Hepatitis

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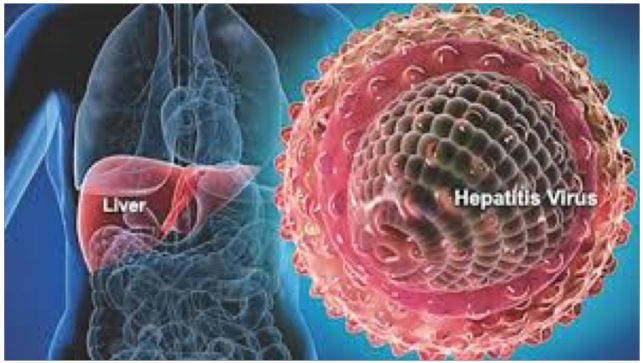
Session Objectives

1. Understand the classification of viral hepatitis
2. Recognize the global burden, epidemiology and risk factors of viral hepatitis infection
3. Enumerate modes of transmission of different serotypes
4. Provides measures of prevention and control
5. Recognize the epidemiology, burden of disease and national measures to prevent spread of viral hepatitis in KSA

Introduction to Hepatitis



What Is Hepatitis?

Hepatitis: An inflammation of the liver

Causes of Hepatitis

- Drugs
- Alcohol
- Autoimmune
- Virus
  - Hep A
  - Hep B
  - Hep C

Viral Hepatitis

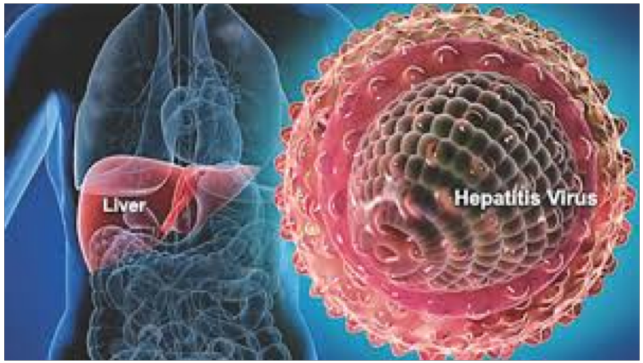
- **Infection of the liver caused by any type of viruses.**
- Past → Hepatitis A virus (HAV) and hepatitis B virus (HBV) were the only known aetiological agents of viral hepatitis
- Present → Hepatitis viruses C, D, E and G have also been identified and are recognized as aetiological agents of viral hepatitis
- Other causative viruses → cytomegalovirus (CMV), Epstein-Barr virus, yellow fever virus and rubella virus

Viral Hepatitis

WHO Global Hepatitis Report 2017:

- Viral hepatitis caused **1.34 million** deaths in 2015
- Most viral hepatitis deaths in 2015 were due to chronic liver disease and primary liver cancer
- Globally, in 2015,
  - **257 million** people were living with chronic HBV infection,
  - **71 million** people with chronic HCV infection.

Hepatitis A



Hepatitis A

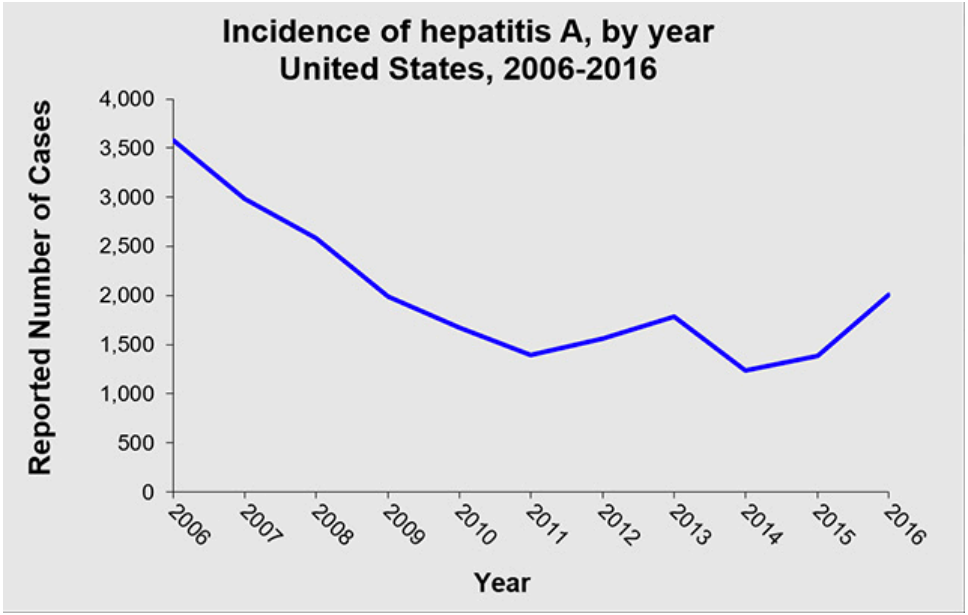
- Acute infectious disease caused by hepatitis A virus (HAV).
- Symptoms
  - Non specific symptoms (Fever, chills, headache, fatigue, generalized weakness and pains)
  - Followed by (anorexia, nausea, vomiting, dark urine and jaundice).
- Mode of transmission
  - Fecal–oral rout

