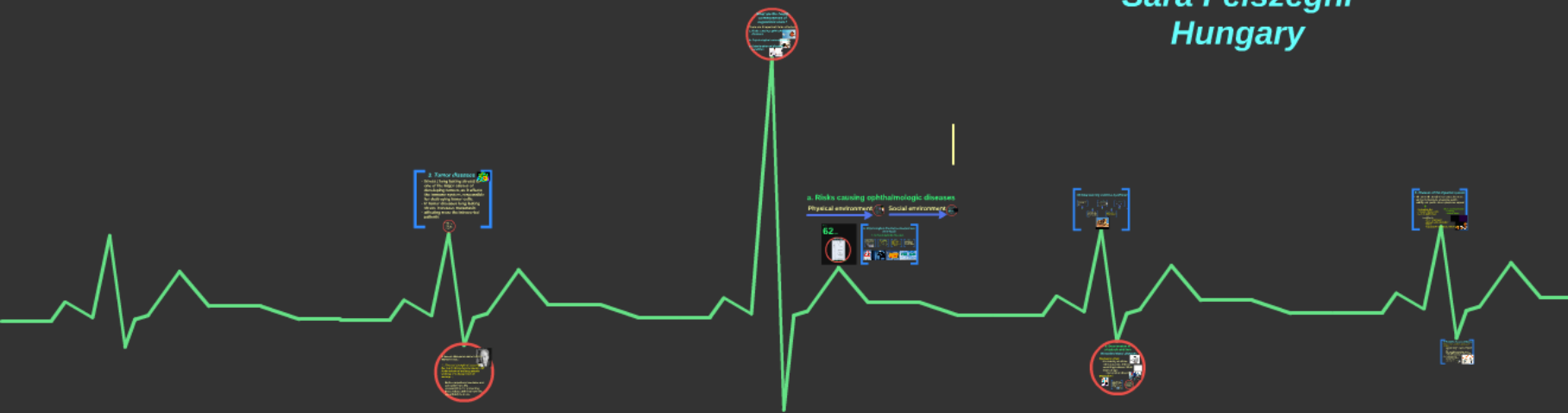




Health effects of ergonomic risks

Sara Felszeghi
Hungary





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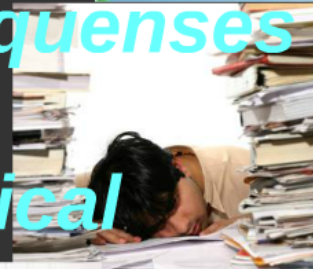
What are the health consequences of ergonomic risks?

There are 3 important fields affected:

a. Risks causing ophthalmologic diseases



b. Psychological consequences



c. Deterioration of physical condition

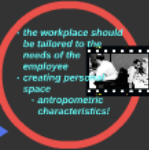


a. Risks causing ophthalmologic diseases

Physical environment



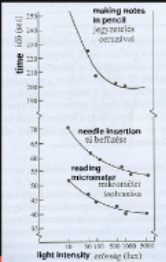
Social environment



ECG

62 bpm

Lighting and work effectivity



• visual acuity deteriorates

b. Psychological (mental) consequences (overload)

1. Nervous system diseases

Burnout syndrome

„a state of physical, emotional, and mental exhaustion caused by chronic mechanical stresses resulting from intense, unambiguously demanding, unchangeable work people do over long periods of time“

• e.g. stress, factors, social network, treatment and psychological problems, customer service relationships, etc.

