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ENGLISH:

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1. Invictus: the undefeated & the assault course of exceptional people

Invictus (1875)

William Ernest Henley (1849-1903)

Out of the night that covers me,
Black as the pit from pole to pole,
I thank whatever gods may be
For my unconquerable soul.

In the fell clutch of circumstance
I have not winced nor cried aloud.
Under the bludgeonings of chance
My head is bloody, but unbowed.

Beyond this place of wrath and tears
Looms but the Horror of the shade,
And yet the menace of the years
Finds and shall find me unafraid.

It matters not how strait the gate,
How charged with punishments the scroll,
I am the master of my fate,
I am the captain of my soul.

Invictus: the movie (2009)

Invictus, the movie based on Playing the Enemy: Nelson Mandela and the Game That Made a Nation, a book by John Carlin, was released in 2009. Morgan Freeman portrayed Nelson Mandela, and Matt Damon was François Pienaar, the former South African rugby team captain.

"The film tells the inspiring true story of how Nelson Mandela joined forces with the captain of South Africa's rugby team to help unite their country. Newly elected President Mandela knows his nation remains racially and economically divided in the wake of apartheid. Believing he can bring his people together through the universal language of sport, Mandela rallies South Africa's underdog rugby team as they make an unlikely run to the 1995 World Cup Championship match."

Invictus: Nelson Mandela (1995)

Nelson Mandela was born in 1918, in South Africa, a country that was governed by apartheid (meaning: "the fact of being apart, separated"), which imposed racial segregation, causing political and economic discrimination against non-whites.

Mandela studied law; the university *he attended* was against discrimination and ended up in conflict with the government or the police quite often, which led to the detention of faculty staff members and students. He joined the ANC (African National Congress) in 1944 and after becoming its leader, he helped the *organisation* to oppose apartheid policies.

At first, he was non violent, but after the massacre of Sharpeville in 1960, he convinced the ANC to perform acts of sabotage and trained in guerilla warfare in Algeria. After he came back to South Africa, he was arrested in 1964, and sentenced to life imprisonment.

He spent 18 years at Robben Island prison, in solitary confinement most of the time. He survived, *reflecting on* his condition, writing letters and reading a lot of biographies or poems – such as **Invictus**. The black population and the international community supported him, condemning apartheid, which led South Africa to be forced out of the *Commonwealth* in 1985.
Mandela was finally released in 1990.

Frederick De Clerk, the president of South Africa at the time, worked with Mandela to put an end to the apartheid regime in a peaceful *manner*. They were jointly awarded the Nobel Peace Prize for their work in 1993.
Mandela became the first Black president of South Africa in 1994. In 1995, he managed to reconcile the country, uniting Blacks and Whites around the victory of the *Springboks*, the South African national rugby team.

After his presidency ended, he founded the Elders, a group of independent global leaders who work for peace and aim at improving human rights. Nelson Mandela International Day (*Mandela Day*) was launched in recognition of Nelson Mandela's birthday on 18 July 2009 via unanimous decision of the UN General Assembly.
Mandela died in December 2013.

Invictus: the first Games (2014)

Festival of sport helping Afghanistan veterans combat stress

Ex-military personnel find new purpose training for Invictus Games – with some hoping to become Paralympians

(The Guardian, Article by Steven Morris, 27/08/2014)

https://www.theguardian.com/sport/2014/aug/27/invictus-games-sport-afghanistan-military-veterans-combat-stress

Ex-military personnel who will be taking part in the Invictus Games. From left: Paul Wilson, Andy Phillips, Danni Hampson-Carroll, Susan Cook and Mary Wilson. Photograph: Sam Frost

Paul Wilson, a 30-year-old veteran of the Afghanistan conflict, says this time last year his life was a mess. He was in the grip of *post-traumatic stress disorder* brought on by the horrors he had witnessed, was drinking heavily and was in and out of hospital after taking overdoses.

"But now I have a purpose, something to aim for," says Wilson. His goal is to be selected for **Invictus Games, a new festival of sport to be held in September for military veterans and serving personnel. "Sport has given meaning to my life, a structure."**
Tickets for the event, which takes place at some of the Olympic Park venues in London including the Aquatics Centre, *went on sale* on Friday. More than 400 competitors from 14 countries who have been wounded, injured or fallen ill will compete in nine sports including athletics, swimming, archery and wheelchair rugby.

The event is **inspired by the Warrior Games in the US** in which five teams representing the army, marines, navy, coastguard, air force and special forces compete in seven sports. Its aim is to rehabilitate through sport and is designed for talented novices and keen amateurs more than established elite athletes.

The London event comes as figures reveal the number of Afghanistan veterans seeking help for **mental health problems**, like Wilson, has surged. With British troops *pulling out* of Afghanistan after 13 years, it is also a way of making sure the public does not forget injured personnel.

When the Guardian met Wilson at Tedworth House, a *recovery centre* for military personnel, he had just come out of a support group run by the charity Combat Stress. "I've really struggled with *flashbacks and nightmares*. This led to me drinking heavily, taking some overdoses and ending up in hospital," he says. "Things have started to get better and a lot of that is due to sport. When I'm doing something physical it's impossible to think about the bad things; you have to concentrate on what is happening now. *I train once or twice a day*. Just knowing what you're going to be doing every day is massive."

Some of those training for the Invictus Games hope to become Paralympians. Susan Cook, 26, says sport and the army were her life until a training injury led to her using a wheelchair. She struggled as a civilian until she found programmes searching for the next Paralympians. She hopes to take part in the Invictus Games as a wheelchair racer. "I train six times a week. My coach refuses to let me train seven times. He says that if David Weir [winner of six Paralympic golds] gets a rest day, everyone gets a rest day. The idea of getting a whole day off is alien to me, but I'm having to accept that. I'm already trying to work out who my rivals are likely to be at the games so I can find a way of beating them." But she says the games are not just about competition, but about camaraderie. "Sport gives you a whole new family – as the army did."
Prince Harry has *spearheaded* the project to *stage the event* after attending the Warrior Games in Colorado last year. The Invictus Games – invictus means "unconquered" in Latin – is backed by the Ministry of Defence and the Royal Foundation, the vehicle for good works championed by Prince Harry, Prince William and the Duchess of Cambridge. As well as UK and US troops and retired personnel, there will be competitors from nations including France and Australia. Iraq and Afghanistan will also be represented.

