Epidemiology of viral hepatitis

PART 2

HBV Vaccination

Immunization in adults

Pre-exposure vaccination should be considered for groups of adults who are at increased risk of HBV infection.

- **Adults 20 years of age and older should receive 1 ml of adult formulation.**
- **The usual schedule for adults is two doses separated by no less than 1 month.**

The high-risk persons for whom the vaccination is recommended are

- persons with high-risk sexual behaviour.
- Household contacts of HBsAg-positive
- Drug users, persons ,blood or blood products
- Recipients of solid organ transplantation.
- Occupational risk of HBV infection, as care workers
- International travellers to HBV endemic countries.

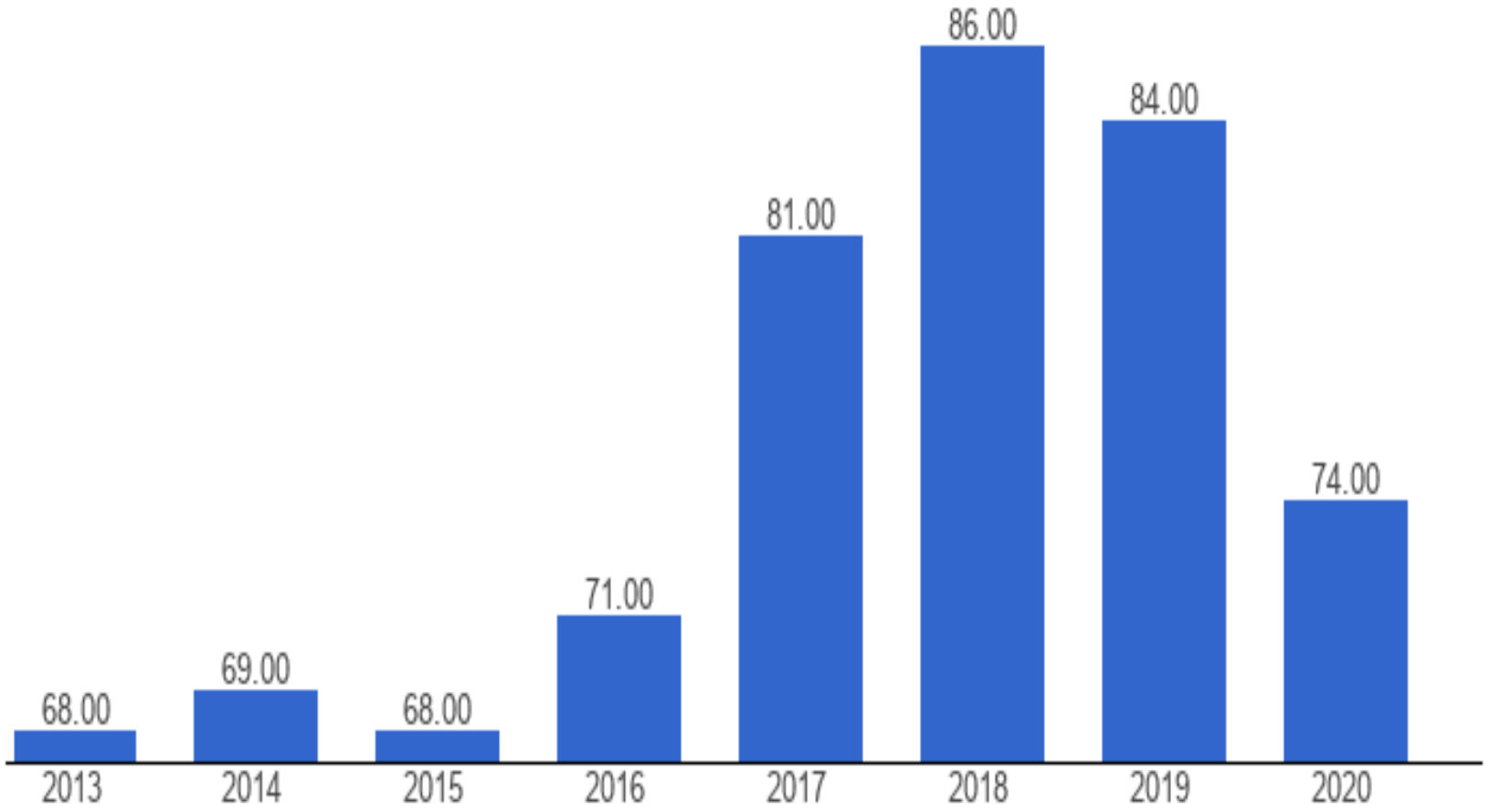
Iraq Hepatitis profile

- Hepatitis B is endemic to Iraq
- **A reported prevalence ranging from approximately 1% in the northern region to 3.5% in the southern region**

