



You, Your Liver and Hepatitis C

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Anatomy

Function

Stores sugar needed for energy

Breaks down poisons (toxins) and drugs

Rib cage

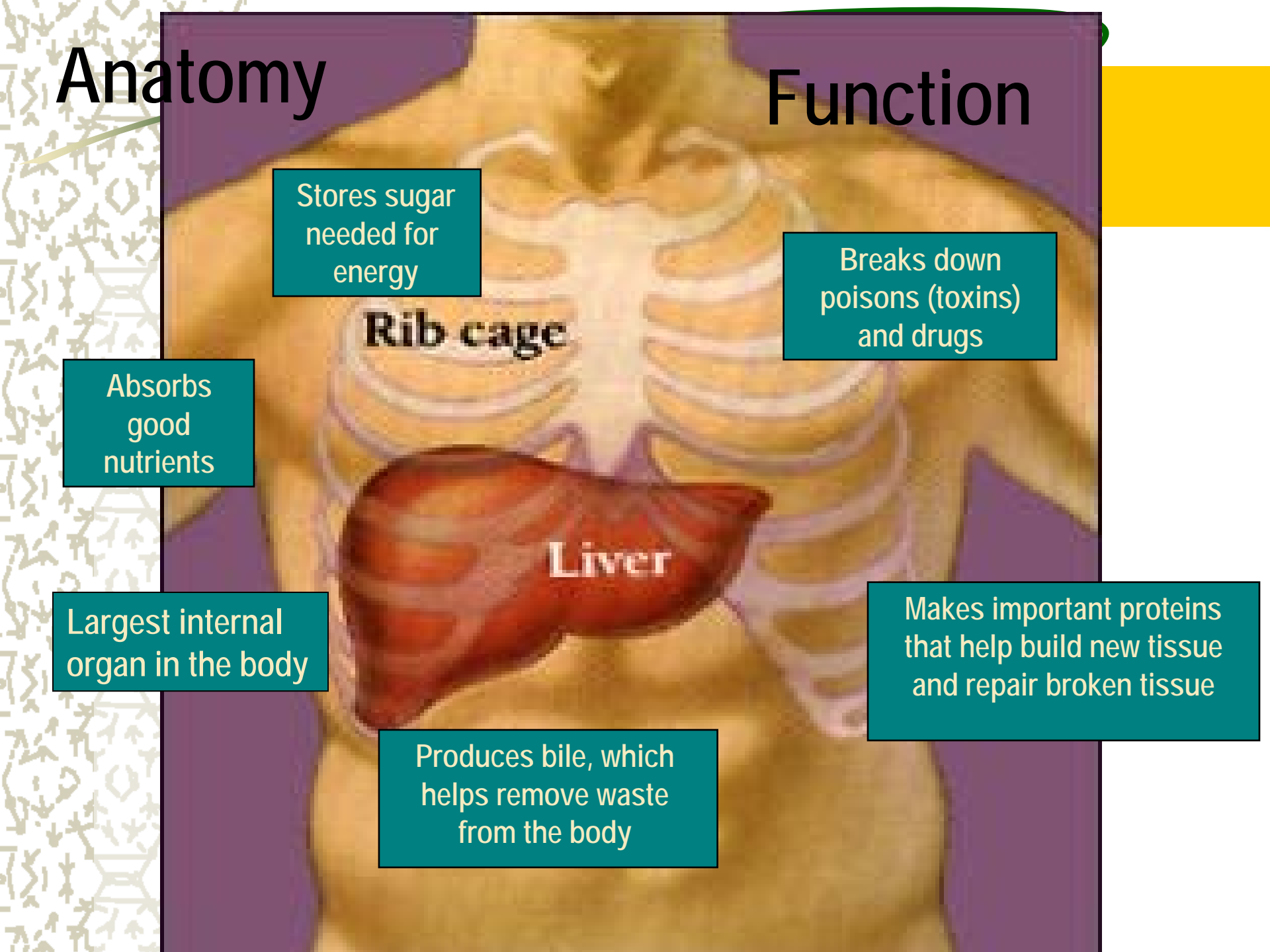
Absorbs good nutrients

Liver

Largest internal organ in the body

Makes important proteins that help build new tissue and repair broken tissue

Produces bile, which helps remove waste from the body



What Is Hepatitis?

It is an inflammation (infection) of the liver.

Acute Hepatitis:

- Sudden onset
- Short-term hepatitis
- Body's immune system clears the virus from the body within 6 months

Chronic Hepatitis:

- Long-term hepatitis.
- Infection lasts longer than 6 months because the body's immune system cannot clear the virus from the body

What Is Hepatitis C?