Mary Wilson was part of the UK team at the Warrior Games. "It was a life-changing experience for me. No matter who you are, no matter what *disability* you have, you can do whatever you set out to do," says the 50-year-old swimmer.
Wilson, formerly of the Royal Artillery, had an accident while on a military horse riding course and was *medically discharged* because she could not pass her weapons handing test. "Now I spend most of my life doing sport. I want to be as good as I can even if I am older than most of the people I'll be competing against."

Danni Hampson-Carroll, 27, had to leave the army and now walks with the aid of a stick after suffering what was later diagnosed as functional neurological syndrome, which she puts down to heavy lifting while working with the 1st Regiment Royal Horse Artillery. She is often in great pain and shakes uncontrollably.
A keen footballer when she was younger, Hampson-Carroll has now found a love of sitting volleyball.
"Until I found the sport I was suffering mentally. I was very low. There's no cure for what I have, it's just a case of managing it. But volleyball has given me back my mental well-being. Sport has always given me some mind space and that's what I've got back. The games are everything to me," she says.

Andy Phillips, a former RAF armourer and veteran of the Gulf war, was medically discharged more than 20 years ago at a time when sports for former personnel was not as organised. "When you were discharged it was just: 'That's it, you can't serve any more, here's your *pension*, good luck.' I didn't have any contact with anyone for 15 years. Then I found a couple of military charities and discovered *wheelchair sport* through that. I still hate having to use a wheelchair, but I also love it because it allows me to take part in sport," he says.
Phillips has taken part in archery events in the UK and US, where he has competed alongside American veterans. "Games like these are important for the athletes but also useful as a reminder to the British public. The public has been brilliant while we've been at war. The test is going to come in the years ahead when service personnel aren't so visible because we're not at war. Hopefully these sort of events will be a reminder that help is still needed."

Vocabulary:

post-traumatic stress disorder (PTSD):

to go on sale:

to pull out of…:

recovery centre:

flashbacks and nightmares:

Please answer the questions:

1. When are the first Invictus Games due to occur?

2. What inspired the Games?

3. Where are they taking place?

to train:

*once or twice **a** week:*

to spearhead:

to stage an event:

a disability:

to be discharged:

pension:

wheelchair sport:

4. Who's behind the project?

5. What problems do the future competitors suffer from?

2. The Invictus Games: product, events, financing, promotion

Your ideas about the Games visual identity:

The opening ceremony of the Opening Games in Toronto, 2017:

1. What are the Invictus Games an example of?

2. What did Prince* Harry witness while he was waiting onboard a plane before flying him back home? *(Prince* = His Royal Highness)*

3. What impact did it have on him?

4. Prince Harry uses the expression: "a beacon of light". What does he mean?

5. Where did the Games occur the previous year?

6. More, more, more: please list all the "more" Prince Harry mentions in his speech.

7. What is the motto he finally uses (twice) before closing?

8. Please describe the venue. What can you say about the logo?

Write down the vocabulary we insisted on today:

The Invictus Games, as a product: what sports, what nations, what locations?

Write down the vocabulary we insisted on today:

3. Invictus Games: a challenge for ergonomics

Small Step, Big Impact: A 3D-Printed Part Helps This Military Vet Compete

(Article by Kristin Kloberdanz, 10/11/2020)

(Source: https://www.ge.com/news/reports/small-step-big-impact-a-3d-printed-part-helps-this-military-vet-compete)

Just about every day, Stevin Creeggan trains for international competition in three sports. Four to six times a week, **he hits the gym** for 90 minutes. He gets on his bike five to six days a week — 30 minutes each time. His wheelchair basketball team meets three hours a week **for practice** and a game. Because he's new to that sport, he'll spend an additional two to three hours working on his own. In between, he **fits in** archery practice, learning to shoot with his stronger but **nondominant left hand.**

The constant effort is preparing Creeggan, who lives in North Queensland, Australia, to **participate** next year **in** the Invictus Games, which Britain's Prince Harry founded in 2014 for wounded, injured or sick military-service personnel and veterans. Creeggan's commitment to his training shows that he's persistent and resourceful. He had to be, after **sustaining injuries** in a military helicopter crash in 2010, which killed everyone aboard but him. The accident required doctors to rebuild his body and Creeggan to learn a new way of living.

When Creeggan applied for the games last year, "I found that certain things caused a lot more **pain** than what I could **handle**, but I gave things a go," he says. "With the cycling, I could get some speed and some power back into the pedals, even with my legs at different lengths at that stage." But with his right leg nearly an inch shorter than his left — caused by **shattered** bones and the surgery to reconstruct them — Creeggan could never fully get into a rhythm. That is, **until a team of New Zealand Defence Force (NZDF) engineers crafted a slim, 3D-printed titanium spacer to close the distance.**

To create the custom metal part, which connects to Creeggan's pedal — fitting snugly against his cycling cleat to compensate for the gap between his shorter leg and the pedal — they turned to Zenith Tecnica, a company based in Auckland, New Zealand, that specializes in a type of additive manufacturing known as electron beam melting. It's a form of 3D printing, which builds up an object in layers. **Zenith Tecnica uses titanium powder to manufacture objects that are lightweight and strong** — exactly what an athlete needs to **withstand** the rigors of competition.

Engineers Martin Campbell and Ewan Conaghan display a prototype of their 3D-printed attachment. Image credit: GE Additive.

(…)

Initially, Creeggan had fashioned his own spacer made from bog, a flexible body filler typically used like wall putty for car repair, but it was heavy and not particularly ergonomic. **When he saw Creeggan's stopgap solution, David Pilgrim, the former**

manager of the NZDF Invictus Games team, recruited engineers Ewan Conaghan and Martin Campbell to help. Campbell, who grew up working in his uncle's bicycle shop, was excited **to tackle the custom project**. He and Conaghan spend most of their time designing soldiers' equipment such as **weapon ancillaries** to military vehicle parts. It's rare that they get to focus on one person. "The basic version that Stevin made was just a solid block," Campbell says. "3D printing lends itself to an organic shape better. But trying to remove as much material as possible while trying to retain strength and shape has its difficulties, because you're taking that material away from the main structure. That was one of the biggest challenges." (...)The team was able to print a titanium spacer that is partially hollow in the middle and conforms to Creeggan's **cycling cleat.** They dramatically reduced its weight: While Creeggan's homemade version weighed a noticeable half-pound, the new spacer weighs only about one-tenth of a pound. "Just to be able to do this little bit to assist him was amazing," Conaghan says.