Burnout evolves through a **chronic stress cycle**

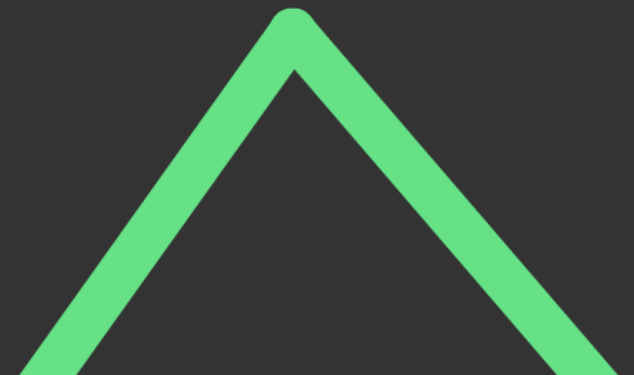
Prevention

The most effective solution to prevent burnout consists of job reorganization, including:

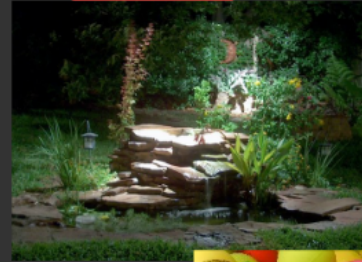
- changing of mental setting
- introducing a structured system to set the workload and time limit to
- working with the optimal quality level to be achieved
- job rotation (rotation of tasks, organizational)
- every 5-7 years changing roles to avoid the same monotony
- „cultural of work“ can be useful

Prevention

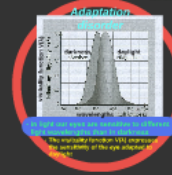
- flexible workload
- it is important to care for personal problems
- flexible holiday system
- individual and team building trainings to prevent burnout



