

## Asthma

**Causes:** Genetically, skin reactions to common allergens, IgE → inflammation of the bronchi → airflow limitation, airway hyperresponsiveness

**Symptoms:** Wheeze, chest tightness, cough, shortness of breath (worsen at night)

**Diagnostic tools:** PEFR → demonstrating variable airflow limitation, spirometry, CO transfer test is normal in asthma, histamine test, blood and sputum test, chest X-ray, skin prick tests

**Treatment:** Inhalers with corticosteroids → relieving symptoms

## Bronchitis

**Causes:** Chronic Bronchitis → smoking, air pollution. Acute bronchitis → virus.

Causes an inflammation of the mucous membranes of the bronchi. Acute bronchitis → cough with or without the production of sputum. Chronic bronchitis → type of COPD

**Symptoms:** Cough, production of sputum (clear, white, yellowish-grey, green), fatigue, slight fever and chills, chest discomfort

**Diagnostic tools:** Stethoscope → listen to lungs, auscultation → wheeze with occasional crackles, Chest X-ray, sputum culture → check for bacteria, pulmonary function test

**Treatment:** Medications: antibiotics when caused by bacteria, cough medicine, inhaler and other medications to reduce inflammation

## COPD

**Causes:** Long-term exposure to toxic particles and gases: smoking (10-20% of heavy smokers), air pollution, urbanization, climate. → increased numbers of mucus-secreting goblet cells in the bronchial mucosa → inflammation → scarring and thickening of the walls which narrows the small airways

**Symptoms:** Airflow limitation, air trapping, PaCO<sub>2</sub> levels increase, mucus secretion, infections, cough with white or clear sputum, wheeze and breathlessness.

**Diagnostic tools:** Lung function tests → FEV1:FVC is reduced and PEFR is low, Chest X-ray, electrocardiogram

**Treatment:** Stop smoking. Drugs: bronchodilators (B-Adrenergic agonists), Phosphodiesterase type 4 inhibitors, corticosteroids, antibiotics, diuretic therapy, oxygen therapy.

## Emphysema

**Causes:** Smoking, air pollution, deficiency of alpha-1 antitrypsin → air sacs in lungs are gradually destroyed. Worsens: air sacs with holes in inner walls → reduces surface area → less gas exchange.

Destroys elastic fibers that hold open the small airways → airways collapse when you breathe out.

**Symptoms:** Shortness of breath, lips and fingernails turn blue or grey, not mentally alert, heartbeat is very fast

**Diagnostic tools:** X-ray, CT, Lung function tests

**Treatment:** For relieving of symptoms: Bronchodilators → relieve coughing, shortness of breath. Corticosteroid drugs → relieve shortness of breath.

Pulmonary rehabilitation.

Surgery (depending on severity) → lung volume reduction or lung transplant

## Pleural effusion

**Causes:** Congestive heart failure, pneumonia, cirrhosis, renal disease, cancer, Autoimmune conditions, pulmonary embolism → fluid accumulates in the space between the layers of pleura

**Symptoms:** Often no symptoms, shortness of breath, chest pain, fever, cough

**Diagnostic tools:** symptoms and physical examination: auscultation (stethoscope), percussion, imaging tests: X-ray, CT and ultrasound

**Treatment:** Fluid sample is taken to determine the character and seriousness: thoracentesis. Goal treatment: remove fluid, prevent fluid from building up again. Cause of fluid buildup must be treated. Heart failure → diuretics. Infection → antibiotics. Cancer → chest tube for days to drain the fluid.

## Pneumothorax

**Causes:** Normally: liquid in the pleural space (between *pleura visceralis* = *longvliet* and *pleura parietalis* = *borstvlies*). In pneumothorax: air in the pleural space due to a rupture of a pleural bleb, due to congenital defects in the connective tissue of the alveolar walls. Patients over 40 years: usual cause is COPD. Can also occur as a result of trauma (accident)

**Symptoms:** Sudden, sharp chest pain on the same side as the affected lung, doesn't occur in the center of your chest under the breast bone, shortness of breath

**Diagnostic tools:** X-ray

**Treatment:** Small: observe 2 weeks, Medium: re-expansion. Large: remains tube tubing

## Pneumonia

**Causes:** Usually bacteria, but can be due to viruses and fungi → inflammation in the lungs

**Symptoms:** Acute illness with cough, purulent sputum, breathlessness, fever and pleuritic pain

**Diagnostic tools:** Chest X-ray, blood test → count white blood cells, when productive cough → sputum investigation and culture

**Treatment:** Antibiotics, oxygen, intravenous fluids, thromboprophylaxis, physiotherapy, nutritional supplementation, analgesia

## Pulmonary embolism

**Causes:** Restricted and slow bloodstream → blood clot in veins → break free → travels to the lungs and blocks artery → permanent damage to portion of the lung

**Symptoms:** Unexplained dyspnea, problems breathing, coughing (sometimes blood), pain over affected lung region, arrhythmia

**Diagnostic tools:** Ultrasound → detecting blood clots in veins, CT → detect blood clot, Lung ventilation scan

**Treatment:** High flow oxygen (bed rest and analgesia), Medicines: anticoagulants and blood thinners to decrease the ability of the blood to clot. Fibrinolytic therapy → break up blood clots. Surgery

Upper respiratory tract infection

**Causes:** Most URTI's are due to a viral infection, some due to bacteria. Most common: rhinovirus

**Symptoms:** Cough is main symptom, fever, headache, aches and pains. Cold symptoms when infection also affects the nose. Peak after 2-3 days and gradually clear, only cough may persist (2-3 weeks)

**Diagnostic tools:** Bases on history, skin-prick testing, blood tests

**Treatment:** Ease symptoms → paracetamol, ibuprofen, aspirin to reduce fever, drinking, stop smoking, enough sleep

Rhinitis

**Causes:** Smoking, air pollution, pollen → hay fever

**Symptoms:** Sinusitis, Eustachian tube dysfunction, chronic ear infection, loss of smell, asthma, obstructive sleep apnea, running nose, sneezing, itchy eyes.

**Diagnostic tools:** Skin prick test, RAST (radioallergosorbent test) → measures IgE

**Treatment:** Can't be cured, but controlled by avoiding rhinitis triggers, using home remedies, take medications. In allergic rhinitis: antihistamines, eye drops and nasal sprays, immunotherapy.

Gastritis

**Causes:** irritation due to excessive alcohol use, chronic vomiting, stress, medication, *H. pylori* bacteria → inflammation of the stomach

**Symptoms:** nausea, abdominal bloating and pain, vomiting, indigestion, burning feeling in the stomach, hiccups, loss of appetite, vomiting blood and black stool

**Diagnostic tools:**  
Upper endoscopy → check inflammation and may perform a biopsy.  
Blood tests → check anemia.  
Stool test → check for presence of blood in stool.

**Treatment:** Taking antacids → reduce stomach acid. Elimination irritating foods from diet.  
Due to anemia → B12 vitamin shots  
Due to *H. pylori* → antibiotics

Gallstones (cholecystitis + gallstones = cholelithiasis)

Cholesterol stones (80%) and pigment stones (made of bilirubin)

**Causes:** Genetics, body weight, decreased motility of the gallbladder, diet

**Symptoms:** Pain in the upper abdomen and upper back, nausea, vomiting GI problems, including bloating, gas, indigestion and heartburn

**Diagnostic tools:**  
Blood tests → check inflammation  
Ultrasound → identify gallstones  
Endoscopic ultrasound → look for gallstones

**Treatment:** Treated with surgery (cholecystectomy) to take out the gallbladder. Laparoscopic cholecystectomy → remove gallbladder with instruments and camera.

Celiac Disease

**Causes:** Eat gluten → inflammation in the intestines and damages the villi → cannot absorb nutrients properly → malnourished

**Symptoms:** abdominal bloating, pain, gas, diarrhea, pale stools, weight loss, severe skin rash, iron deficiency, muscle cramps, joint and bone pain, growth problems

**Diagnostic tools:** Discuss medical history  
Blood test → test for higher levels of antibodies  
Biopsy of small intestine → check for damage to villi

**Treatment:** Remove gluten from diet → villi healed within six months

Diabetes Mellitus type 1

**Causes:** Autoimmune disease → destroy the insulin-producing (islet) cells in the pancreas → produce little or no insulin

**Symptoms:** heavy thirst, increased hunger, dry mouth, nausea and vomiting, pain in belly, frequent urination (polyuria), unexplained weight loss, fatigue, blurred vision.