Creeggan was shocked by the improvement. He had a chance to give the team his feedback in person, after his first training session using the new design. "Having quite a large weight that I was trying to pull up when I was cycling, the leg wasn't very appreciative of it," he says. "The difference was just huge." He now experiences less pain on the bike, and he's dropped three to four minutes off his 20K time in the track criterium, a closed-circuit cycling race.

That doesn't mean Creeggan's progress is easy. He copes daily with neck, back and leg injuries from the crash. And he missed his chance to compete this year when the Invictus Games were postponed because of COVID-19. (...)

Please answer the questions:

1. How many sports does Stevin train in?
2. Where does Stevin live?
3. What happened to him in 2010?

4. What's wrong with his legs?

5. Please convert the figure into millimeters
6. What's the impact on Stevin's cycling?

7. Who decided to help him?

8. What type of technology was used?
9. What material? Why?

10.How had Stevin tried to solve the problem before? What had he done? Had it been successful?

11. What's a cleat spacer and what's the difference between both cleat spacers?

Vocabulary:

to hit the gym:

***practice**
&
training*

to fit in:

nondominant left hand:

*to participate **in:***

to sustain an injury:

to handle pain:

shattered:

to withstand:

to tackle:

a custom project:

12. Has the new cleat spacer helped?

a weapon ancillary:

a cycling cleat:

Video by Neill Stanbury about leg length discrepancy

Please answer the questions:

1. Is a leg length **discrepancy** of less than ____ "**mill**" a problem in everyday's life?

2. What did Neill Stanbury study?

3. How does he **temper with** what the medical books say?

4. What does cycling **demand**?

5. What damage can the discrepancy cause in the long run?

6. Neill is about to show how we may spot out a leg length discrepancy without **resorting to medical imaging**. What is the condition to run these tests?

7. Before he starts he underlines the need to distinguish between 2 types pf discrepancies. What are they?

8. Please describe the differences between them.

9. The location of the discrepancy is important. What part of the leg matters the most? (tibia/fibula = the tibios) or femur?

Please take notes from the video about the different ways you can spot leg length discrepancies while cycling

4. Just for fun! Back pain blues

(by Augie Dawg)

Please listen and fill in the gaps*!*

I got it bad (X2)
I got the back pain blues (X2)
I don't know what to do
(I) Got the back pain blues

You're _____ , you're _____
You don't know (if) you can take any more
(It) happened so fast, (it) built like something _____ _____
All (of a) sudden, (you) feel real real _____
You can barely _____

It feels pretty lonely
No one can quite _____
No bones sticking out or _____ _____ _____ _____
You got the back pain blues (X2)
Oh! You're gonna _____ ____ _____
(if you) don't get rid of this back pain blues

Everyone got advice
Telling you _____ _____ _____
What worked for the brothers, Mamma, (it) might work for you
You got the back pain blues (X2)
You've tried everything but you've still got the back pain blues

Way back in high school
_____ was never fun
Now that I can't move
All I wanna do is _____

I'm feeling way too _____
Not like my _____ _____
If this is what _____ _____ _____
Put it back _____ _____ _____

(There) can be a _____ _____ like there was for me
Thirteen years on, eighteen _____ _____
I had the back pain blues (X2)
I paid my _____
With the back pain blues

No No No one would choose
The back pain blues
I had the back back back back back back back pain blues (no more)
I had the back back back back back back back pain blues (goodbye)
I had the back back back back back back - back pain blues

5. Health / medical glossary

1. Expressing pain

- accident
- ambulance
- aspirin
- bandage
- bleed
- blood
- blood pressure
- bone
- broken
- bruise
- burn
- cancer
- cavity
- check-up
- clinic
- cold
- contagious
- cough
- dentist
- diabetes
- diet
- disease
- doctor
- emergency
- exercise
- fever
- first aid
- flu
- headache
- heart attack
- home remedy
- illness
- infection
- insomnia
- insurance
- medical
- nurse
- operation
- operate
- overweight
- phobia
- pill
- prescription
- relax
- runny nose
- sneeze
- sore
- sickness
- sprain
- stitches
- stomachache
- stress
- sunburn
- temperature
- toothache
- underweight
- virus
- vitamin
- weight
- x-ray

Describing Pains :

Common aches:
Headache, toothache, stomach ache, backache

Digestive complaints:
Diarrhoea, constipation, nausea, sickness, vomiting

Throat complaints:
Cough, sore throat,
'Something is stuck in my throat'
'I can't swallow' / 'I'm finding it hard to swallow'

Other problems:
Faintness, tiredness, shortness of breath, cramp
Period pain, menstrual pain, abnormally heavy periods (menorrhagia)

Medical phrases you might want to use:
I'd like to see a doctor
I need to see a doctor
I'd like to make an appointment
I've got a stomach ache / sore throat / pain here …
I've been feeling sick / ill / faint / tired
I've been getting headaches / diarrhoea / pains
I have really strong period pain / menstrual pain
Do I have to take time off work?
Will I get a sick note?

