Occupational Safety and Health for works

OUTLINE

1. Objectives and legal basis for training
2. Introduction - basics of health and safety at work.
3. Practical safety: warning (signs); evacuation; in case of fire, accident …
4. First aid
5. Personal Protective Equipment
6. Ergonomics of workplace
7. Testing

1. Objectives and legal basis for training

Accidents can happen

1. Objectives and legal basis for training

New Haven Register

'A TRUE TRAGEDY': Yale student asphyxiated in lathe accident at chemistry lab,

nature International weekly journal of science

A death in the lab

Fatality adds further momentum to calls for a shake-up in academic safety culture.

Richard Van Noorden

Accidents can happen

1. Objectives and legal basis for training

The legal basis of training

1. Regulation of the Minister of Economy and Labour of 27 July 2004 on training in the field of occupational health and safety, Rozporządzenie Ministra Gospodarki i Pracy z dnia 27 lipca 2004 r. *w sprawie szkolenia w dziedzinie bezpieczeństwa i higieny pracy,*
2. Regulation of the Minister of Science and Higher Education of 05 July 2007 on health and safety in schools, Rozporządzenie Ministra Nauki i Szkolnictwa Wyższego z dnia 05 lipca 2007 r. *w sprawie bezpieczeństwa i higieny pracy w uczelniach,*
3. The Labour Code, Article 207 - 237 Kodeks Pracy; Art. 207 - 237

1. Objectives and legal basis for training

Initial safety training (IST) consists of:

1. General safety instructions
2. Job Training

1. Objectives and legal basis for training

IST provides participants with knowledge about:

1. The basic rules of safety and health contained in the Labour Code,

2. Key industry regulations regarding health and safety issues relevant for their employer

3. The rules of procedure in case of fire and first aid in the event of an accident at work or other local emergency.

1. Objectives and legal basis for training

Job training provides knowledge about:

1. work environment factors that are present in the workplace,
2. common occupational hazards in the workplace,
3. methods of protection against hazards in the workplace,
4. methods to work safely.

1. Objectives and legal basis for training

General obligations in OSH:

art. 66 of the Polish Constitution "Everyone has the right to safe and healthy working conditions."

According to art. 211 of the Labor Code, each employee is required to:

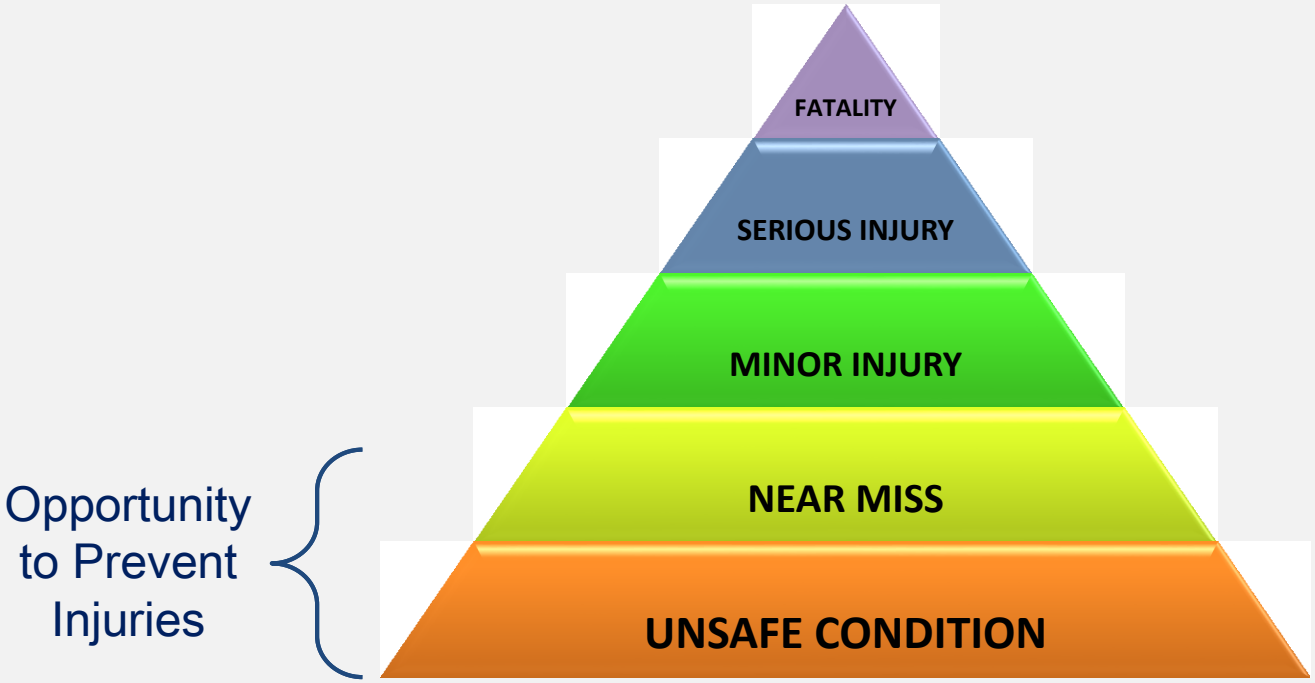
1. Know the rules and principles of occupational health and safety, to take part in the training and instruction and pass required examinations;
2. Carry out the work in accordance with the provisions and principles of occupational health and safety and comply with the issued instructions in this regard and guidance of superiors;
3. Ensure proper state machinery, equipment, tools and equipment, and the order and harmony in the workplace,

1. Objectives and legal basis for training

General obligations in OSH (cont):

4. Use collective protective measures, and use of personal protective equipment assigned, clothing and footwear, as intended;
5. Subject initial and periodic inspection and other prescribed medical examinations and comply with medical indication;
6. Immediately notify the supervisor about noticed workplace accidents or danger to the lives or health of people and warn co-workers and other persons in the hazardous area, the threat of the danger;
7. co-operate with their employers and supervisors in carrying out responsibilities for health and safety.

