

Gastroenterology and Exercise

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Outline

- Infections and sports
 - Blood borne infection
 - Food/Water borne infection
- Stress related GI disorder



Blood borne sports

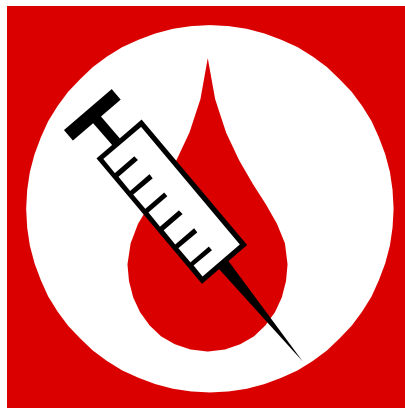


Risk of bleeding injury

| High | Mid | Low |
|-------------|------------|------------|
| Wrestling | Basketball | Baseball |
| Boxing | Soccer | Gymnastics |
| Tae Kwon Do | Ice Hockey | Tennis |
| | Judo | Badminton |
| | Handball | |

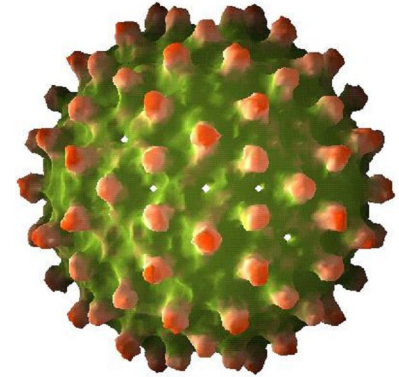
Blood borne infections

- Hepatitis B virus (HBV)
- Hepatitis C virus (HCV)
- Human immunodeficiency virus (HIV)



Hepatitis B virus

- Stable in environment
- Resistant to drying, detergents and alcohol
- Stay in environment for > 7 days
- Can transmit through inanimate objects
- Highest risk among all blood borne transmission



Risk of transmission of HBV

- Depends on type of sports
- From 1 in 10,000 to 4,25 million games
- Outbreaks reported
 - Wrestling (skin cuts and abrasion)
 - American football (open wound contact)
 - Cross country track running (skin lesions during washing after running)

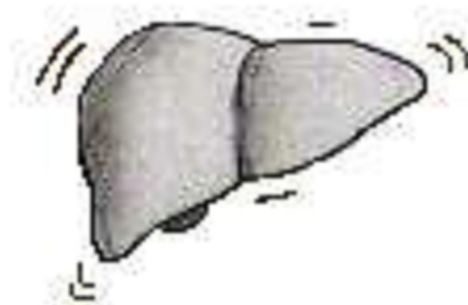


Other alerts

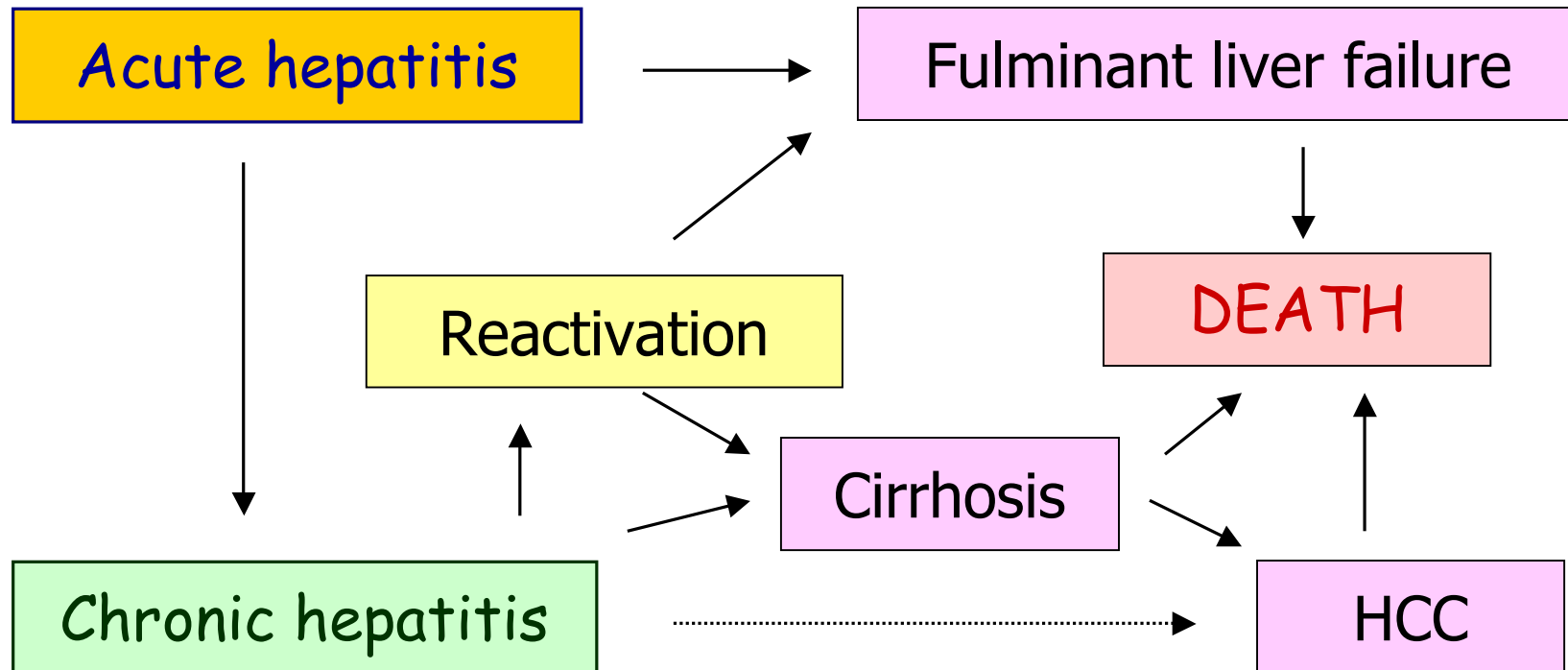
- Drug abuse (sharing needles) – steroid, hormones, vitamins
 - 3 of 40 (7.5%) of ex-soccer players in Brazil between 1970-1989 had HCV infection related to sharing needles for vitamin injection
- Sexual activity
- Coaches, first aiders and health care providers
 - Case of HCV transmission by sharing a handkerchief to dry bleeding wounds after a bloody fisticuffs