Medical phrases you might hear

What seems to be the problem?
How can I help you today?
What are your symptoms?
Can you describe the pain?
Does it hurt? Does it hurt here?
Does it hurt when I press here? Does it hurt when I exert pressure here?
Let me listen to your chest / back (using stethoscope)
I'm going to take your blood pressure / temperature /
pulse
I'm going to give you an injection
I'm going to need to examine you
I'll write you a prescription
I'm going to prescribe some antibiotics

Medical Vocabulary:

Care:
Heathcare:
Primary care:

Intensive care:

Diagnosis – after examination, the doctor gives you the diagnosis (identifies the illness you have)
Prescription – an instruction written by a doctor that authorises a patient to be given a specific medicine
Surgery – the operation to fix an internal body part, where the body is cut open and repaired
Incision – a cut with a scalpel (surgical knife) into the skin during surgery
Bandage – a wrap that supports a limb
Cast – a hard casing that supports a broken bone

Treatment :
Medicine:
Remedy:
Medication:

Ambulance – emergency vehicle that takes a patient to the hospital
Crutches – medical walking sticks that support someone who can't walk properly, usually due to a broken leg or ankle
Thermometer – a measuring device to assess the temperature
Stethoscope – a medical device used to listen to the internal sounds of the body
Syringe – a medical device like a needle to draw blood or to inject a vaccine
Vaccine – a substance that is injected into the body to prevent a disease (it activates the body's immune system so that it creates antibodies to fight the disease)
Inoculation / vaccination – the process of injecting a vaccine to immunise the body against a disease
Nurse:
Practitioner:
Physician:

1 Audiologist
2 Cardiologist
3 Cardiothoracic
4 Chiropodist
5 Chiropractor
6 Dentist
7 Dermatologist
8 Endocrinologist
9 Gastrologist
10 Gastroenterologist
11 Gerontologist
12 Gynaecologist
13 Neurologist
14 Obstetrician
15 Oncologist
16 Ophthalmologist
17 Orthodontist
18 Orthopaedic
19 Orthopedist
20 Osteopath
21 ENT specialist (Otologist)
22 Pathologist
23 Paediatrician
24 Podiatrist
25 Psychiatrist
26 Psychologist
27 Pulmonologist
28 Rhinologist
29 Urologist
30 Veterinarian