2. Basics of health and safety at work



2. Basics of health and safety at work

The objectives of labor protection:

1. protection of workers against accidents at work,
2. protection of workers from occupational diseases,
3. limit hiring for particularly heavy or burdensome work,
4. protection of material goods and zones of work from damage,
5. protection of employees 'rights' - long-term employment, pay, special protection of young people and women at work and the protection of other rights of employees (working hours, employees' leaves, etc.).

2. Basics of health and safety at work

Hazards

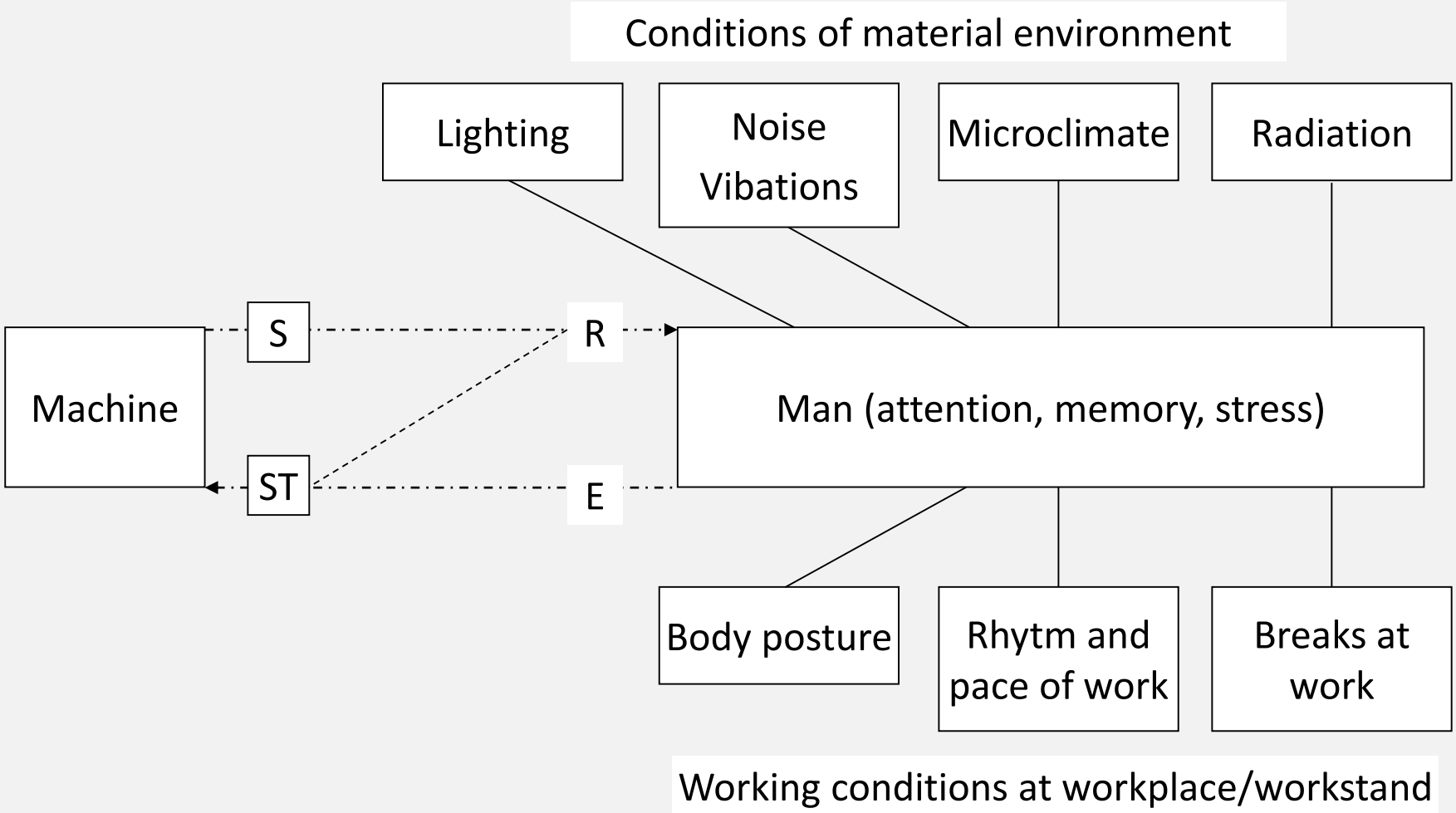
The division of factors in the work environment, allows to distinguish the three types of factors:

1) Dangerous factors,
2) Harmful factors,
3) Burdensome factors.

Each of the above types of factors has a different degree of impact on employees; the consequences may also be variable.

2. Basics of health and safety at work

hazards



2. Basics of health and safety at work

A **hazard** can cause harm or adverse effects

Risk is the chance or probability that a person will be harmed or experience an adverse effect if exposed to a hazard

Risk Assessment is the process where you:

Identify the hazards
Analyze or evaluate the risk associated with that hazard
Determine appropriate ways to eliminate or control the
perform hazard identification and risk assessment

2. Basics of health and safety at work

Likelihood	Values
Expected	10
Possible	6
Unusual	3
Remote	1
~ Conceivable	0.5
~ Impossible	0.1

Exposure	Values
Continuous	10
Daily	6
Weekly	3
Monthly	2
Few/year	1
Yearly	0.5

Possible Consequences	Value
Catastrophe (many fatalities, $\$10^8$ damage)	100
Disaster (few fatalities, $\$10^7$ damage)	40
Very serious (fatality?, $\$10^6$ damage)	15
Serious (serious injuries, $\$10^5$ damage)	7
Important (injuries, $\$10^4$ damage)	3
Noticeable (first aid, $\$10^3$ damage)	1

$$OH = L \bullet E \bullet P$$

3. Practical safety

Pogotowie Policji	Police	997
Straż Pożarna	Fire	998
Pogotowie Ratunkowe	Emergency	999
Pogotowie Gazowe	Gas leak	992
Straż Miejska	Municipal police	986
SOS - pomoc przy każdym zagrożeniu		112

3. Practical safety

Fundamental Safety Principles

Do not start work at a height level without carefully planning it,
Make sure that you identify all possible circumstances that could pose a danger
Always analyze whether there are safer ways of performing your job.
Use only the proper and approved safety equipment, tailored to work at right level.
Before using protective equipment, refer to its instruction manual.