**Diagnostic tools:**  
Check blood sugar levels  
Check urine for glucose or chemicals your body makes when you don't have enough insulin

**Treatment:** Use insulin injections to control their blood sugar.

Diabetes Mellitus type 2

**Causes:** Overweight → insulin resistance. Bad communication between cells, broken beta cells.

**Symptoms:** heavy thirst, frequent urination, blurry vision, being irritable, tingling or numbness in your hands or feet, feeling worn out, wound that don't heal.

**Diagnostic tools:**  
Check blood sugar levels  
Fasting plasma glucose → measure blood sugar on an empty stomach  
Oral glucose tolerance test (OGTT) → check your blood glucose before and 2 hours after you drink a sweet drink.

**Treatment:** Healthy eating, regular exercise, diabetes medication or insulin therapy, blood sugar monitoring

Diabetes complication: ketoacidosis

**Causes:** Hallmark of diabetes type 1. Usually seen in previously undiagnosed diabetes, interruption of insulin therapy, the stress of intercurrent illness. → uncontrolled catabolism associated with insulin deficiency.

**Symptoms:** uncontrolled diabetes with acidosis, → prostration, hyperventilation, nausea, vomiting, abdominal pain

**Diagnostic tools:**  
Dipstick → hyperglycaemia  
Blood plasma → ketonaemia  
Arterial blood sample → blood gas analysis

**Treatment:** correction of

- Fluid loss with intravenous fluids
- Hyperglycemia with insulin
- Electrolyte disturbances
- Acid-base balance

Diabetes complication: retinopathy

**Causes:** Chronically high blood sugar from diabetes → damage to tiny blood vessels in the retina → diabetic retinopathy → leak fluid or hemorrhage in blood vessels → distorting vision.

**Symptoms:** Appearance of “floating” spots, without treatment → risk of permanent vision loss.

**Diagnostic tools:**  
 Visual acuity testing → ability to see  
 Tonometry → pressure inside eye  
 Pupil dilation

**Treatment:** Anti-VEGF Injection Therapy → block VEGF → reverse abnormal blood vessel growth and decrease fluid in retina

Diabetes complication: nephropathy

**Causes:** High blood sugar → kidneys filter too much blood → hard work → start to leak → useful protein is lost in urine

**Symptoms:** Fluid buildup, loss of sleep, poor appetite, upset stomach weakness, difficulty concentrating

**Diagnostic tools:** Blood pressure  
 Urine → check protein  
 Blood → check waste products  
 Organs → other complications for diabetes

**Treatment:** Tight control of blood glucose and blood pressure.  
 Low-protein diet → decrease proteins loss in urine and increase protein levels in blood.  
 Low blood pressure drugs: ACE inhibitors

Diabetes complication: neuropathy

**Causes:** Blood sugar levels too high for too long → nerve damage.

**Symptoms:** Usually affects the feet and legs, rare cases affect the arms, abdomen and back. Symptoms are tingling, numbness, nausea, pain problems with urination and weakness.

**Diagnostic tools:** On basis of symptoms and physical examination: blood pressure, heart rate, muscle strength and reflexes. Heart rate variability and ultrasound.

**Treatment:** Early symptoms usually get better when blood sugar is under control. Medications to help manage discomfort.

Gastro-Oesophageal Reflux Disease (GORD)

**Causes:** Pregnancy, obesity, smoking, fat, coffee, alcohol → abnormal relaxation of the LES → stomach acid back in the esophagus.

**Symptoms:** heartburn and swallow problems. Worsens by bending, stooping or lying. Pain by drinking hot liquids or alcohol.

**Diagnostic tools:** Usually without investigations. But if necessary: endoscopy or intraluminal monitoring

**Treatment:** Oral antacids  
 Raising the head of the bed at night  
 Loss of weight  
 Surgery  
 Reduction of alcohol and caffeine consumption

Hepatitis A

**Causes:** Hepatitis A (HAV) is a picornavirus, spread is mainly by the faeco-oral route and arises from the ingestion of contaminated food or water. Replicates in the liver, excreted in bile and then excreted in the faeces.

**Symptoms:** Nausea, anorexia, distaste for cigarettes. After 1 or 2 weeks symptoms often improve

**Diagnostic tools:** Liver biochemistry → serum bilirubin reflects level of jaundice. Haematological tests → leucopenia with a relative lymphocytosis.

Viral markers → antibodies to HAV

**Treatment:** Rest and dietary measures are helpful. Prevention → good hygiene, vaccination

Hepatitis B

**Causes:** HBV spreads via blood, sperm and vaginal fluids → STD. It also spreads from mother to child. It can lead to chronic hepatitis, cirrhosis and hepatocellular carcinoma.

**Symptoms:** acute viral hepatitis: general illness, loss of appetite, nausea, vomiting, body aches, mild fever, dark urine → jaundice. After few weeks it gradually improves in most people.

**Diagnostic tools:** Blood tests, ultrasound, CT, MRI, liver biopsy

**Treatment:** Almost always cures itself, promoted by good nutrition and lifestyle. Some cases: virus inhibitors

Hepatitis C

**Causes:** HCV spreads via blood and blood products → STD. Mother-to-child transmission (vertical) is very rare. Can lead to liver cirrhosis.

**Symptoms:** Most symptoms are asymptomatic, some patients have a mild-flu-like illness with jaundice

**Diagnostic tools:** Blood tests, HCV RNA can be detected from 1 to 8 weeks after infection. Ultrasound, CT, MRI, liver biopsy

**Treatment:** Mostly becomes chronic. Interferon has been used in acute cases to prevent chronic disease. Peinterferonen → stimulate own immune system and inhibit virus division  
 Antiviral Ribavirine → erase HCV out of the blood and body to prevent further liver damage.

Hepatitis D

**Causes:** Occurs in combination with hepatitis B. Transmission of HDV can occur via simultaneous infection with HBV. Caused by hepatitis D virus. It is unable to replicate on its own but is activated by the presence of HBV.

**Symptoms:** Worsens the symptoms of hepatitis B

**Diagnostic tools:**

**Treatment:** No specific treatment or vaccination. Can be prevented by vaccination for hepatitis B.

Hepatitis E

Hyperthyroidism

Hypothyroidism

Inflammatory bowel disease

**Causes:** HEV infection, via faecal-oral route, due to lack of hygiene. It reaches the liver probably via the portal vein.  
**Symptoms:** fever, nausea, abdominal pain, liver enlargement, decreased appetite. Symptoms easily mistaken for hepatitis A infection.  
**Diagnostic tools:** Based on the detection of specific IgM and IgG antibodies to the virus in the blood.  
**Treatment:** No treatment, only prevention: take care of good hygiene.

**Causes:** Graves' disease autoimmune process, Solitary toxic adenoma/nodule, de Quervain's thyroiditis → overactivity of the thyroid.  
**Symptoms:** Weight loss, increased appetite, irritability, restlessness, muscle weakness, tremor, thirst, vomiting, diarrhea.  
**Diagnostic tools:** Clinical markers are eye signs, a diffuse goiter (krop), proximal myopathy and wasting. Also weight loss despite a normal or increased appetite. Serum TSH is suppressed and free T4 or T3 levels hyperthyroidism are increased in hyperthyroidism.  
**Treatment:** Antithyroid drugs and radioactive iodine

**Causes:** Atrophic (autoimmune) hypothyroidism, Hashimoto's thyroiditis, iodine deficiency → underactivity of the thyroid.  
**Symptoms:** myxedema, dry-haired, thick-skinned, slow patients, weight gain, feeling cold, bradycardia, constipation  
**Diagnostic tools:** Serum TSH level high, and low free T4 level.  
**Treatment:** Replacement therapy with levothyroxine is given for life. Monitoring aim is to restore T4 and TSH to well within normal range.