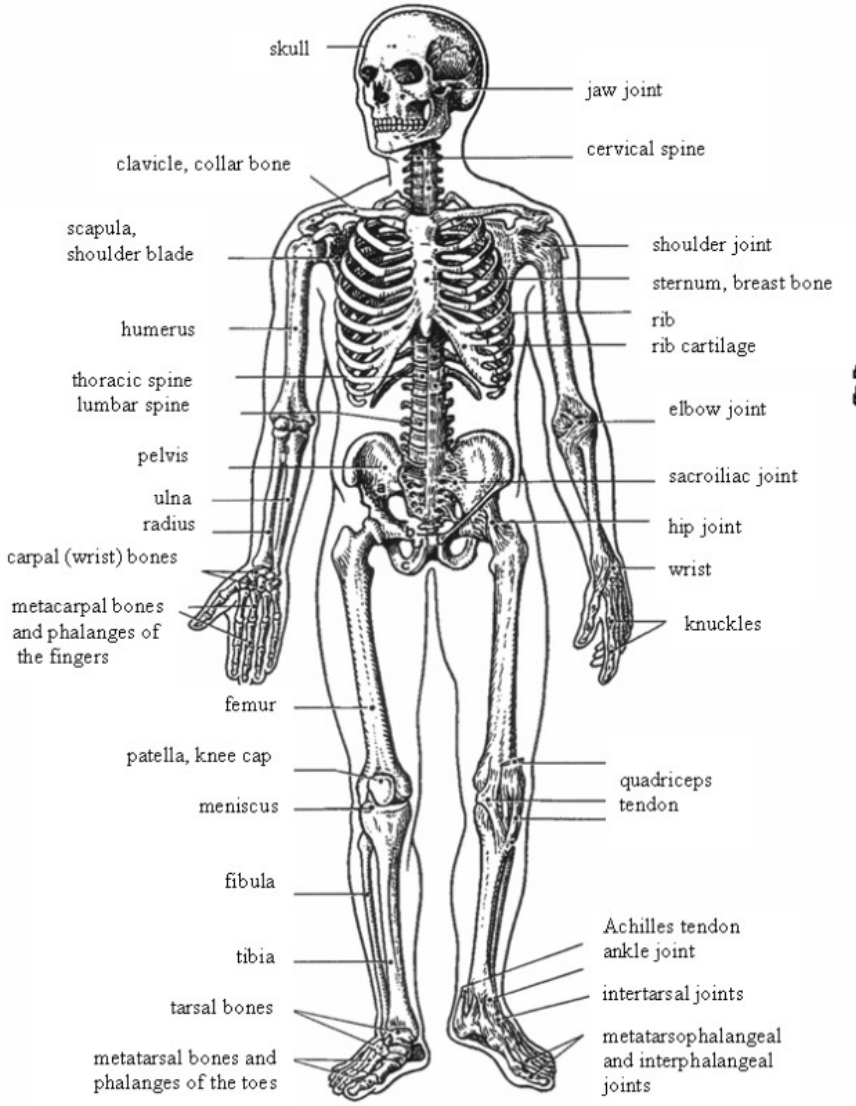
Illnesses and treatments in English

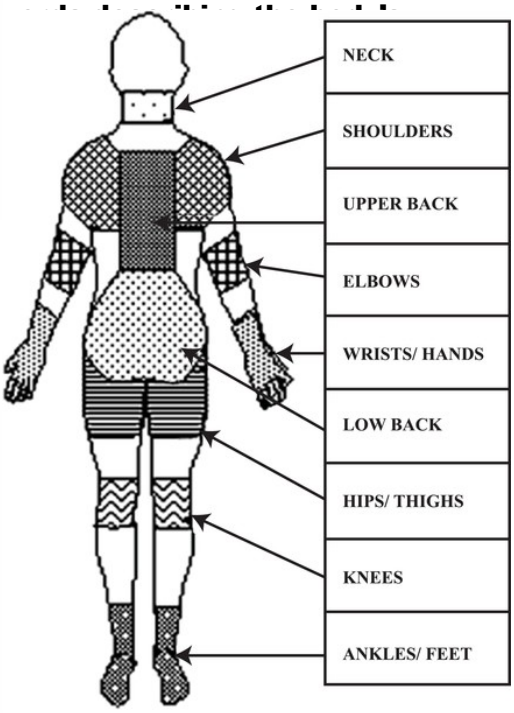
2. Locating pain

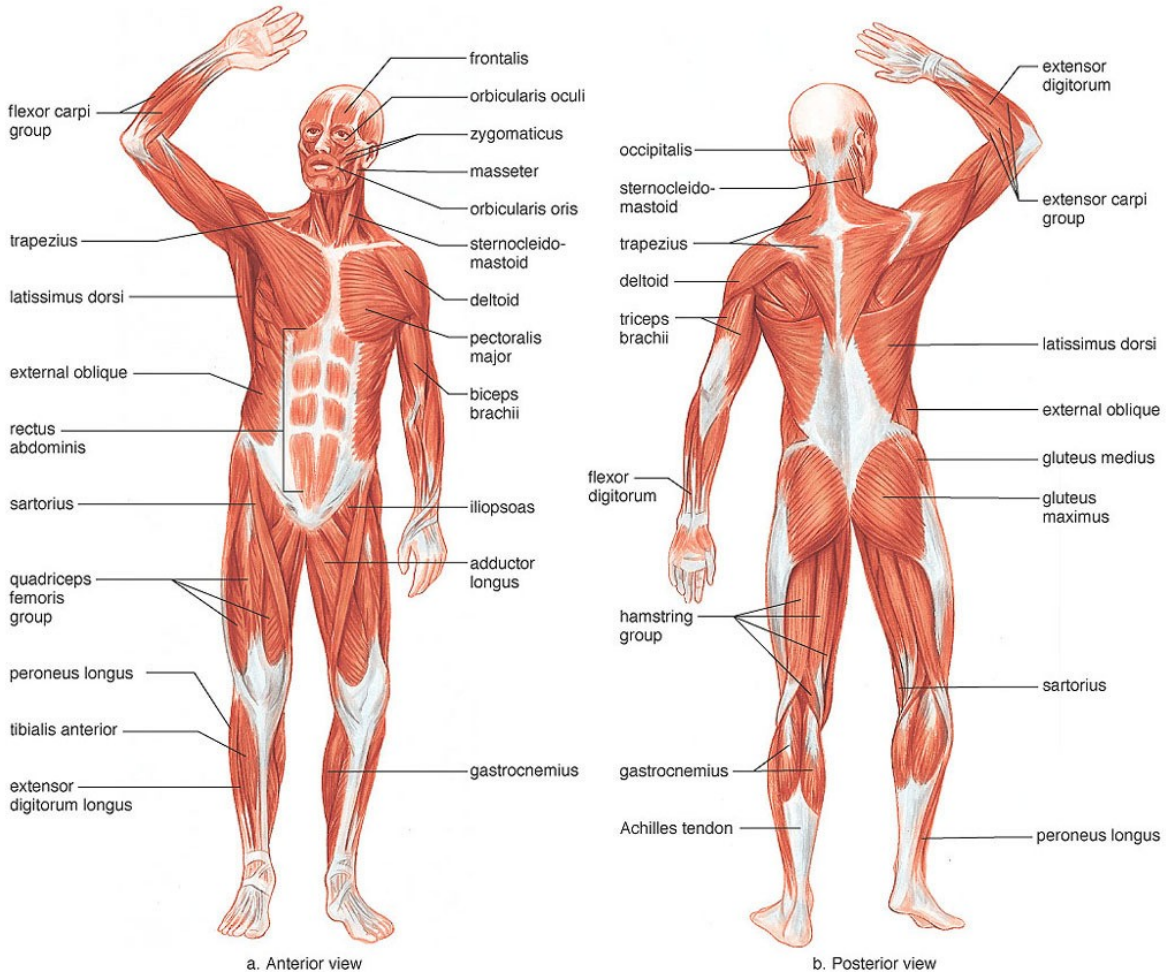
Human body vocabulary:
Head, face, eyes, eye lashes, eye brows, nose, nostrils, ears, lips, mouth, tongue, chin, cheeks, forehead, hair
Neck, shoulders, chest, breasts, back, spine, arms, elbows, wrists, hands, fingers, knuckles, finger nails
Stomach, abdomen, hips, bottom/backside, thighs, knees, shins, calves, ankles, feet, heels, toes, toe nails
Muscle, tendon, bone, skeleton, spine, vein, artery, brain, heart, liver, kidney, bladder, bowel, lungs, blood, sweat
→ Arms and legs are called ‘limbs’
→ Fingers and toes are sometimes called ‘extremities’

Internal organs

Brain, liver, kidney, lungs, kidney, stomach, bowel, colon, intestines, bladder, appendix, spleen, womb/uterus, urethra, pancreas


skull
jaw joint
cervical spine
clavicle, collar bone
scapula,
shoulder blade
shoulder joint
sternum, breast bone
rib
rib cartilage
humerus
thoracic spine
lumbar spine
elbow joint
pelvis
sacroiliac joint
ulna
radius
hip joint
carpal (wrist) bones
wrist
metacarpal bones
and phalanges of
the fingers
knuckles
femur
patella, knee cap
quadriceps
tendon
meniscus
fibula
Achilles tendon
ankle joint
tibia
intertarsal joints
tarsal bones
metatarsophalangeal
and interphalangeal
joints
metatarsal bones and
phalanges of the toes


NECK
SHOULDERS
UPPER BACK
ELBOWS
WRISTS/ HANDS
LOW BACK
HIPS/ THIGHS
KNEES
ANKLES/ FEET



Musculoskeletal Disorders

Painful disorders of muscles, tendons, and nerves that develop over time from tasks that repeatedly cause stress and injury to tissues

Common causes

Material handling injuries due to repeated lifting, pushing and pulling

Workstation furniture, layout, job design and keyboarding

Repetitive motion injuries risk factors due to job design, awkward body motions, and tools

Inadequate job design pace of work, production pressure, lack of sufficient time to recover from overwork

Musculoskeletal disorders (MSDs) are the most frequent type of lost-time injury and the single largest source of lost-time costs in Canada.

What employers can do

Hazards are best eliminated at the source. Employers should focus on avoiding repetitive patterns of work through **job design** changes:

- **Mechanization** automate tasks
- **Job rotation** moving between different tasks
- **Team work** distributing work more evenly
- **Job enlargement** increasing the variety of tasks

If elimination of repetitive patterns of work is not possible, prevention strategies can focus on:

- **Workplace design** fitting the workstation to the worker
- **Assistive devices** using carts, hoists, or other mechanical handling devices
- **Work practices** training workers, allowing rest periods, and giving workers more job control
- **Tool and equipment design** providing proper tools that decrease the force and avoid awkward positions

Symptoms

Musculoskeletal disorders (MSDs) do not happen overnight.

