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DEGLI STUDI DI BARI
ALDO MORO**

CORSO DI IGIENE

**Scuola
di
Medicina**

Hepatitis C



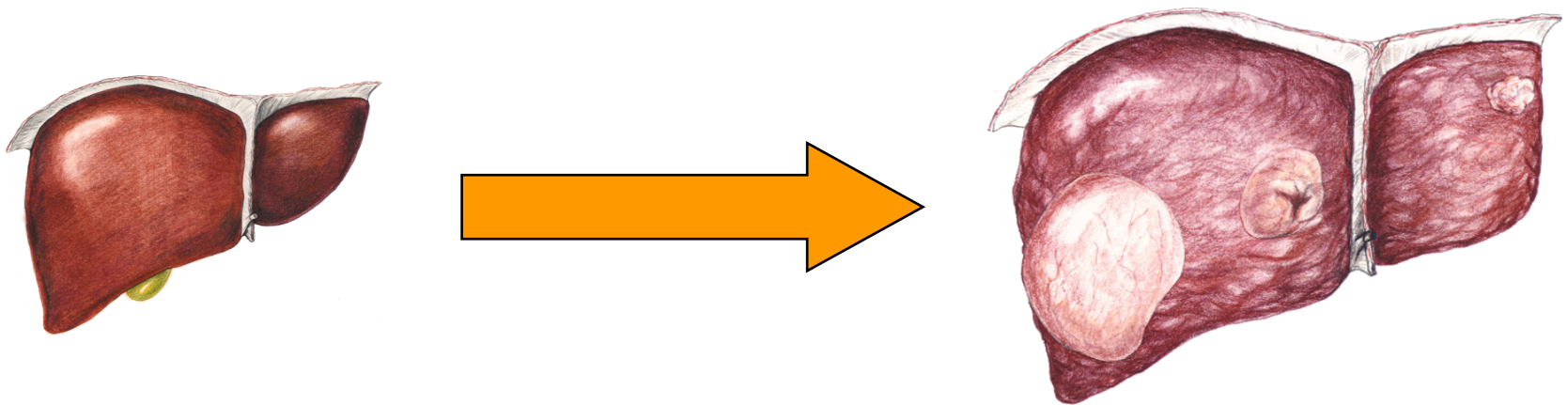
Today We Will

- Define hepatitis, viral hepatitis & the liver
- Learn about the 5 different types of viral hepatitis
- Learn more about hepatitis C:
 - The scope of the disease
 - Signs/symptoms
 - Risk factors and prevention



What Is Hepatitis?

- Hepatitis means inflammation of the liver
 - Hepat (liver) + itis (inflammation)= Hepatitis
- Viral hepatitis means there is a specific virus that is causing your liver to inflame (swell or become larger than normal)