**Causes:** Diet, stress, immune system malfunction  
**Symptoms:** diarrhea, fever, fatigue, abdominal pain and cramping, blood in stool, reduced appetite, unintended weight loss  
**Diagnostic tools:** Symptoms, tests for anemia or infection, fecal occult blood test, colonoscopy, upper endoscopy, X-ray, CT, MRI  
**Treatment:**  
 Anti-inflammatory drugs: aminosalicylates and corticosteroids  
 Antibiotics  
 Pain relievers  
 Iron supplements  
 Vitamin B12 shots

Crohn's Disease

Ulcerative Colitis

Irritable bowel syndrome

Liver Cirrhosis

**Causes:** Chronic inflammatory condition of the GI tract, but it most commonly affects the small bowel (ileum) and the beginning of the colon. It can affect the entire thickness of the bowel wall.  
**Symptoms:** Persistent diarrhea, rectal bleeding, abdominal cramps and pain, sensation of incomplete evacuation, constipation, fever, loss of appetite, weight loss, fatigue, night sweats.  
**Diagnostic tools:** Check sign of infection, inflammation, internal bleeding, low levels of substances, such as iron, protein, or minerals. X-rays, CT, colonoscopy, video capsule endoscopy.  
**Treatment:** Anti-inflammatory drugs (corticosteroids), immune system suppressors, antibiotics, external nutrition or surgery: remove a damaged portion of digestive tract and reconnect sections

**Causes:** Abnormal response by immune system → combination of inflammation and ulceration. Only affects the lining of the colon.  
**Symptoms:** Bowel movements become looser and more urgent, persistent diarrhea, cramps, abdominal pain, blood in stool, loss of appetite, weight loss, fatigue, delay growth and development in children.  
**Diagnostic tools:**  
 Blood test → check anemia  
 Stool sample → check white blood cells  
 Colonoscopy, CT, X-ray  
**Treatment:** Anti-inflammatory drugs (corticosteroids), immune system suppressors, antibiotics, pain relievers, surgery: remove entire colon and rectum

**Causes:** Factors that can trigger IBS are affective disorders (depression, anxiety), psychological stress and trauma, GI infection, antibiotic therapy, pelvic surgery, eating disorders → muscular contraction in your colon are abnormal → food moves too quickly or too slow  
**Symptoms:** Bloating, abdominal pain, nausea, joint hypermobility, back pain, headaches, bad breath, fatigue, not sleeping.  
**Diagnostic tools:** Based on medical history and physical exam: ruling out other conditions: ROME criteria → most important is recurring abdominal pain and problems with stool.  
**Treatment:** Constipation IBS with pharmacological treatment, pro- and prebiotics, diet, psychiatrist, Low FODMAP diet, hypnotherapy

**Causes:** Alcohol, hepatitis B (+D) or C, autoimmune hepatitis → necrosis of liver cells, followed by fibrosis and nodule formation.  
**Symptoms:** Abdominal pain, abnormal accumulation of fluid in abdominal cavity, dark urine, exhaustion, gallstones, itchy hands and feet, lack of appetite, nausea  
**Diagnostic tools:** Liver function: serum albumin and prothrombin time. Serum electrolytes: low sodium → severe liver. Ultrasound → Look for changes in size and shape liver  
**Treatment:** Depending on the cause of the disease. No alcohol, low sodium diet, medications to control hepatitis, weight loss

Peptic ulcer disease (ulcus pepticum)

**Causes:** Mostly *H. pylori*. Riskfactors are painkillers (NSAIDs), excessive drinking of alcohol, smoking, radiation treatment to the area → painful sores or ulcers in the lining of the stomach or duodenum

**Symptoms:** recurrent, burning epigastric pain, nausea, anorexia, weight loss, persistent and sever pain, back pain.

**Diagnostic tools:** Endoscopy, biopsy

**Treatment:** No alcohol, no smoking, (no NSAIDs).

Medications: proton pump inhibitors → reduce acid levels and allow ulcer to heal. Due to *H. pylori* → antibiotics.

Perforated ulcer

**Causes:** Most often caused by *H. pylori* bacteria or by NSAIDs that irritate the stomach lining → can perforate the lining of the stomach or intestine.

**Symptoms:** Severe abdominal pain, abdominal swelling, nausea, vomiting, fever.

**Diagnostic tools:** Taking an erect abdominal/chest X-ray, endoscopy

**Treatment:** Laparoscopic surgery is usually performed to close the perforation and drain the abdomen. Nasogastric suction, intravenous fluids and antibiotics are used in elderly and sick patients. Non-surgical management and observation as initial treatment.

Panreatitis

**Causes:** Digestive enzymes are activated before they are released into the small intestine and begin attacking the pancreas → inflammation of the pancreas

**Symptoms:** Abdominal pain that radiates into the back, swollen and tender abdomen, nausea and vomiting, fever, increased heart rate.

Chronic: weight loss caused by poor absorption of food. Diabetes may develop if the insulin-producing cells of the pancreas are damaged

**Diagnostic tools:** Measure blood levels of amylase and lipase. High levels → acute pancreatitis. Glucose tolerance test, ultrasound, CT and MRI.

**Treatment:** Treated with IV fluids and pain medications. Severe pancreatitis → surgery: remove the damaged tissue

Alzheimer's Disease

**Causes:** Progressive brain cell death. The total brain size shrinks with AD → fewer nerve cells and connections. Plaques are found between the dying cells in the brain and are build-up of a protein called beta-amyloid. Tangles are within the brain neurons, from a disintegration of tau.

**Symptoms:** Worsened ability to remember information, impaired reasoning, impaired speaking, changes in personality and behavior

**Diagnostic tools:** Medical history, physical examination, cognitive tests: MMSE, Clock drawing test.

**Treatment:** No cure, not reversible, symptomatic relief: cholinesterase inhibitor.

Parkinson (idiopathic)

**Causes:** Idiopathic → cause is unknown. Chronic, progressive, degenerative brain disorder

**Symptoms:** Tremor, rigidity and slowness of movement

**Diagnostic tools:** Symptomatic diagnosis, or by seeing if there is a response to medication

**Treatment:** No cure, but various therapies that may improve quality of life: exercise, rehabilitation, adequate nutrition.

Medications that may help are Levodopa, COMT inhibitors, Dopamine Agonists and MAO-B inhibitors

Bell's Palsy

**Causes:** Herpes virus → cold sores → the nerve that controls muscles on one side of the face is damaged by inflammation → weakness or paralysis of one side of the face

**Symptoms:** Sudden weakness or paralysis on one side of your face, drooling, eye problems, loss of ability to taste

**Diagnostic tools:** Asking questions about development, neurological exam to check facial nerve function. Blood tests, MRI, CT

**Treatment:** Most people recover completely without treatment, in 1-2 months. Some people → permanent weakness. Corticosteroid medicines (prednisone) → more likely that you will regain all facial movement.

Epilepsy

**Causes:** Stroke or TIA, dementia, brain injury, infections, congenital brain defect, brain tumor or other illness that damage or destroy brain tissue

**Symptoms:** Depends on the part of the brain affected and cause of epilepsy.

- Partial seizure: electrical discharge in limited party of the cortex: simple (without loss of awareness) or complex (with loss of awareness)
- Generalized seizure: electrical discharge in both hemispheres → loss of consciousness

**Diagnostic tools:** ECG → abnormal electrical activity. Blood test, MRI

**Treatment:** Anticonvulsants → may reduce the number of seizures. Medication does not work → surgery → remove abnormal brain cells or place a vagus nerve stimulator (VNS)

Cerebrovascular Disease

**Causes:** Atherosclerosis, embolism, aneurysms, low flow states, hypertension → stroke

**Symptoms:** Depend on location and type of cerebrovascular disease. Flaccid paralysis, spasticity, loose reflex, communication problems

**Diagnostic tools:** Clinical history, physical exam, neurological examination

**Treatment:** Medication: antiplatelets, blood thinners, antihypertensives and anti-diabetic medications. Surgery and lifestyle changes

Transient ischemic attack (TIA)

**Causes:** Blood clots that temporarily block blood flow to the brain. This is a result of atherosclerosis. Long-standing high blood pressure or diabetes may damage smaller blood vessels in the brain → blood clot

**Symptoms:** A TIA is a warning: you are likely to have a stroke in the future. Sudden and temporary (10-20 min): numbness, tingling, weakness or loss of movement in your face, arm or leg, vision changes, trouble speaking, confusion

**Diagnostic tools:** Description based, clinical evidence of a source of embolus, like atrial fibrillation, recent myocardial infarction.

