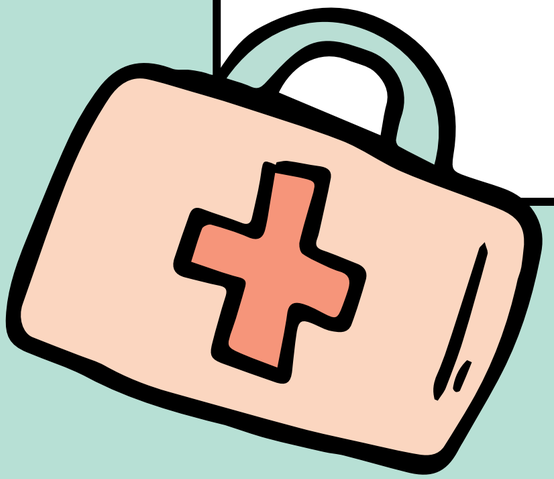
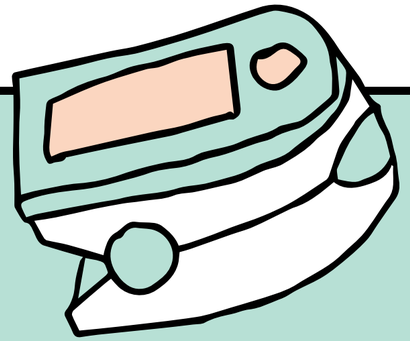
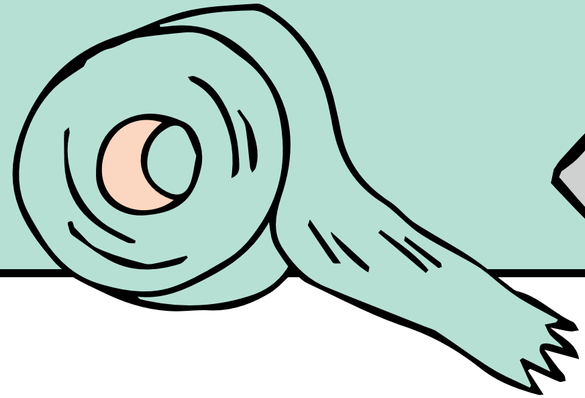
First aid:

learning to care









What is first aid?

First aid is the immediate help give to someone in need. The main goals are to save life, stop the condition from getting worse, and help the person recover before professional medical help arrives.

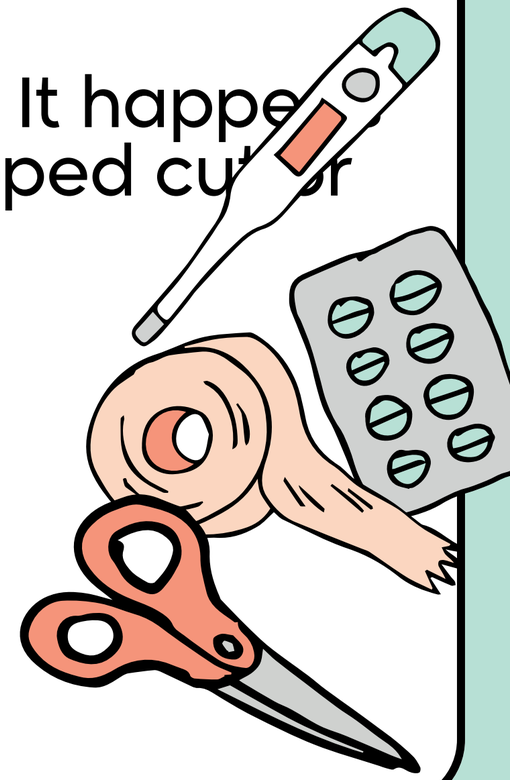


Our presentation is based on what St John Ambulance approves.

CUTS AND BLEEDS

INTRODUCTION: WHAT IS BLEEDING?