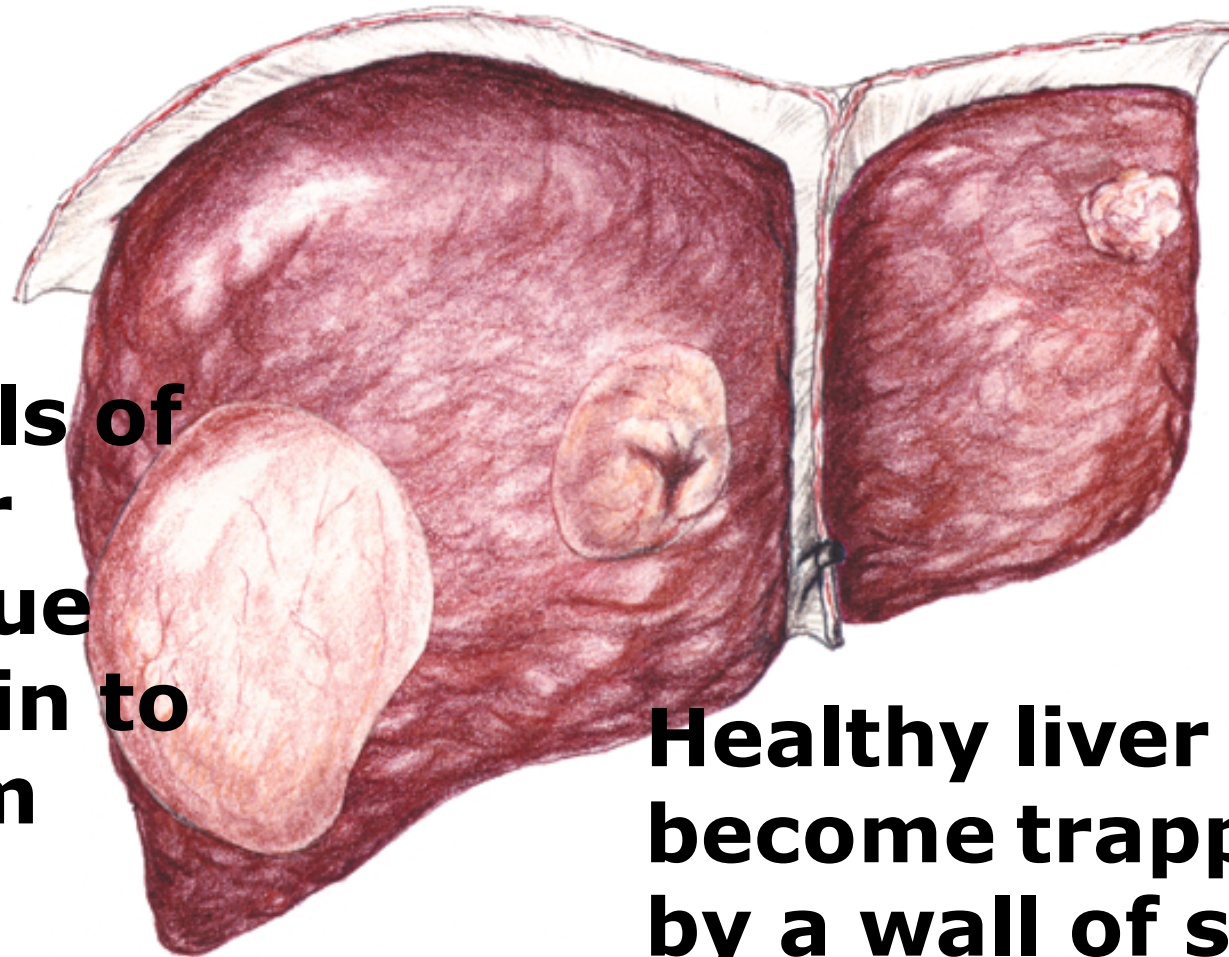




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Inflammation



**Walls of
scar
tissue
begin to
form**

**Healthy liver cells
become trapped
by a wall of scar
tissue**



Viral Hepatitis

5 types:

A: fecal-oral transmission

B: sexual fluids & blood to blood

C: blood to blood

D: travels with B

E: fecal-oral transmission



**Vaccine
Preventable**



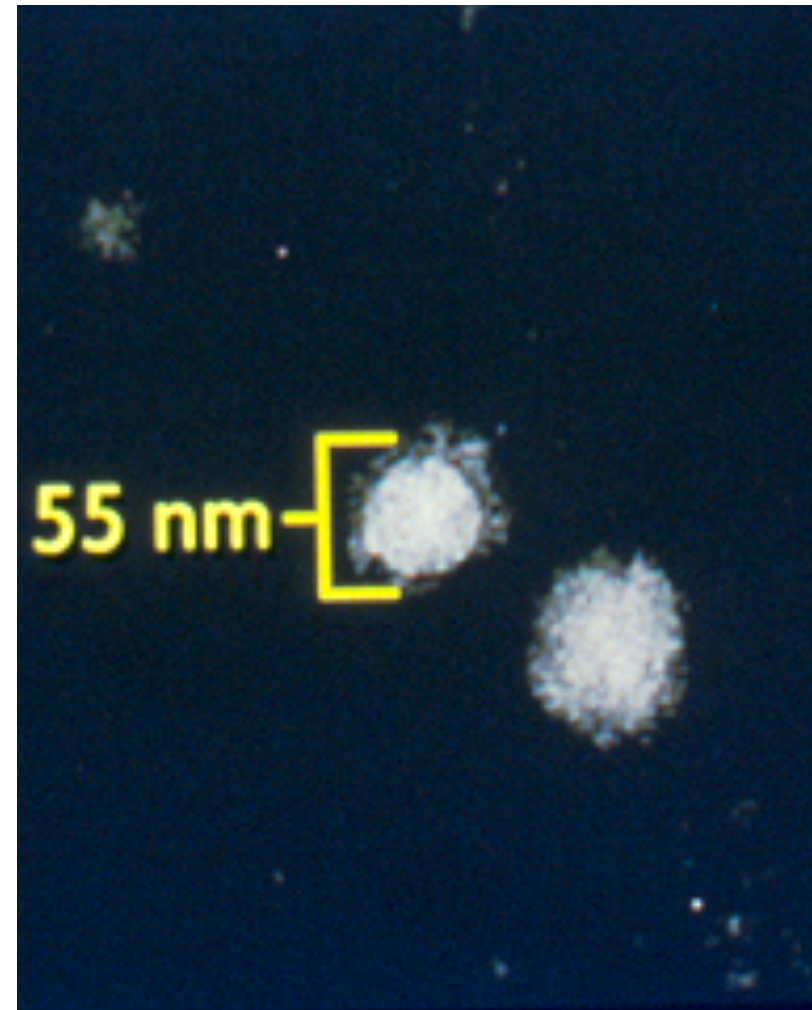
Hepatitis C Virus

- **Identified in 1989**
- Blood test became available in 1992
- Used to be known as “non-A, non-B” hepatitis
- Spread through blood-to- blood contact
- **No vaccine available to prevent hepatitis C**



Hepatitis C virus

- Nucleic acid: **ssRNA**
- Classification related to pestiviruses and **flaviviruses**
- Serotypes: one with multiple genotypes
- In vivo replication: liver and lymphocytes