Acute hepatitis

- Asymptomatic
- Malaise, nausea, upper abdominal pain
- Yellow sclera and skin
- Liver failure



Complications of hepatitis

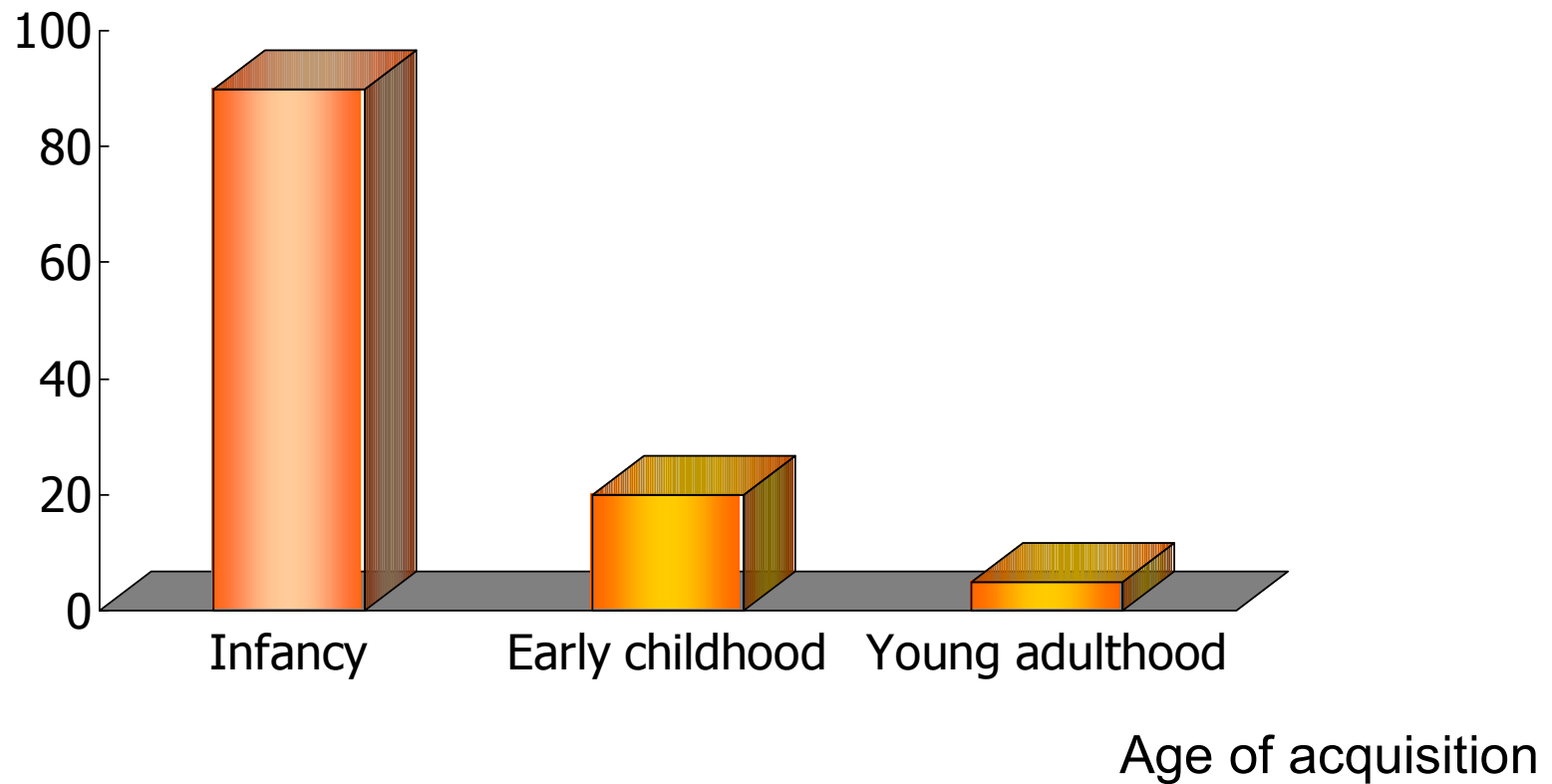


Hepatitis B virus infection

| Prevalence | High (10%-20%) | Intermediate (3%-5%) | Low (0.1%-2%) |
|---------------------------|--|--|--|
| Geographical distribution | SE Asia, China, Sub-Saharan Africa, Alaska | Mediterranean, Central Asia, Middle East, Japan, Latin and South America | North America, Western Europe, Australia and New Zealand |
| Transmission | Perinatal Percutaneous | Percutaneous Sexual | Sexual Percutaneous |
| Age of infection | Perinatal & early childhood | Early childhood | Adult |

Risk of chronic hepatitis B

Risk of chronic hepatitis (%)