WATCH FOR SIGNS

Pain, joint stiffness, muscle tightness, redness, swelling of the affected area, numbness, "pins and needles" sensations, skin colour changes

Being aware of the causes and developing a prevention program is essential. Inform and train workers, encourage early reporting of symptoms, and identify and control job-related risk factors.

CCOHS.ca
Canadian Centre for Occupational Health and Safety

More?

Specifics:

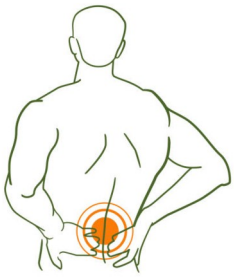
Foot injuries
https://footpainmanagement.org/common-foot-injuries/

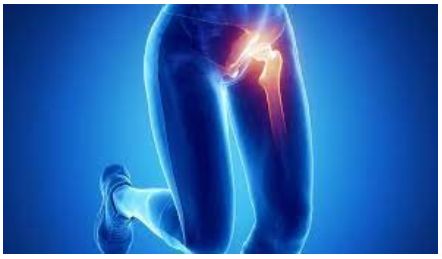
Leg injuries
https://medlineplus.gov/leginjuriesanddisorders.html

Back injuries
https://medlineplus.gov/backinjuries.html

MOST IMPORTANT: SPORTS INJURIES
https://www.nhs.uk/conditions/sports-injuries/types/

Let's describe some situations:





"A very advanced case of tennis elbow, Mr Scudworthy !"

6. Describing a situation

Most Common Ergonomic Issues/ Symptoms:

Common Workplace Ergonomic Issues and their Causes

(source: https://ergonomictrends.com/common-workplace-ergonomic-issues/)

Ergonomic issues most commonly arise in a person's neck, shoulders, back, or extremities. Depending on the condition, common symptoms can include:

- **Tingling** or **numbing**
- **Dull and aching, sharp and stabbing, or burning pain**
- Muscle weakness, **decreased grip strength**, or cramping
- Loss of coordination
- **Decreased range of motion** or **discomfort**
- Coldness or discoloration of the affected area
- Swelling of inflammation
- **Joint stiffness**
- Visual fatigue
- **Blurred** vision
- Burning or **watery** eyes
- Frequent headaches

(…)

Most Common Tasks that Lead to Ergonomic Problems

There are many variables that affect the chances of developing ergonomic problems. Identifying these risk factors is fundamental in making the necessary changes to mitigate and prevent MSDs (= **Musculoskeletal disorders)**.

1. Prolonged Repetitive Tasks

Repetitive tasks refer to using the same joints and muscle groups to perform the same tasks over and over again. This causes fatigue and, eventually, injuries to the affected area since there's little time for the body to **recover**.

2. Sustained Awkward or Static Posture

Over time, these two types of postures are

more likely to lead to ergonomic injuries:

- **Awkward Postures: Bending**, **twisting**, and **overextending**, which puts the body out of its natural alignment.
- **Static Postures:** Non-changing positions like **gripping**, **standing**, and **sitting**, which cause muscle fatigue and prevent natural body restoration from **restricted blood flow**.

An improper workplace setup is one of the most common causes of awkward posture in the office.

3. Vibration

Vibrations may feel **innocuous**, but when it's **sustained,** can cause MSD. Whole body vibrations like those experienced by bus drivers or localized vibrations caused by **power tools** can damage the small **capillaries** that bring **nutrients** to the body. This leads to less feeling in the affected area, and overtime, pain and stiffness.

Up to 65% of occupational drivers are at an increased risk of developing lower back pain due to whole body vibration.

4. Exerting Too Much Force

The greater the force **exerted**, ***the higher*** the stress on the body. When little **recovery time** is given or the force exceeds the worker's **capability**, the higher the risk of developing ergonomic injuries.

Examples of overexertion include **lifting**, **pushing**, or **pulling heavy loads**, using **worn-out tools**, and controlling equipment. Cold temperature can also numb hands, which lead to workers misjudging how much effort they are expending.

35% of work-related injuries are caused by ***overexertion****. It is also the top contributor to* ***workers' compensation costs*** *at 25%.*

Vocabulary:

Tingling:

Grip strength:

Range of motion:

Discomfort:

Numbing:

Dull:

Sharp pain:

Stabbing pain:

Burning pain:

Awkward:

Bending:

Twisting:

Overextending:

Gripping:

Standing:

Sitting:

(Restricted) blood flow:

Innocuous:

Sustained:

Power tools:

Capillaries:

Joint stiffness:

Stiff:

Blurred (vision):

Watery eyes:

Musculoskeletal disorders (MSDs):

Nutrients:

Exerted:

Recovery time:

Capability*:

Lifting:

Pushing:

Pulling:

Heavy loads:

Worn-out tools:

Overexertion:

Workers' compensation costs:

Please answer the questions:

1. Try and find an example of industry or profession where each one of the 4 types of tasks may cause pain to the people who are carrying them out

2. By helping you with the list of common symptoms in the upper part of the text, try to describe what type of pain each of these bad postures or hard tasks may create

Watching the video on posture analysis:

Please answer the following questions:

1. What position do you look at first?

2. What way do you examine the person?

3. What does "tilted head" mean?

4. What does "lifted shoulders" mean?

5. What does "imbalance" mean?

6. What can be observed that suggests muscle imbalance?

7. What can be observed when looking at the hands?

8. Moving sideways: Write down the 4 various types of head tilts

9. Now viewing from the back: what type of back problem can you detect?

7. Posture corrections

5 Common Ergonomic Problems and Solutions

By Team Briotix, June 2018

(Source: https://news.briotix.com/5-common-ergonomic-problems-and-solutions)

Estimates suggest that US companies spend more than $20 billion each year in **workers' compensation claims** resulting from musculoskeletal injuries. When you factor in **employee replacement**, **loss of productivity**, and **increased insurance premiums**, that cost more than doubles. The good news is with the right **training** and **work practices**, work-related **musculoskeletal injuries can be significantly reduced**.