HCV diversity

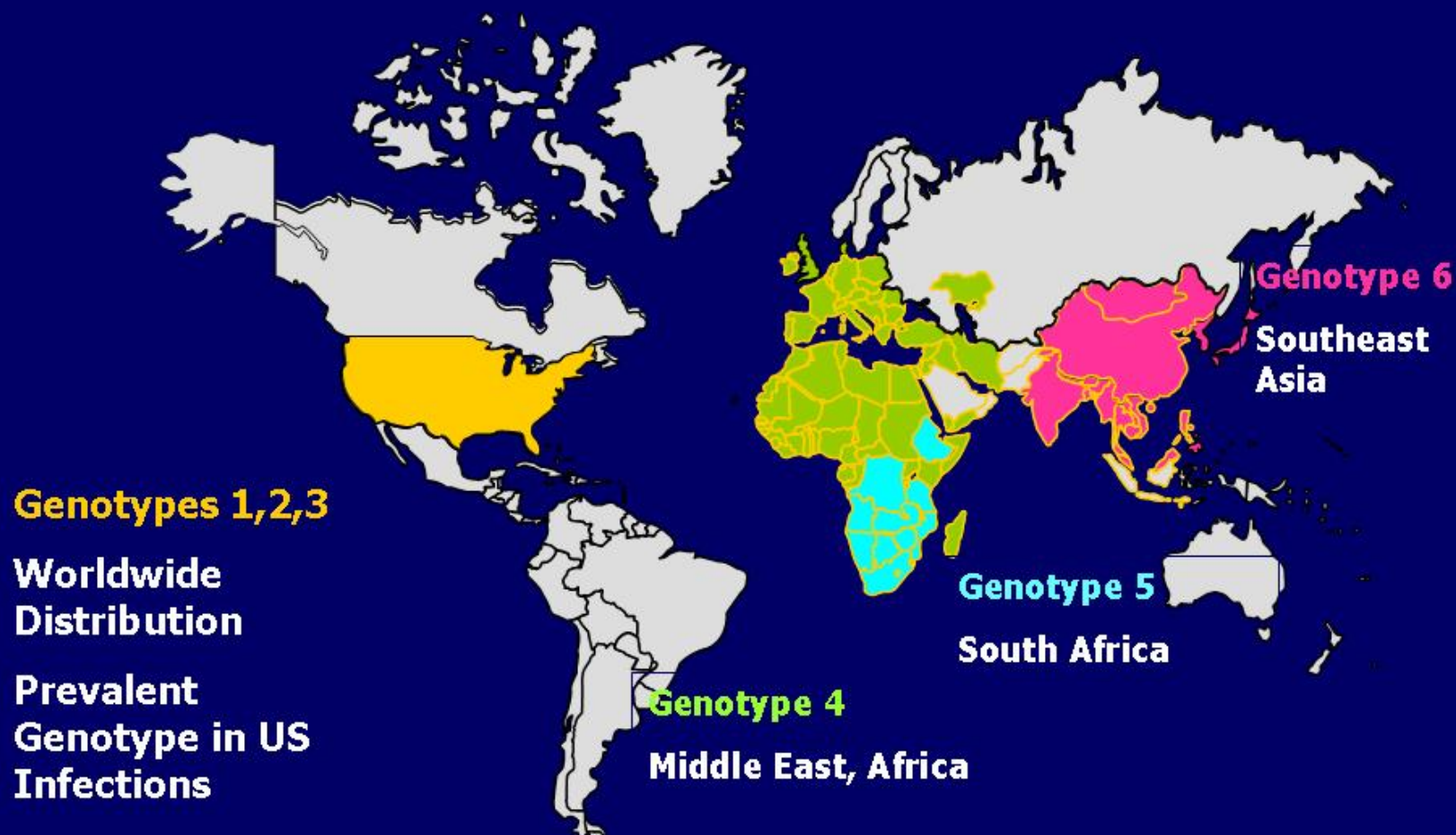
- HCV replicates at high levels (>10 trillion virions/day)
- Lack of error correction leads to drift
- **Drift** is observed in two forms
 - Quasispecies
 - Genotypes



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HCV Infection: Worldwide Genotype Distribution



HCSP FactSheet. Version 2.0. February (2006) Accessed via www.hcvadvocate.org



HCV infection

- 200,000,000 Chronic Infections Worldwide
- At least 4 Million in US
- Highly Associated With Development of
 - Cirrhosis
 - Hepatocellular Carcinoma
- Leading Etiology for Liver Transplant in the United States



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Global epidemiology of hepatitis C virus infection