- ✚ Viral hepatitis C is caused by the hepatitis C virus (HCV)
- ✚ HCV can be found in the blood of a person with hepatitis C
- ✚ The most efficient route of transmission involves percutaneous exposure (direct passage of blood through the skin)
- ✚ The #1 reason for liver transplant in the US
- ✚ Most common blood-borne pathogen
- ✚ Up to 85% of people who are infected to hepatitis C develop chronic infection..they have it forever
- ✚ Most remain symptom-free for decades
- ✚ Infects 4 times more people than does HIV
- ✚ 200 million infected world-wide
- ✚ 4 million Americans infected – 1.8%
- ✚ Significantly higher for inmates versus the US population (10x higher)



What Are the Symptoms of Hepatitis C

- Nausea
- Loss of appetite
- Vomiting
- Fatigue
- Fever
- Dark urine
- Pale stool
- Jaundice
- Stomach pain
- Side pain

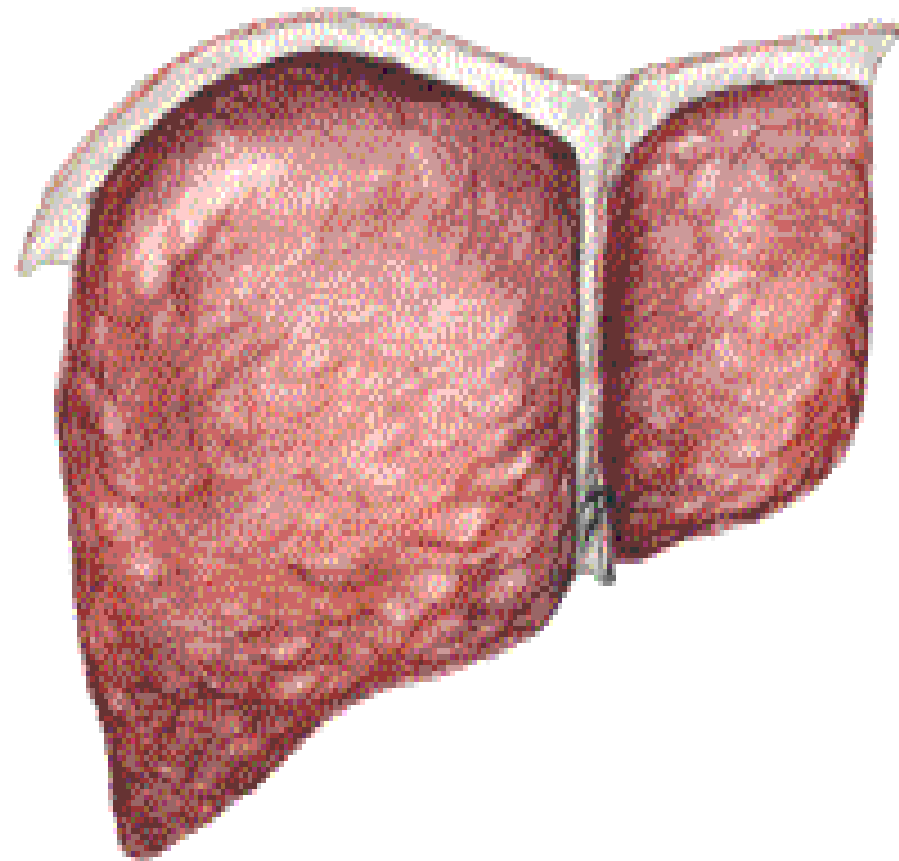
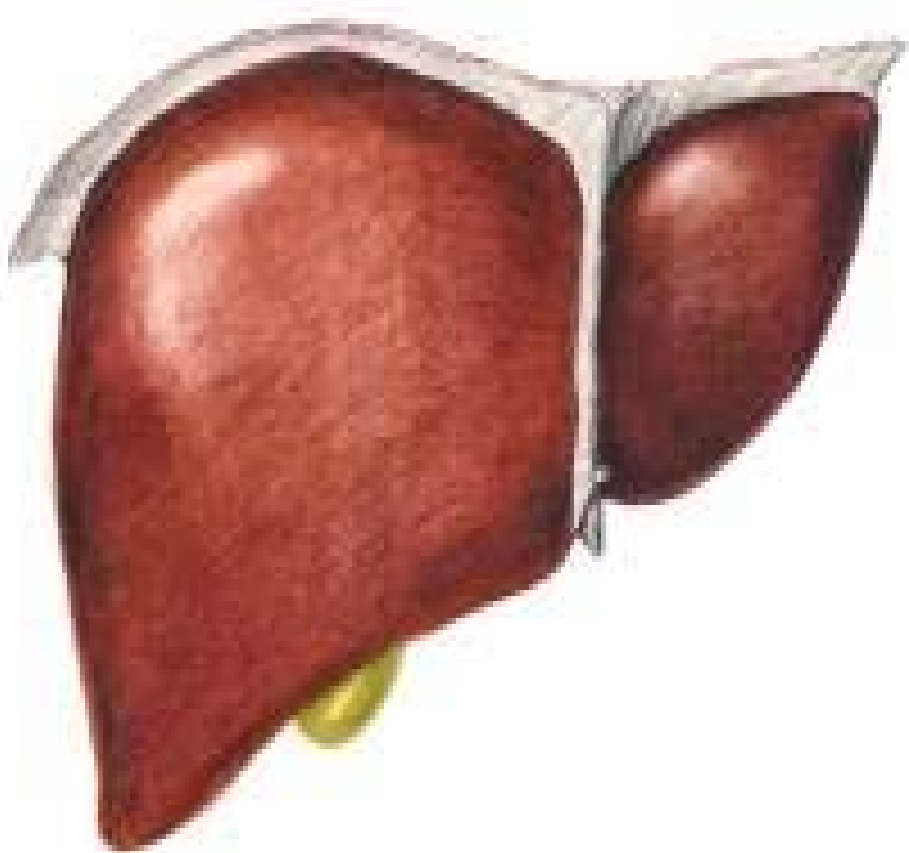
3 out of 4 persons have no symptoms and can infect others without knowing it