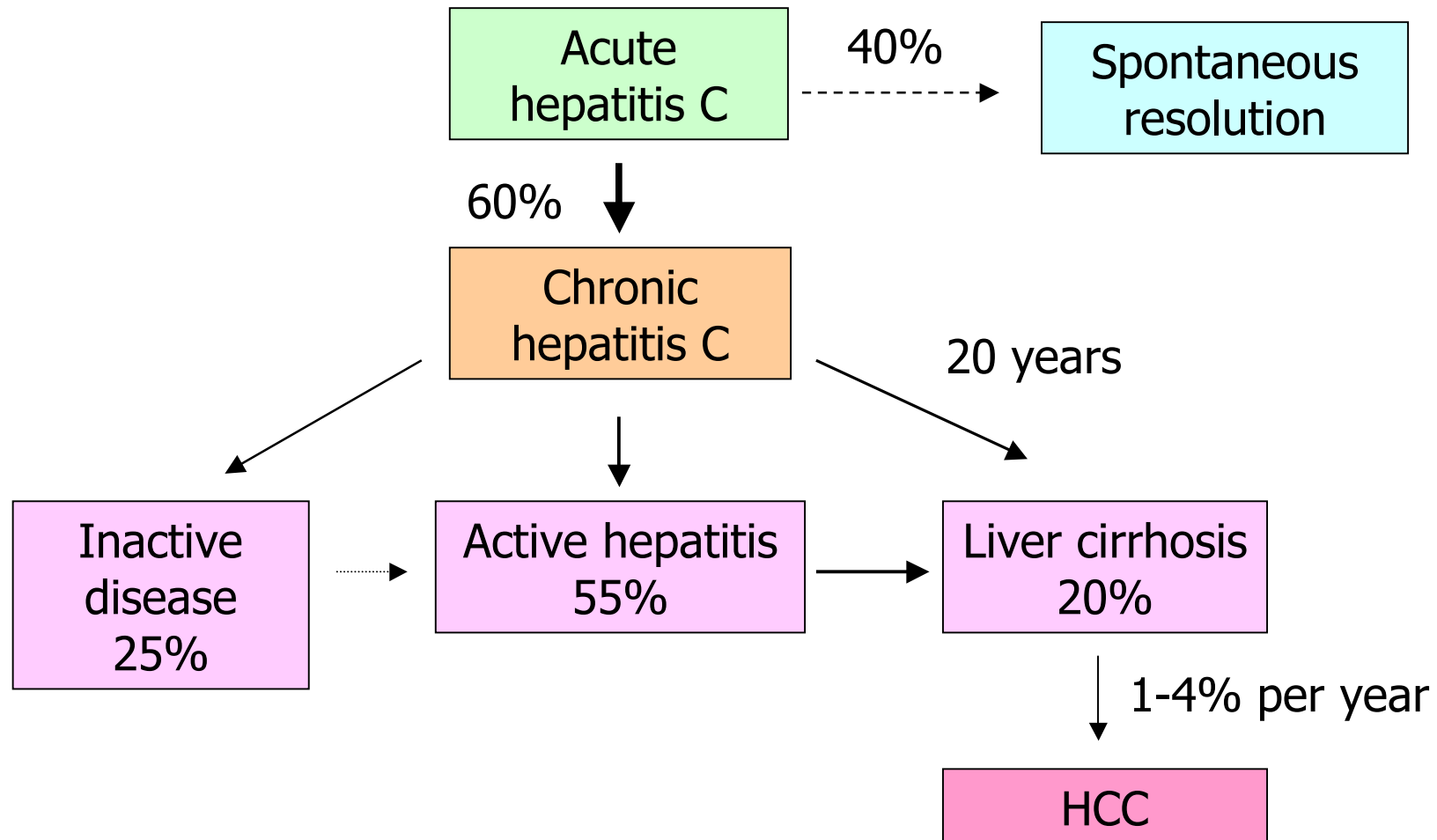


Chronic hepatitis B in HK

- Commonest cause of liver cirrhosis and hepatocellular carcinoma in HK
- Up to 25% of CHB patients died of liver disease
- HCC
 - second commonest cause of cancer death in male
 - seventh commonest cause of cancer death in female



Natural history of hepatitis C

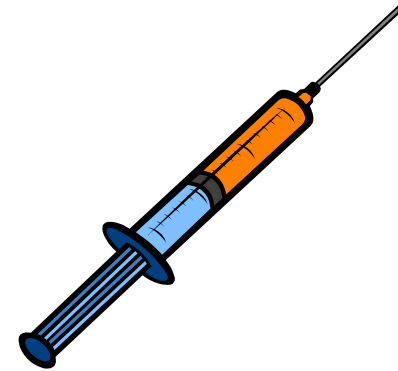


Prevention of blood-borne infection

- Education to athletes coaches and healthcare providers
- Prompt and appropriate treatment of injuries
- Wounds covered during sports activity
- Prompt detection of wounds
- Protective equipments in contact sports
- Healthcare provider guidelines
- Remove contaminated equipments from sports area

Vaccination to HBV

- Recombinant DNA vaccine
- 3 doses: 0, 1 and 6 months
- Protection 95%, ? Life long immunity
- Universal vaccination for newborn in HK since 1989
- Athletes not categorized as high risk group for vaccination



Suggestions for HBV vaccination

- Non-infected athletes living in endemic regions
- Athletes living in low endemic regions but regularly traveled to endemic regions
- Athletes who practice first-aid in the absence of healthcare providers
- Athletes suspected of iv drug abuse
- Participants in contact and collision sports

Prevention of HCV

- No vaccine available
- Post-exposure prophylaxis with interferon for 24 weeks
 - >90% chance of cure (prevention to chronicity)
- Need check HCV RNA and liver biochemistry after suspected exposure

Infected athletes

- Can participate in competitive sports
- Risk of transmission to other athletes low
- Emphasis on preventive activities