3. Practical safety

- Extension Cords and Power Strips
  - Extension cords for temporary set-ups only
  - Secure extension cords to prevent tripping hazard
  - UL listed and rated for electrical load
  - Power strips must have circuit breaker
  - Do not “daisy chain”
- Do not use any equipment with damaged cords or plugs

3. Practical safety

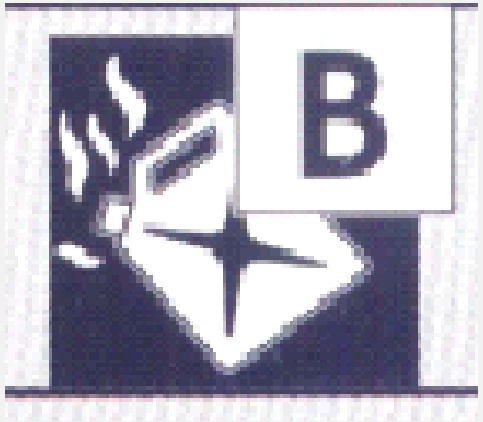
General principles for equipping an object in handy fire-fighting equipment;

Quick-fighting equipment is designed to extinguish fires in the first stage of their development. The fire extinguishers include all kinds of fire extinguishers (fluid, foam, powder, snow), a small fire extinguishers (up to 25 kg. Extinguishing agent) and fire blankets.

According to the Regulation on the protection of buildings, other buildings and areas (...) one unit of firefighting equipment weighing 2 kg extinguishing medium (or 3 dm3) should occur for every 100 m2 (area of the fire in the building) is not protected fixed device extinguishing (sprinkler, sprinklers, etc.).

3. Practical safety

The fire-fighting group "A" (solids) of organic, in which the phenomenon of burning incandescent eg wood, paper, cloth, apply **water** or **foam** extinguishers.



The fire-fighting group "B" (flammable liquids and solids melting, such as gasoline, alcohol, oil, grease, paint), used interchangeably extinguishers: **fluid, foam, snow or powder.**

3. Practical safety

The fire-fighting group "C" (flammable gases, such as propane, acetylene, natural gas) are used interchangeably **powders** or **snow** extinguishers.

To extinguish the group "D" (light metals, such as magnesium, sodium, potassium, lithium), **powders** extinguishers are used specially for this type fires.

3. Practical safety

To extinguish fires with index "E" (energized electrical equipment and other materials nearby of these devices) are used interchangeably snow or powder extinguishers.

To extinguish unusual fires: fats, oils, foodstuffs foodstuffs in culinary equipment group "F" (vegetable oils, animal fats), are used specifically fire extinguishers

3. Practical safety

Powder type fire extinguisher are designed to extinguish fires of the groups A, B and C, or B, C depending on the type of powder used. (...). Extinguishing powder is thrown to a distance of 8 m by compressed natural gas (carbon dioxide or nitrogen). Fire extinguishers are recommended for fighting fires in areas where it is not advisable to use water. This is because it does not damage (make wet) the extinguished objects.

3. Practical safety

Snow extinguishers: They are designed to extinguish flammable liquid fires, gas fires, such as group B, C, and E (gasoline, solvents, paints) and fire systems and electrical equipment up to 1000 Volt. Extinguishing agent in the extinguisher is contained in the high pressure cylinder, liquefied carbon dioxide, which is cooled during the expansion to about -78 ° C. The advantage is the lack of fire extinguishers snow extinguished any contamination of objects and spaces.

3. Practical safety

Fire extinguishers, water (fog)
They are designed to extinguish flammable materials from the "A" (wood, paper, textiles, etc.) is especially recommended extinguisher to extinguish the office, hotel, restaurant, burning clothing on people, etc. where the water (water spray) is not a danger of damage or destruction of valuable and sensitive things get wet. DONT USE fog extinguishers to extinguish electrical equipment is energized, since the stream of water conducts electricity. Also, do not put out the substances that react chemically with water.

3. Practical safety

Foam extinguishers are primarily used to extinguish some types of flammable liquids and solids. Extinguishing substance in the extinguisher foam is ejected with a compressed gas (nitrogen or carbon dioxide).
Do not extinguish with foam bodies that react chemically with water. Also, do not use foam to extinguish precious or fragile things get wet. Due to the requirements of environmental protection, foam are not uncommon but are still produced.

3. Practical safety

Fire extinguishers specialized electronic equipment:
They are designed to extinguish electrical and electronic equipment with voltage (up to 36 kV with the distance of 2 m). They do not leave impurities, and do not cause thermal shock extinguished devices.
Contain clean extinguishing agent halon replacement being. The design of the outlet of the nozzle allows for precise application extinguishing medium to the fire source, without causing damage to the immediate environment.

3. Practical safety

Watering pot is a portable container made of plastic usually located about 15 - 20 liters of water, with a pump suction and forcing a manually and short hose extinguishing Watering pot (Hydronetka) is most useful for small fires

3. Practical safety

Spray extinguishers
Extinguishing sprays are universal extinguishing agents designed to extinguish A and B.
They do not require periodic inspections. They are characterized by simplicity of use and efficiency comparable to a traditional fire extinguisher 2 kg. They have the ability to extinguish electrical equipment up to 1000 Volt. They are characterized by an extremely high cooling properties.
Presented above Spray media: silver: foam, red: Liquid (foggy).

3. Practical safety

Fire blankets, are used to mechanically cut off the flow of air to the burning material. They are made of fiberglass. The area is around 3m2. The use of fire blanket is tightly covering the burning object. Using a blanket, be sure to cover the embers of the fire from the windy side to avoid burning fire. Fire blanket disadvantage is that it can be used effectively only to extinguish a small fire sources and located close to the person putting out a fire. The advantage is the ability to reuse objects and avoid destroying extinguished objects.