What Does Hepatitis C Do to the Liver?

- ✘ Makes the liver cells inflamed
- ✘ Causes scarring of the liver
 - Cirrhosis
- ✘ Some people have no obvious effects from hepatitis C
- ✘ Causes the liver to malfunction
- ✘ Causes cancer of the liver
- ✘ May require you to have a transplant

Healthy Liver

Cirrhosis Liver





Symptoms of Cirrhosis

- ✚ As scar tissue replaces healthy cells, liver function starts to fail with symptoms:
- ✚ Exhaustion and fatigue
- ✚ Nausea
- ✚ Loss of appetite
- ✚ Weakness
- ✚ Weight Loss



HCV Transmission

HCV is a blood-borne pathogen.

The most efficient route of transmission involves percutaneous exposure (direct passage of blood through the skin).

How Can You Get Hepatitis C?

Exposure to blood of an HCV-infected person through:

- Sharing needles and works (like cookers and water) used to inject drugs, steroids, hormones, or vitamins
- Mother to baby
- Accidental needle stick injuries (mainly to healthcare workers on the job)
- Unprotected sex (sex without a condom)

✦ It is also possible to spread hepatitis C through:

- Sharing razors, toothbrushes, or nail clippers with a person who has hepatitis C
- Tattoos or piercing, especially if it is not done by a professional with sterile equipment
- Sharing straws used to snort cocaine or other drugs



HCV Risk - IDU

- ✚ Needle sharing from injection drug use is the greatest risk for HCV
- ✚ In the U.S. 70% of those with HCV
- ✚ Injection drug use, even once many years ago, is a risk
- ✚ 90% of IDUs are infected with HCV within 5 years
- ✚ IDU accounts for 60% of all new infections

HCV – Sexual Transmission

- ✚ Sexual transmission occurs, but it is not the most efficient route
- ✚ Accounts for 10%-15% of HCV+ cases
- ✚ Increased risk for persons with many sex partners and other STD
- ✚ Monogamous relationships average risk 1.5%
- ✚ MSM increased risk in recent studies

HCV Risk – Mom to Baby

- ✚ Risk of infected mother to infant at birth is 5%-6%
- ✚ HIV co-infection increases risk from mother to fetus 17%-20%
- ✚ Breast feeding not a risk

HCV and HIV

- ✚ If at risk for HIV, then at risk for HCV
- ✚ 1 in 4 people infected with HIV is also infected with HCV (30% prevalence overall in U.S.)
- ✚ More rapid progression of HCV liver disease
- ✚ Do not know the affects of HCV on HIV disease
- ✚ Increases risk of mom-to-baby transmission (14-17%)
- ✚ Complications of HIV medication regimes – toxic to the liver



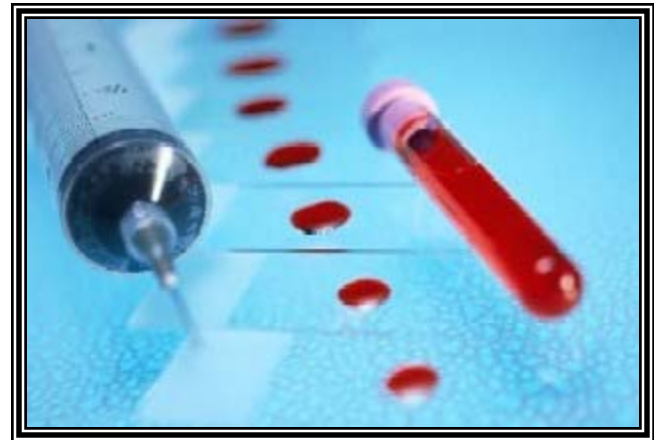
Who Should Get Tested for HCV?