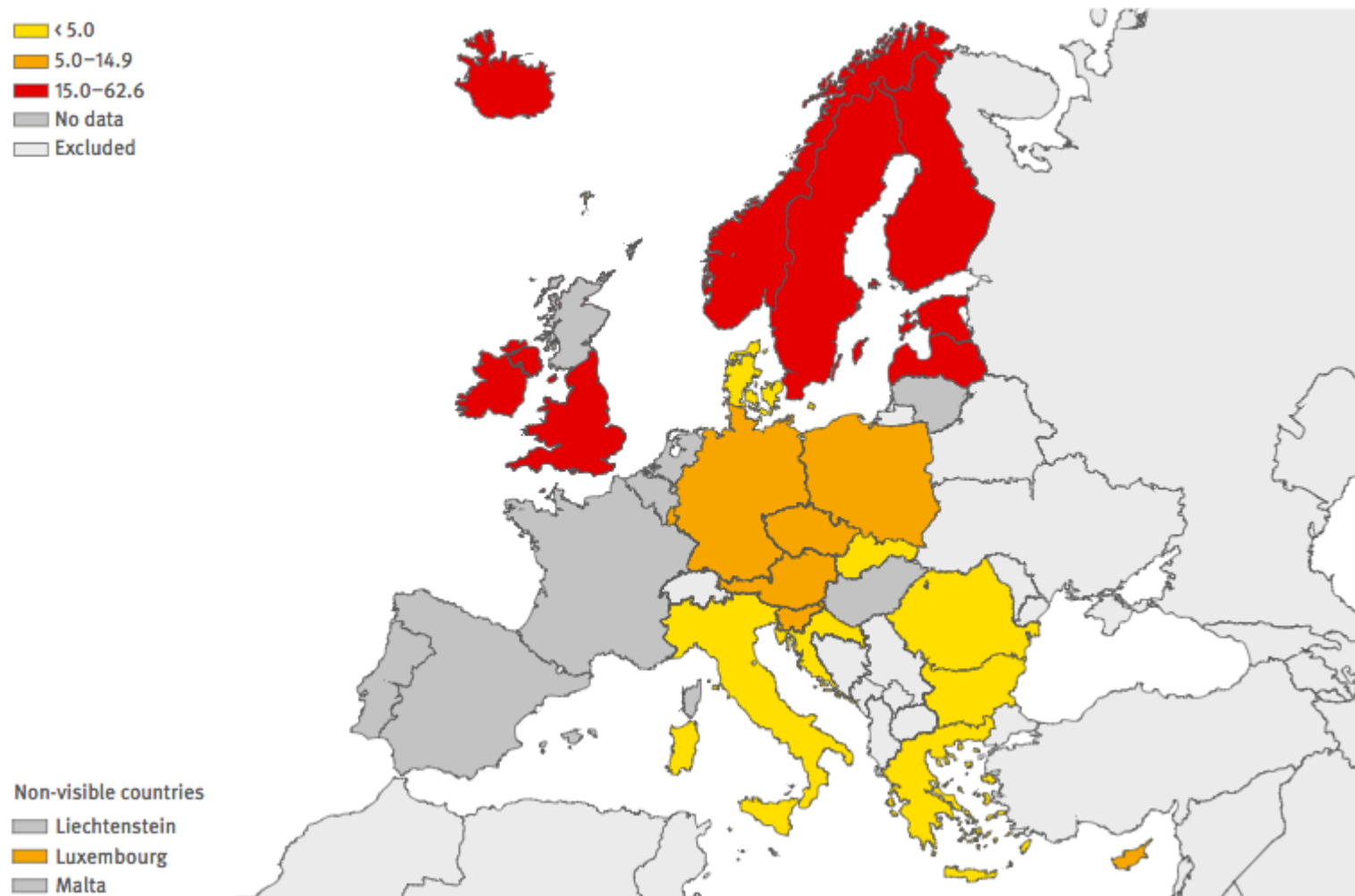
CDC



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Number of reported hepatitis C cases per 100000 population in selected EU/ EEA countries, 201



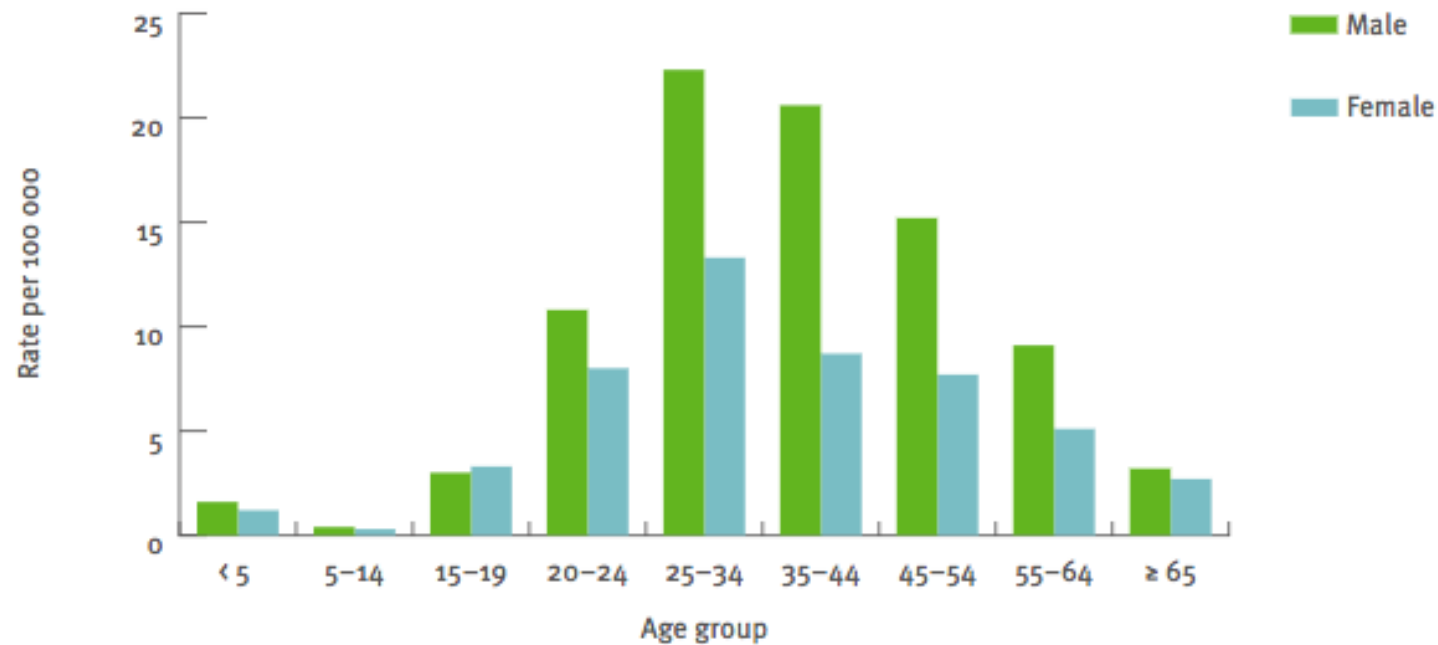
ECDC



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Number of reported hepatitis C cases (acute, chronic and unknown) per 100000 by age group and gender, EU and EEA, 2012