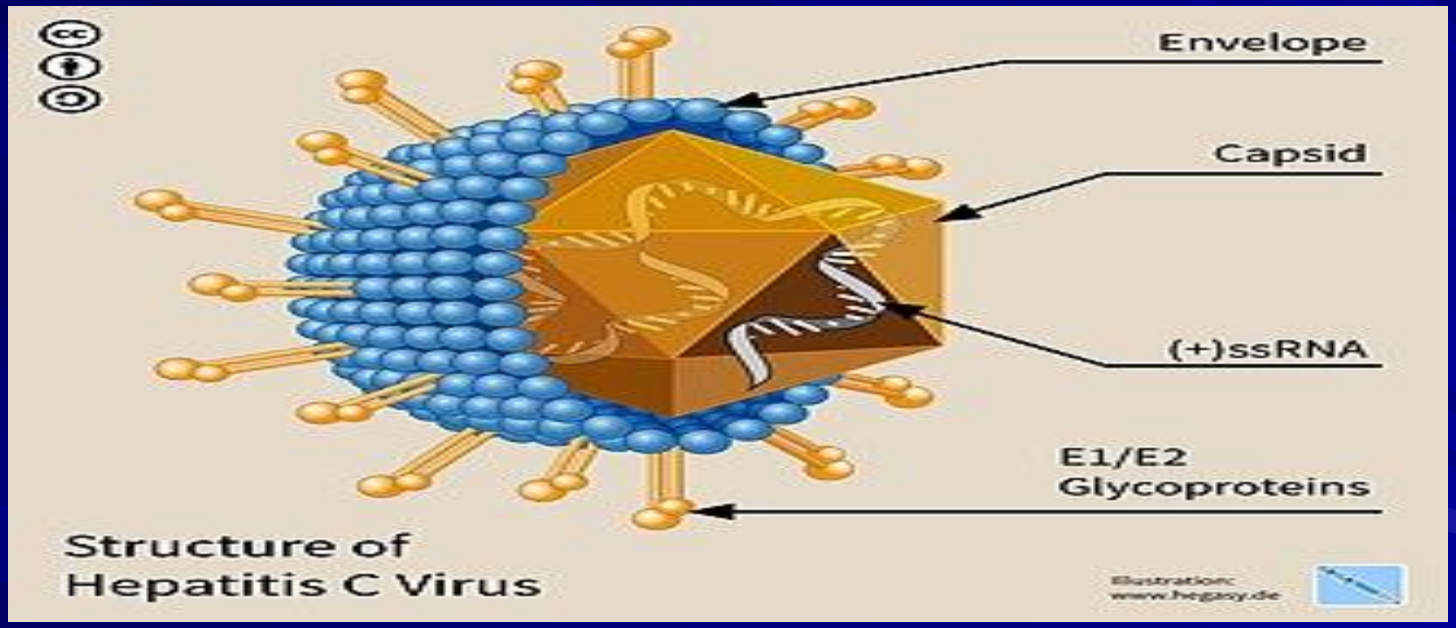
Prevalence of hepatitis B virus infection and genotype distribution in some Asian countries

Countries	HBsAg-positive prevalence[16,85-92,96,99,105-108]	HBV genotype distribution[109-118,121,123,125]
Cambodia	4.6%	A: India A1 India B: China
China	7.18%	B2 southern China
Gaza Strip	3.5%	C: China
India	3.7%	C1 southern China, India
Iraq	0.6%	C2 northern China
Jordan	1.4%	D: Arabian countries and India
Kazakhstan	3.8%	D1 Persian Gulf (Iran, Syria, Turkey), India, Pakistan D2, D3, D4, D9 India
Kuwait	3.5%	
Saudi Arabia	1.5%-2.6%	
Singapore	3.6%	C/D1-CD2 western China
South Korea	4.0%	
United Arab Emirates	2%-7%	
Yemen	5.1%	

Percent of one-year-old children with Hepatitis B immunization



Hepatitis C


Envelope
Capsid
(+)ssRNA
E1/E2
Glycoproteins
Structure of
Hepatitis C Virus

- Can range in severity from a mild illness lasting a few weeks to a lifelong illness.
- It is among the most common virus that infect the liver and it has been shown to be a major cause of parenterally transmitted hepatitis.