3. Practical safety

Safety Signs types

prohibition sign

information sign

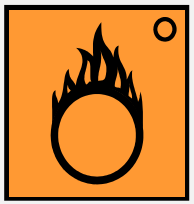
warning sign

mandatory sign

3. Practical safety

Highly flammable

Flammable



Oxydising

Explosive

Highly toxic

Toxic

Noxious

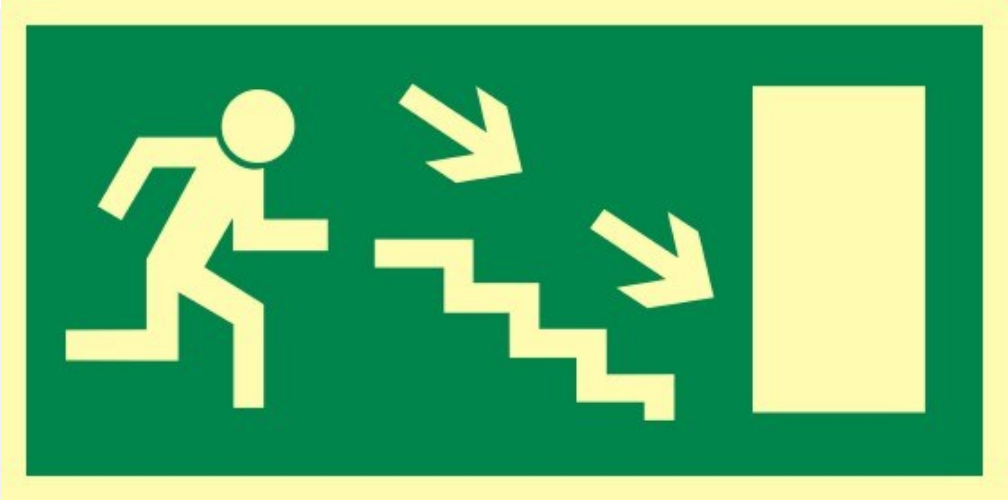
Irritant

Corrosive

Hazardous to the environment

Safety Signs

3. Practical safety



Safety Signs

3. Practical safety

Safety Signs

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Safety Signs

3. Practical safety

Safety Signs

4. First aid

General rules

Evaluate the scene

Assess safety

Prioritize care

Check for medical alert tags

Do head-to-toe check

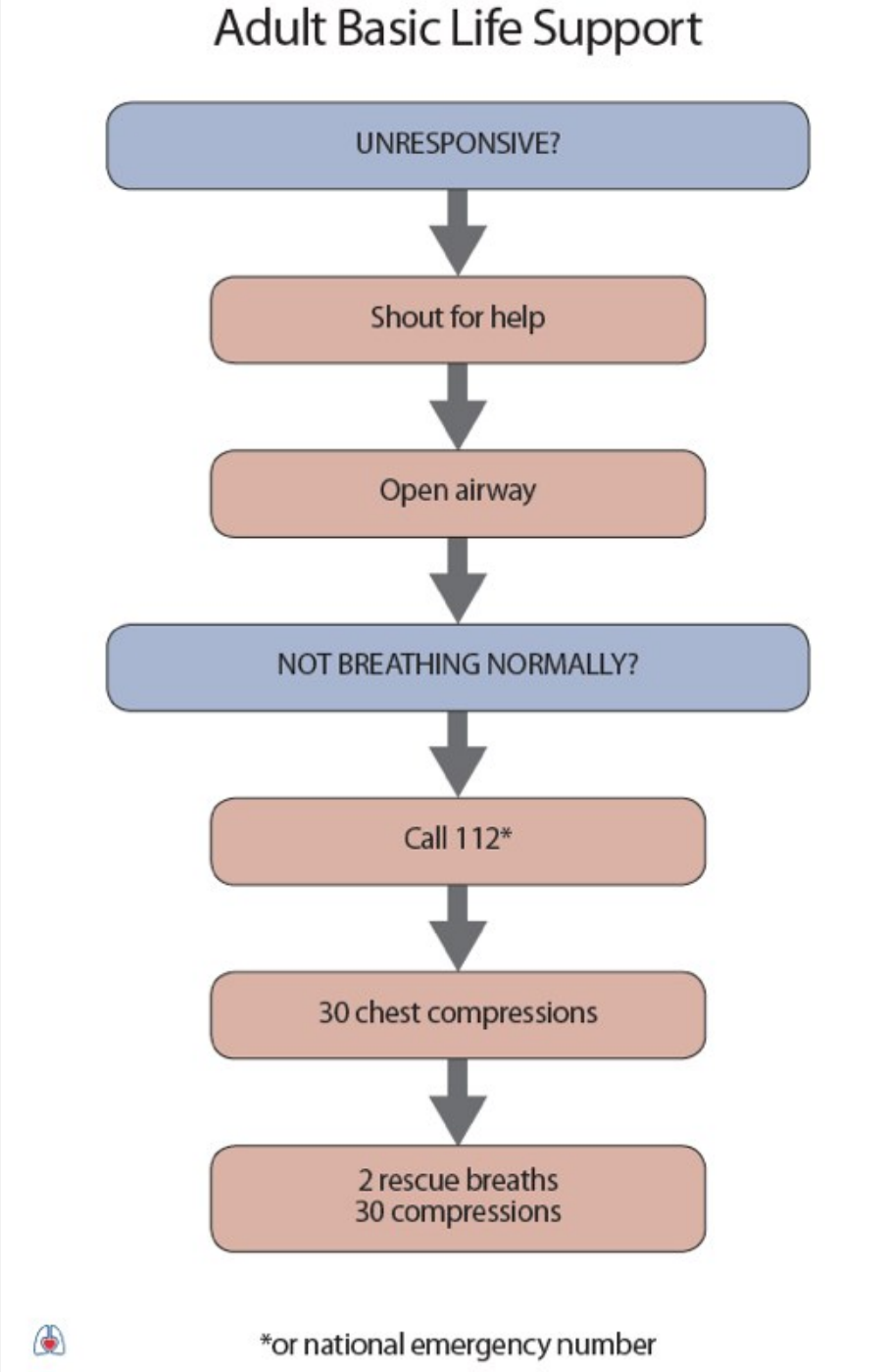
Move only if necessary

4. First aid

Administer CPR:

- Lay the person on his or her back
- Tilt head slightly
- Give chest compressions 30 x
- Breathe into the person's mouth 2x (not always)
- Continue until EMS personnel arrive

No Breathing



4. First aid

No Breathing

4. First aid

- Lay the victim down
- Cover
- Raise feet

Shock

4. First aid

- Call 112
- Make victim comfortable
- Loosen tight clothing
- Check for medication
- Keep victim still
- Don’t give stimulants

Heart Attack

4. First aid

- Ask a person to speak or cough
- Deliver 5 back blows
- Perform 5 abdominal thrusts
- Repeat sequence of back blows and abdominal thrusts

Choking

- Call 112
- Finger sweep
- Abdominal thrusts
- Check ABCs
- Perform CPR if not breathing

4. First aid

Don’t touch!

Turn power off

Call 112

Remove person from live wire

Check for breathing

Electrical Shock

4. First aid

Move to cool place

Lay victim down

Elevate feet

Loosen clothing

Give fluids

Apply cool compresses

Heat Exhaustion

4. First aid

- Stop the flow of blood
- Wear gloves
- Cover the wound
- Apply pressure
- If a body part has been amputated, put it on ice

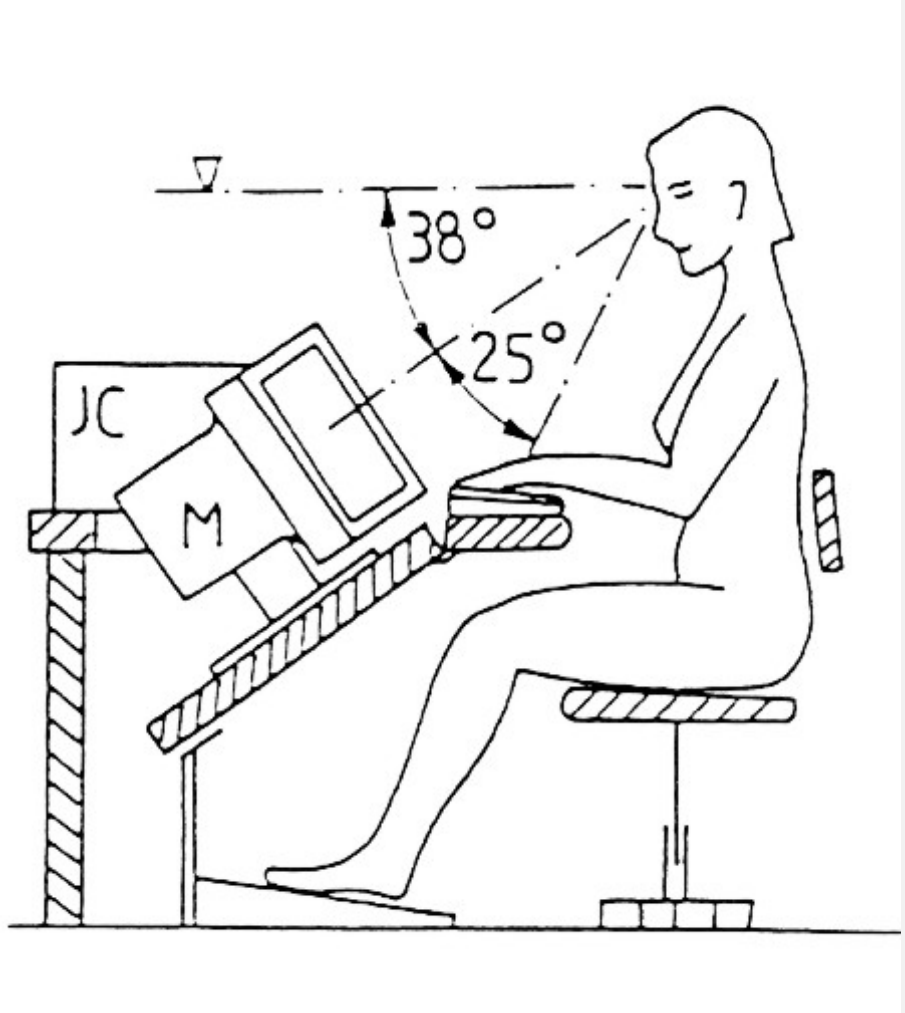
Bleeding

5. Personal Protective Equipment

- Eye and face protection
  - Safety glasses
  - Splash goggles
  - Face shield

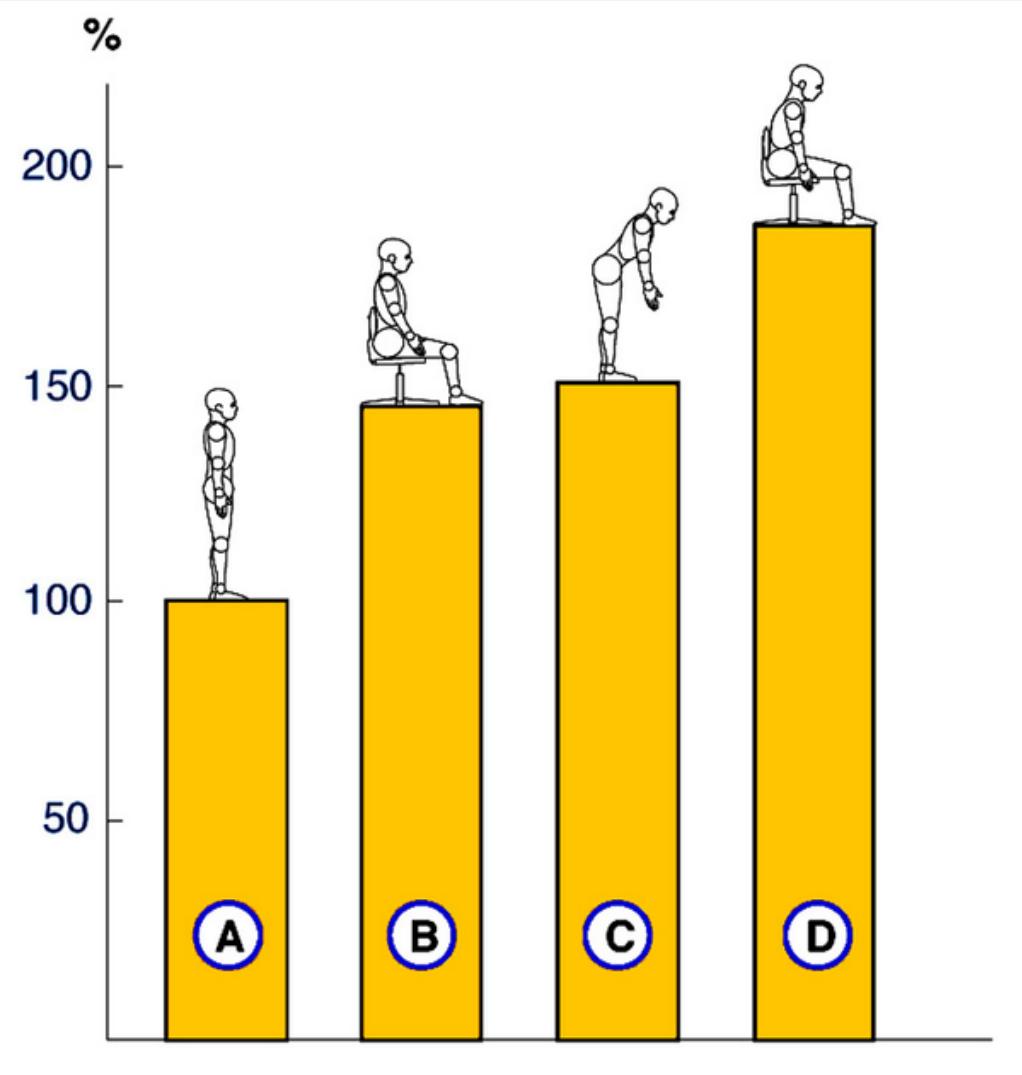
- Gloves
  - Disposable nitrile
    - Accidental splash protection only
  - ➤ Chemical resistant gloves
    - Chemical specific