Bleeding is the loss of blood from your circulatory system . It happens when a blood vessel-like an artery , vein or capillary is ripped cut or broken .



THE THREE MAIN TYPES OF BLEEDING

CAPILLARY BLEEDING: THIS IS THE MOST COMMON TYPE, COMING FROM THE TINY, MICROSCOPIC BLOOD VESSELS RIGHT UNDER YOUR SKIN. THE BLOOD OOZES OUT SLOWLY AND IS USUALLY VERY EASY TO STOP. THIS HAPPENS WITH MINOR SCRAPES AND PAPER CUTS.

VENOUS BLEEDING: THIS HAPPENS WHEN A VEIN IS TORN. THE BLOOD IS DARK RED BECAUSE IT IS LOW ON OXYGEN, AND IT FLOWS OUT IN A STEADY, SMOOTH STREAM. IT CAN BE SERIOUS BUT IS USUALLY CONTROLLABLE WITH FIRM PRESSURE.

ARTERIAL BLEEDING: THIS IS THE MOST DANGEROUS TYPE OF BLEEDING, CAUSED BY A DAMAGED ARTERY. BECAUSE ARTERIES CARRY BLOOD DIRECTLY FROM THE BEATING HEART, THE BLOOD IS BRIGHT RED AND SPURTS OUT IN RHYTHM WITH YOUR HEARTBEAT. THIS IS A MEDICAL EMERGENCY.

SECTION 1: HOW THE BODY FIXES A CUT

When you get a cut, your skin breaks and you bleed. Your body immediately starts a highly organized, four-stage rescue mission to stop the bleeding and repair the damage.

Stage 1: Stopping the Bleed (Hemostasias)

This happens in the first few minutes. First, the broken blood vessels squeeze shut to slow down the rush of blood. Next, tiny blood cells called platelets rush to the injury. They stick together like glue to plug the hole. Finally, your body creates a net of proteins that locks these cells into place, forming a solid clot that turns into a scab.

Stage 2: Cleaning the Area (Inflammation)

This takes place over the first few days. Your blood vessels open up again to let fresh blood, oxygen, and immune cells rush to the wound. This causes the area to look red, feel warm, swell up, and hurt. Special white blood cells act like a cleanup crew, eating up dirt and germs to prevent an infection.

Stage 3: Rebuilding the Skin (Proliferation)

This happens over the next few weeks. Cells called fibroblasts build a temporary framework to fill the gap. Tiny new blood vessels grow into this framework to give it oxygen, making the area look pink and bumpy. Finally, new skin cells creep across the top until the gap is completely closed.

Stage 4: Strengthening the Scar (Remodelling)

This final stage can take a year or longer. Your body slowly replaces the temporary repair work with much stronger skin fibres. The randomly scattered fibres arrange themselves into neat, strong lines. The pink colour fades away, and the scar becomes flatter and tougher.

SECTION 2: SIMPLE FIRST AID STEPS

Treating a minor cut focus on three goals: stopping the blood, keeping germs out, and keeping the skin moist so it can heal faster.

1. Clean Your Hands: Always wash your hands with soap and water before touching a wound. You can also put on clean medical gloves. This stops germs on your hands from getting into the cut.
2. Apply Pressure: Press firmly on the cut with a clean cloth or gauze pad. Holding continuous pressure pushes the edges of the blood vessels together, which helps the blood clot and stop flowing.
3. Raise the Wound: If the cut is on your arm or leg, lift it up above the level of your heart. Gravity will slow down the blood flow to the injury, making it easier to stop the bleeding.

- Wash the Cut: Gently rinse the wound with clean tap water or saline. Do not use harsh liquids like rubbing alcohol or hydrogen peroxide. These chemicals actually damage your healthy skin cells and slow down healing.

4. Protect the Skin: Put a thin layer of petroleum jelly (like Vaseline) over the clean cut. This keeps the skin moist so cells can move easily to fix the gap. Cover it with a clean bandage to protect it from dirt.