Transmission

Most commonly transmitted through exposure to infectious blood. This can occur through:

(a) Contaminated blood transfusions, blood products, and organ transplants.

(b) injections given with contaminated syringes and needle-stick injuries in health-care settings;

(c) injection drug use

(d) Being born to a hepatitis C-infected mother.

- **Less common as STI.**

Incubation period

- The incubation period for hepatitis C is 2 weeks to 6 months.

- High prevalence of HCV infection occurs in certain countries such as Egypt, where >20% of the population (as high as 50% in persons born before 1960) in some cities is infected.
- 100 million chronic carriers worldwide (>3%)
- 4 million with chronic HCV (1.5-2%)
  - 30 thousand new HCV cases per year (incidence decreasing)
  - 10 thousand deaths/year from HCV (incidence increasing)

- Acute hepatitis is rare
  - Fulminant hepatitis is extremely rare
  - 15% can spontaneously resolve infection
  - 85% develop chronic infection
  - HCV RNA becomes + 2 weeks after exposure
  - HCV Ab becomes + by 12 weeks in most

TABLE 339-4 High-Risk Populations for Whom HCV-Infection Screening Is Recommended

All adults aged 18–79 should be screened, a recommendation that supplants the earlier focus on persons born between 1945 and 1965

Persons who have ever used injection drugs

Persons with HIV infection

Hemophiliacs treated with clotting factor concentrates prior to 1987

Persons who have ever undergone long-term hemodialysis

Persons with unexplained elevations of aminotransferase levels

Transfusion or transplantation recipients prior to July 1992

Recipients of blood or organs from a donor found to be positive for hepatitis C

Children born to women with hepatitis C

Health care, public safety, and emergency medical personnel following needle injury or mucosal exposure to HCV-contaminated blood