Global Burden of HAV

- Endemic in most **developing** countries
- WHO estimates that worldwide, hepatitis A caused approximately 11 000 deaths in 2015 (accounting for 0.8% of the mortality from viral hepatitis).

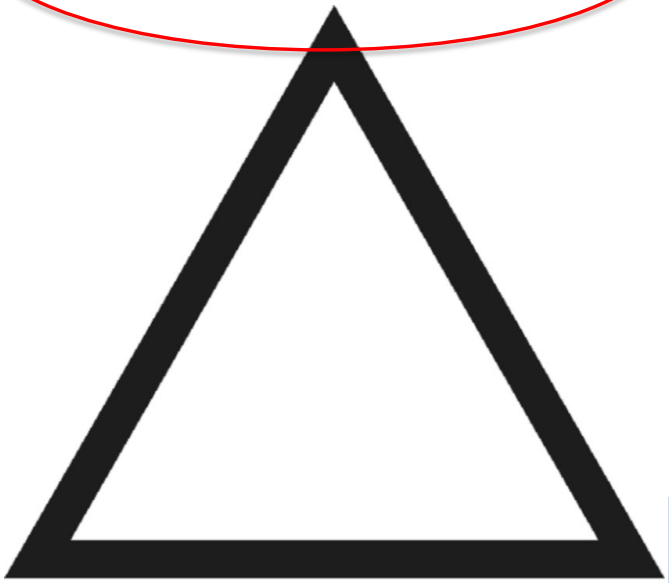
Prevalence of HAV in USA

- Hepatitis A rates in the United States have declined by more than 95% since hepatitis A vaccine first became available in 1995.



Epidemiological determinants of HAV

Agent Factors



Host Factors

Environmental factors

Agent Factors

AGENT

- The hepatitis A virus, is an enterovirus
- It multiplies only in hepatocytes.
- Faecal shedding of the virus is at its highest during the later part of the incubation period and early acute phase of illness.

RESERVOIR OF INFECTION

The human cases are the only reservoir of infection.

PERIOD OF INFECTIVITY

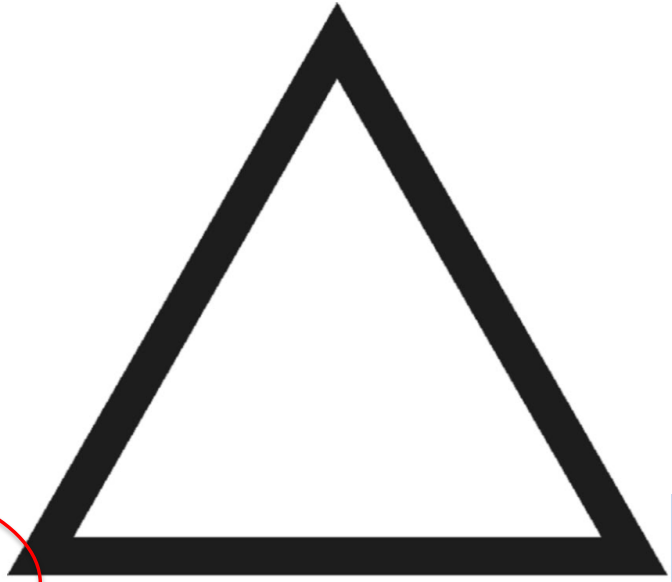
The risk of transmitting HAV is greatest from 2 weeks before to 1 week after the onset of jaundice.