SECTION 3:WHEN TO SEE A DOCTOR

Most small cuts heal on their own, but you should go to a doctor or emergency room immediately if you notice any of these danger signs:

- The bleeding does not stop even after you press down firmly for 10 to 15 minutes without stopping.
- The cut is deep, gaping open, jagged, or you can see fat, muscle, or bone inside it. These wounds need stitches to close properly.
- The wound gets infected. Signs of infection include spreading redness, skin that feels hot, worsening pain, heavy swelling, or yellow pus oozing out.
- The cut was made by something dirty or rusty, like an old nail or a tool covered in soil. You may need a tetanus shot to protect your nerves from dangerous bacteria.
- There is glass, dirt, or gravel stuck deep inside the wound that you cannot easily wash away.

Asthma

EACH YEAR, MORE THAN $50 BILLION IS SPENT IN THE UNITED STATES TREATING ASTHMA, WITH MORE THAN 94,000 INPATIENT HOSPITAL STAYS AND 900,000 EMERGENCY ROOM VISITS.

ASTHMA IS MORE PREVALENT IN FEMALES THAN MALES. 9.7% OF THE ADULT FEMALE POPULATION IN THE US HAS BEEN DIAGNOSED WITH ASTHMA, COMPARED TO ONLY 6.2% OF THE ADULT MALE POPULATION.

INTRODUCTION

Asthma causes the airways to tighten and swell, making breathing harder and sometimes triggering coughing or wheezing. For some people it's mild, but for others it can disrupt daily life or become dangerous during severe episodes. Even with better treatments, asthma is still influenced by factors like biology and the environment, which affect how often symptoms occur and how serious they are. Understanding these influences helps explain why asthma looks different for everyone and why managing it involves more than just medication.



NATURE

- The recurrence risk of asthma in children with one affected parent is around 25%, whereas the risk if both parents are affected is around 50%.
- people with no family history of asthma have a 5% risk of developing asthma.
- Having a monozygotic twin increases the risk to 75%. This clearly illustrates a strong genetic basis for asthma risk.
- Gastroesophageal reflux disease (GERD), a condition in which stomach acids back up into your throat
- Respiratory infections, such as the common cold
- Most asthma-linked genes help control inflammation, immunity, and lung function. When these genes have certain variations, they don't regulate these processes as well, leading to extra inflammation, changes in the airways, and increased sensitivity. These effects together make asthma symptoms more likely and more severe.