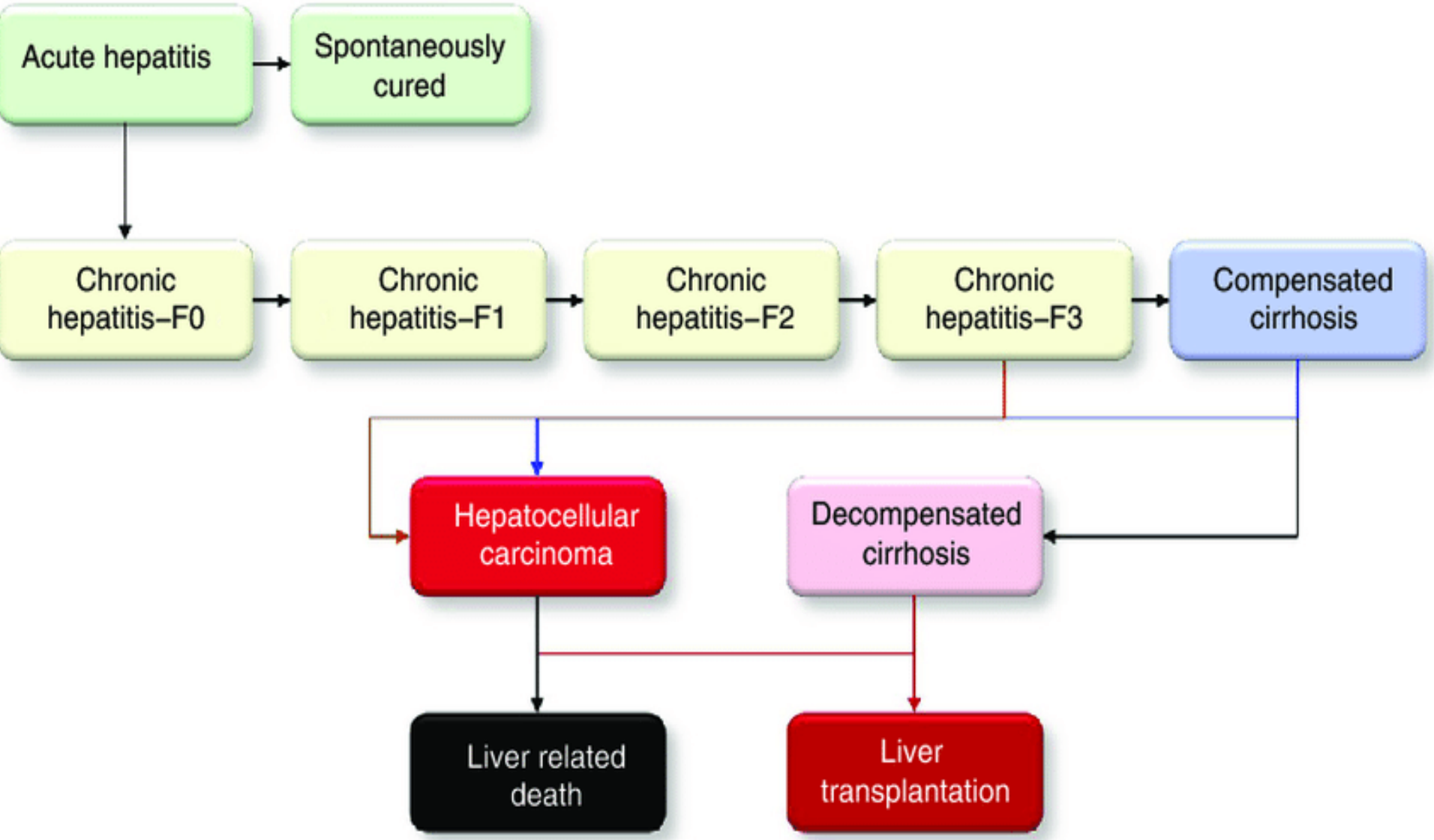
Sexual partners of persons with hepatitis C infection

Pregnant women

HCV Natural History

- 30% with HCV have normal ALT
  - 20% have normal or minimal histology
  - 80% have abnormal histology
  - 15% have advanced histology
  - Disease progression is slower
- Mean progression =
  - Chronic hepatitis 13.7 years
  - Cirrhosis 20.6 years
  - Hepatoma 28.3 years
  - 20% have cirrhosis at 20 years

HCV Natural History



Hepatitis C

Factors Associated with Disease Progression

- Age > 40
- Male
- Alcohol > 50 gm/d
- Immunosuppression: HIV, transplant, etc.
- Infection by blood transfusion
- Co-infection with HBV
- Genotype 1