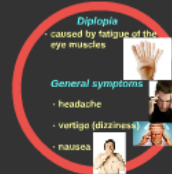
• **Lightening**



• **Colours**



• **Noise**



• **Vibration**

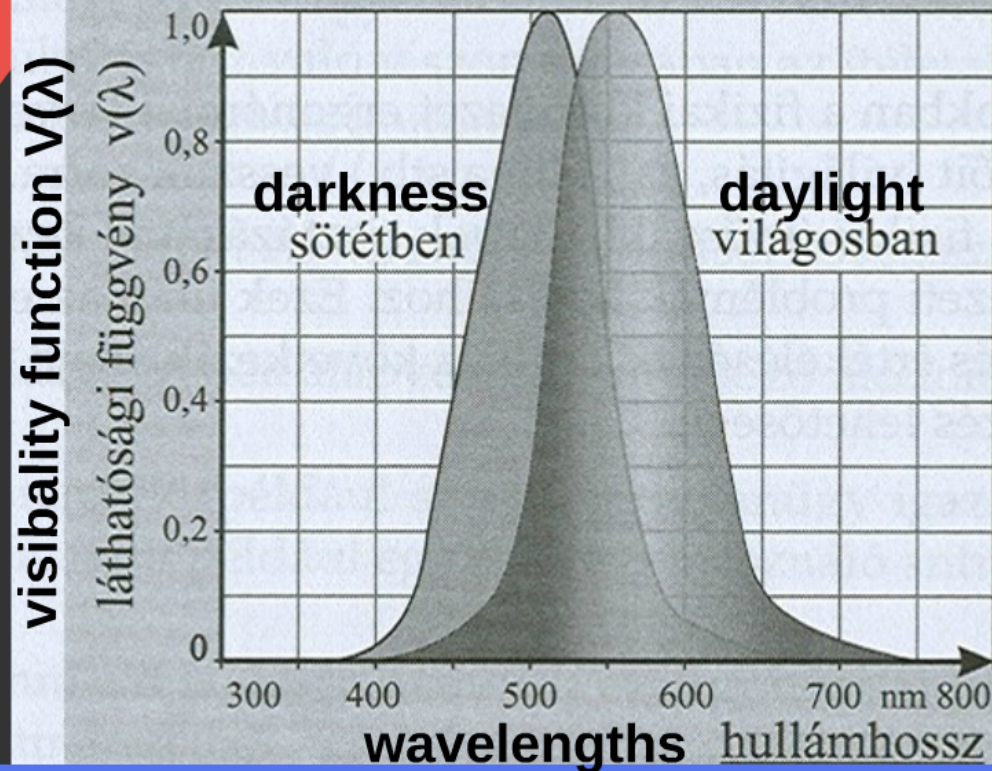


• **Climatic environment**

• **Radiation contamination**

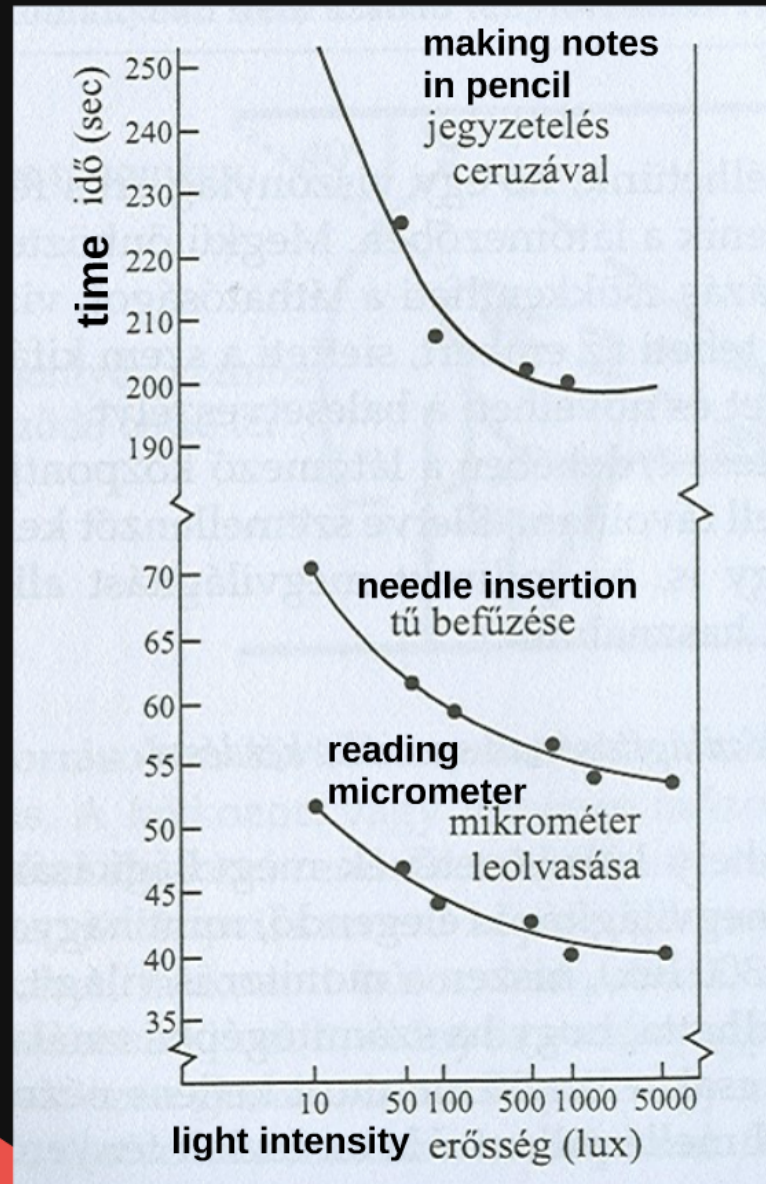


Adaptation disorder



- in light our eyes are sensitive to different light wavelengths than in darkness
- The visibility function $V(\lambda)$ expresses the sensitivity of the eye adapted to daylight

Lighting and work effectivity



- visual acuity deteriorates

Diplopia

- caused by fatigue of the eye muscles



General symptoms

- headache
- vertigo (dizziness)
- nausea



t

- *the workplace should be tailored to the needs of the employee*
- *creating personal space*
 - *antropometric characteristics!*



b. Psychological (mental) consequences (overload)

1. Nervous system diseases

Burnout syndrome

„a state of physical, emotional, and mental exhaustion caused by chronic emotional stresses resulting from intense, emotionally demanding involvement with people over long period of time“ Pines & Kafry 1981, 139

- e.g. nurses, doctors, social workers, teachers and pedagogical professionals, customer service assistants, etc.