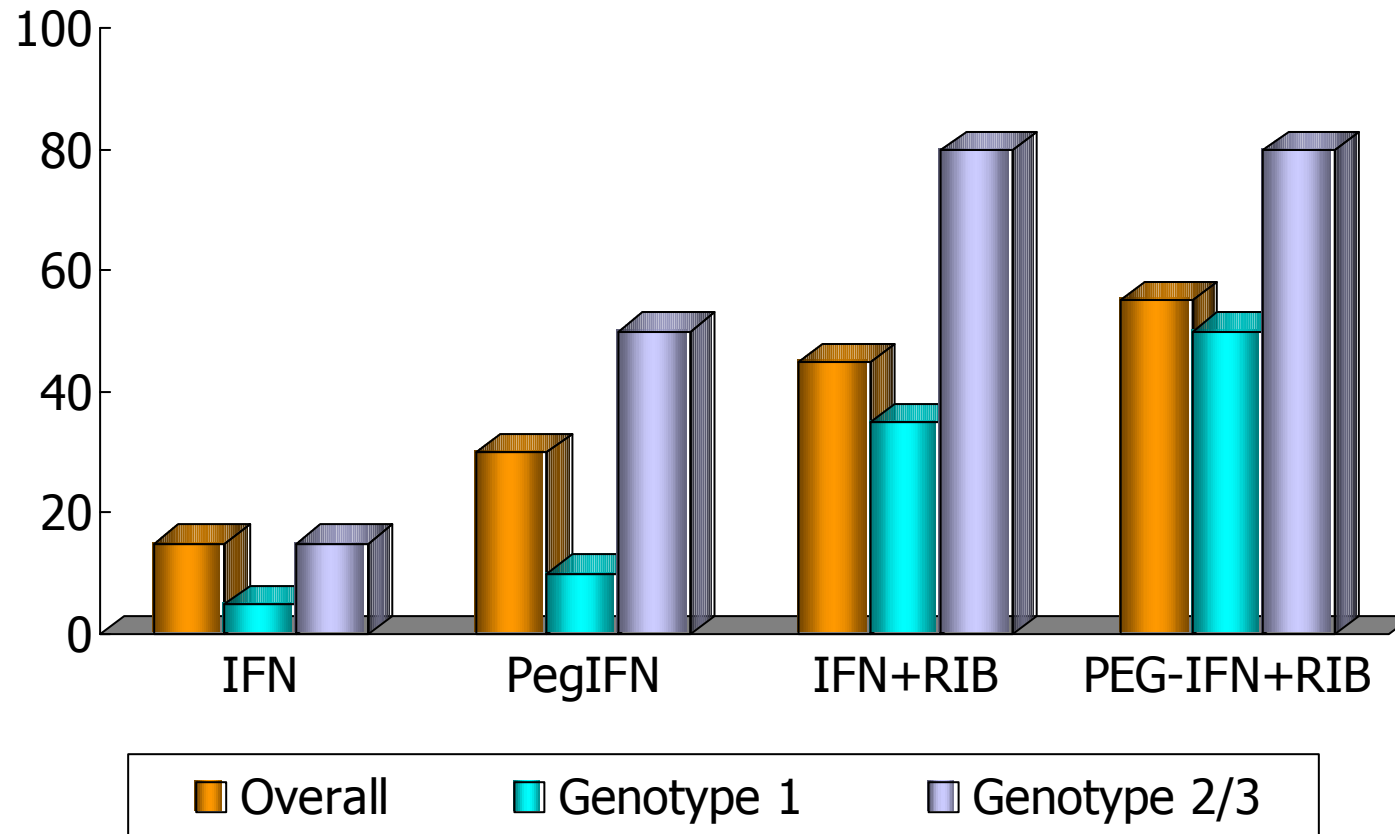
Treatment of chronic hepatitis B

- Peg(interferon)
 - Finite period of treatment
 - Low success rates
 - Adverse events common
 - May cause hepatitis flare-up
- Lamivudine/adefovir/entecavir/telbivudine
 - Effective viral suppression
 - Good safety profile
 - Extended treatment duration
 - Post-treatment relapse
 - Drug resistance



Treatment of chronic hepatitis C

Peginterferon + ribavirin = standard treatment



Center for Liver Health Website



<http://www.cuhk.edu.hk/centre/liver>

Food/Water Borne GI infections



Recreational water illness

- Illness after contact with contaminated water
- Diarrhea = commonest symptom
- Common organisms: cryptosporidium, giardia, shigella, E. coli O157:H7
- Mainly through fecal contamination of pools, lakes and rivers
- Chlorine may take hours to days to kill the germs

CDC suggestions

Protection against recreational water illness

For all swimmers

- Don't swim if diarrhea especially for kids on diapers
- Don't swallow water
- Practice good hygiene (hand-washing)

For parents with young kids

- Take your kids to bathroom if they need
- Check diapers at poolside but not in pool
- Wash your child before swimming



Food/water borne infections

Gastroenteritis

- Diarrhea and vomiting
- Norovirus



Norovirus Outbreak

- Outbreak of norovirus infection after a college football game
- Primary case on same day of game: turkey sandwich (n=43)
- Secondary case on second day of game: aerosolized vomitus (n=11)
- Persons with acute gastroenteritis should be excluded from playing contact sports

Becker et al., NEJM 2000

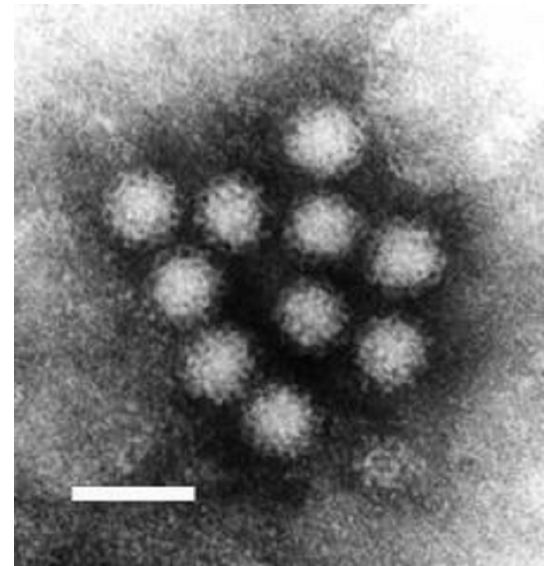
Outbreak in Atlanta, USA

- 3 February 2004, reports of acute gastroenteritis in persons who had recently visited a swimming facility.
- A retrospective cohort study among persons attending the facility between 30 January and 2 February.
- 53 of 189 (28%) persons developed vomiting or diarrhea within 72 h after visiting the facility.
- 5 specimens positive for norovirus and 3 specimen sequences identical.
- Maintenance system failures: chlorine equipment failure, poorly trained operators, inadequate maintenance checks, failure to alert management, and insufficient record keeping.