6. Ergonomics of workplace



6. Ergonomics of workplace

Sitting and the vertebral load



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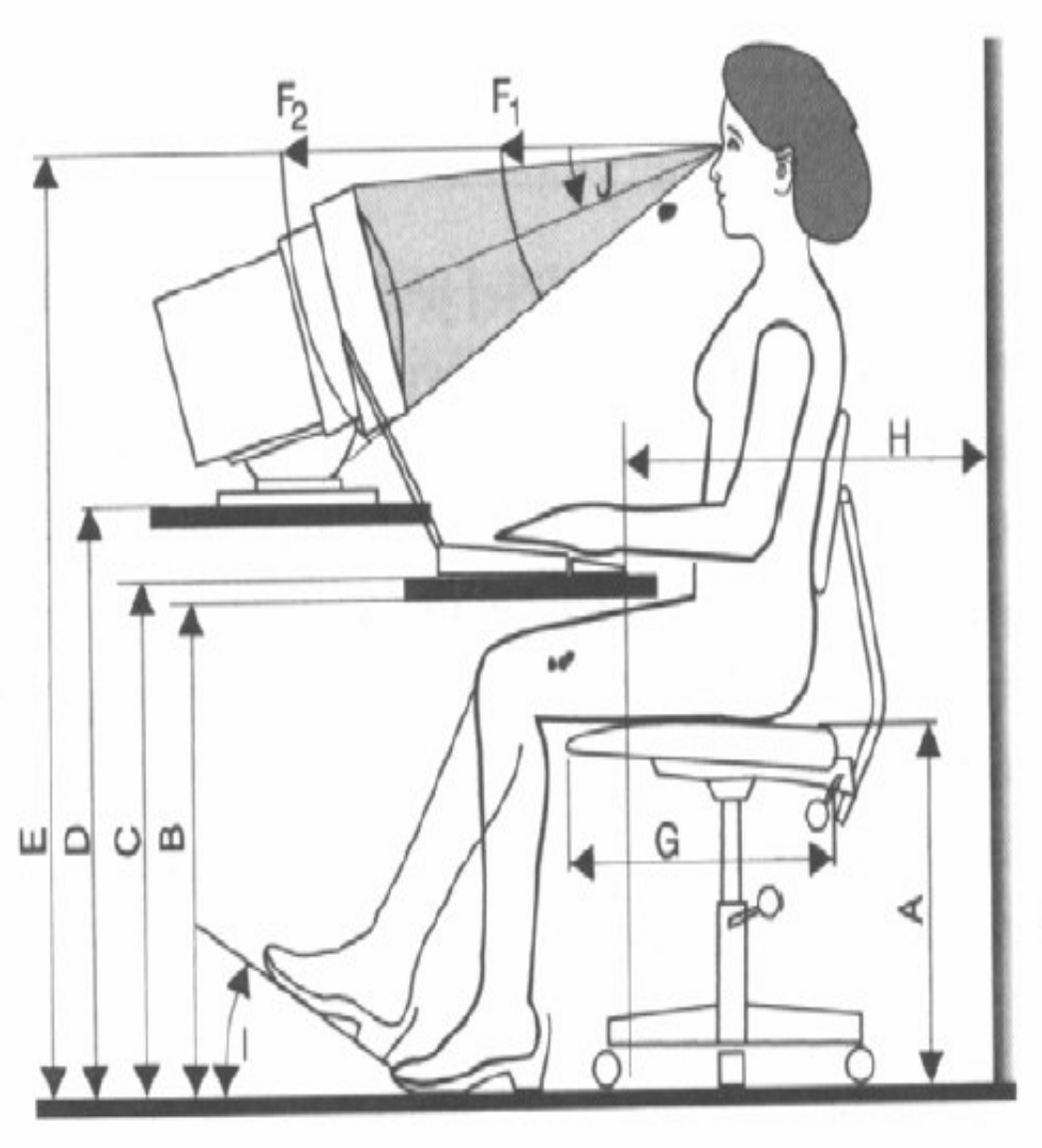
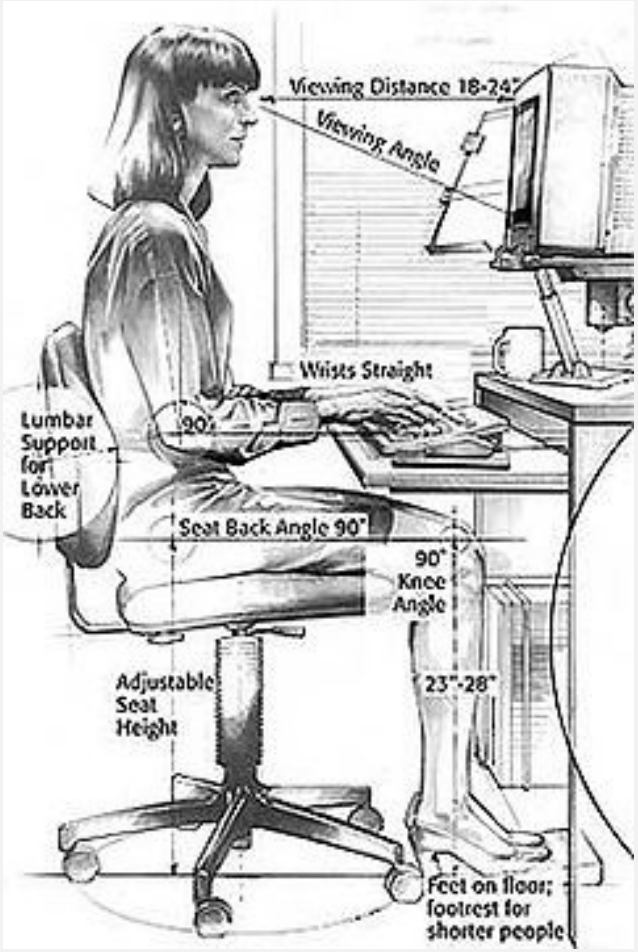
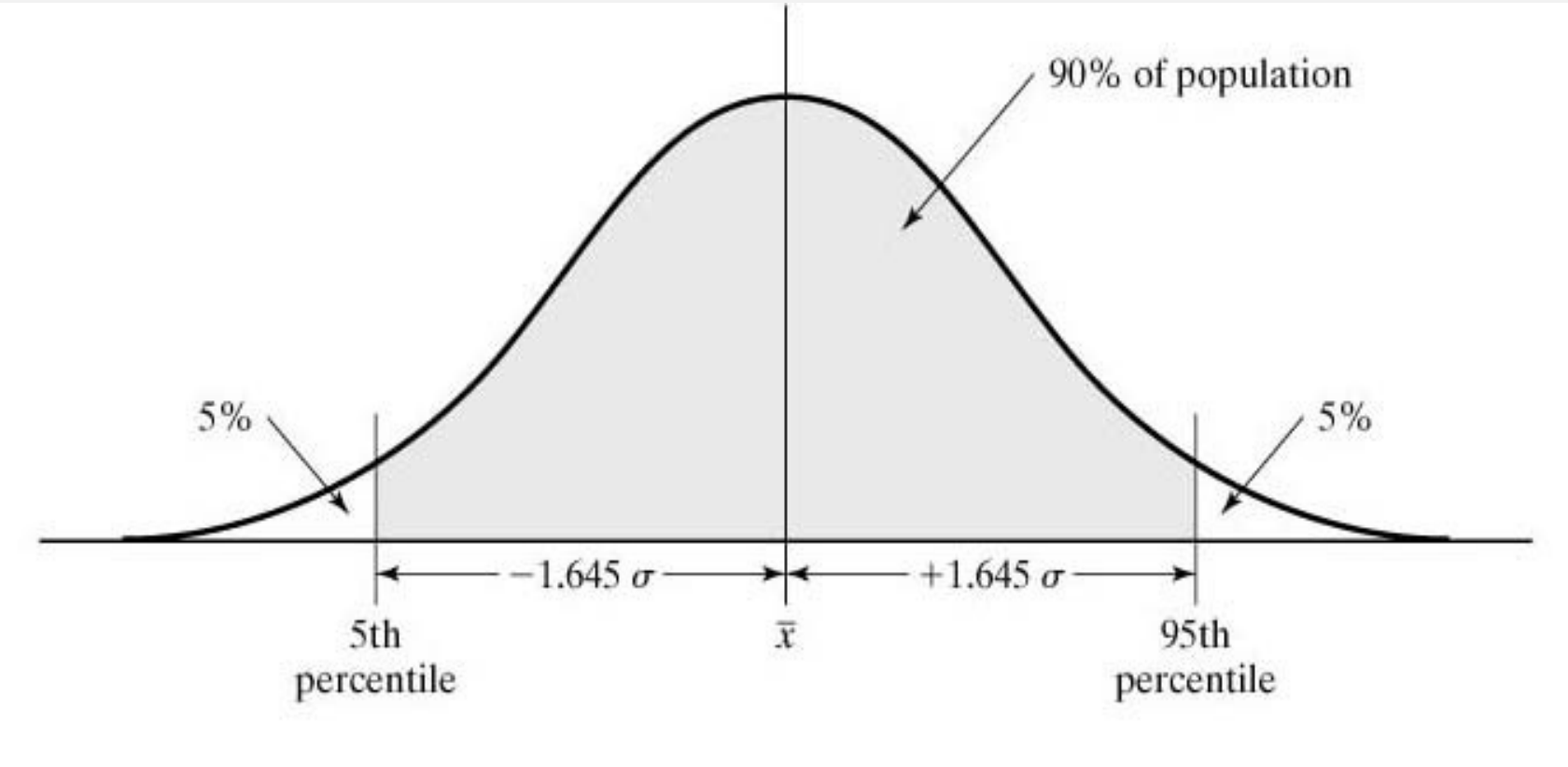