INFECTIVE MATERIAL

Mainly man's faeces.

Epidemiological determinants of HAV

Agent Factors



Host Factors

Environmental factors

Host Factors

AGE

- Infection with HAV is more frequent among children than in adults. However, people from all ages may be infected if susceptible.

SEX :

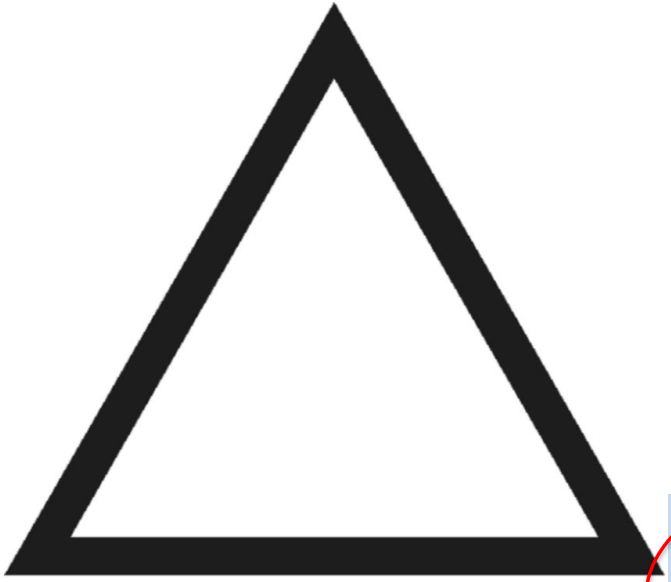
- Both sexes are equally susceptible

IMMUNITY:

- Immunity after attack probably lasts for life.

Epidemiological determinants of HAV

Agent Factors



Host Factors

Environmental factors

Environmental Factors

Poor sanitation and overcrowding favour the spread of infection, giving rise to water-borne and food-borne epidemics.

Incubation Period

- 14-28 days.
- The length of the incubation period is proportional to the dose of the virus ingested

Clinical spectrum

Hepatitis A resolves completely in 98 % of cases but relapse of symptoms are noted in 3-20 % of cases

Prevention and Control

- Control of reservoir
- Control of transmission
- Control of susceptible population

Control of reservoir

Control of reservoir is difficult because of:

- Faecal shedding of the virus is at its height during the incubation period and early phase of illness
- The occurrence of large number of subclinical cases

Strict isolation of cases is not a useful control measure

Control of transmission

The best means of reducing the spread of infection is by

- Promoting simple measures of personal and community hygiene
  - Hand washing before eating and after toilet
  - The sanitary disposal of excreta which will prevent contamination of water, food and milk
  - Proper disposal of sewage within communities.

Control of susceptible population

- Targeted protection of high-risk groups e.g. travellers to areas of intermediate or high endemicity.
- Vaccine
- Human immunoglobulin

Vaccines

Types of hepatitis A vaccines:

- Formaldehyde inactivated vaccines
- Live attenuated vaccines

Formaldehyde inactivated vaccines

- Safe after the age of 12 months
- The complete vaccination schedule consists of 2 dose administration into the deltoid muscle
- The interval between the first (primary) dose and second (booster) dose is commonly 6-12 months (18–36 months)
- It can be administered simultaneously with other vaccines
- Following 2 doses of vaccine the protective efficacy is about 94%

Live attenuated vaccines

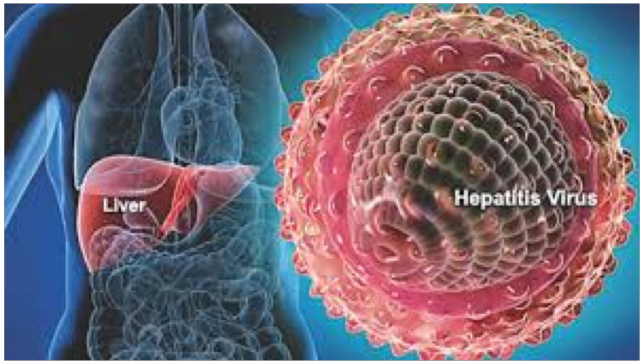
- The live attenuated vaccine is administered as a single subcutaneous dose.