Norovirus

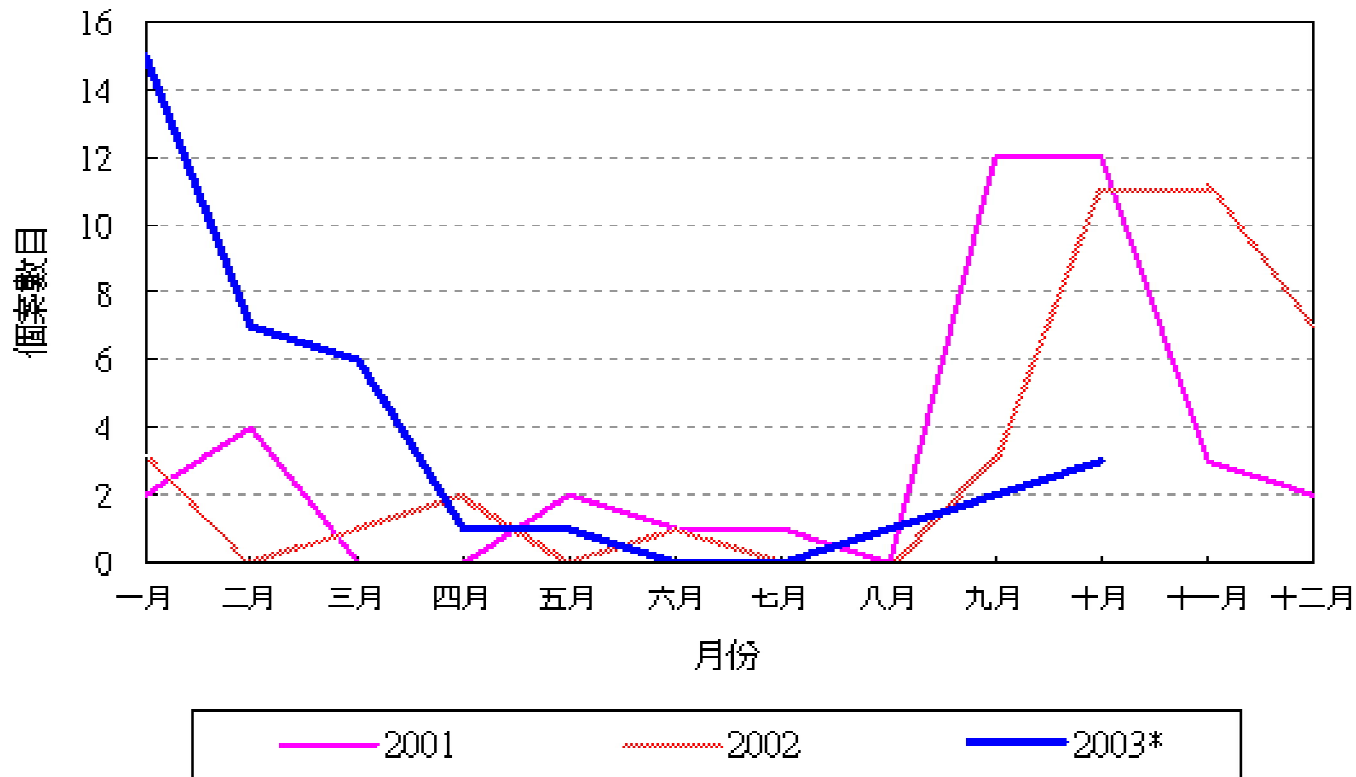
Norwalk-like viruses NLVs,
Small round-structured virus SRSVs

- Shellfish
- Sewage contamination of oyster harvesting area
- Depuration is not effective
- Cold food items (salad, sandwiches) contaminated by food handler



Background

二零零一年至二零零三年*
諾沃克類病毒集體感染個案數目



Data: Centre for Health Protection

Shellfish



- Suspected etiological agents in 11-17% of local food poisoning outbreaks

Data from CHP

Diarrhea - General Approach

- Are the vital signs stable?
- Is the patient dehydrated?
- Save stool for inspection: Any mucus? Blood? Watery?
- Send stool for investigation
- Stool isolation & hand washing



Prevention of enteric infection

- Personal hygiene
- Public sanitation
- Antibiotic prophylaxis is not the best option



Food poisoning - *Treatment*

- Rehydration
- **NO** antibiotic needed



Gastroenteritis

- Commonest causes: *E.coli*, *Salmonella. enteritidis*, *Rotavirus* (pediatric)
- Incubation: 2-4 days
- Symptoms: vomiting, watery diarrhea, abdominal cramps, fever
- Treatment: rehydration and electrolyte replacement, usually no antibiotic needed

Dysentery

- Symptoms: Bloody diarrhea and abdominal pain, tenesmus, fever and septicaemia in severe cases
- Incubation: 2 days



Dysentery

- Common causes:
 - *Shigella, E.coli, Campylobacter jejuni* (Bacterial dysentery)
 - *Amoeba* (Amoebic dysentery)
- Treatment: Rehydration and electrolyte replacement, Ciprofloxacin (bacterial) or Metronidazole (amoebic)