**Treatment:** If necessary with medical therapy and surgical treatment if appropriate

Cerebral/brain infarction

**Causes:** An artery in your brain becomes completely blocked → no blood flow → death of area of tissue → ischemic stroke

**Risk factors:** diabetes, smoking, high blood pressure, obesity, hypercholesterolemia

**Symptoms:** Weakness and loss of sensation on the opposite side of the body in seconds, minutes or hours, abnormal pupil dilation, light reaction and lack of eye movement. Headache is unusual, consciousness is usually preserved.

**Diagnostic tools:** CT and MRI

**Treatment:** Removing the blockage by breaking the clot down (thrombolysis) or by removing it mechanically (thrombectomy).

Brain haemorrhage (intracranial, cerebral, subdural, epidural)

**Causes:** *Intracranial:* when a blood vessel within the skull is ruptured or leaks, due to physical trauma or ruptured aneurysm. *Subdural:* rupture of a vein, often due to head injury. *Epidural:* rupture of arteries, often due to trauma.

**Symptoms:** *Intracranial:* paralysis *Cerebellar:* head ache, often followed by stupor, paralysis of the eye, sometimes hydrocephalus (waterhoofd) *Subdural:* headache, drowsiness and confusion, focal deficits, sensory loss *Epidural:* head ache with lucid interval, followed by paralysis and unconsciousness.

**Diagnostic tools:** CT (and later MRI)

**Treatment:** Control of hypertension is vital. Urgent neurosurgical clot evacuation is occasionally necessary when there is deepening coma.

Subarachnoid haemorrhage (SAH)

**Causes:** Most often caused by a brain aneurysm. Weakened vessel → bulge → rupture → bleeding around the brain (between the brain and the tissues that cover the brain)

**Symptoms:** Sudden, severe headache, numbness throughout your body, shoulder pain, seizures, confusion, irritability, decreased vision, nausea, vomiting, rapid loss of alertness

**Diagnostic tools:** Physical exam: stiff neck and vision problems. CT of head → look for bleeding in skull. MRI, X-ray, ultrasound

**Treatment:** Surgery: to clip or close the aneurysm and stop future bleeding, craniotomy: opening skull to expose the area of involvement → endovascular coiling.

Migraine

**Causes:** A migraine begins when hyperactive nerve cells send out impulses to the blood vessels → clamp down or constrict → dilation and release of prostaglandins and serotonin. Triggers are fatigue, stress, caffeine, weather changes

**Symptoms:** Throbbing headache (aggravated by physical activity), nausea and vomiting, loss of appetite, fatigue, dizziness, blurred vision, diarrhea.

**Diagnostic tools:** History of headaches, description of headache symptoms.

**Treatment:** No cure, but pain relieving drugs, anti-nausea drugs, abortive medicines (stop migraines)

Neurogenic claudication

**Causes:** Result of lumbar spinal stenosis, or the narrowing of the spinal canal in the lumbar region → nerve compression on the spinal cord or the nerve roots.

**Symptoms:** Cramping, pain, weakness and tingling in the lumbar region (lower back), buttocks and legs

**Diagnostic tools:** MRI and CT

**Treatment:** Symptomatic relief and prevention of neurological sequelae. Pharmacologic therapy and physical therapy provide temporary relief.

Meningitis/encephalitis

**Causes:** Meningitis=hersenvliesontsteking Bacteria, viruses or fungi → inflammation of the protective membranes converting the brain and spinal cord. Encephalitis = hersenontsteking is caused by viruses (rabies, HIV or herpes) → acute infection and inflammation of the brain

**Symptoms:** Meningitis: headache, neck stiffness and fever, photophobia and vomiting. Encephalitis: same, but personality and behavioural change is common, which progresses to a reduced level of consciousness and coma. Long term → memory impairment, epilepsy.

**Diagnostic tools:** Lumbar puncture, to see if its due to a bacteria/virus. CT

**Treatment:** Bacterial infection: antibiotics. Fungi infection: penicillin. Virus: wait and rest until it's over.

(Poly) neuropathy

**Causes:** Diabetes, alcoholism, medications, infections, trauma, tumors → occlusion of the vasa nervorum (small arteries that provide blood supply to the peripheral nerves)

**Symptoms:** Muscle weakness, cramps, spasms, loss of balance, tingling, numbness, burning pain, abnormal blood pressure and heart rate, constipation, bladder dysfunction

**Diagnostic tools:** Neuropathy → neuropathic pain. so-DN4 pain scale → score 4 or more → neuropathic pain

**Treatment:** Drugs that act on the CNS (antidepressants and antiepileptic drugs) are useful in managing neuropathic pain.

#### Anaemia

**Causes:** Blood loss, decreased or faulty red blood cell production, destruction of red blood cells → blood lacks healthy red blood cells or hemoglobin. → cells in your body will not get enough oxygen.

**Symptoms:** fatigue, unusually rapid heartbeat, shortness of breath, difficulty concentrating, dizziness, pale skin, leg cramps, insomnia

**Diagnostic tools:** Medical history, physical exam and blood tests

**Treatment:** Caused by blood loss: treated with fluids, blood transfusion, oxygen and possible iron. Chronic blood loss: stop the bleeding.  
Caused by iron deficiency: iron supplements.

#### Arterial and venous thrombosis

**Causes:** Smoking, obesity, high blood pressure, increasing age, diabetes and family history → formation of thrombosis in artery or vein.

**Symptoms:** Swelling, pain, discoloration of the affected extremity, calf tenderness, unilateral edema, warmth, venous dilation

**Diagnostic tools:** Medical history and physical exam, ultrasounds, MRI and CT.

**Treatment:** Anticoagulant (blood thinning) medication, catheters, stent placement, antiplatelets.

#### Cardiac arrest

**Causes:** Ventricular fibrillation or rapid ventricular tachycardia, bradyarrhythmias → the end of normal circulation of the blood due to failure of the heart to contract effectively (hartstilstand).

**Symptoms:** Loss of consciousness → abnormal or absent breathing. Brain injury is likely if cardiac arrest goes untreated for more than five minutes

**Diagnostic tools:** Clinically by the absence of a pulse, lack of carotid pulse is the golden standard for diagnosing → ECG

**Treatment:** Immediate and decisive treatment is imperative: Ventricular fibrillation, defibrillation, cardiopulmonary resuscitation and drugs. Asystole can be treated with vasopressin. Implantable cardioverter-defibrillator.

#### Cardia arrhythmias

**Causes:** Heart disease, wrong balance of electrolytes in blood, changes in your heart muscle, injury from a heart attack, healing process after heart surgery → heartbeat is irregular.

**Symptoms:** Palpitation (feeling of skipped heart beats), pounding in your chest, dizziness, fainting, shortness of breath, chest pain, weakness and fatigue.

**Diagnostic tools:** Physical exam by taking your pulse or ECG.

**Treatment:** Depends on the severity: Antiarrhythmic drugs: beta-blockers and calcium channel blockers → control heart rhythm. Anticoagulant or antiplatelet therapy: drugs that lower the risk of blood clots and stroke. Surgery, pacemaker, Implantable Cardioverter Defibrillator (ICD)

#### (Congestive) heart failure

**Causes:** Coronary artery disease, heart attack, cardiomyopathy, overwork of the heart → heart's pumping power is weaker than normal → blood moves through the heart and body at a slower rate → not enough oxygen and nutrients

**Symptoms:** Congested lungs, fluid and water retention, dizziness, fatigue, weakness, rapid or irregular heartbeats

**Diagnostic tools:** Medical history, symptoms, physical exam: listen to heart, ECG, X-ray, blood test

**Treatment:** Goal is to decrease the likelihood of disease progression: tight control over your medications and lifestyle, coupled with careful monitoring. ACE inhibitors, beta-blockers, pacemaker

#### Coronary artery disease = ischaemic heart disease

**Causes:** Result of plaque build-up in your coronary arteries (atherosclerosis) → blockages. The heart becomes starved of oxygen and the vital nutrients it needs to pump properly.

**Symptoms:** Angina (chest pain), shortness of breath, palpitations (irregular heartbeats), faster heartbeat, weakness, dizziness, nausea, sweating.

**Diagnostic tools:** Medical history, symptoms, physical exam, ECG, stress tests, CT.

**Treatment:** Reduce risk factors, medications (drugs depend on specific heart problem), surgery: balloon angioplasty (PTCA), stent placement, coronary artery bypass surgery.

#### Angina pectoris

**Causes:** Smoking, diabetes, family history, kidney disease, obesity, physical inactivity, prolonged stress → obstruction or spasm of the coronary arteries → ischemia of the heart muscle → chest pain.