Burnout evolves through a development cycle.



Prevention

The most effective solution is prevention:

- conscious choice of job
- changing of mental setting
- introducing a stabilized system in our life which we can keep to
- must be able to spend quality time for recreation
- affording freedom of rest, regeneration
- every 5-7 years changing roles in career is recommended
- „sabbatical years“ can be useful

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Burnout evolves through a development cycle.

The phase of hopes (period of idealisation)



Characteristics of this phase of burnout:

- The feeling of "I have no time for anything"
- overexcitement,
- increased energetic responses,
- lively relationship with colleagues
- confusing private and working life roles,
- expecting immediate results from own work
- any failure in work is experienced as failure of their own personality
- need of proving themselves

The phase of love of work

- The individual becomes "cool and collected"
- Overexcitement about the profession turns into dedication
- The individual can differentiate between appropriate and unrealizable tasks
- They can create cooperation with colleagues and carry out the work with interest and patience
- The individual is open to creative plans and initiatives

The phase of frustration



This evolves when the individual

- is unable to create a natural harmonious rhythm of work and private life "feeling of content"
- "no control over his/her life"
- pursues performance which leads to fatigue, frequent mistakes and errors in private life
- life is pushed into the background



- Early recognition is important: it is the key to recovery



Psychosomatic reactions



They are characterised by:

- deepening fatigue, disinterest, apathy
- the individual loses motivation completely
- overwhelming sense of frustration and hopelessness
- depression and various psychosomatic diseases may appear
- in the state of total burnout the individual may become unfit for work and may turn self-destructive
- both physical and psychological dangers exist



The phase of apathy



Characteristics of this phase of burnout:

- withdrawing from work and public activity
- Belligerence
- feeling senseless and exhausted in the profession
- The individual protecting himself against real or imaginary fiasco
- initiative decreases
- self-esteem is troubled

The phase of hopes (period of idealisation)



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BURN OUT

- **Burnout is easily reversible in the first two phases, later it's very difficult**



The phase of frustration

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Main characteristics

The signs of physical exhaustion appear but the individual tries to hide these from their environment

- The response is often excessive performance (excessive sports activity, too much sleep)
- The individual's self-expectations diminish, which leads to decreasing performance, dedication and openness.



Main characteristics:



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- The person's self-esteem diminishes and simultaneously their sense of guilt increases.

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• emotional responses become weaker, a sense of disinterest appears
• the immune system weakens
• the individual becomes unable to relax
• sleeping disorders and nightmares appear
• thoracic pressure, faster pulse rate, nervous tick, digestion problems, nausea and weight problems may appear
• often alcohol, coffee, cigarette consumption and some other drug abuse increases
• their psychological state turns into deeper helplessness,
• due to existential problems,
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Monday morning sickness / syndrome

Symptoms:

- on the same day of the week (on Monday)
- Thoracic pain (angina pectoris),
- High blood pressure (hypertonic crisis)
- Palpitations (paroxysmal atrial fibrillation)
- Headache
- Vertigo
- Sleeplessness
- Anxiety, tension
- Heartburn or stomach ache

Cardiovascular Health Programme of Pécs University (Hungary)

- Distribution of AMI according to weekdays (a study involving 81 956 people between 2000-2004)

• Monday is a peak



- it shows a continuous decrease (which reduces by 15% by Friday, and increases by 23.7% from Friday to Saturday)

Mental health – depression and other common mental disorders



Tokyo Women's Medical University

- A study (published in the American Journal of Hypertension) found that the stress which accompanies the necessity of returning to work on Monday morning may induce dangerous hypertension
- This might be the explanation for the peak times of heart attack and stroke being Monday morning
 - The occurrence of heart attacks is some 20% higher on Monday morning compared to other days

Common characteristics

- Managerial position, mainly men
- Symptoms mainly occur on Monday
- Symptoms show similar pattern of appearance (with varying intensity)
- Among employees with high risk stressors (business sector, high ranking managers, etc.)