Enterohemorrhagic E. coli (O-157)

- Subtype of *Escherichia coli*
- Cause bloody diarrhea and colitis
- May be complicated by hemolytic anemia and acute renal failure
- Treatment : Ciprofloxacin

Stress related GI disorder



GI symptoms in athletes

| | Runners (199) | Cyclists (197) | Triathletes (210) |
|-------|------------------|-------------------|----------------------|
| Upper | 36% | 67% | 52% |
| Lower | 71% | 64% | 45% |

Upper GI symptoms: nausea, vomiting, belching, heartburn, chest pain

Lower GI symptoms: bloating, GI cramps, side ache, urge to defecate, defecation, diarrhea

Runners diarrhea

- Diarrhea and lower GI symptoms especially in long-distance runners
- Possible reasons
 - High fibre diet
 - Use of laxatives
 - Milk intolerance
 - Stress (irritable bowel syndrome)
- Watch out for ischemic colitis (bloody diarrhea)



Recommendations for Runners Diarrhea

- Establish pre-run ritual
- Avoid eating 2 to 3 hours before running
- Decrease dietary sugars
- Decrease dietary fibre or use liquid meals before race
- Decrease caffeine intake
- Avoid mints or gum sorbitol
- Avoid large vitamin doses (especially vitamin C)
- Switch training time of day to evening
- Stay conditioned
- Consider anti-diarrheal drugs
- Consider temporary decrease in miles or intensity
- Initially decrease program by 20-25% and slowly re-increase exercise program

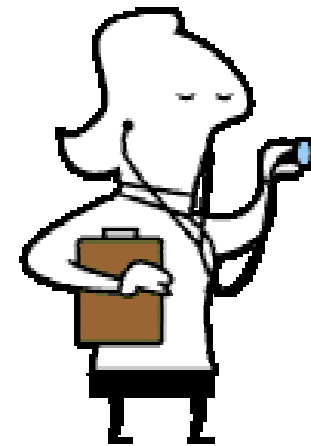
Irritable bowel syndrome?

Functional GI disorder ...

...poorly understood

...difficult patients

No effective treatment !



IBS: Definition for practitioners

Chronic or recurrent

- Lower abdominal pain
- Disturbed defecation
- Bloating

Not explained by structural or biochemical abnormalities

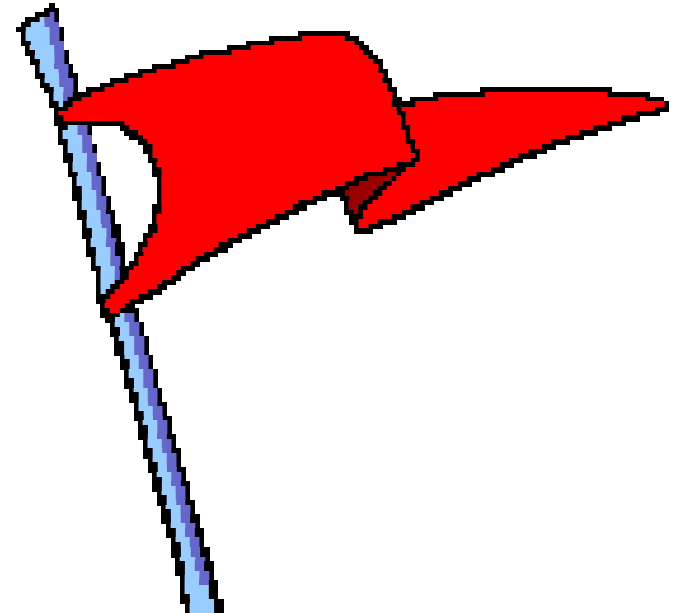
Alarming Features

HISTORY

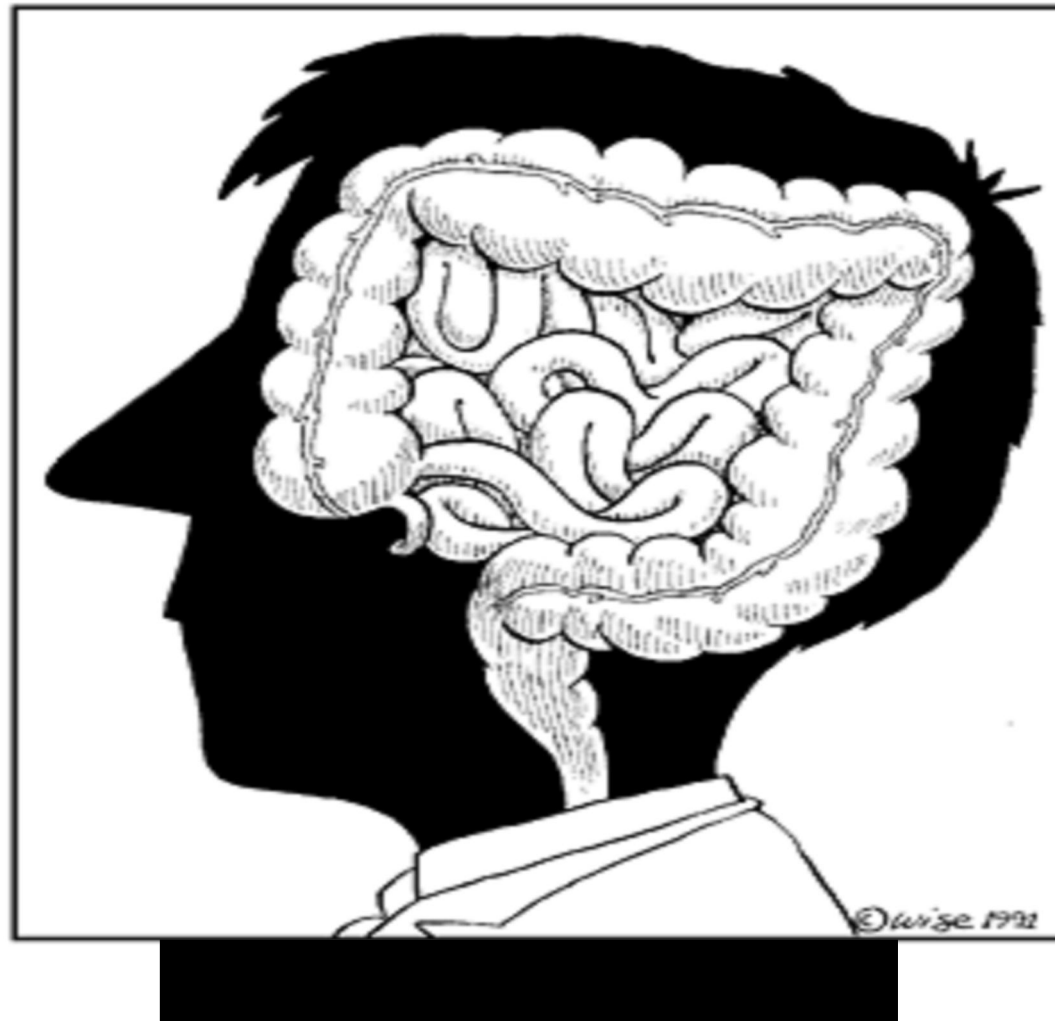
- Weight loss
- Rectal bleeding
- Onset in older patients
- Family history of CA colon or IBD