- ✚ Ever injected illegal drugs, even once
- ✚ Ongoing nasal drug use
- ✚ Received clotting factors made before 1987
- ✚ Received blood/organs before July 1992
- ✚ Ever on chronic hemodialysis
- ✚ Evidence of liver disease
- ✚ health care, emergency, public safety workers after needle stick/mucosal exposures to HCV-positive blood
- ✚ Children born to HCV-positive women

How is Hepatitis C Diagnosed?

✦ Blood testing

1. Hepatitis C antibody test
2. Hepatitis C PCR test to find virus in blood





Hepatitis C Genotype?

• Genotype 1:

- 6 different genotypes
- Most common in U.S.

• Genotypes 2 & 3:

- Less common

Other Blood Tests

✦ Liver Function Tests (LFTs)

- Measures substances in your body to look for warnings signs of liver damage
- May normal one day and high the next day
- When elevated, liver cells are being destroyed
- ALT, AST, SGOT, SGPT
- Bleeding time, platelets, albumin, AFP

Projected Prevalence of Chronic HCV, Cirrhosis, and Complications Over 4 Decades

	2000	2010	2020	2030	2040
HCV infection	2,940,678	2,870,391	2,681,556	2,433,709	2,177,089
Cirrhosis	472,103	720,807	858,788	879,747	828,134
Decompensated cirrhosis		103,117	134,743	146,408	
Hepatocellular carcinoma		11,185	13,183	13,390	
Liver-related death		27,732	36,483	39,875	

Davis GL et al. *Liver Transpl.* 2003;9:331-338. Projecting future complications of chronic hepatitis C in the United States.
 Davis GL, Albright JE, Cook SF, Rosenberg DM. *Liver Transpl.* 2003 Apr;9(4):331-8. Copyright 2003. Reproduced with permission of John Wiley & Sons, Inc.

What Is a Liver Biopsy?

- ✦ Best way to measure how much damage has been done to your liver
- ✦ Looks for inflammation, fibrosis (scarring) and cirrhosis (scar tissue between the liver cells)
- ✦ Not everyone needs one
- ✦ Helpful if you and your doctor are thinking about treatment

✦ How is it done?

- It is not very painful
- You do not need to be knocked out. You the skin on your stomach will be numbed
- A long, thin needle is inserted into your liver to remove some liver tissue
- After procedure you will need to rest at the hospital to prevent any bleeding