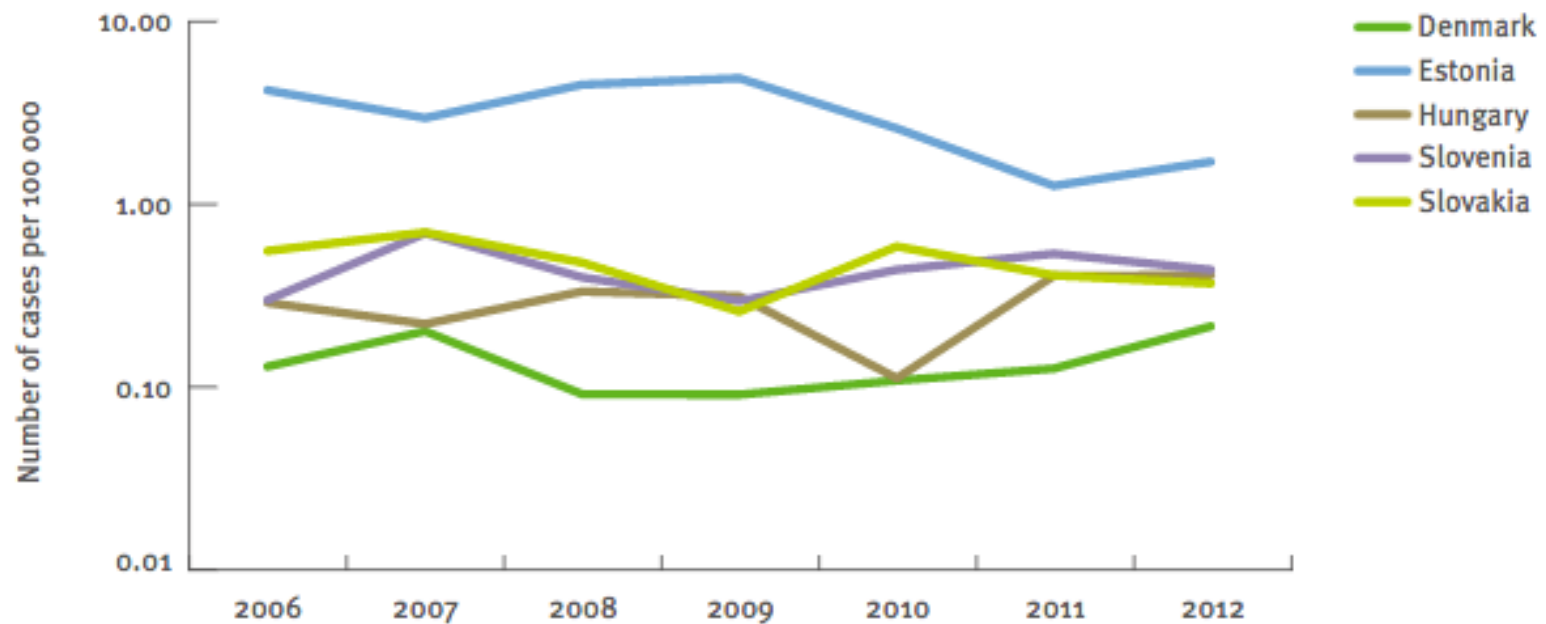




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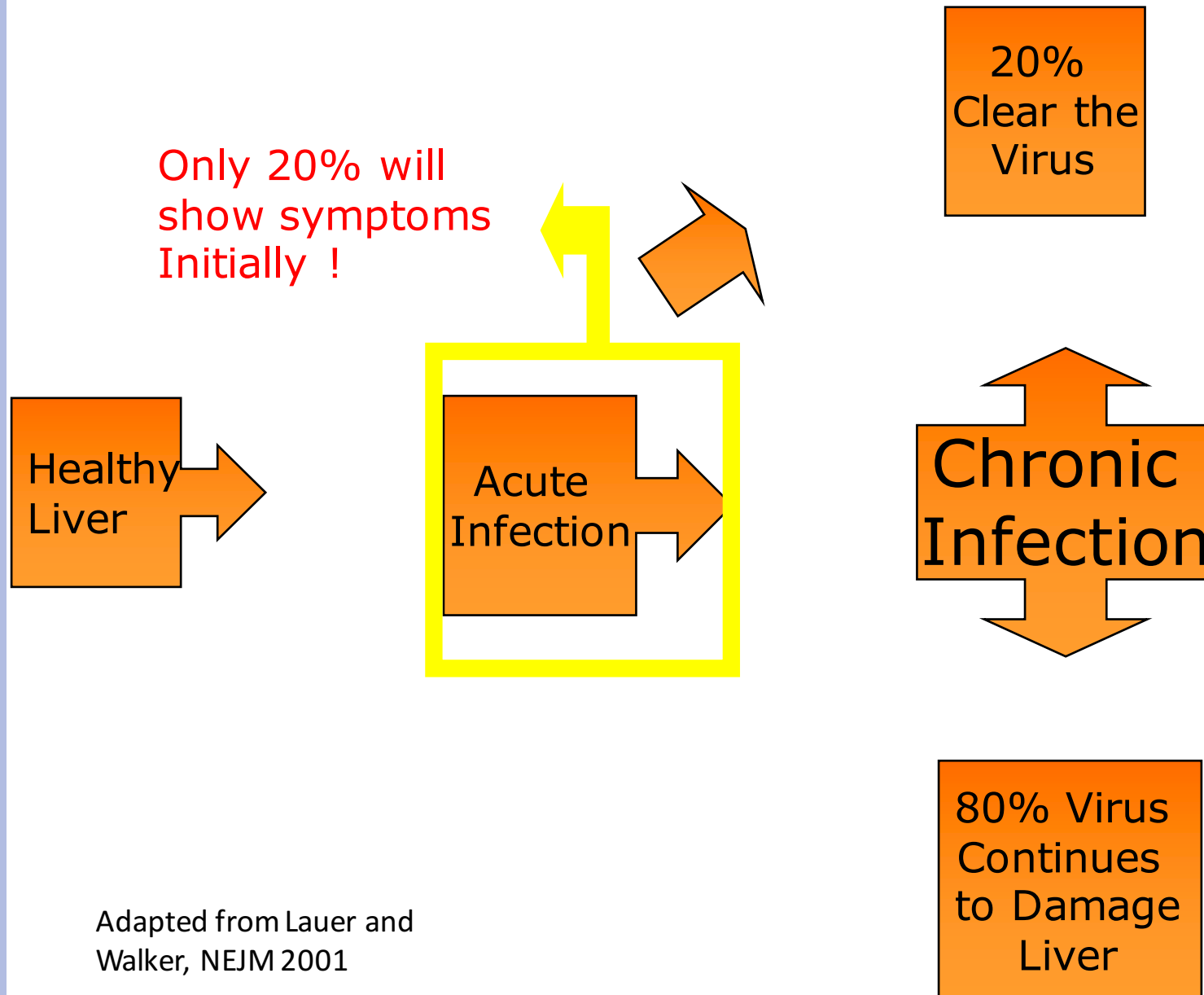
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Number of acute hepatitis C cases per 100000 population in five selected EU/ EEA countries, by year, 2006–2012