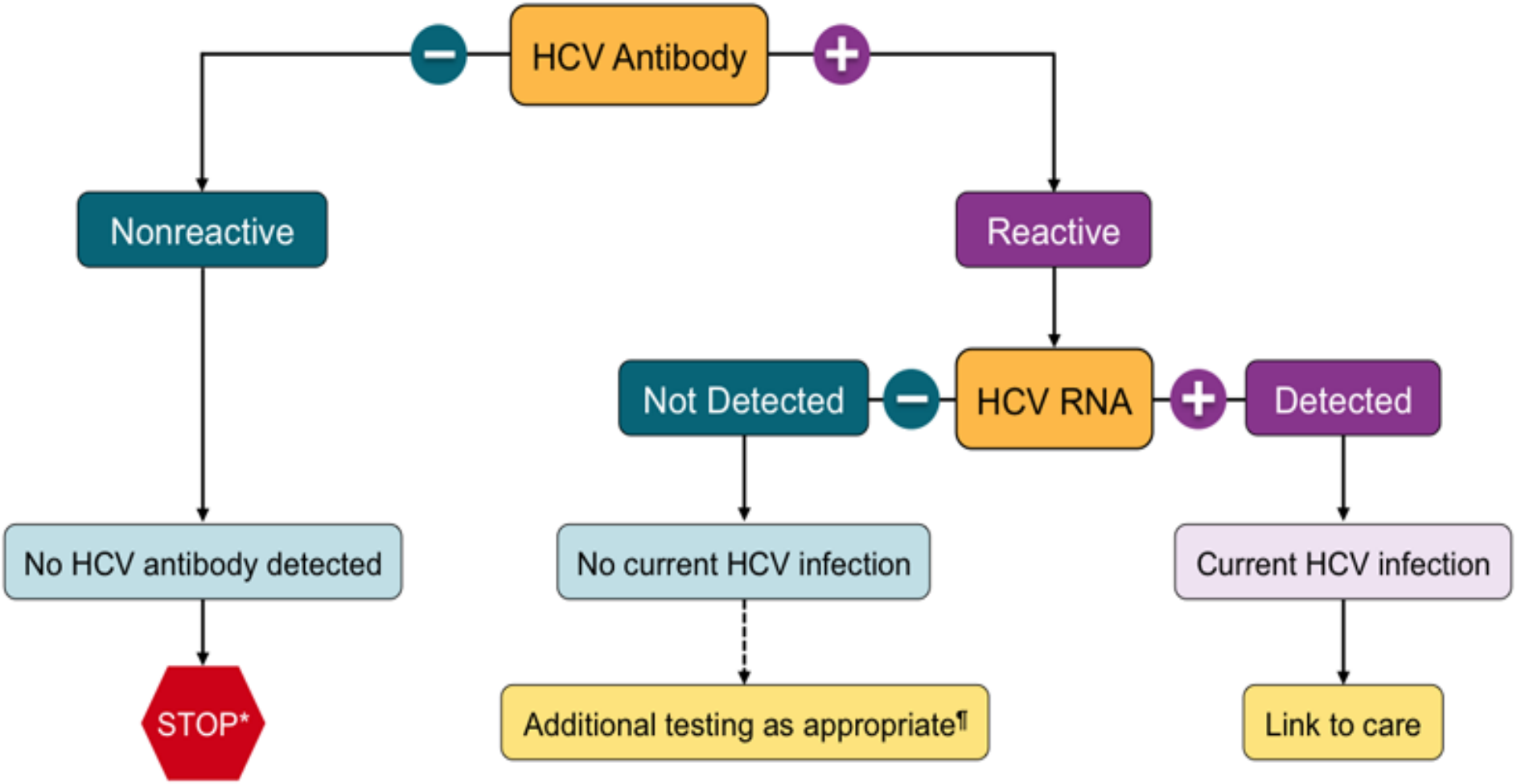
- After acute HCV infection, the likelihood of remaining chronically *infected* approaches 85–90%.
- Although many patients with chronic hepatitis C have no symptoms, cirrhosis may develop in as many as 20% within 10–20 years of acute illness.
- Cirrhosis has been reported in as many as 50% of patients with chronic hepatitis C.

DIAGNOSIS

- Specific serologic diagnosis of hepatitis C can be made by demonstrating the presence in serum of anti-HCV.

- Assays for HCV RNA=PCR are the most sensitive tests for HCV infection and represent the “gold standard” in establishing a diagnosis of hepatitis C.

Recommended Testing Sequence for Identifying Current HCV Infection



* 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.

PROPHYLAXIS

- IG is ineffective in preventing hepatitis C and is no longer recommended for post exposure prophylaxis in cases of perinatal, needle stick, or sexual exposure.
- Although prototype vaccines that induce antibodies to HCV envelope proteins have been developed, currently, hepatitis C vaccination is not feasible practically.

Primary prevention

There is no vaccine for hepatitis C.

The risk of infection can be reduced by avoiding :

- **Unnecessary and unsafe injections;**
- **Unsafe blood products;**
- **Unsafe sharps waste collection and disposal;**
- **Use of illicit drugs and sharing of injection equipment;**
- **Unprotected sex with hepatitis C-infected people;**
- **Sharing of sharp personal items that may be**
- **Contaminated with infected blood;**
- **Tattoos, piercings, and acupuncture performed with**
- **Contaminated equipment.**

Delta Hepatitis
Hepatitis D

- Defective RNA virus, requires presence of HBV Surface Ag
- More common in southern, eastern Europe, Middle East, and South America
- Transmission is similar to HBV