Risk of Fatal Outcome in Persons Who Develop Hepatitis C Virus Infection



100

Resolve
15



Chronic
85



Stable
68



Cirrhosis
17



Stable
13

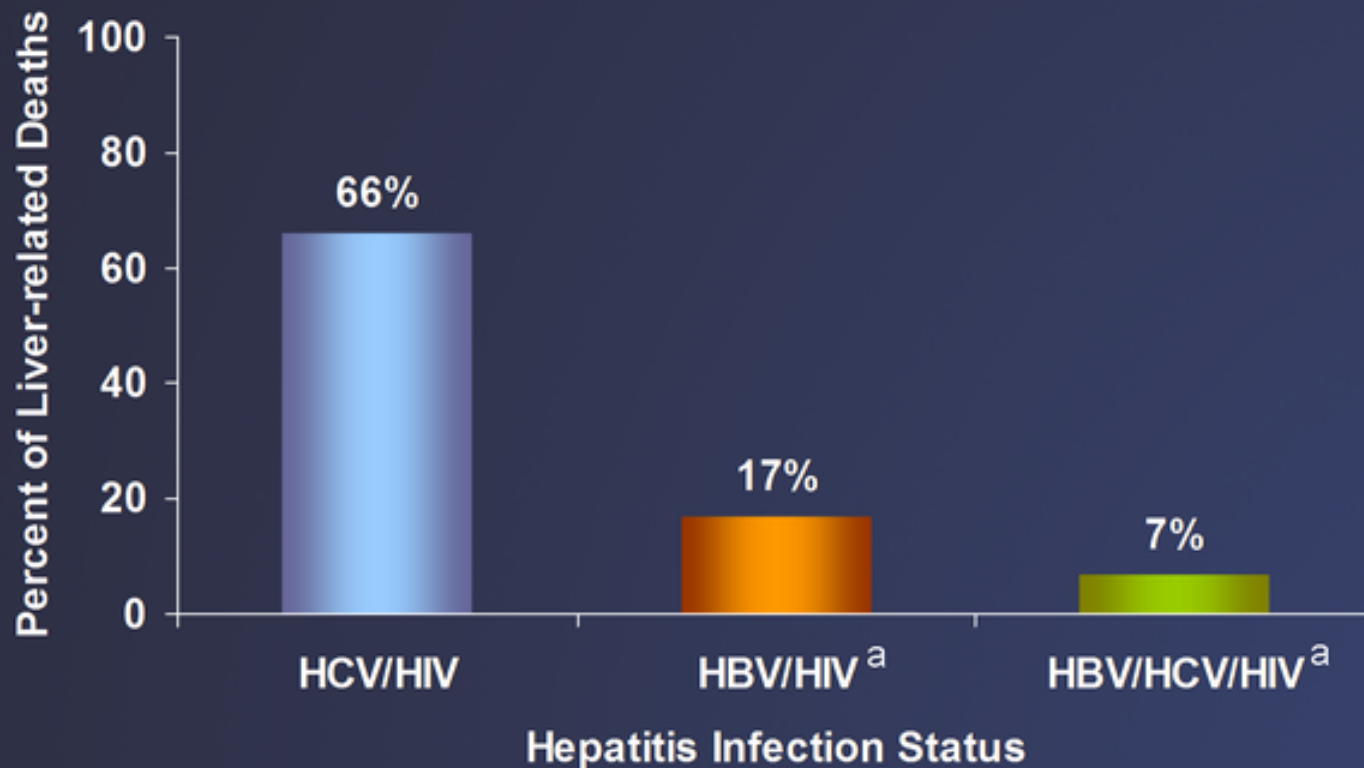


Mortality
4

Time (accelerated with co-infections/leading cause of death)
20-30 years

End-stage Liver Disease (ESLD): *Liver-related Mortality and Hepatitis Infection Status*

- Number of liver-related deaths = 181 (15% of 1,246)



^aActive HBV infection (HBsAg-positive or HBeAg-positive) or HBV DNA positive.

How Can I Protect Myself From Becoming Infected?

🦋 If you are injecting drugs

- Stop injecting!
- Enter and complete a substance abuse treatment program.
- If you choose to continue to inject
 - Never reuse or share syringes, needles, water or drug preparation equipment (cotton, cooker, water)
 - If you must reuse, be sure to clean with bleach and water first
 - Use only sterile syringes obtained from a reliable source,
 - Use a new sterile syringe to prepare and inject drugs
 - Use sterile water to prepare drugs or clean tap water

- Use a new or disinfected cooker and a new piece of cotton,
- Clean injection site before injection with alcohol swab
- Always dispose syringes safely after one use

🦋 If you are having sex

- Have sex with one uninfected person or not at all
- Use a latex condom correctly each time

If You Are Infected...

- ✘ 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
- ✘ Practice safe sex – use condoms
- ✘ Avoid or reduce drinking alcohol.
- ✘ Seek advice before any new over-the-counter medication or dietary supplement
 - Tylenol, Motrin, vitamins
- ✘ Be informed of the potential for sexual transmission and discuss with sexual partners
- ✘ Practice safer sex.
- ✘ Discuss the importance of diet, nutrition and rest

What If I Am Pregnant?

- ✘ 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
 - Consider testing any children born since woman became infected
 - Evaluate infected children for CLD



How Can You Keep Your Liver Healthy?

- ✚ Get vaccinated against hepatitis A and B
- ✚ Avoid alcohol
- ✚ Avoid *tylenol* products
- ✚ Eat healthy
- ✚ Avoid herbs that are toxic
- ✚ Do not take iron supplements
- ✚ Exercise regularly and reduce your stress



Diet and Nutrition

- ✚ Eat a balance of fresh fruit, vegetables, lean protein, and whole grains
- ✚ Drink plenty of water and avoid high fat foods.
i.e.- fast food
- ✚ Take vitamins and supplements only in consult with health care provider