VILÁGÉLETEMBEN HITTEM BENNE

Hogy a nap legcsodásabb pillanata, amikor reggel felébredünk. I... aztán jött a hétfő...

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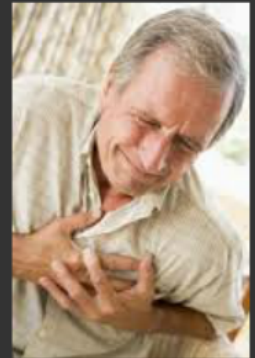
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Depression

Depression is

- one of the leading causes of disability
- job insecurity, low control and low social support at work, weekend working hours, job-related life events and dissatisfaction with work and with the boss are independent mental health risk factors, but there are important gender differences.

[Kopp et al. (2008) Hungary]



2. Cardiovascular diseases

High blood pressure

- frequent,
- because of silent symptoms mostly diagnosed late, usually with complications (retinopathy, nephropathy, stroke, etc.)

Coronary diseases

- angina pectoris
- ischemic heart disease,
- heart attack

Vasculo-cerebral diseases (Stroke)

- embolism
- haemorrhage



Anxiety

• It can be **defined** as malfunction of the fear system

symptoms:

- Insecurity,
- compulsion of **proving oneself**,
- sense of futility,
- lack of self-confidence



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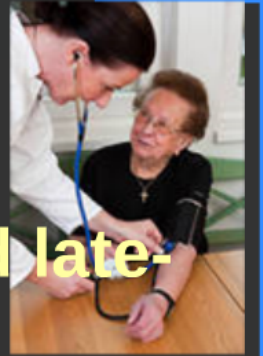
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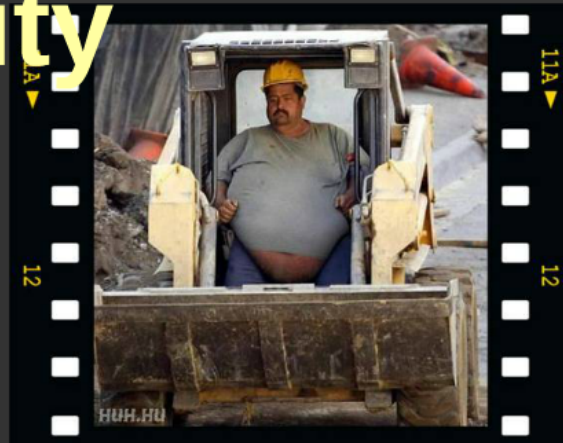
These can be accelerated by „stress releasing agents“, such as

- smoking
- alcohol abuse, together with
- inadequate diet
- sedentary work and
- obesity

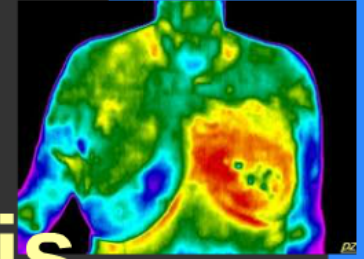


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3. *Tumor diseases*



- **Stress (long lasting stress) is one of the major causes of developing tumors, as it affects the immune system, responsible for destroying tumor cells.**
- **In tumor diseases long lasting stress increases metastasis**
- **affecting more the introverted patients**

In addition to:

- inadequate diet
- smoking
- alcohol abuse
- weight problems,
- obesity

In addition to:

- **inadequate diet**
- **smoking**
- **alcohol abuse**
- **weight problems,**
- **obesity**

4. Metabolic diseases (diabetes)

- **Stress is one cause of developing type 2 diabetes**
 - excessive overtime associated with 4-fold higher risk of type 2 diabetes in Japanese men
 - The rate of diabetes is higher among people suffering from burnout (Tel-Aviv University of Medicine)
- It is accompanied by
 - inadequate nutrition,
 - alcohol abuse
 - sedentarism