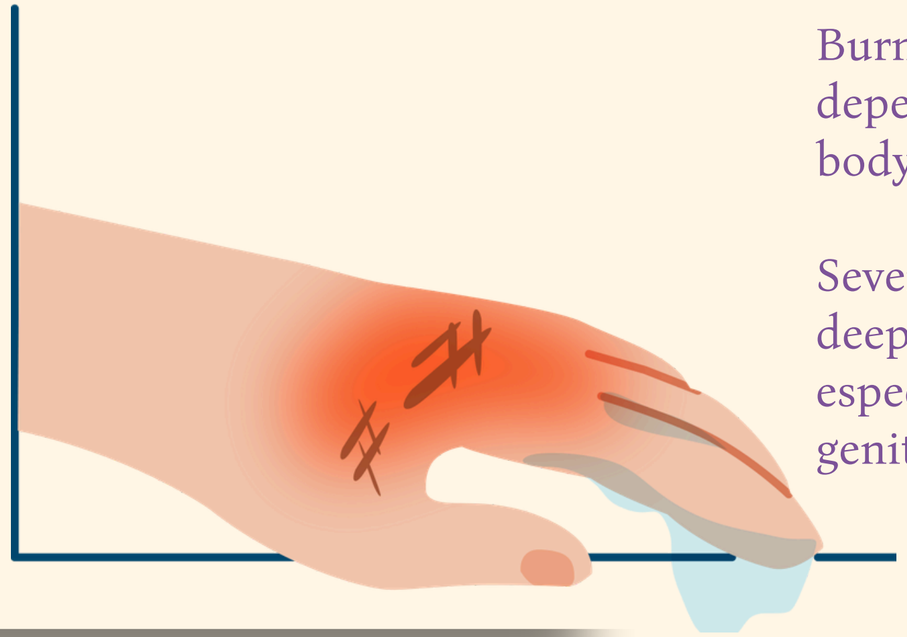
NURTURE

- Physical activity
- Cold air
- Air pollutants and irritants, such as smoke
- Sulfites and preservatives added to some types of foods and beverages, including shrimp, dried fruit, and processed potatoes.
- Dust Mites (microscopic pests that live in pillows, mattresses, and other soft surfaces. It feeds on dead skin cells, so they thrive in warm, humid environments that are rarely cleaned)
- Pet dander
- Cockroaches (produce allergens when they shed their skins)
- Indoor mold



What Is a Burn?

A burn is an injury to the skin and sometimes the tissues underneath it. A burn happens when the skin is damaged by dry heat. Common causes include fire/flames, hot objects such as an iron, and hot surfaces. Burns can also be caused by electricity or chemicals. The longer the skin is exposed to the source of heat, the more severe the damage can become.



Burns damage or destroy skin cells, and the severity depends on how deep the burn is and how much of the body is affected.

Severe burns can cause fluid loss and infections. Large or deep burns may require urgent medical treatment, especially if they affect the face, hands, feet, major joints, genitals, or a large area of the body

How Serious Is the Burn?

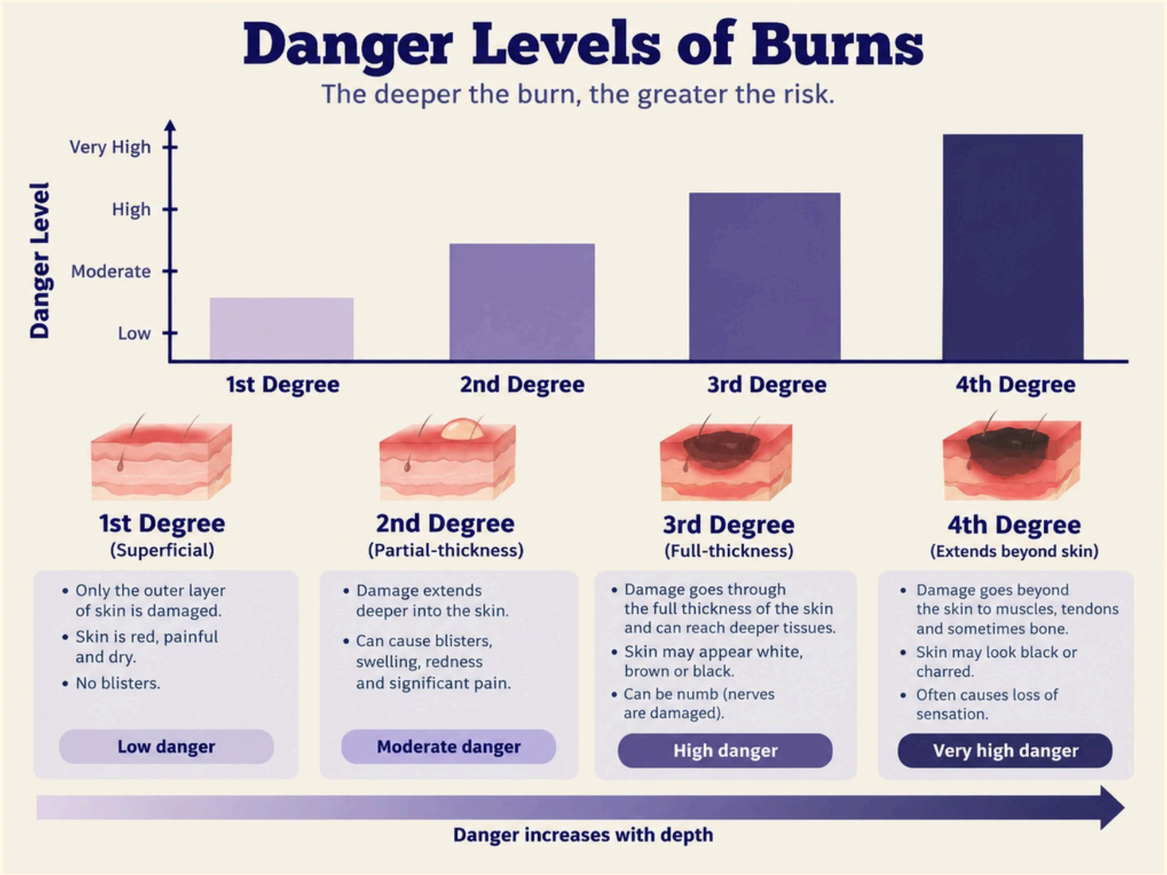
Types/severity of burns:

First Degree Burn: affects only the outer layer of skin. It can cause redness and pain.

Second Degree Burn: damages the outer layer and deeper layers of skin and may cause blisters, swelling and significant pain.

Third Degree Burn: damages all layers of the skin and can also affect deeper tissues. The skin may appear white or charred, and surprisingly, a severe burn may not always be very painful because nerves can be damaged.

Fourth Degree Burn: damages all layers of the skin, extending deep into underlying tissues like muscle, tendons, ligaments, and bone. The skin appears severely charred, black, or dry and leathery, and because the nerve endings are completely destroyed, the burn site itself is usually not painful.



How to treat a burn?

1. Cool- Move the person away from the heat source safely, then cool the burn under cool running water for at least 20 minutes. Do not use ice or iced water, as this can cause further damage.

2. Remove jewellery/clothing- Carefully remove jewellery or clothing near the burn before swelling develops. However, do not pull away anything stuck to the skin, as this could cause further damage.



3. Cover- Once the burn has been cooled, loosely place cling film over the burn. Don't wrap it tightly around a limb because swelling can occur.

4. Get medical help when necessary- Call 999 or go to A&E if the burn is very large or deep, affects the face, genitals or bottom, or has been caused by electricity or chemicals. Smaller burns can often heal at home, but NHS 111 can provide advice if you're unsure.

DIABETES



DIABETES IS A CHRONIC METABOLIC DISEASE WHERE THE CONCENTRATION OF GLUCOSE IN THE BLOOD BECOMES TOO HIGH. GLUCOSE PROVIDES CELLS WITH ENERGY, BUT IT NEEDS TO BE CAREFULLY CONTROLLED BY THE HORMONE INSULIN, WHICH IS PRODUCED BY BETA CELLS IN THE PANCREAS. INSULIN HELPS CELLS ABSORB GLUCOSE FROM THE BLOODSTREAM. IN DIABETES, THE BODY EITHER PRODUCES LITTLE OR NO INSULIN, OR THE CELLS BECOME LESS RESPONSIVE TO IT. IN 2022, AROUND 830 MILLION PEOPLE WORLDWIDE WERE LIVING WITH DIABETES.



THE 2 TYPES

THERE ARE TWO MAIN TYPES OF DIABETES, AND THEY DEVELOP DIFFERENTLY. TYPE 1 DIABETES OCCURS WHEN THE IMMUNE SYSTEM ATTACKS THE INSULIN-PRODUCING BETA CELLS IN THE PANCREAS, MEANING THE BODY CANNOT PRODUCE ENOUGH INSULIN. PEOPLE WITH TYPE 1 THEREFORE REQUIRE INSULIN TREATMENT. TYPE 2 DIABETES DEVELOPS WHEN BODY CELLS BECOME LESS RESPONSIVE TO INSULIN, KNOWN AS INSULIN RESISTANCE. THE PANCREAS MAY INITIALLY PRODUCE MORE INSULIN, BUT EVENTUALLY IT MAY NOT PRODUCE ENOUGH. GENETICS, AGEING AND LIFESTYLE FACTORS CAN ALL CONTRIBUTE TO TYPE 2, WHICH ACCOUNTS FOR MORE THAN 95% OF DIABETES CASES GLOBALLY.