**Symptoms:** Chest pain situated behind the sternum (borstbeen) and may radiate to the jaw and/or arms. It is provoked by physical exertion, especially after meals and in cold weather or by anger or excitement. It is relieved (usually within minutes) with rest.

**Diagnostic tools:** Largely based on clinical history. During attack, transient ST depression, T wave inversion or other changes of the shape of the T wave may appear with an ECG.

**Treatment:** Reduction of risk factors, underlying problems should be treated (anaemia or hyperthyroidism)

#### Hyperlipidaemia / hypercholesterolemia

**Causes:** Hypothyroidism, diabetes, obesity, renal impairment, nephrotic syndrome, dysglobulinaemia, hepatic dysfunction, alcohol, drugs → high levels of cholesterol in the blood.

**Symptoms:** Normally no symptoms, but it can lead to CVD.

**Diagnostic tools:** Blood tests → measuring cholesterol level. Under 5.0 mmol/L is normal, above 6.5 mmol/L is too high

**Treatment:** Lipid-lowering diet. Statins are the most widely used lipid-lowering agents.

#### Hypertension

**Causes:** Unknown, but risk factors are genetics, low birth weight, obesity, alcohol intake, sodium intake, stress, arterial stiffness, NSAIDs  
**Symptoms:** Headaches, epistaxis (bleeding of the nose) or nocturia (urinate at night)  
**Diagnostic tools:** Measuring blood pressure. Normal BP: 120/80.  
Hypertension: BP: >140/>90.  
Hypertension grade 2 (>160) → treatment  
**Treatment:** Lose weight, more exercise, reduce fat intake and salt intake, increase fish oil intake.  
Drugs: ACE inhibitors or angiotensin receptor antagonists, beta-blockers, calcium-channel blockers or diuretics.

#### Myocardial infarction

**Causes:** Interruption of blood supply to a part of the heart → heart cells die. This can be due to an embolism. Risk factors are atherosclerosis, stress of physical exertion, high blood pressure, diabetes, smoking, obesity, alcohol  
**Symptoms:** Chest pain, deterioration of pre-existing angina. Atypical: indigestion, pleuritic chest pain, dyspnea.  
**Diagnostic tools:** Troponin and CK-MB in the blood are elevated.  
ECG → ST depression and T wave inversion can be seen  
MRI  
**Treatment:** Drugs: thrombolytic therapy, antiplatelets, heparin, beta-blockers, ACE-inhibitors  
Percutaneous coronary intervention: dottering.  
Bypass surgery

#### Pericarditis

**Causes:** Viruses, post-myocardial infarction, bacteria, tuberculosis, fungi → inflammation of the pericardium (hartzakje)  
**Symptoms:** Sharp central chest pain by movement, respiration and lying down, but relieved by sitting forward. Chest pain may refer to the neck or shoulders, fever  
**Diagnostic tools:** Based on serological test of pericardial fluid and identification of organisms in pericardial or myocardial biopsies. ECG: widespread concave-upwards ST elevation, reciprocal ST depression.  
**Treatment:** Bed rest and oral NSAIDs are effective in most patients

#### Peripheral arterial disease / vascular disease

**Causes:** Atherosclerosis, inflammatory processes leading to stenosis, an embolism, thrombus → obstruction of large arteries not within the coronary, aortic arch vasculature, or brain but in the limbs.  
**Symptoms:** The lower limbs are cold with dry skin and lack of hair. Pulses may be diminished or absent. Ulceration with dark discoloration of toes or gangrene.  
**Diagnostic tools:** Duplex ultrasound using B-mode ultrasound and color Doppler can provide an accurate anatomical map of lower limbs.  
**Treatment:** Exercise, avoid obesity, dottering  
Acute ischemia: surgery: bypass  
Severe ischemia: amputation

#### Intermittent claudication

**Causes:** Most often a symptom of peripheral artery disease, in which the arteries that supply blood to your limbs are damaged, due to atherosclerosis → muscle pain  
**Symptoms:** Pain when exercising, in feet, calves, thighs, hips or buttocks, intermittent pain, pain at rest, discolored skin or ulcerations, aching or burning feeling, weakness.  
**Diagnostic tools:** Check pulses in feet, MRI, CT  
**Treatment:** Medications: aspirin, anti-clotting-medication, cholesterol-lowering drug.  
Angioplasty: widens damaged arteries  
Vascular surgery: takes healthy blood vessel from another part of your body.

#### Acute ischaemia of the leg (acute lower limb ischaemia)

**Causes:** Due to an embolism or thrombosis → a sudden decrease in the blood flow to a limb. Risk factors are atherosclerosis, smoking and diabetes.  
**Symptoms:** Pain, paleness, paresthesias, poikilothermia, pulselessness, paralysis  
**Diagnostic tools:** Heart rate, CT, MRI  
**Treatment:** Surgery: vascular bypass.  
Pharmacological thrombolysis.

#### Abdominal Aortic Aneurysm

**Causes:** Atherosclerosis, genetics, aging, infections, injury, inflammation, tobacco use → aortic aneurysms in the abdomen  
**Symptoms:** Pulsating feeling near the navel, deep, constant pain in abdomen, back pain.  
**Diagnostic tools:** X-ray, ultrasound, CT, MRI  
**Treatment:** Small aneurysm (<4 cm): watch and wait  
Medium aneurysm (4-5.3 cm): watch and wait or surgery.  
Large, fast-growing or leaking aneurysm (>5.3 cm): open-abdominal surgery: removing the damaged section of the aorta and replacing it with a synthetic tube. Endovascular surgery: repair an aneurysm

#### Variouse veins

**Causes:** Dysfunctioning of the veins → the walls of the veins stretch and become less flexible → weakens the valves and stop them from working properly → blood leaks backwards in the vein → swell  
Risk factors are obesity, smoking, high blood pressure, pregnancy and age.  
**Symptoms:** Skin may change color and becomes irritated or swollen.  
Inflammation or bleeding, ulcer formation, worsens when standing long.  
**Diagnostic tools:** Can be seen at the skin, ultrasound → check blood flow  
**Treatment:** Lifestyle changes: avoid standing for extended periods, avoid excessive sun exposure, lose weight, exercise, elevate legs when resting or sleeping.

**Causes:** Congenital (before birth), acquired during lifetime, or a result of an infection → changes in the structure of your heart valves as a result of mineral deposits on the valve or surrounding tissue

**Symptoms:** Shortness of breath, dizziness, pressure on chest, heart palpitations, swelling in your ankles, feet or belly, sudden weight gain

**Diagnostic tools:** Symptoms, listening to heart (hear valves open and close), conducting echocardiogram, MRI, X-ray, ECG.

**Treatment:** Medication, minimally invasive procedures → corrects a heart valve that is not functioning properly, open-heart surgery → replacing damaged heart valve.

**Causes:** Occurs when electrical system to the heart malfunctions and suddenly becomes very irregular → ventricles may flutter or quiver → blood is not delivered to the body. Most are caused by arrhythmias.

**Symptoms:** Racing heartbeat or feeling dizzy. In most cases it occurs without prior symptoms: unconsciousness.

**Diagnostic tools:** ECG → disturbances  
Blood tests → check potassium, magnesium, hormones.

X-ray → check size and shape of heart  
**Treatment:** Emergency action must take place immediately → CPR, defibrillation

**Causes:** Bacteria, such as Streptococcus, Staphylococcus and E. Coli

**Symptoms:** Depends on the location of the infection

**Diagnostic tools:** Medical history and physical examination → localize the infection.

**Treatment:** Antibiotics are the usual treatment

**Causes:** Most cases are caused by a type of *E. Coli* bacteria → enter urinary tract through the urethra and begin to multiply. May occur in women as a result of sexual intercourse.

**Symptoms:** Strong, persistent urge to urinate, burning sensation when urinating, small amounts of urine, blood in the urine (hematuria), strong-smelling urine, pelvic discomfort, pressure in the lower abdomen, low-grade fever.