Alcohol and Your Liver

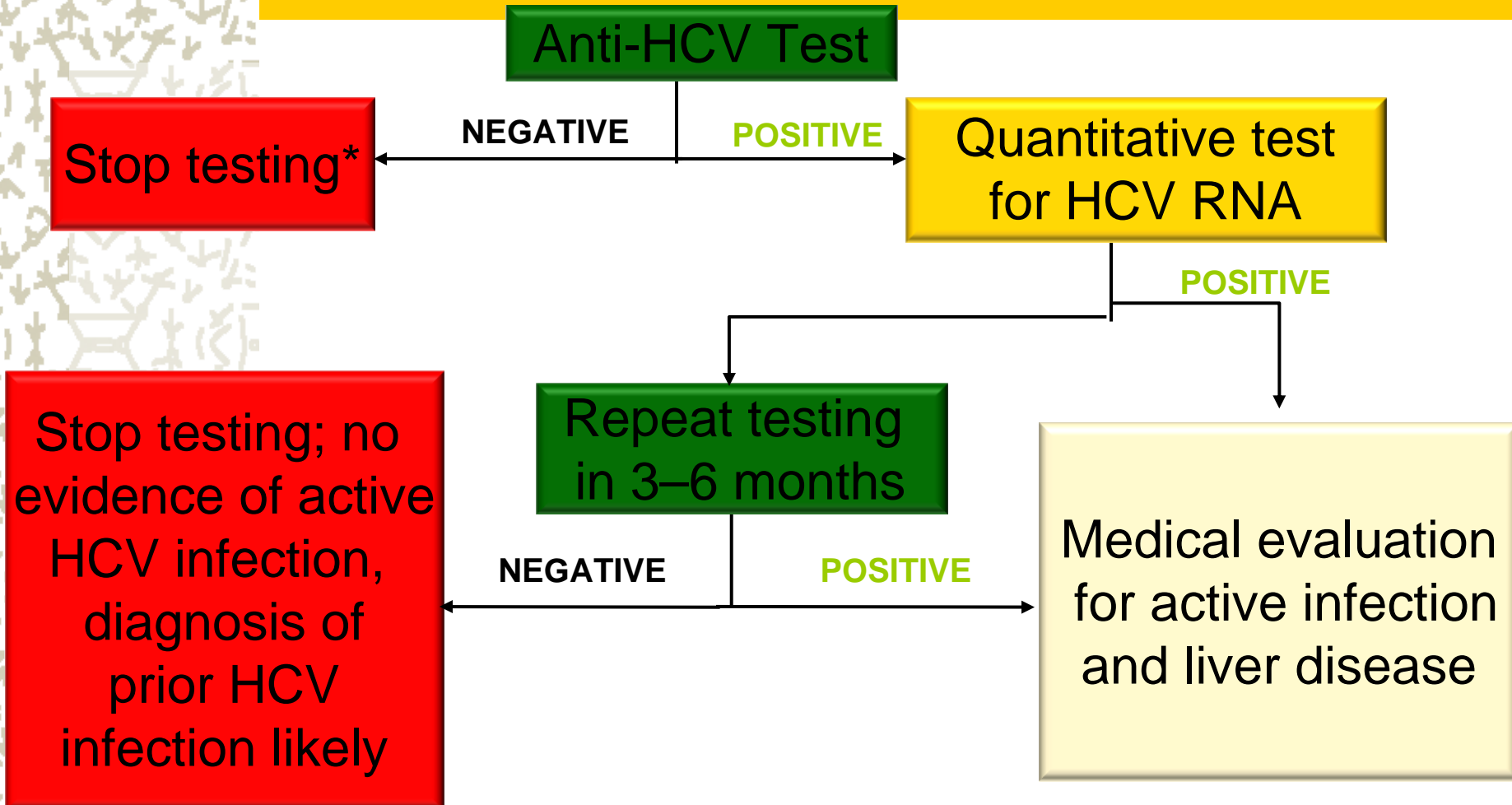
- ✖ Alcohol is the most commonly abused drug in the US
- ✖ Alcohol is toxic to the liver
- ✖ One of the leading causes of liver disease in the US
- ✖ Continuous use of alcohol weakens your immune system
- ✖ If you are HCV positive you should
 - Stop drinking or at least cut back on your intake
 - Seek treatment and support for alcohol problem
- ✖ HCV and alcohol are a deadly combination
 - Cirrhosis
 - Liver cancer
 - Need for transplant
 - Death



Important

- ✘ HCV not spread by kissing, hugging, sneezing, coughing, food or water, sharing eating utensils or drinking glasses, or casual contact,
- ✘ There is NO vaccine to prevent hepatitis C!
- ✘ You can not be excluded from work or school because of your infection.