Hepatitis A

In Summary

- Hepatitis A causes only acute hepatitis.
- HAV is transmitted mostly through exposure to contaminated food or water, or through exposure to infected persons.
- A safe and effective vaccine is available.

Hepatitis B



Hepatitis B

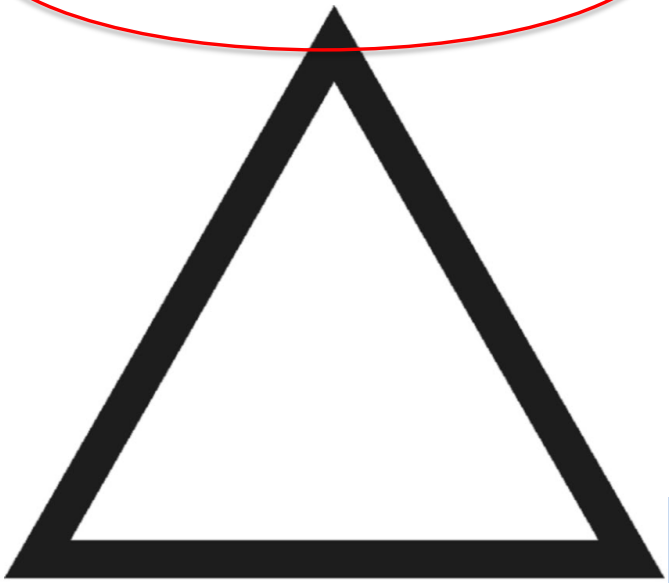
- Blood-borne infection
- Usually, it is an acute infection, which may be either subclinical or symptomatic.
- In approximately 5 to 15% of cases, HBV infection fails to resolve and the affected individuals then become persistent carriers of the virus
- Persistent HBV infection may cause progressive liver disease including chronic active hepatitis and hepatocellular carcinoma

Burden of Hepatitis B

- In 2015, the global prevalence of HBV infection in the general population was 3.5%
- Prevalence was the highest in the African (6.1%) and Western Pacific regions (6.2%)
- Adults chronically infected may include 65 million women of childbearing age who can potentially transmit HBV to their babies

Epidemiological determinants of HBV

Agent Factors



Host Factors

Environmental factors

Agent Factors

AGENT

- The hepatitis B virus
- It multiplies in liver cells.

RESERVOIR OF INFECTION

- The human cases are the only reservoir of infection.
- Persistent carrier defined as the presence of HBsAg for more than 6 months

INFECTIVE MATERIAL

- Contaminated blood is the main source of infection
- body secretions such as saliva, vaginal secretions and semen of infected persons

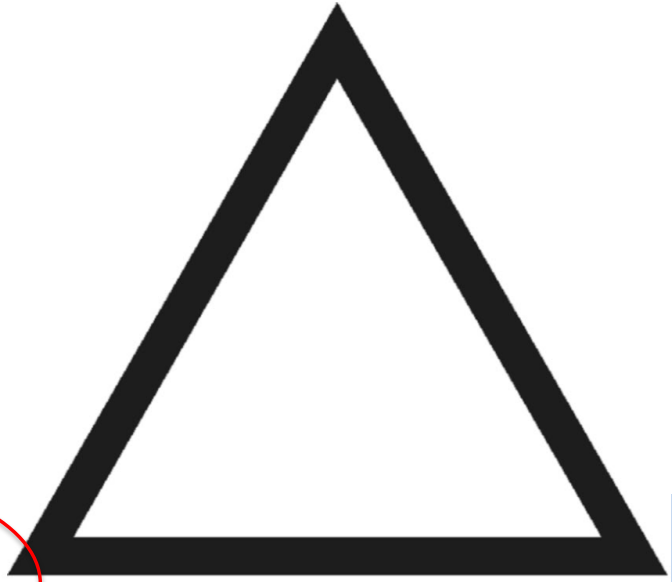
Agent Factors

PERIOD OF INFECTIVITY

- The virus is present in the blood during the incubation period (for a month before jaundice) and acute phase of the disease.
- Period of communicability is usually several months or until disappearance of HBsAg and appearance of surface antibody.