**Diagnostic tools:** Urine analysis → determine whether bacteria, blood or pus is in urine

**Treatment:** First-time infection: antibiotic treatment for 3-7 days  
Repeat infection: longer antibiotic treatment.

**Causes:** Fungal infection that can affect areas such as the skin, genitals, throat, mouth and blood. Caused by the overgrowth of a type of yeast called *Candida albicans*. This yeast is normally found in small amount in the human body

**Symptoms:** Most common are in vagina and mouth (Thrush) → itching, soreness, white spots, redness, painful.

**Diagnostic tools:** The fungi can be demonstrated in scrapings from infected lesions, tissue secretions or in invasive disease from blood cultures

**Treatment:** Depending on the site and severity of the infection. Oral → local nystatin or amphotericin B.  
Systemic infection → parental therapy with amphotericin B, fluconazole.

**Causes:** STD, caused by genital infection of the intracellular bacteria Chlamydia Trachomatis.

**Symptoms:** Up to 80% is asymptomatic. Vaginal or penis discharge, post-coital or intramenstrual bleeding, lower abdominal pain, reactive arthritis, painful urination, painful sex.

**Diagnostic tools:** Cell culture techniques (golden standard)

**Treatment:** Most common: tetracyclines or macrolide antibiotics. Tracing sexual contacts.

**Causes:** Bacteria, viruses, lupus, diabetic nephropathy → inflammation of the kidney's glomeruli.

**Symptoms:** Red blood cells in urine (hematuria), protein in urine (proteinuria), hypertension, edema in face, hands, feet and abdomen, kidney failure → anemia → fatigue

**Diagnostic tools:** Urine test → check protein, red and white blood cells  
Blood test

X-ray, ultrasound, CT  
Kidney biopsy

**Treatment:** Depends on the cause.  
Bacteria → antibiotic  
Lupus → corticosteroids and immune-suppressing drugs  
IgA nephropathy → fish supplements

**Causes:** Gram-negative intracellular diplococcus *Neisseria gonorrhoeae* (STD) → infection in the urogenital tract, rectum, pharynx and conjunctivae.

**Symptoms:** Dysuria, increased discharge, pelvic pain, intermenstrual bleeding, infertility.

**Diagnostic tools:** Microscopy of gram-stained secretions, blood cultures, urine test, swab of affected area.

**Treatment:** Antibiotics depending on history patient and test which strain.

Herpes Simplex Virus Infection

HSV-1: oral herpes  
 HSV-2: genital herpes  
**Causes:** HSV-1 can happen from general interactions. HSV-2 is contracted through forms of sexual contact.  
**Symptoms:** Blistering sores (in mouth or on the genitals), pain during urination (HSV-2), itching  
**Diagnostic tools:** Physical exam: check sores. HSV testing → take swab sample of fluid from sore.  
 Blood tests → check for antibodies to HSV-1 and HSV-2  
**Treatment:** No cure, treatment for getting rid of sores and limiting outbreaks → medications.

HIV

Viral infection that destroys CD4 cells → IS weakens  
**Causes:** HIV infected blood, semen or vaginal secretions must enter your body → having sex, blood transfusions, sharing needles, during pregnancy, delivery or breast-feeding.  
**Symptoms:** HIV: fever, headache, muscle aches and joint pain, rash, sore throat, swollen lymph glands.  
 AIDS: soaking night sweats, recurring fever, chronic diarrhea, persistent whit spots in mouth, fatigue, weight loss, skin rashes.  
**Diagnostic tools:** Blood test or saliva test → check for antibodies to the virus (but are present from 12 weeks after infection)  
**Treatment:** No cure, but anti-HIV drugs blocks the virus in different ways.

Prostatitis

**Causes:** Bacteria (when bacteria carried in urine leaks into prostate) → inflammation of the prostate.  
**Symptoms:** Pain when urinating (dysuria), frequent urination (nocturia), pain in abdomen, groin or lower back, pain in area between scrotum and rectum, pain in penis or testicles, painful orgasms, flu-like symptoms  
**Diagnostic tools:** Blood culture, urine tests, bladder tests  
**Treatment:** Antibiotics, alpha blockers, NSAIDs.

Pyelonephritis

When UTI progresses to involve the upper urinary system (kidneys and ureters)  
**Causes:** Complications of bladder infections → bacteria enter the body from the skin around the urethra → travel up the urethra to the bladder → travel up the ureters to one or both kidneys  
**Symptoms:** Back pain, fever, nausea, vomiting, blood in urine (hematuria), cloudy urine, pain when urinating, increased frequency or urgency to urinate  
**Diagnostic tools:** History, vital signs, press kidneys to check tenderness, urine culture, blood culture, CT, ultrasound.  
**Treatment:** Antibiotics

Renal Disease

**Causes:** Acute: lack of blood flow to the kidneys, direct damage to the kidneys or urine backed up in the kidneys. Chronic: kidneys that don't work well for longer than 3 months.  
 Can be caused by diabetes, hypertension, UTI, inflammation in kidneys, drugs, toxins  
**Symptoms:** Nausea, vomiting, loss of appetite, fatigue, sleep problems, changes in urine output, muscle cramps, hiccups, swelling of feet and ankles, persistent itching, chest pain, shortness of breath.  
**Diagnostic tools:** Blood tests → look at level for waste products. Urine tests, ultrasound, kidney biopsy.  
**Treatment:** Cure the cause, and manage symptoms. Hypertension medication: ACE inhibitors. Medication to lower cholesterol levels an anemia.

Renal calculi / nephrolithiasis/urolithiasis

Kidney stones  
**Causes:** Stone formation in the kidney, made from calcium oxalate, uric acid, struvite or cysteine. Risk factors are obesity, dehydration, high-protein, salt or glucose diet, gastric bypass surgery IBD and medications such as diuretics, anti-seizure drugs, and calcium-based antacids  
**Symptoms:** Severe pain (renal colic) on one side of your back or abdomen, blood in urine, vomiting, nausea, discolored and smelling urine, fever, frequent need to urinate and urinate small amounts urine.  
**Diagnostic tools:** Blood tests for calcium, blood urea nitrogen, urinalysis to check crystals, bacteria, blood and white cells.  
**Treatment:** Drink a lot → increased urine flow, medication for pain relief, surgery → stones are removed.

Sexually transmitted disease

**Causes:** Bacteria, parasites and viruses. More than 20 types of STDs.  
**Symptoms:** painful urination, lower abdominal pain, discharge, pain during sexual intercourse bleeding periods in women, testicular pain in men.  
**Diagnostic tools:** Physical examination: pelvic exam. Medical history, blood test and culture. Urine test.  
**Treatment:** Antibiotics, anti-HIV drugs.

Syphilis

**Causes:** Treponema pallidum bacterium, through contact with an infected person's sore during sexual activity (STD), during pregnancy, childbirth, toilet, etc.  
**Symptoms:** Primary: small sore (chancre). Secondary: chancre is healing, but rash begins, itchy and sores in the mouth or genital area. Muscle aches, fever, sore throat, swollen lymph nodes.  
**Diagnostic tools:** Blood sample → check antibodies. Fluid from sores → check presence of bacteria  
**Treatment:** Antibiotics: penicillin.

**Causes:** Sexual Transmitted Infection, caused by the parasite *Trichomonas vaginalis*.

**Symptoms:** Vaginal discharge, blood spotting, burning or itching sensation in the genitals, genital redness or swelling, urge to urinate frequently, pain during urination or sexual intercourse.

**Diagnostic tools:** Test cell cultures, antigen tests, tests that look for the presence of *Trichomonas* DNA, examining samples of vaginal fluid or urine under microscope

**Treatment:** Antibiotics.

**Causes:** Most breast cancers arise from the epithelial cells of the milk ducts and reproduce their histological features in a variety of patterns. Inherited Breast Cancer: due to a mutation in the BRCA1 or BRCA2 gene

**Symptoms:** Swelling of (part of) the breast, skin irritation or dimpling, breast pain, nipple pain, the nipple turning inward, redness, scaliness, thickening of the nipple or breast skin.

**Diagnostic tools:** Mammography (lumps can be seen), ultrasound, MRI, biopsy of the breast (malignant cell can be found)

**Treatment:** Surgery (lumpectomy = weghalen tumor) and node biopsy  
Radiotherapy  
Chemotherapy

**Causes:** Benign enlargement of the prostate gland, but the cause is unknown. Risk factors are obesity, age and family history.

**Symptoms:** Enlargement of the gland → stretches and distorts the urethra → obstructing bladder outflow. Frequency of urination, difficulty in initiating urination, acute retention of urine. Prostate cancer may cause pain, difficulty in urinating, erectile dysfunction and hematuria.