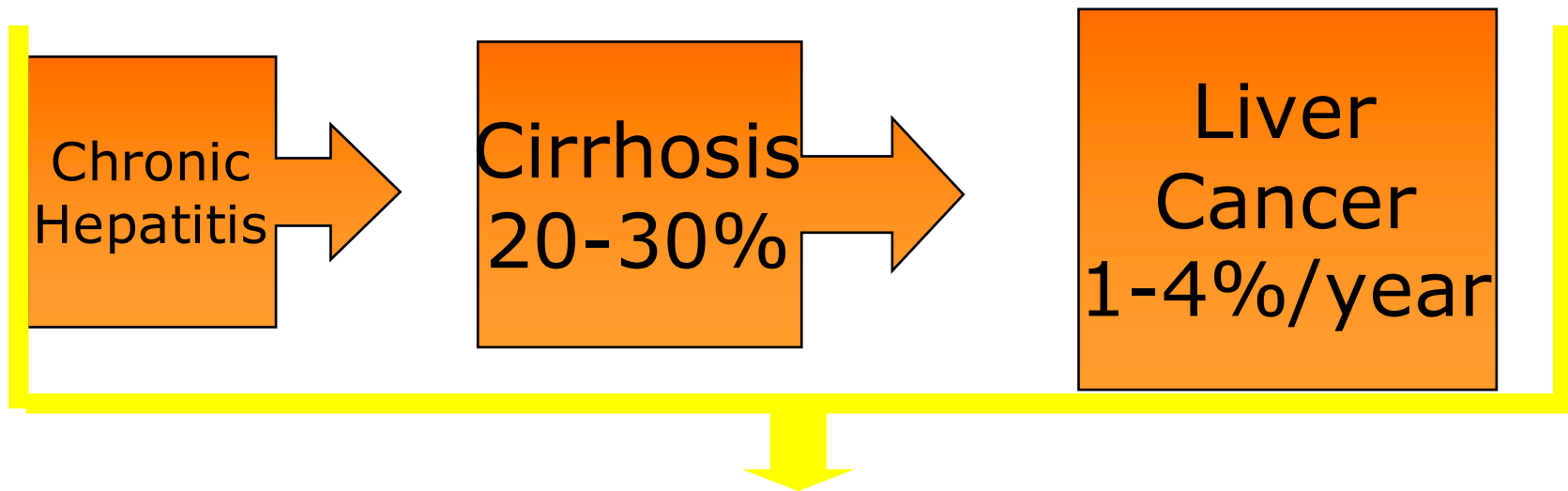
Natural History of Hep C



Adapted from Lauer and Walker, NEJM 2001



Natural History



Most symptoms begin to show only when liver is more severely damaged



Factors Affecting Progression

- **30yrs or longer if:**
 - Young at time of infection
 - Healthy liver at time of infection
 - Female
- **20yrs or less if:**
 - Drinking alcohol
 - Co-infection (HIV, Hep B)
 - Damaged liver before infection



Signs and Symptoms

Individuals may have one or more of the following symptoms, while others experience no symptoms:

- Tiredness
- Nausea
- Muscle or joint pain
- Trouble sleeping
- Loss of appetite
- Weight loss
- Abdominal pain
- Itchiness
- Depression
- Dark urine (pee)



Signs and Symptoms

A few may have specific liver related symptoms initially:

- Pale stool (poo)
- Jaundice (yellowing of the skin or eyes)





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Transmission route of hepatitis C cases by disease status in EU/EEA countries, 2012