EFFECT & WHY IT MATTERS

- LONG-TERM HIGH BLOOD GLUCOSE CAN DAMAGE BLOOD VESSELS AND NERVES
- EYES: DIABETIC RETINOPATHY → POSSIBLE SIGHT LOSS
- KIDNEYS: REDUCED ABILITY TO FILTER WASTE
- HEART: INCREASED RISK OF HEART ATTACKS AND STROKES
- TYPE 2 CAN OFTEN BE PREVENTED OR DELAYED
- TYPE 1 CANNOT CURRENTLY BE PREVENTED
- EARLY DIAGNOSIS AND EFFECTIVE MANAGEMENT ARE IMPORTANT
- IN ENGLAND (2024–25), ONLY 30.7% OF TYPE 1 AND 45.2% OF TYPE 2/OTHER DIABETES PATIENTS ACHIEVED ALL THREE RECOMMENDED TREATMENT TARGETS

CONCUSSION: A COMMON BUT COMPLEX BRAIN INJURY



a concussion is a mild traumatic brain injury (TBI) caused by a direct or indirect force that makes the brain move rapidly inside the skull.

- Causes temporary changes in brain function
- Often shows no visible damage on CT or MRI
- Diagnosis mainly relies on clinical assessment
- Loss of consciousness is not necessary for a concussion to occur.

Why does it matter?

Although most people recover within a few weeks, repeated concussions can increase the risk of more serious and long-term complications.

CAUSES, BIOLOGY & EFFECTS

How does a concussion happen?