HCV Screening Algorithm



HCV, hepatitis C virus; anti-HCV, antibody to hepatitis C virus.
Kuritzky L, et al. *Family Practice Recertification*. 2006;28(2):41-57.
CDC Division of Viral Hepatitis. www.cdc.gov/hepatitis

Hepatitis C Timeline

1973

NANB Hepatitis described

1990

First HCV Antibody test.
Begins screening blood supply

1993

Supplemental HCV test developed

2001

FDA approves Pegylated Interferon

1989

Hepatitis C Virus is isolated

1991

Alpha Interferon for HCV approved

1998

Combination therapy approved

2011

DAAs approved

CURRENT TREATMENTS

INTERFERON



- ☛ Naturally occurring substance
- ☛ Stimulates the immune system to attack Hepatitis
- ☛ Inhibits viral entry and replication
- ☛ Given by injection

RIBAVIRIN

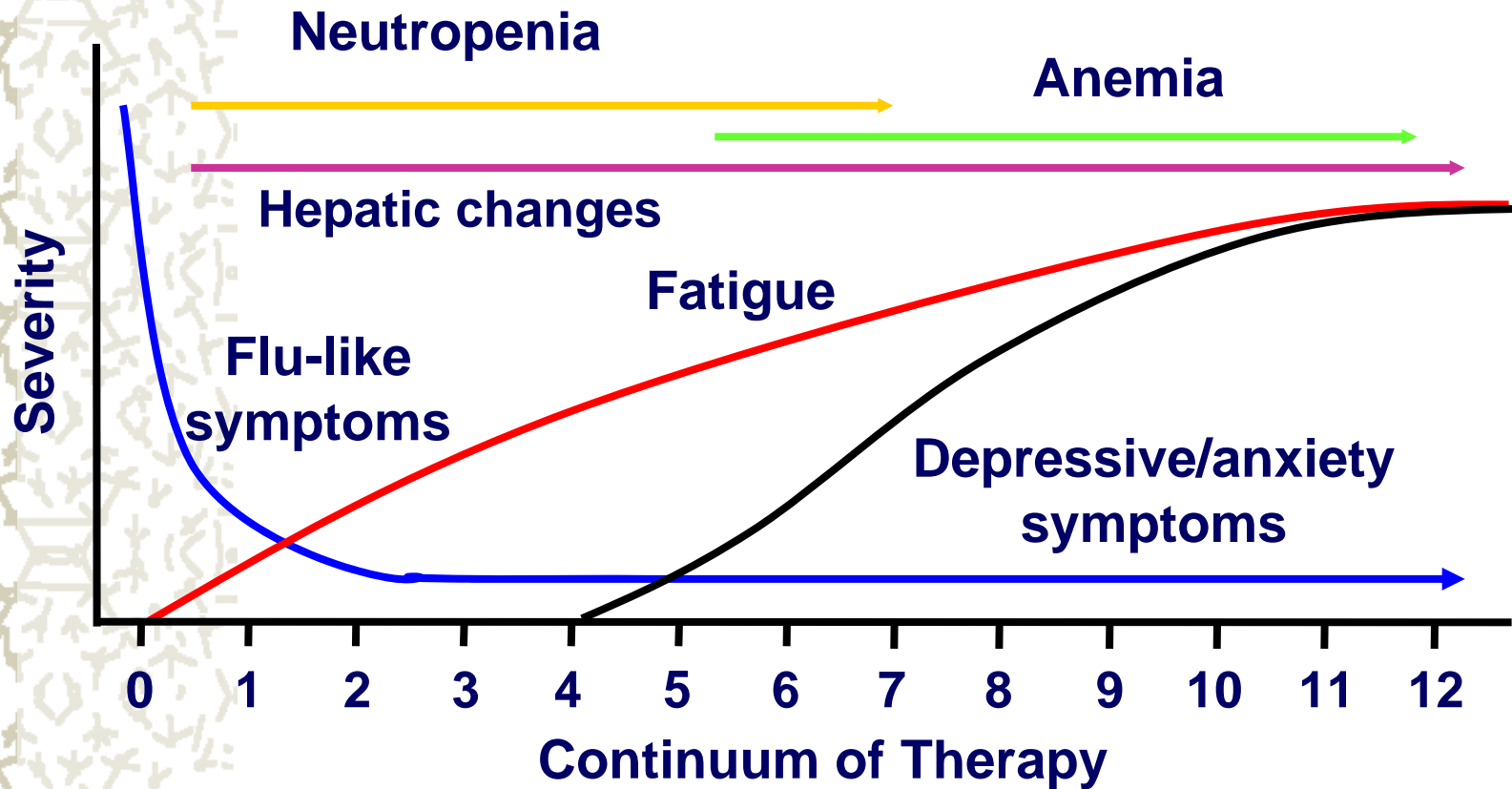
- ☛ Active against RNA viruses
- ☛ Synthetic nucleoside analogue
- ☛ mechanism of action thought to be modulator of the immune system
- ☛ Ribavirin monotherapy ineffective for the treatment of chronic hepatitis C*