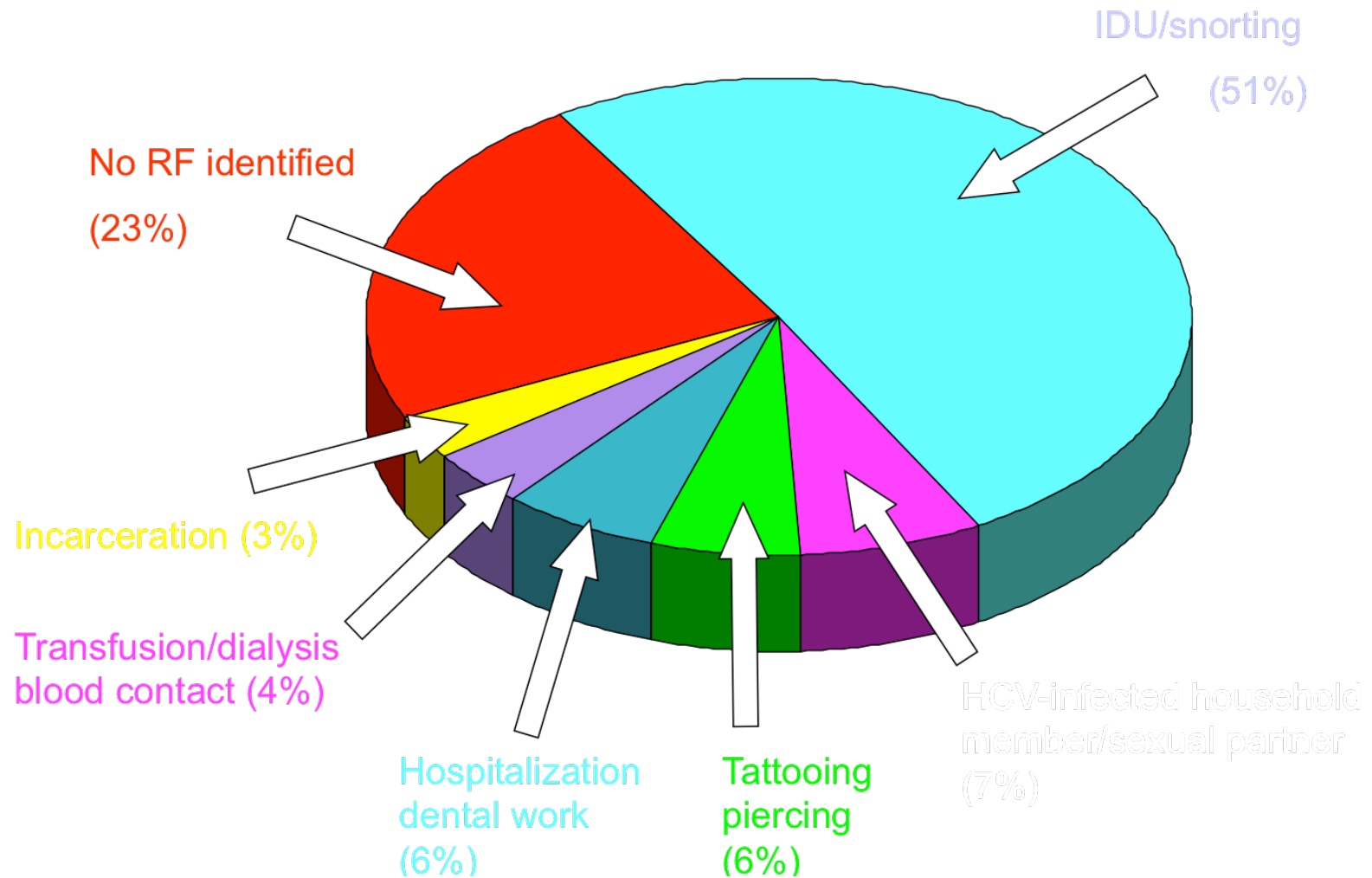
Transmission category	Acute (%)	Chronic (%)	Unknown (%)	Total (%)
Injecting drug use	29.9	58.6	86.0	76.5
Nosocomial (includes hospital, nursing home, etc.)	26.5	9.5	0.5	4.0
Men who have sex with men	14.6	0.1	2.0	2.2
Heterosexual transmission	10.3	3.3	1.7	2.5
Sexual transmission (not specified)	5.6	4.9	3.0	4.3
Non-occupational injuries (needle stick, bites, tattoos, piercings)	5.3	8.2	0.8	2.0
Other	4.0	4.2	0.9	1.8
Household	1.5	0.8	0.1	0.3
Haemodialysis	0.8	0.5	0.8	0.7
Blood and blood products	0.6	7.4	3.5	4.3
Mother-to-child transmission	0.5	1.4	0.7	0.9
Needle-stick and other occupational exposure	0.3	1.2	0.1	0.4
Organ and tissues	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0



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Risk Factors



Health Canada Enhanced Surveillance, Oct 98-Oct 99, Calgary, Edmonton, Winnipeg, Ottawa



Hepatitis C

Dispelling Myths

Hepatitis C is not spread by casual contact

- Hugging/kissing
- Sharing eating utensils and drinking glasses
- Sneezing/coughing
- Shaking hands
- Sitting on a toilet seat



Prevention

- Always make sure **new & sterilized equipment** is being used for tattooing & piercing
 - Make sure ink for tattooing is not being shared
- Do not touch dirty **needles** without proper equipment or following proper procedures



Dirty Needle Precautions

1. Handle only if you have proper equipment
 - Sturdy pair of gloves, tongs or pliers and a puncture proof container (heavy plastic or metal)
2. Place needle in puncture proof container
 - Do not touch needle with bare hands and do not try to recap needle if cap present
3. Can dispose container in garbage but better if it is taken to health clinic or needle exchange



Who Does Not Need Routine Screening?