Impact → Brain movement → Cellular disruption → Symptoms

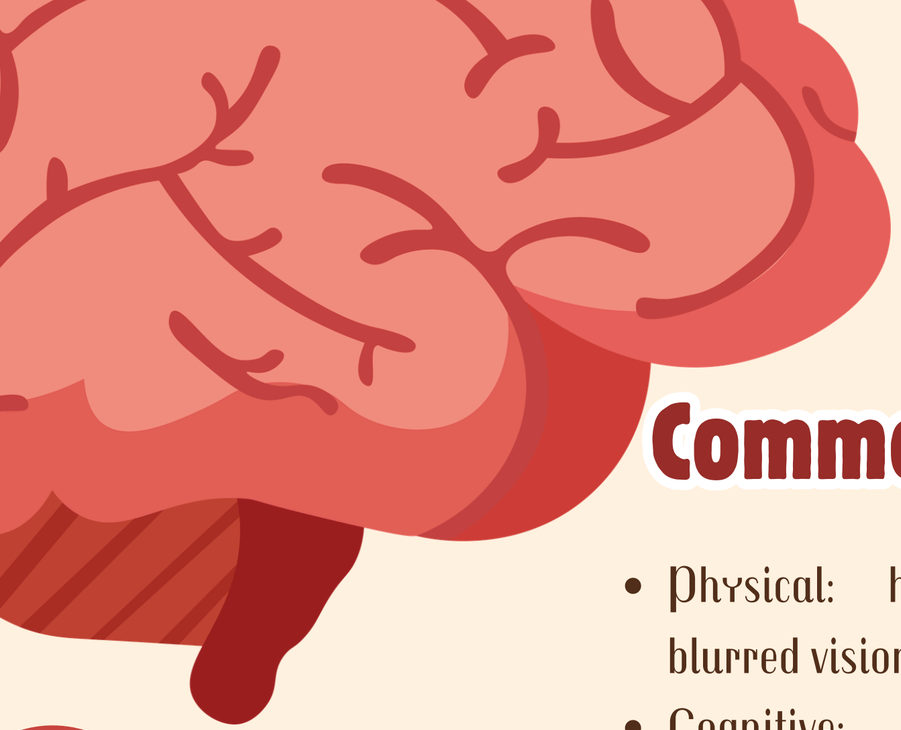
Common Causes

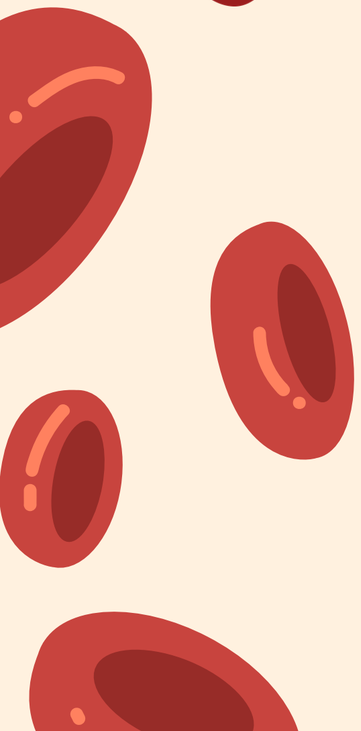
- Contact and collision sports
- falls
- Motor vehicle and bicycle accidents
- Workplace accidents
- Physical assaults

What happens inside the brain?

The brain moves and twists inside the skull, stretching axons (nerve fibers) and triggering a neurometabolic cascade.

- Abnormal release of neurotransmitters
- Imbalance of calcium (Ca^{2+}) and potassium (K^{+})
- Increased energy demand
- Reduced blood flow to the brain
- Neuroinflammation and temporary changes to the blood-brain barrier







Common Symptoms

- Physical: headache, dizziness, nausea, blurred vision, sensitivity to light/noise
- Cognitive: confusion, slowed thinking, memory difficulties
- Emotional and Sleep: irritability, sadness, and disrupted sleep
- Important: a person does not have to lose consciousness to have a concussion.

Diagnosis

- Concussion is diagnosed primarily through clinical assessment.
- SCAT6 evaluates symptoms, memory, concentration, balance, and other functions.
- CT or MRI is mainly used to rule out more serious injuries, such as bleeding or skull fractures.
- Warning signs such as worsening headache, repeated vomiting, seizures, slurred speech, or increasing confusion require urgent medical attention.



Recovery & Management

24–48 hours of relative rest → Gradual, symptom-guided activity → Return to learning/work → Return to sport

- Modern guidelines no longer recommend prolonged complete rest.
- Light aerobic activity can be introduced gradually when tolerated.
- Athletes follow a six-stage graduated return-to-sport protocol.
- Most people recover within 1–4 weeks.
- Persistent symptoms may require specialist rehabilitation.

Prevention

- Early recognition and removal from play
- Appropriate safety measures and sporting rules
- Gradual return only after recovery

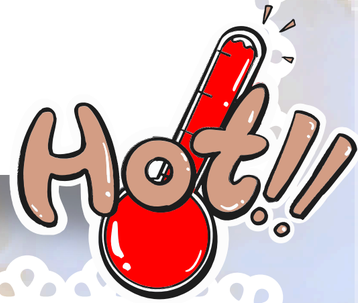
Scalds

Thermal burns caused by hot water, oil, or steam.



Commonly Affected Parts

- Hands
- Arms
- Chest
- Face



Scald Severity

Scald severity is determined by the depth of tissue damage (first degree, second degree, etc), total body surface area affected, location, and patient factors (eg age).

Main dangers

Fluid loss and shock

1. Heat damages skin
2. Inner fluid loss by evaporation
3. Blood volume loss
4. Less circulation in damaged area
5. Poor blood flow and low blood pressure



Infection

- The surface of every burn wound is contaminated to some level by bacteria.
- Of the deaths that do occur in adult burn patients, 50%–75% result from infection.
- There are many factors that make burn wounds susceptible to infection with anaerobic organisms.