INVESTIGATIONS

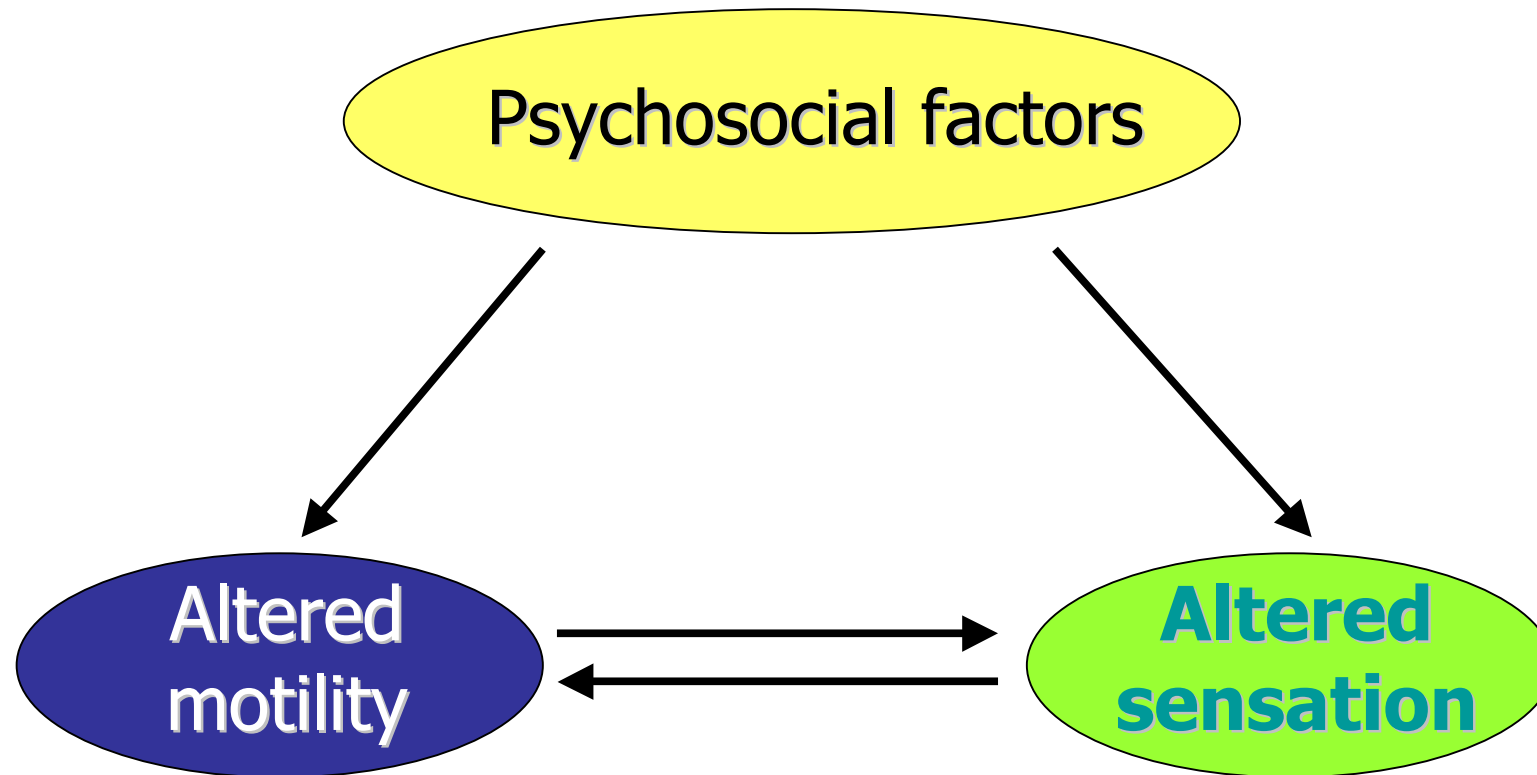
- Positive occult stool
- Anemia
- ↑ WBC
- ↑ ESR
- Abnormal biochemistry



Irritable bowel or irritable brain?