Why Company Leadership Should Be Concerned About Ergonomic Problems

According to a recent Gallop poll, 70% of the US workforce reports suffering discomfort due to a musculoskeletal injury. When you combine those numbers with the current research from the American Medical Association that indicates an employee in pain loses 5 ½ hours of productivity due to discomfort, quickly and efficiently **addressing** employee pain is not only crucial to overall employee health but also has significant implications for a company's bottom line.

What Are the Most Common Ergonomic Problems and Their Solutions?

Regardless of industry, some common ergonomic problems can be addressed with **early intervention practices** to **prevent an injury from occurring** in the first place. Below are five of those ergonomic problems and solutions to correct the issue.

1. Not Operating in Neutral Position

The body functions best when we work in a neutral position. The neutral position is merely a comfortable position that **aligns all of your joints**. When you are working in neutral, your body has less stress on your muscles, tendons, and skeletal system reducing the risk of **incurring** a musculoskeletal injury.

Create an "L" with your body

To operate in neutral, you want to keep your body **lengthened** and **aligned**. To do this, you create an "L" position with your body. To do this:

- Keep your head directly **above your shoulders** not **tilting forward**, **backward** or **to the side**.

- Align hips ***slightly*** above knees forming a 110-degree angle. This will take the pressure off of your bones.
  Create a 90-degree bend in your knees to support your upper body. Knees should be 2”-3” off the front of your chair when sitting.
- **Place feet flat** on the floor. If your chair is too high, adjust down if possible. If not adjustable, use a flat stole to place your feet on.

2. Repetitive Motions

A significant portion of work-related injuries happen over time and are caused by **ongoing**, repetitive movements. Those repetitive motions can be everything from **typing**, to answering a phone, to **hammering a nail**. By itself, those activities do not typically cause **strain** but the consistent use of the muscles to complete the same action, overtime can lead to stress and pain with the musculoskeletal system.

Switch Tasks Every Hour

A good rule to follow when it comes to preventing repetitive motion injuries is to frequently switch tasks so that you are using an entirely different muscle group at the top of every hour. This will allow your muscles to recover while maintaining work productivity.

Additionally, workers should take advantage of any ergonomic tools **at their disposal**. **Adjustable chairs**, **monitor stands**, and **headsets** are just a few tools that can be easily integrated into a **workspace** to reduce the risk of injury from repetitive motions.

3. Awkward Positioning

Awkward positioning refers to positions in the body when a person **deviates** significantly from neutral position while performing tasks. When a person completes a task in an awkward position, the muscles operate less efficiently and require the worker to expend more force to complete the task. This additional force and decreased efficiency can result in musculoskeletal injury. **Some examples of awkward positioning** include **bending, reaching, lifting, and twisting.**

Keep What You’re Working on Close to You

Avoid awkward positions, it is important to keep whatever you are working on close to you. Specifically, try to keep everything **within arms-reach**. This keeps your body closer to neutral by not requiring you to reach, twist, or bend to get to your work. If you are working on a stationary object that cannot be moved closer to you, make sure to check your position frequently respect your discomfort if it develops. **Take breaks**, change positions, and **stretch stiff muscles.**

4. Not Moving Frequently

Research suggests that when the body is in a static state for an extended period, a worker has a higher chance of suffering a musculoskeletal injury. Beyond a musculoskeletal injury, **extended sitting** can cause **chronic life-altering injuries*** such as obesity and type-2 diabetes. *(* not injuries but diseases)*

Get UP Every 30 Minutes

In a recent study published in the Annals of Internal Medicine, it is suggested that after 30 minutes of sitting, a person should get up and move. The new research finds that moving every 30 minutes significantly not only reduces the risk of suffering a musculoskeletal injury but also the risk of early mortality. Some suggestions for movement include:

- **Doing a lap** around your office.
- Walking to the **water fountain.**
- Printing to a printer outside of the office and walking to collect the paper.
- Standing for some simple stretches at your desk.

5. Pulling Injuries

Injuries while pulling objects are often associated with overexertion and are some of the most common ergonomic injuries reported in the workplace. Along with **muscle strains**, it is not uncommon for other injuries to be associated with pushing and pulling objects including **slips**, **trips**, and **falls**.

Push Rather than Pull

Whenever possible, it is best to push an object rather than pull. This is true for some reasons, including:

- You can see where you are going.
- Pushing puts less stress on your shoulders, decreasing your chance of injury.
- Using your body weight allows you to apply more force requiring less strain of your muscles.

In the workplace, the best way to address musculoskeletal injuries it to prevent them in the first place. With simple behaviour modifications and training, employees can avoid common ergonomic problems reducing absenteeism, workers' compensation claims, and claims costs.

Vocabulary:

*Workers ' compensation **claims:***

Employee replacement:

Loss of productivity:

Increased insurance premiums:

Training:

Work practices:

Significantly:

To address:

Early intervention practices:

*To **prevent** an injury **from** occurr**ing**:*

To operate:

To incur:

***Above** the shoulders:*

*Tilting **forward**:*

Backward:

To the side:

To strain:

To switch:

At one's disposal:

An adjustable chair:

A monitor stand:

A headset:

A workspace:

To deviate:

Within arms-reach:

To take a break (or take breaks):

To stretch stiff muscles:

Extended sitting:

Chronic life-altering injuries:
(not injuries but diseases)*

To do a lap:

A water fountain:

To place (one's) feet flat:

Ongoing:

To type:

To hammer:

A nail:

Muscle strains:

A slip:

A trip:

A fall:

Please answer the following questions:

1. How much do musculoskeletal injuries cost US companies each year?

2. What costs do they pay?

3. What are the means of reducing these costs?

4. What is the neutral position?

5. Why can repetitive motions create pain?

6. Why is “bending” called an awkward position?

7. Same question with “reaching”?

8. Why is the fact of not moving frequently a risk for people’s health and a cause for “chronic life-altering” diseases?

9. Please comment the 3 reasons why it is best to push rather than pull.

8. Economic costs of musculoskeletal disorders

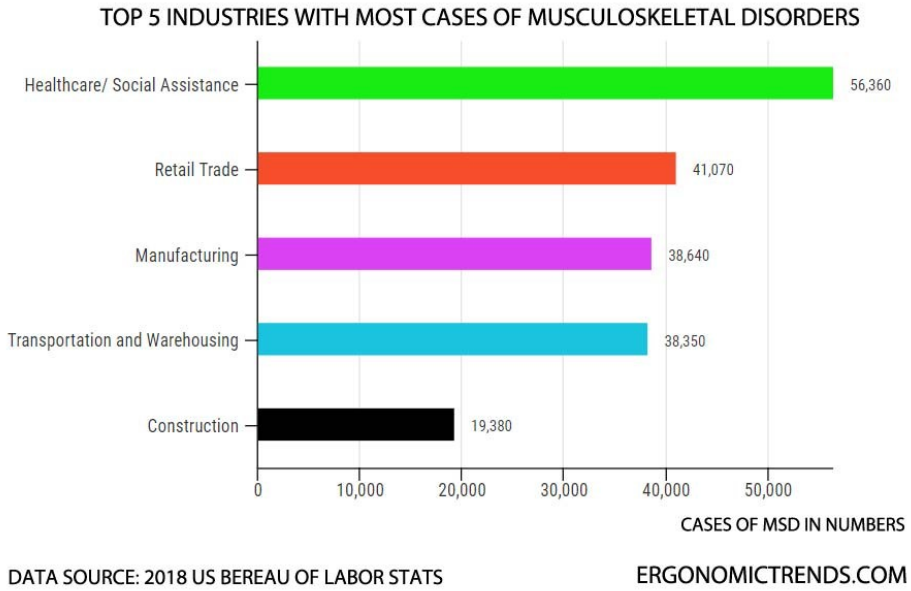
Going further with :

Common Workplace Ergonomic Issues and their Causes

(Source: https://ergonomictrends.com/common-workplace-ergonomic-issues/)

Industries and Jobs Most At Risk

Some industries and jobs are much more **prone to** ergonomic injuries. The **health care sector**, **retail trade**, and **manufacturing industries accounted for** about half of all Musculoskeletal Disorders cases in the US, according to the US Bureau of Labor Statistics. The top 5 industries with the highest incidence rates are:



Here are the specific types of occupations that are at the highest risk.

Construction Workers

Construction workers are often subjected to **prolonged** awkward positions, lifting heavy loads, repetitive arm-hand movements, and controlling vibrating hand tools. This makes them especially prone to developing MSDs like **tendonitis**, back pain, **arthritis**, **herniated discs**, CTS (**Carpal Tunnel Syndrome**) and hand-arm vibration

syndrome.

•A 10 year study showed that construction and extraction occupations are most at risk of developing workplace tendonitis, with up to 44.2% of those surveyed suffering from the disorder.
•**Upper limb** disorders are most common in **bricklayers** (58.2%), followed by electricians (55.8%), **ironworkers** (55.7%), and **carpenters** (46.2%).
•Among ironworkers, there are many prevalent MSDs including (19%) tendonitis, (18%) **ruptured spinal disc**, (15%) **shoulder bursitis**, and (12%) CTS.
•According to the Survey of Occupational Injuries and Illnesses (SOII) 2019, 41.7% of construction workers had back injuries, 12.4% had knee injuries, and 45.6% had arthritis.

Operators, fabricators, and labourers make up 38% of back injury cases and 36.7% of CTS cases.

Computer and Office Workers

Office workers often type, **mouse**, and sit for long periods of time. When these aren't **paired with** good sitting habits, enough breaks, and proper ergonomics, employees can develop CTS, forward head posture, low back pain, radial tunnel syndrome (RTS), tendonitis, eye strain, and more.

•A 2008 BLS report found that 60% of US computer workers complain of wrist pain due to poor ergonomics and inadequate breaks.
•In a 2016 survey, 41% and 38% of the surveyed computer workers in a study had upper back and neck fatigue respectively.

Technical, **sales**, and **administrative support** office workers account for 34.2% of carpal tunnel syndrome cases.

Healthcare Professionals

Healthcare professionals such as nurses are the most susceptible to ergonomic injuries according to data. **Patient handling**, moving machines, working in **cramped areas**, standing for prolonged periods of time all contribute to their risk levels.
This leads to work-related MSDs like back pain, tendonitis, CTS, and tension neck syndrome.

•According to the US Bureau of Labor Stats, Healthcare as an industry ranks #1 for instances of musculoskeletal disorder among workers.
•In terms of annual prevalence, hospital workers, particularly nurses, have neck pain (40%), back injuries (30 to 60%), and shoulder injuries (47%).
•The work-related MSD rate for nurses is four times higher than other workers.
(...)

Manufacturing Workers

As an industry, **manufacturing** and **warehousing** comes in third for highest rate of MSD in the US, according to the US Labor Bureau 2018 statistics.

Assembly line workers often get **stationed** in areas where they

do repetitive assembly work while standing, which not only strains the eye but increases their risk of CTS and hip and back pain. Male production workers usually get tasked with operating machinery and heavy loads, causing them to overexert and develop back pain and tendonitis.

- In a 2010 study of 500 assembly workers, one third had upper and lower back pain.
- Upper limb MSD prevalence is 35% for women and 12% for men in some manufacturing plants. For neck, shoulder, and back MSDs, the prevalence was 27% female and 18% for male workers.
- Musculoskeletal discomfort is rampant among assembly workers in the following body areas: right shoulder (61.4%), right wrist (60%), and upper back (63.2%).

75.4% of assembly workers complain of musculoskeletal pain in the lower back.

Vocabulary:

To be prone to:

Health care sector:

Retail trade:

Manufacturing industry:

To account for:

A construction worker:

Prolonged:

Tendonitis:

Arthritis:

Herniated disc:

Carpal Tunnel Syndrome:

Upper limb:

A bricklayer:

An iron worker:

A carpenter:

Ruptured spinal disc:

Shoulder bursitis:

To mouse:

To be paired with:

Sales:

Administrative support:

Patient handling:

Cramped areas:

Warehousing (vs Manufacturing):

An assembly line worker:

To be stationed:

Please answer the following questions (I am asking your opinion here, not really querying your understanding of the text):

1. Why are healthcare sector workers more affected by MSDs?

2. Why are construction workers less affected than healthcare workers?