DAAs

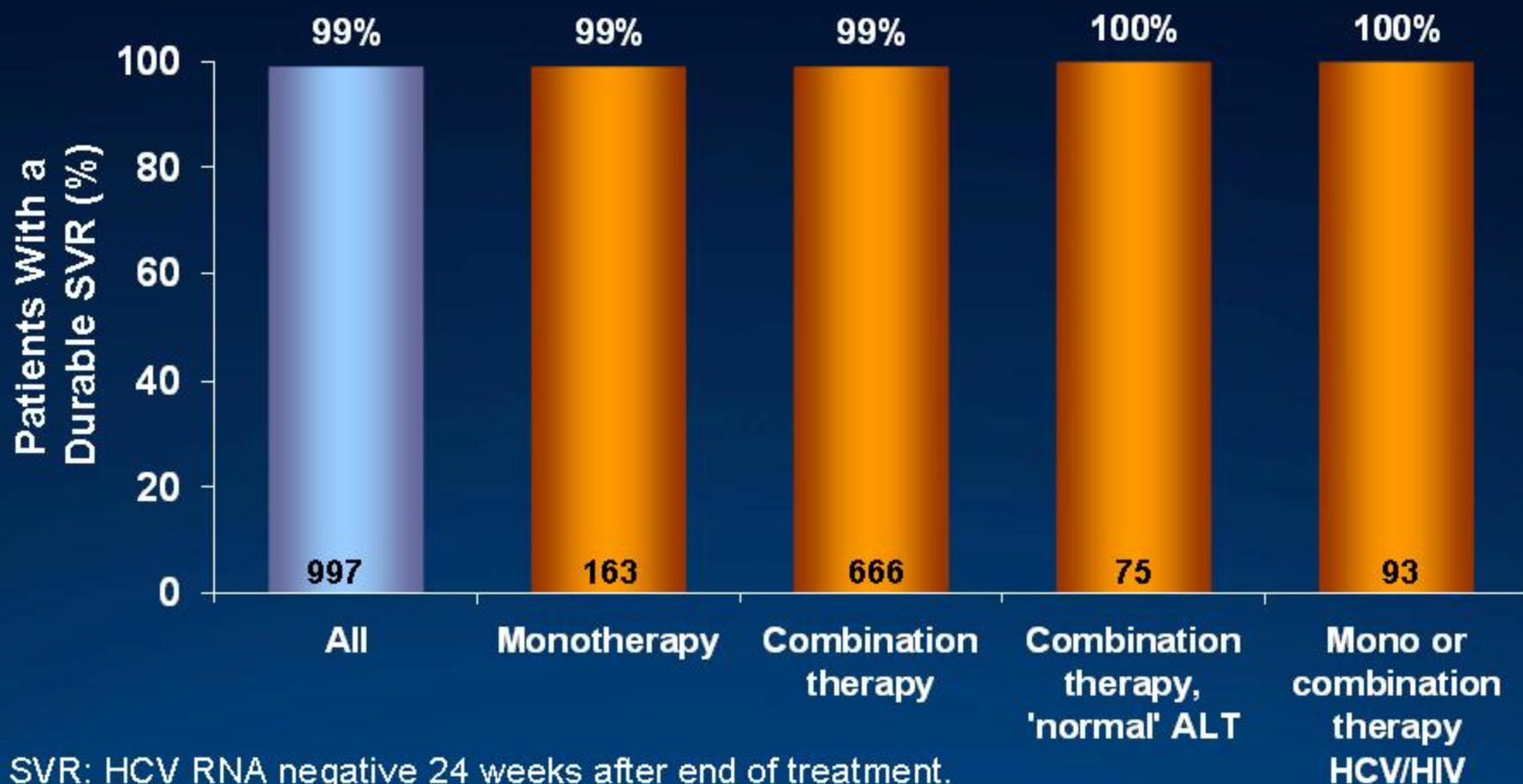
- ☛ Directly Acting Antivirals
- ☛ Protease Inhibitors, inhibit N3/4sb protease



TIME COURSE OF SIDE EFFECTS



Patients With a Durable SVR at Mean 4.1 (0.4–7) Years' Follow-up



Swain M, et al. Presented at EASL 2007. April 11-15, 2007; Barcelona, Spain. Oral presentation.
Desmond CP, et al. *J Viral Hep.* 2006;13:311-315.

Please see PEGASYS full prescribing information and slides 4-12 for Important Safety Information



awareness

THANK YOU
FOR YOUR
ATTENTION