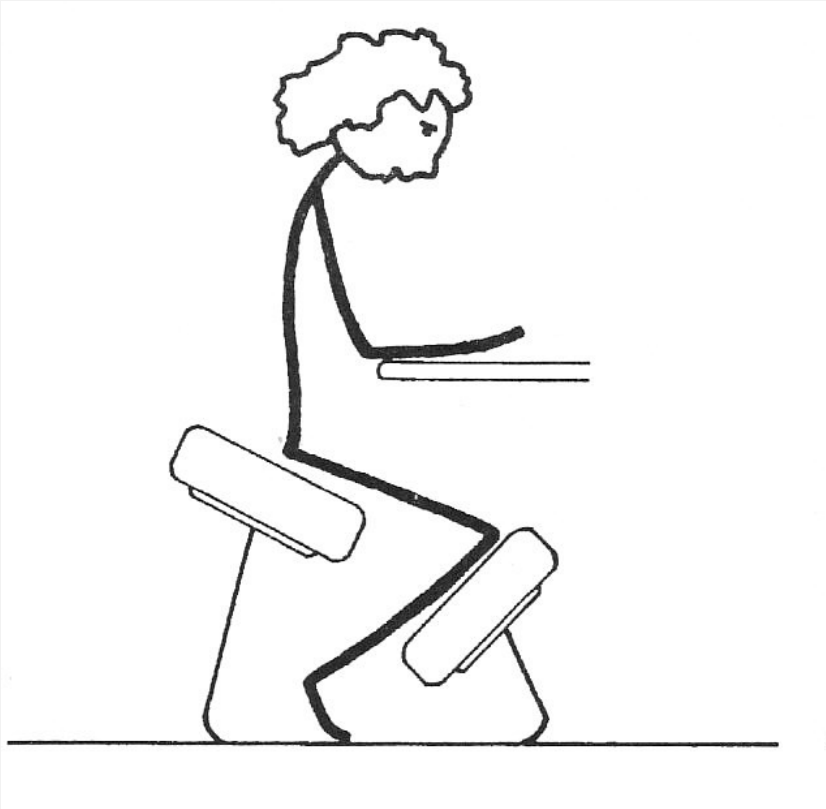


6. Ergonomics of workplace

Anthropometry



6. Ergonomics of workplace



Life is movement,
movement is life

6. Ergonomics of workplace

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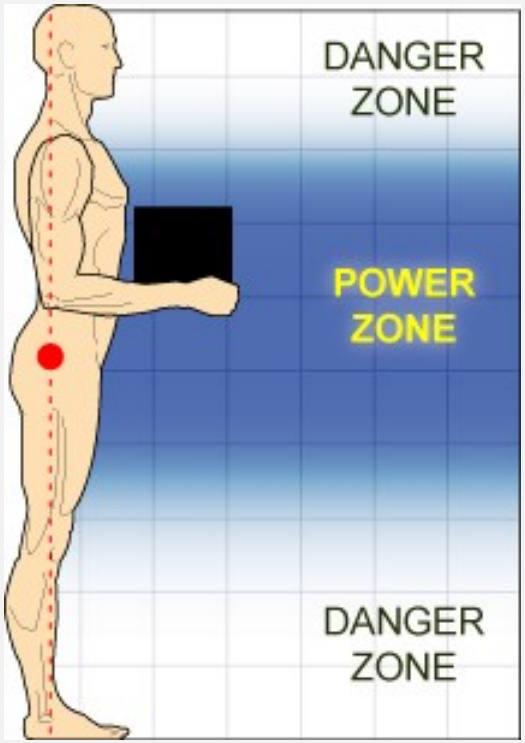
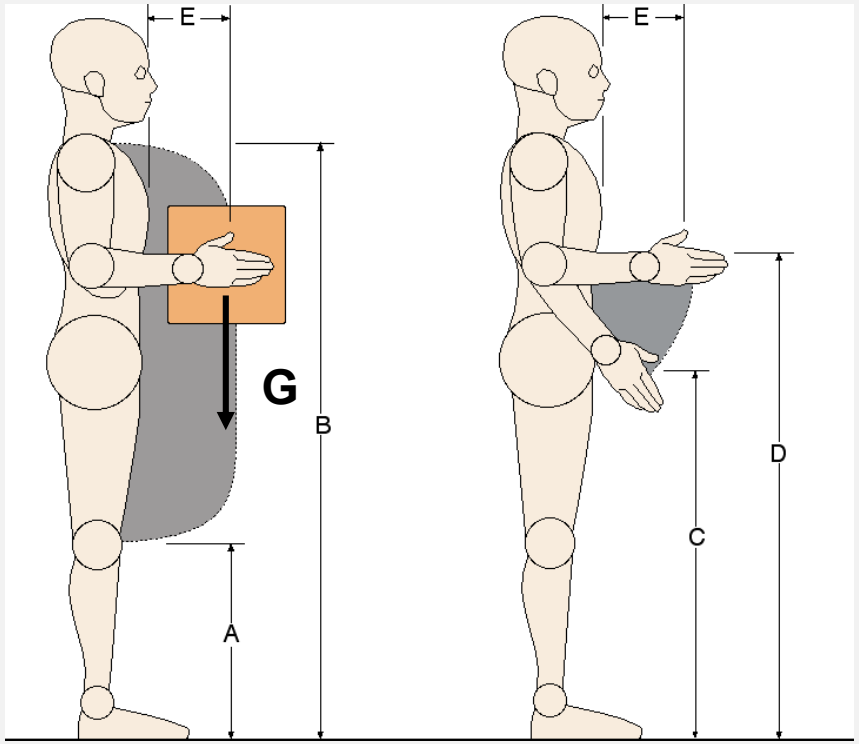
Torques
M = E x G





7. Testing