Systemic complications affecting organs

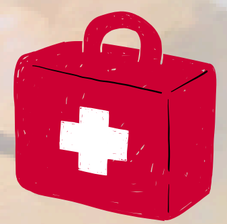
- Kidney strain: Reduced blood flow stops kidneys from filtering waste → acute kidney failure.
- Immune overreaction: Damaged cells → severe inflammatory response.
- Sepsis: Bacterial invasion → possibly fatal state where blood pressure falls greatly and multiple organs can shut down.



Scalds Vs Burns

- Depth of Tissue Damage: Usually limit damage to the upper layers of skin, unless immersion is prolonged.
- Systemic Complications:
  - Burns: Flame-related injuries carry a higher statistical risk.
  - Scalds: While severe scalds can cause dangerous fluid loss, shock, and infections, they present a different metabolic and inflammatory response over time.
- Both injury types are treated initially with the same first-aid response.

First Aid



Do	Don't
Hold affected area under cool running water for a minimum of twenty minutes.	Use ice or iced water.
Remove tight items (clothing, jewelry, etc).	Remove items stuck to the skin (eg bandages)
Cover the area with cling film or a plastic bag once cool.	Wrap the area tightly.
Avoid contaminating the blisters.	Pop or touch blisters, or use products like lotion in the area.

Seizures

Protecting the Brain Through Early Awareness



Overview

Seizures are sudden, uncontrollable surges of eleictrical activity in the brain that temporarily disrupts communication between nerve cells. Seizures occurring twice or more times within a time window of less than 24 hours is known as epilepsy.

What causes seizures?

Sometimes, seizures may happen just once, due to a clear and treatable issue, also known as provoked siezures. Common causes include:

- High fever, especially in children
- Low blood sugar or other metabolic imbalances
- Alcohol or drug withdrawal
- Certain medications
- Sleep deprivation or extreme stress
- Infections, especially ones affecting the brain
- Head trauma or strokes

If seizures happen more than once without a clear trigger, doctors may explore the possibility of epilepsy.



Seizure types

Seizures typically present as one of two main types. These include:

Focal seizures

Results from electrical activity in one area of the brain, and can occur with or without losing consciousness. These seizures may present in two ways:

Focal seizures with impaired awareness: These seizures result in a shift or absence of consciousness or awareness that may resemble a dream-like state.

Focal seizures without impaired awareness: Emotions may shift throughout these seizures, and do not result in unconsciousness.

Generalised seizures

Seizures that appear to involve all the areas of the brain from the time they start. Types of these seizures include:

- Absence seizures: People experiencing these seizures often stare into space or make slight body movements.
- Tonic seizures: Causes muscles to get stiff. May cause the patient to pass out or fall to the ground.
- Atonic seizures: Causes a sudden loss of muscle use, most often in the legs.
- Clonic seizures: Linked with jerking muscle movements.
- Myoclonic seizures: Most often cause sudden brief jerks or twitches of the arms and legs.
- Tonic-clinic seizures: Can cause passing out, body stiffness and shaking.

Seizure stages

Prodome

The earliest warning a seizure may happen. May include an aura, which is the first symptom of a seizure. Many people with seizures have a prodome or aura, but some people do not.

Ictal phase

The ictal phase lasts from the first symptom, including the aura, if there is one, to the end of the seizure. Symptoms of this phase is dependant on seizure type.

Postictal phase

This is the period after a seizure during recovery. During this phase, people may be slow to respond, have trouble with memory, talking, or writing.

How can we treat seizures?





- Seizure Medication for controlling seizures, especially ones caused by epilepsy.
- Seizure rescue therapies that can stop seizures quickly to prevent emergency situations by getting into the bloodstream quick.
- Alternative therapies that are different from medicines usually prescribed by doctors, including mind and body practices and natural herbs.
- Dietary therapies, such as ketogenic, low glycemic, and medium-chain glyceride (MCT) diets, can aid in controlling seizures.

Thank you so much!

