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

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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