Epidemiological determinants of HBV

Agent Factors



Host Factors

Environmental factors

Host Factors

AGE

- The outcomes of HBV infection are age-dependent
- The development of chronic HBV infection is inversely related to age
  - 80-90% of persons infected perinatally
  - 30% infected in early childhood (less than 6 years of age)
  - 5 % infected after 6 years of age

Hepatitis B and HIV infection:

- It is estimated that 10% of the 40 million people infected with HIV worldwide are coinfected with HBV.

Host Factors

HIGH-RISK GROUPS :

- Recipients of blood transfusions
- Health care workers
- Laboratory personnel
- Percutaneous drug abusers
- Infants of HBV carrier mothers
- Recipients of solid organ transplants
- patients who are immunocompromised

Mode of Transmission

1. Parenteral route
   - Transfusions
   - Dialysis
   - Contaminated syringes and needles
   - Pricks of skin
   - Handling of infected blood
2. Perinatal transmission
   - Spread of infection from HBV carrier mothers to their babies
   - The majority of children born to mothers who are HBeAg-positive become chronically infected
3. Sexual transmission

Incubation Period

- It is clinically characterized by a tendency to a long incubation period
- Usually 30 to 180 days (average 75 days)
- Lower doses of the virus result often longer incubation period.

Prevention and Control

- Since there is no specific treatment, prevention has been the major aim in managing viral hepatitis B.
- General preventive measures:
  - All blood donors should be screened for HBV infection
  - Health Care workers should be alerted to the importance of adequate sterilization of all instruments and to the practice of simple hygienic measures
  - Carriers should be told not to share tooth brushes and use barrier methods of contraception; they should not donate blood

Hepatitis B Vaccine

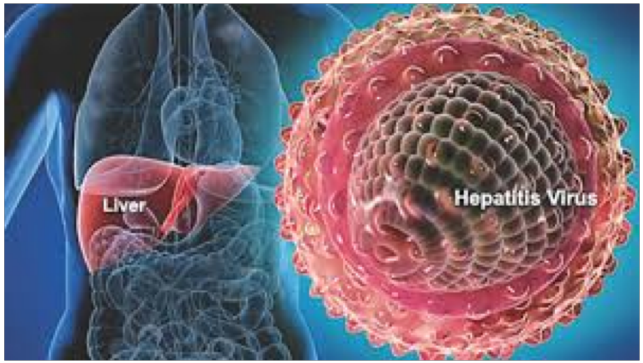
- The recommended schedule for vaccination is a 4 dose schedule where the dose at birth is followed by three additional doses at 2, 4 and 6 months with DPT vaccination.
- These doses may be given either as monovalent vaccine or as a combination (eg. With DPT and/or Hib)
- The minimum recommended interval between the doses is 4 weeks.

Hepatitis B Vaccine

Immunization in adults

- Routine pre-exposure vaccination should be considered for high risk group
- The usual schedule for adults is 2 doses separated by no less than 4 weeks, and a third dose 4 to 6 months after the second dose

Hepatitis C



Hepatitis C

- Hepatitis C is a contagious liver disease that results from infection with the hepatitis C virus.

Rout of transmission:

- The HCV is most commonly transmitted through exposure to infectious blood
  - Receipt of contaminated blood transfusions, blood products and organ transplants
  - Injections given with contaminated syringes and needle-stick injuries in health-care settings
  - Injection drug use
  - Born to a hepatitis C-infected mother
- Sexual transmitted rout

Burden of Hepatitis C

- Every year, 3-4 million people are infected with the HCV.
- About 130-150 million people are chronically infected and are at risk of developing liver cirrhosis and/or liver cancer.
- More than 500,000 people die from hepatitis C - related liver diseases every years.
- About 75-85% of newly infected persons develop chronic disease
- 60- 70% of chronically infected people develop chronic liver disease; 5-20% develop cirrhosis and 1-5% die from cirrhosis or liver cancer.
- In 25% of liver cancer patients, the underlying cause is hepatitis C.