**Diagnostic tools:** Rectal examination → a benign prostate feels smooth.

In prostate cancer: blood tests → raised serum PSA. Ultrasound-guided needle biopsy. MRI.

**Treatment:** Watchful waiting, alpha-blockers, urethral catheter drainage. Prostate cancer: surgery, radio therapy, androgen receptor blockers

**Causes:** Unknown. Risk factors are ionizing radiation and family history.  
**Symptoms:** Mass lesions within the brain produce symptoms and signs by three mechanisms:

- Direct effect → brain is infiltrated and local function is impaired
- Secondary effects → raised intracranial pressure

- Provoking generalized and/or partial seizures and changes in mood

**Diagnostic tools:** CT + MRI, biopsy, MR angiography → define blood supply  
PET → locate primary tumor  
X-ray → look for metastases

**Treatment:** Biopsy and tumor removal, but not always possible. For edema surrounding a tumor → steroids.  
Epilepsy → anticonvulsants  
Gliomas and metastases → radiotherapy

**Causes:** *Atrocytomas* are gliomas that arise from astrocytes (nerve cell in the brain and spinal cord).

*Oligodendrogliomas* arise from oligodendrocytes → grow slowly

**Symptoms:** Produce symptoms by three mechanisms:

- Direct effect → brain is infiltrated and local function is impaired
- Secondary effects → raised intracranial pressure

- Provoking generalized and/or partial seizures and changes in mood

**Diagnostic tools:** CT, MRI, biopsy, X-ray, PET

**Treatment:** Biopsy and tumor removal, but not always possible or necessary. Epilepsy is treated with anticonvulsants. Metastases and gliomas, radiotherapy is usually given and improves survival.

Tumors arising from the meninges, the membranous layers surrounding the CNS. Benign tumors that may grow to large size

**Causes:** Sporadic, radiation, brain injury, familial

**Symptoms:** Many are asymptomatic. Close to the skull → erode bone or cause local hyperostosis (excessive growth of bone). Symptoms depend on the location: focal seizures, weakness in legs and incontinence, diplopia (double vision)

**Diagnostic tools:** CT, MRI

**Treatment:** Removing by surgery, stereotactic radiotherapy.

Medical term for most common cancer. >98% lung cancer is carcinoma. Nearly all breast cancers are ductal carcinoma. Adenocarcinoma is most common for prostate, colon, rectum and pancreas.

**Causes:** Mostly unknown, probably mix of genetic predispositions and environmental factors as smoking, alcohol diet, obesity, sun exposure, medication and radiation.

**Symptoms:** Depending on the affected site. Coughing, difficulties swallowing, thickening or spot of the skin, lump, changing defecation pattern, unintended weight loss

**Diagnostic tools:** Biopsy, check lymph nodes, X-ray, ultrasound, CT, MRI, PET

**Treatment:** Surgery, radiotherapy, chemotherapy (or both). Targeted therapy such as immunotherapy

Third most common cancer worldwide.  
**Causes:** Most develop as a result of a stepwise progression from normal mucosa → adenoma → invasive cancer. Family history and age are risk factors.

**Symptoms:** Change in bowel habits with looser and more frequent stools, rectal bleeding, tenesmus (pijn bij poepen/plassen) and symptoms of anemia.

**Diagnostic tools:** Colonoscopy, CT, PET

**Treatment:** Surgery, chemotherapy, chemoradiation.

#### Gastric cancer

Fourth most common cancer world-wide  
**Causes:** *H. pylori* infection, dietary factors, smoking, genetics.  
**Symptoms:** Epigastric pain (abdominal tenderness) → may be relieved by foods and antacids. Anorexia, weight loss, nausea, vomiting, dysphagia  
**Diagnostic tools:** Gastroscopy, CT, ultrasound, laparoscopy, PET  
**Treatment:** Surgery, combined chemo-radiotherapy

#### Liver carcinoma

**Causes:** Most common as a secondary tumor, from the GI tract, breast or bronchus. Carriers of HBV or HCV have a high risk of developing Hepatocellular carcinoma (HCC), also cirrhosis, smoking, alcohol, diet, asbestos and drugs.  
**Symptoms:** Secondary: weight loss, malaise, upper abdominal pain, hepatomegaly, with or without jaundice. HCC: weight loss, anorexia, fever, ache in the right hypochondrium and ascites.  
**Diagnostic tools:** Secondary: Ultrasound, CT, MRI, look for primary tumor. Serum alkaline phosphatase is mostly raised. HCC: Serum alpha-fetoprotein may be raised. Ultrasound, CT, MRI, biopsy.  
**Treatment:** Secondary: remove primary tumor and hepatic resection. Surgery, chemotherapy, radiotherapy. HCC: Surgical resection, liver transplantation

#### Lung carcinoma

**Causes:** Tobacco, alcohol, diet, asbestos, combustion of fossil fuels releasing polycyclic hydrocarbons  
**Symptoms:** Cough (sometimes blood), chest pain, malaise, weight loss, shortness of breath, hoarseness  
**Diagnostic tools:** Chest X-ray, CT  
**Treatment:** Depends on histological type of cancer and stage: surgery, chemotherapy, radiotherapy

#### Mesothelioma

**Causes:** Exposure to asbestos → transformed cells originating in the mesothelium. Develops mostly in the pleura, peritoneum (lining of abdominal cavity), pericardium or the tunica vaginalis  
**Symptoms:** Pleural effusion, chest wall pain, restrictive ventilator defect, increasing dyspnea, shortness of breath, unexplained weight loss  
**Diagnostic tools:** X-ray → pleural effusion can be seen. Video-assisted thoracoscopic lung biopsy  
**Treatment:** Chemotherapy, sometimes combined with surgery.

#### Oesophageal cancer

Sixth most common cancer worldwide.  
**Causes:** There are two types:  
- Primarily squamous cell cancer: arises from the cells that line the upper part of the esophagus.  
- Adenocarcinoma: arises from glandular cells that are present at the junction of the esophagus and stomach.  
Risk factors are smoking, alcohol, coeliac disease, obesity, red meat  
**Symptoms:** Dysphagia (difficulty in swallowing), weight loss, coughing or hoarseness, achalasia, fatigue.  
**Diagnostic tools:** Endoscopy, barium swallow  
**Treatment:** Surgery, chemoradiation

#### Pancreas carcinoma

**Causes:** Age, smoking, alcohol, aspirin, diabetes, chronic pancreatitis, genetics  
**Symptoms:** No symptoms, thromboembolic phenomena → blocking of blood vessels by blood clot, Poly arthritis and skin nodules  
**Diagnostic tools:** Transabdominal ultrasound, CT, laparoscopy, biopsy  
**Treatment:** Operate, 5 year survival rate is 2-5%

#### Prostate carcinoma

**Causes:** Risk factors are age, being black, family history of prostate or breast cancer and obesity.  
**Symptoms:** No symptoms, trouble urinating, decreased force in the stream of urine, blood in the semen, discomfort in the pelvic area, bone pain, erectile dysfunction  
**Diagnostic tools:** Rectal examination, prostate-specific antigen test, ultrasound, biopsy.  
**Treatment:** Radiation therapy, hormone therapy, surgery, chemotherapy, freezing prostate tissue.

#### Renal tumour (and urothelial tumours)

**Causes:** Risk factors are smoking, and genetics. Rarely present before the age of 40.  
**Symptoms:** Often asymptomatic, hematuria, loin pain, malaise, anorexia, weight loss, hypertension, fever.  
**Diagnostic tools:** Ultrasound, CT, MRI  
**Treatment:** Nephrectomy (removal of the kidney). In case of metastasis: Surgery and:  
- Radiation  
- Chemotherapy  
- Immunotherapy

Osteoporosis (Rheumatology)

**Causes:** Genetics, nutrition, sex hormone status, physical activity, oestrogen deficiency, vitamin D insufficiency, consequent hyperparathyroidism

**Symptoms:** Increase in fracture risk, with osteoporotic fractures of the spine causing acute pain or deformity and postural back pain.

**Diagnostic tools:** Radiographs, CT or ultrasound

**Treatment:** Bisphosphonate

Tinnitus

Oorsuizen

**Causes:** Can be associated with vascular malformation (e.g. aneurysms or vascular tumors), hearing loss or trauma, due to awareness of neural activity in the auditory pathways.