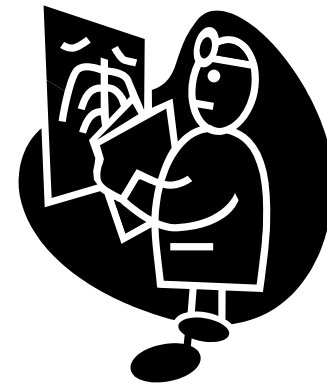


Pathophysiology of IBS



IBS: A positive clinical diagnosis

- Symptom criteria
- Absence of alarming symptoms
- Normal physical examination
- Limited relevant diagnostic testing



Why are IBS patients not happy?

- No curative treatment
- Poor quality of life
- Fear of underlying severe disease
- Unexpected chronic relapsing course of disease

Good doctor-patient therapeutic relationship

Reassurance

Education

Treatment

❑ Non-pharmacological

- Identify psychosocial stressors
- Lifestyle modification
- Dietary advice
- Psychotherapy

❑ Pharmacological

- Pain
- Diarrhea
- Constipation

Dietary Modifications

Avoid dietary excesses

Caffeine

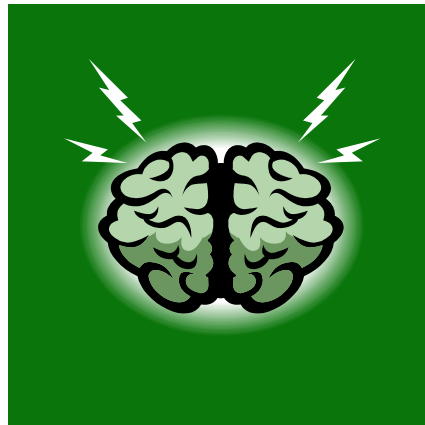
Fat (amplify gut sensation & motor reflex)

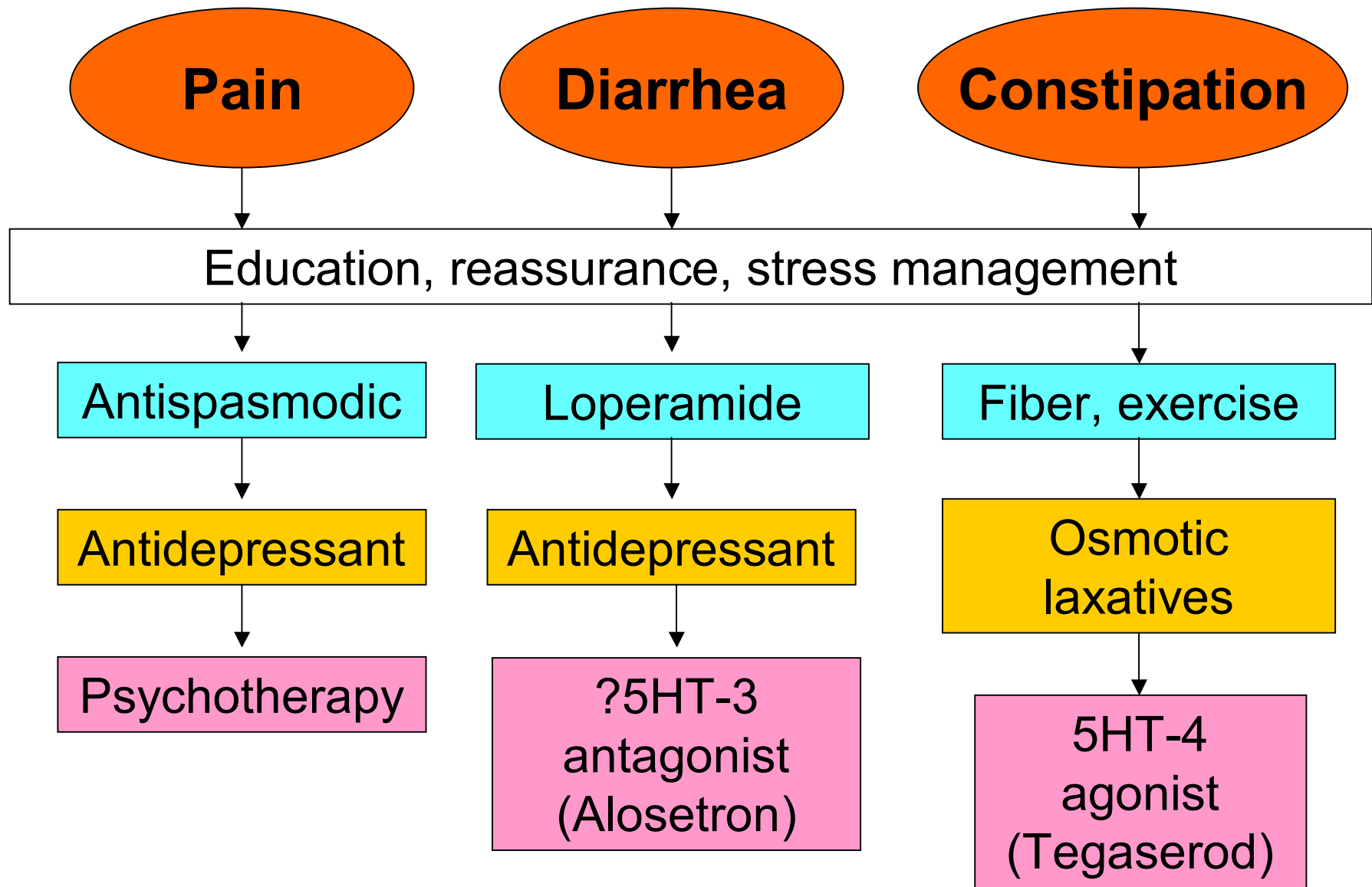
Lactose, fruits, sorbitol (bloating, diarrhea)

Beans, cabbage, broccoli, cauliflower (bloating)

Psychotherapy

- Mainly for pain control
- Patients with anxiety or depression have better outcomes







Thank You