Incubation Period

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

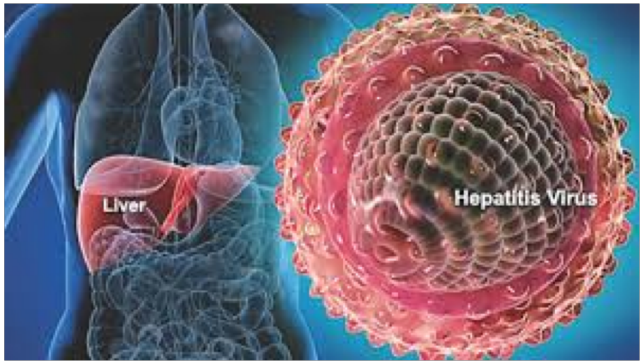
Prevention and Control

- 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.

Prevention and Control

- Secondary and tertiary prevention
  - For people infected with the HCV, WHO recommends:
    - Education and counselling on options for care and treatment
    - Immunization with the hepatitis A and B vaccines to prevent coinfection from these hepatitis viruses
    - Early and appropriate medical management including antiviral therapy if appropriate
    - Regular monitoring for early diagnosis of chronic liver disease.

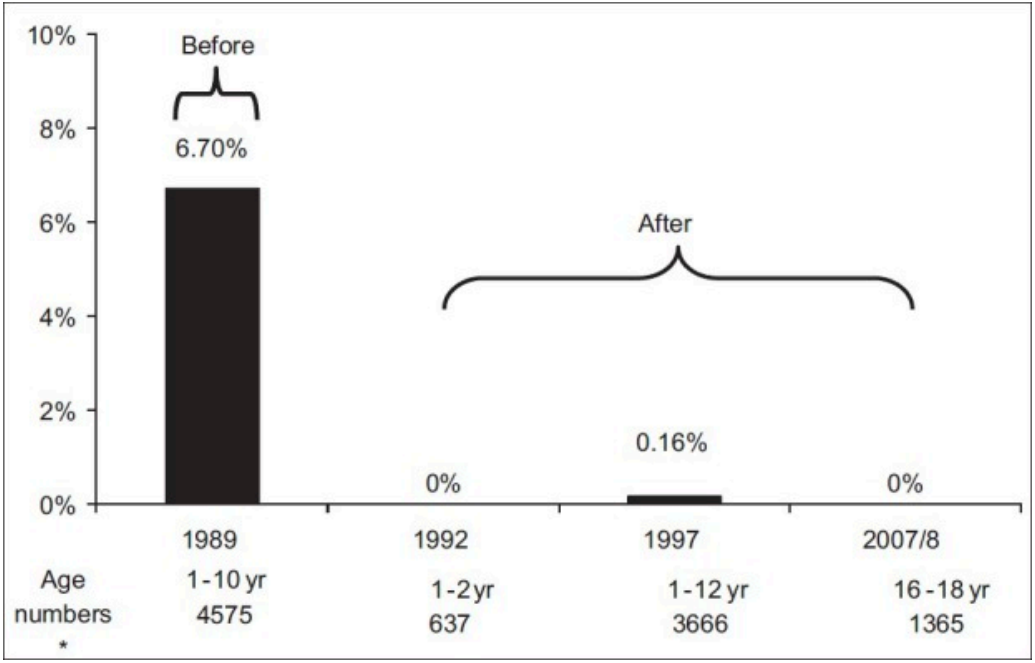
Hepatitis in Saudi Arabia



Hepatitis in Saudi Arabia

- In 2007, the Saudi Ministry of Health (MOH) ranked viral hepatitis as the second most common viral disease after chickenpox, with almost 9000 new cases diagnosed in that year (**52% HBV, 32% HCV, and 16% HAV**).
- A steady decline in prevalence of all 3 common hepatotropic viruses during the past 3 decades due to:
  - better living conditions
  - Universal blood bank screening
  - Increased awareness of safe social and clinical practices
  - Implementation of childhood immunization against hepatitis B virus (HBV).

Prevalence of HBsAg among the Saudi population documented before and after introducing a nation-wide HBV vaccination program, over an 18-year period

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