Hepatitis D

Can be contracted 2 ways

	Coinfection	*Superinfection*
Contracted by:	Getting Hepatitis B and D simultaneously	Being chronically infected with hepatitis B and contracting Hepatitis D
Likelihood of becoming chronic:	5% (Unlikely)	70-90% (Likely)

- Diagnosis: HDV Ag, HDV RNA, HDV Ab.
- Acute Hepatitis
  - Co-infection with HBV
    - Fulminant hepatitis is more common (35%)
    - Progression to chronic infection is uncommon
  - Super-infection of HBV
    - Acute exacerbation of ongoing hepatitis
    - Chronic liver disease occurs in 90%

PREVENTION

- By vaccinating susceptible persons with hepatitis B vaccine.
- No product is available for immunoprophylaxis to prevent HDV superinfection in persons with chronic HBV infection; for these patients,
- avoidance of percutaneous exposures
- limitation of intimate contact with persons who have HDV infection are recommended.

Hepatitis E

- **Is essentially a water-borne disease.**
- **Formerly termed enterically transmitted hepatitis non-A, non-B (HNANB), HEV**

Transmission

- The hepatitis E virus is transmitted mainly through the fecal-oral route, due to fecal contamination of drinking water.

Other transmission routes include :

- (a) food-borne transmission
- (b) transfusion of infected blood products
- (c) vertical transmission from a pregnant woman to her fetus.

Incubation period

- From 3-8 weeks, with a mean of 40 days.
- The period of communicability is unknown.

Prevention

- By maintaining quality standards for public water supplies
- Establishing proper disposal systems to eliminate sanitary waste.
- On an individual level, infection risk can be reduced by :

(a) Maintaining hygienic practices such as hand washing with safe water, particularly before handling food;

(b) Avoiding drinking water and/or ice of unknown purity;

(c) WHO safe food practices.

Epidemiologic and clinical features of viral hepatitis types A, B and C

	Viral Hepatitis Type A	Viral Hepatitis Type B	Viral Hepatitis Type C
Incubation period	10-50 days (avg. 25-30)	50-180 days (avg. 60-90)	2 weeks-6 months (avg. 40-120 days
Principal age distribution	Children,[1] young adults	15-29 years[2]	Adults[2]
Seasonal incidence	Throughout the year but tends to peak in autumn	Throughout the year	Throughout the year
Route of infection	Predominantly faecal-oral	Predominantly parenteral	Predominantly parenteral
Occurrence of virus :			
Blood	2 weeks before to ≤ 1 week after jaundice	Months to years	Months to years
Stool	2 weeks before to 2 weeks after jaundice	Absent	Probably absent
Urine	Rare	Absent	Probably absent
Saliva, semen	Rare (saliva)	Frequently present	Unknown
Clinical and laboratory features :			
Onset	Abrupt	Insidious	Insidious
Fever > 38°C (100.4°F)	Common	Less common	Less common
Duration of aminotransferase elevation	1-3 weeks	1-6+ months	1-6+ months
Immunoglobulins (IgM levels)	Elevated	Normal to slightly elevated	Normal to slightly elevated
Complications	Uncommon, no chronicity	Chronicity in 5-10%	Chronicity in 50% or more
Mortality rate (icteric cases)	< 0.5%	< 1–2%	0.5–1%
HBsAg	Absent	Present	Absent
Immunity :			
Homologous	Yes	Yes	?
Heterologous	No	No	No
Duration	Probably lifetime	Probably lifetime	?
Immune globulin intramuscular (IG, gammaglobulin, ISG)	Regularly prevents jaundice	Prevents jaundice only if immunoglobulin is of sufficient potency against HBV	?

A 32-year-old male presents after 1 week of progressive fatigue, nausea followed by 2 days of jaundice. Examination revealed many tattoos , Laboratory studies demonstrate serum ALT 225 IU/l, ALP of 330 IU/l and bilirubin of 5.2 mg/dl with normal albumin and INR. One of the following test is useful:

A. Anti-HCV
B. Anti-HAV IgM
C. HBs Ag
D. Anti-HDV
E. A and C

REFERNCES

- Park,s Text Book Of Preventive And Social Medicine 23rd Edition
- 21st Edition***Harrison's** PRINCIPLE OF INTERNAL MEDICINE