**Symptoms:** Hissing or ringing in their ears → much distress

**Diagnostic tools:** Patient's history

**Treatment:** Difficult, a tinnitus masker (mechanically produced continuous soft sound) can help.

Tuberculosis

**Causes:** Airborne infection spread via respiratory droplets. It is caused by four mycobacterial species: Mycobacterium Tuberculosis complex (MTb). Only a small number of bacteria need to be inhaled to develop infection.

**Symptoms:** Cough, hemoptysis, weight loss, fever, sweats, hoarse voice.

**Diagnostic tools:** X-ray of the chest → identification of the presence of bacteria by immediate stains. Culture of the sample → determination of antibiotic sensitivity of the infecting stain.

**Treatment:** Prednison, 2HRZE

Prevention → screening and vaccinations

Depression

**Causes:** Multi-factorial, mixture of genetics and environmental factors, such as sleep pattern, childhood traumas, personality, social factors.

**Symptoms:** Fatigue, headache, insomnia, poor appetite, weight loss, disturbances in mood, speech, energy and ideas.

**Diagnostic tools:** Physical investigations should be guided by the history and examination:

Measurement of T4 and TSH, calcium, sodium, potassium, hemoglobin

**Treatment:** Mixture of CBT and antidepressant.

Premature menopause

Menopause before the age of 40

**Causes:** Ovarian failure (may be autoimmune), genetics, may occur surgically (radiotherapy)

**Symptoms:** Irregular or missed periods, hot flashes, periods that are heavier or lighter than usual, vaginal dryness, bladder irritability, emotional changes, sleeplessness, decreased sex drive

**Diagnostic tools:** FSH level measurement, low levels of estradiol → can indicate that ovaries are starting to fail.

**Treatment:** HRT (hormone replacement therapy) can be very good at relieving moderate to severe menopausal symptoms and preventing bone loss

Skin infection

**Causes:** Bacteria, viral, fungal → can result in skin inflammation.

**Symptoms:** Rash

**Diagnostic tools:** Blood count (white blood cells elevated)

**Treatment:** Antibiotics, taking good care of any break in the skin

Spinal cord compression

**Causes:** Develops when spinal cord is compressed by bone fragments from a vertebral fracture (tumor, abscess, etc.)

**Symptoms:** Spastic paraparesis or tetraparesis, radicular pain at the level of compression, sensory loss below the compression.

**Diagnostic tools:** MRI, X-ray

**Treatment:** Surgical exploration is often necessary. Radiotherapy is used to treat cord malignancies.

Back pain

**Causes:** Mechanical problems, injuries, acquired conditions and diseases, infections and tumors.

**Symptoms:** Persistent aching or stiffness along spine, sharp, localized pain in neck, upper back or lower back, inability to stand straight without having pain or muscle spasms. It can radiates from the low back to the buttock, down the back of the thigh, into the calf and toes.

**Diagnostic tools:** Medical history, physical examination (walk on heels or toes, check reflexes), MRI, CT.

**Treatment:** Pain-reducing medication, surgery.

Mechanical low back pain (lumbago)

**Causes:** Majority from benign musculoskeletal problems. Risk factors are: female sex, increasing age, pre-existing chronic widespread pain, psychosocial factors (distress etc.)

**Symptoms:** Back is stiff and a scoliosis (kromlopen) may be present when patient is standing. Muscular spasm is visible and palpable and causes local pain and tenderness. It lessens when sitting or lying

**Diagnostic tools:** Symptomatically treated without exact determination of the underlying cause. Sometimes X-ray, CT or MRI.

**Treatment:** Pain relief and physiotherapy, acupuncture, not excessive rest, re-education of lifting. Short term use of pain and anti-inflammatory medications, such as NSAIDs. Surgery when conservative treatment is not effective.

Anorexia nervosa

**Causes:** Genetics may be involved, obsessive-compulsive personality, extreme drive for perfectionism, high levels of anxiety, social pressure

**Symptoms:** Extreme weight loss, abnormal blood counts, fatigue, insomnia, dizziness or fainting, bluish discoloration of the fingers, hair that falls out, soft hair covering the body, absence of menstruation, irregular heart rhythms, low blood pressure, dehydration, irritability, preoccupation with food, refusal to eat, flat mood.

**Diagnostic tools:** Physical exam: check BMI, heart rate, blood pressure. Lab tests, psychological evaluation. X-ray → check bone density

**Treatment:** Hospitalization for medical complications. Psychotherapy.

Oesophageal varices

**Causes:** Severe liver scarring, blood clot, parasitic infection → increasing pressure in the large vein → blood seeks alternate pathways through smaller veins, such as those in the lowest part of the esophagus → balloon with the extra blood, sometimes rupture

**Symptoms:** Only symptoms when they bleed: vomiting blood, black or bloody stools, in severe cases a shock

**Diagnostic tools:** Endoscope → search dilated veins, CT and MRI

**Treatment:** prevent bleeding or stop bleeding. Tie off bleeding veins. Injecting a solution into bleeding veins. Medications to slow blood flow into the portal vein. Replacing liver

Hernia nucleus pulposus

**Causes:** General wear and tear, traumatic injury to lumbar discs. Also a strong genetic component: mutations in MMP2 and THBS2 → contribute to lumbar disc herniation

**Symptoms:** Depending on the location, can vary from no pain in injured disc to severe pain. Numbness, tingling, muscular weakness, paralysis, paresthesia, and affection of reflexes

**Diagnostic tools:** Based on history, symptoms and physical examination. MRI, CT or X-ray

**Treatment:** Minor hernias heal within several weeks. NSAIDs can reduce pain. Severe hernias may require surgical interventions or an injection with cortisone into the spine to reduce pain.

Torsio testis/testicular torsion

**Causes:** When the testicle rotates on the spermatic cord → brings blood to the testicle from the abdomen. Several times → blood flow can be blocked.

**Symptoms:** Sudden, severe pain in the scrotum, swelling of the scrotum, abdominal pain, nausea and vomiting, painful urination, fever.

**Diagnostic tools:** Physical exam of the scrotum, testicles, abdomen and groin. Test reflexes. Urine test → check infection. Scrotal ultrasound → check blood flow. Surgery

**Treatment:** Sometimes, doctor can untwist the testicle by pushing on the scrotum. But still need surgery to prevent torsion from occurring again.

Varicocele

**Causes:** Spermatic cord carries blood to and from testicles. When the valves inside the veins in the cord prevent your blood from flowing properly → the veins dilate

**Symptoms:** Often no symptoms. Rarely pain

**Diagnostic tools:** Physical exam → feel a non-tender mass above testicle that feels like a bag of worms

**Treatment:** Surgery

Pelvic inflammatory disease

**Causes:** When the cervix is exposed to a STD, the cervix becomes infected and less able to prevent the spread of organisms to the internal organs. PID occurs when the disease-causing organisms travel from the cervix to the upper genital tract.

**Symptoms:** Dull pain or tenderness in the stomach or lower abdominal area, abdominal vaginal discharge, painful urination, fever, nausea and vomiting.

**Diagnostic tools:** Pelvic exam, analysis of vaginal discharge, cervical culture, urine tests. Pelvic ultrasound, endometrial biopsy, laparoscopy.

**Treatment:** Antibiotics

Pick's Disease

**Causes:** Abnormal amount of tau in the nerve cells of the brain's frontal and temporal lobe → degeneration of nerve cells → shrinkage of the brain tissue

**Symptoms:** Abrupt mood changes, compulsive or inappropriate behavior, depression-like symptoms, withdrawal from social interaction, decrease in writing or reading skills, inability to speak, increased memory loss, physical weakness

**Diagnostic tools:** Medical history, physical examination and detailed neurologic examination, speech and writing tests, MRI, CT, PET

**Treatment:** No cure. Antidepressants and antipsychotics are used to treat the symptoms of Pick's Disease.

**Causes:** Chronic kidney disease is caused by damage to the kidneys, due to uncontrolled high blood pressure over many years or high blood sugar over many years.

**Symptoms:** Urinate less than normal, edema, fatigue, not hungry, nausea, vomiting, trouble sleeping, headaches

**Diagnostic tools:** Blood and urine tests, measure the amount of urea and creatinine in blood. Ultrasound, CT, kidney biopsy.

**Treatment:** Dialysis, kidney transplant.