Metabolic syndrome

- Hypertension
- Obesity
- Diabetes
- high cholesterol level

- „Fatal 4“

• Metabolic syndrome (MetS) is considered to be caused primarily by visceral fat accumulation and has been linked to increased risk of cardiovascular disease (Saito et al., 2009)

- This reduces life expectancy by decades
- It can be changed with lifestyle



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5. Diseases of the digestive system

- The more the tension increases, the more stomach disorders, excessive gastric acidity and gastric ulcer symptoms appear



- inadequate diet
 - irregular eating habits
 - lack of quality food
- often accompanied by
 - smoking
 - alcohol abuse

resulting in

- reflux esophagitis
- stomach and colon ulcer
- colitis,
- haepatopathy (cirrhosis, tumor) etc.



c. Deterioration of physical condition

Musculoskeletal diseases

- **Stochastic effect**
 - The totality of all the microtraumatic effects occurring between 18-40 years of age
 - Irreversible disorder
- **prevention!**



1. The third topic will be presented tomorrow by Mrs Katalin Lukács, head physician of rheumatology, rehabilitation and immunology.
2. She is going to speak about musculoskeletal diseases caused by ergonomic risks and she'll present you the work of rheumatology and rehabilitation hospital called Saint Francis in Miskolc.



Conclusion

The teaching of ergonomic risks in the world of work, occupational medicine and work safety must also include their effect on health not only in medical universities but all graduate and postgraduate education.

Without proper knowledge of risks and resulting diseases, there is no primary and secondary prevention.

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A famous Hungarian writer László Németh wrote:



"...The real strength of a society lies not in its rocket-like talents, but in the values of ordinary people working at ordinary tasks in society....,"

- Both occupational medicine and education have the responsibility for preserving these values and they have the opportunity to do so.

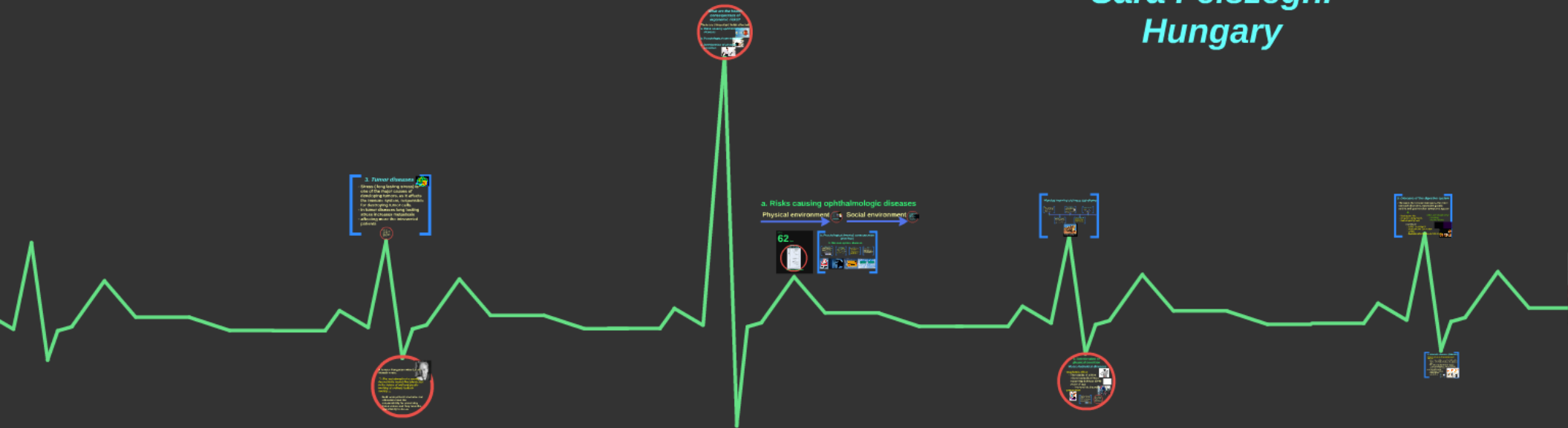
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