- Confirmed risk factor but prevalence low¹
 - Health-care, emergency medical, public safety workers
 - History of STDs or multiple sex partners
 - Long-term steady sex partners of HCV-positive²
 - Individualize; counseling, testing partner may be beneficial
- Unconfirmed and prevalence low³
 - Intranasal cocaine or other non-injecting illegal drug users
 - History of tattooing, body piercing

¹ CDC. MMWR 1998;47(RR-19)

² Strader et al. Hepatology 2004;39:1147-1171

³ Hwang et al. Hepatology 2006;44:341-351



Tests for Hepatitis C

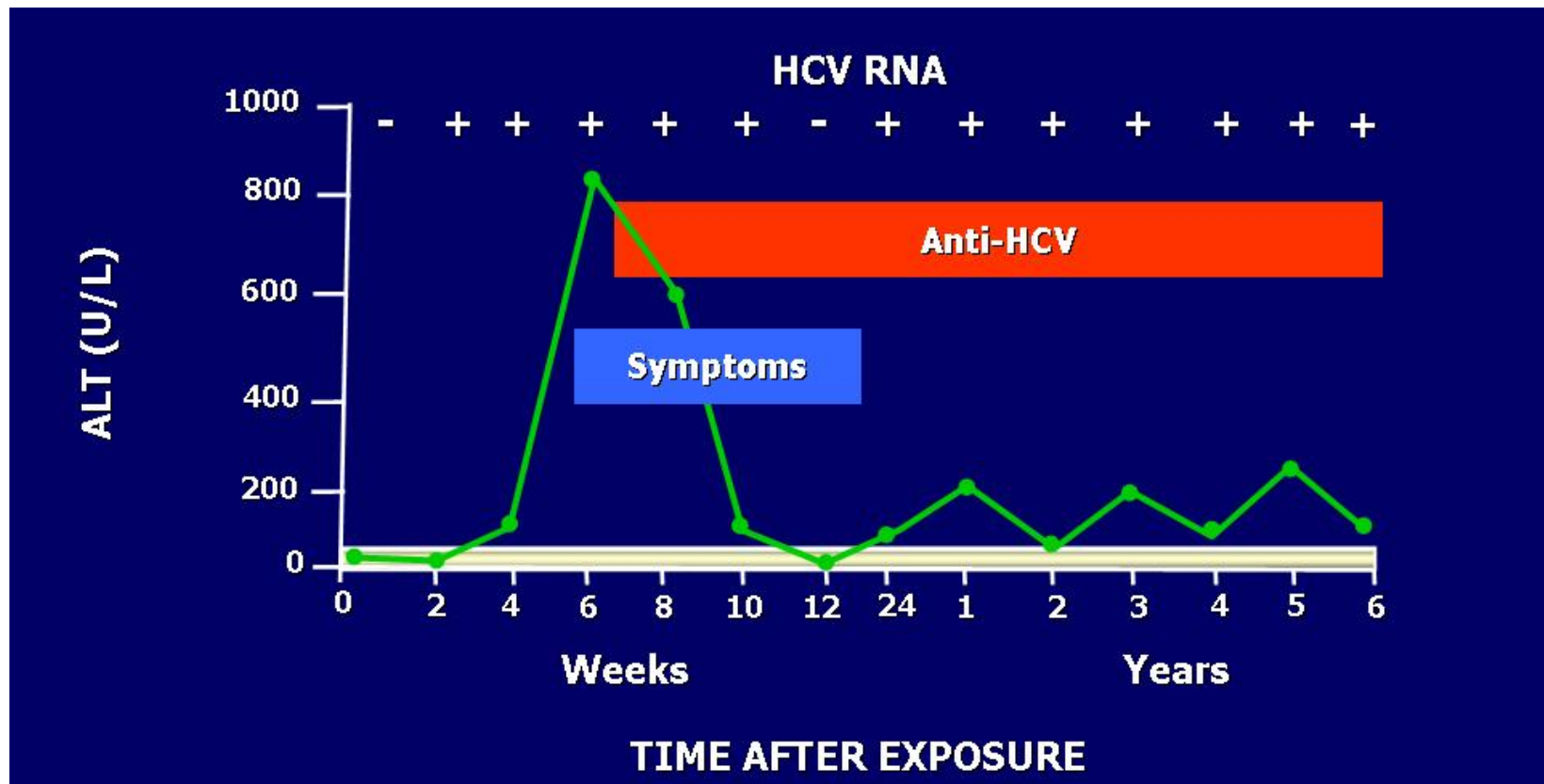
- Enzyme Immunoassay (EIA)
- Recombinant Immunoblot Assay (RIBA)
- Qualitative HCV RNA
- Quantitative HCV RNA
- HCV Genotype



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Serological course of a typical case of Chronic Hepatitis C





Intervention

- INTERFERON
- RIBAVIRIN
- OTHER IMMUNE MODULATORS (e.g. Thymosin, Therapeutic Vaccines)
- ANTIVIRALS
 - Serine Protease
 - Helicase
 - RNA Dependent RNA Polymerase
 - Fusion Inhibitors
- **NEW GENETATION DRUGS**