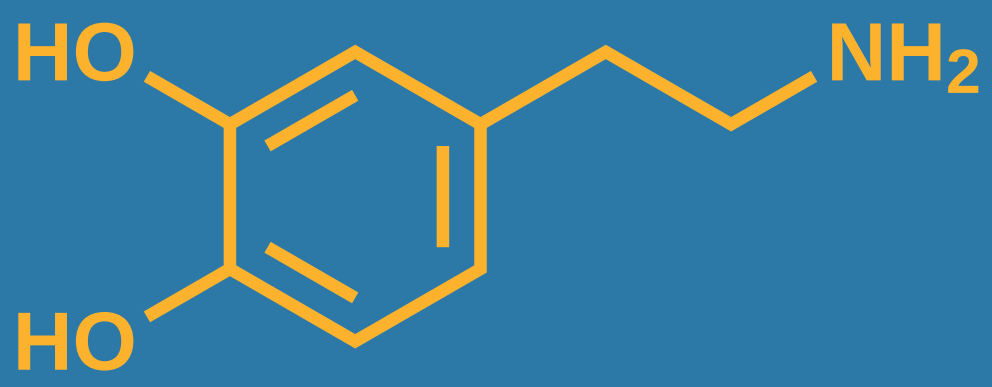
UNDERSTANDING PARKINSON'S DISEASE

LIRM - Lemanic Institute for Regenerative Medicine

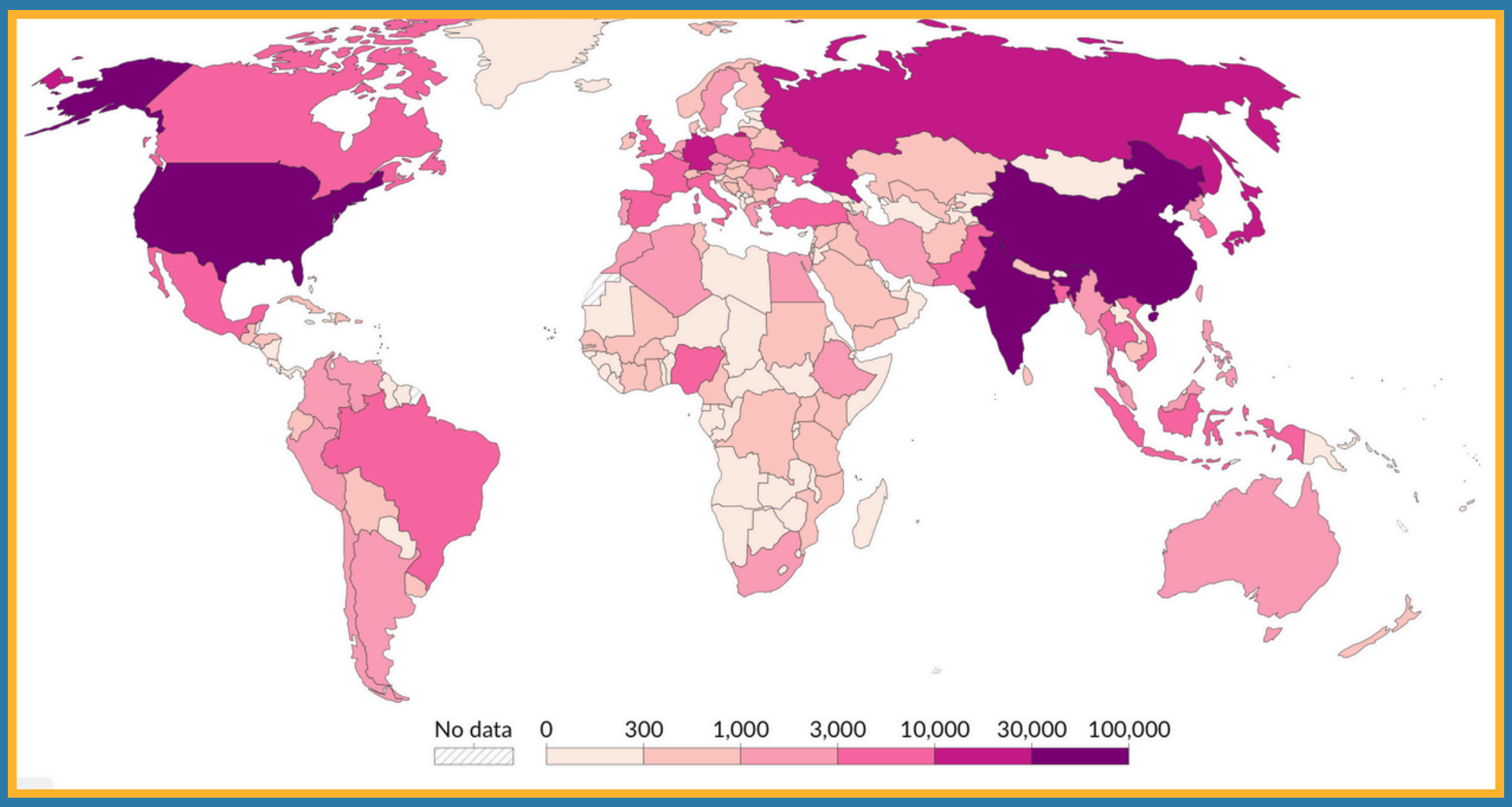
Parkinson’s disease was first described by James Parkinson in 1817 in the study An Assay on the Shaking Palsy.

Parkinson’s disease is a **chronic**, **progressive** **neurodegenerative** disorder that leads to the death of neurons producing **dopamine**.



LIRM - Lemanic Institute for Regenerative Medicine

Parkinson disease affects approximately **10 million people worldwide** of which 15'000 in Switzerland.



source ourworldindata.org

How does Parkinson’s Disease affect the brain?

- **Neurodegeneration:** Loss of dopamine-producing neurons in the brain (in the substantia nigra).
- **Dopamine Role:** Essential for smooth and coordinated movements.
- **Impact:** Results in motor and non-motor symptoms.

What’s happen at the biological level when Parkinson occurs?

Certain brain cells that produce dopamine die. When there’s less dopamine, the brain struggles to send the right signals, leading to motor symptoms and non-motor symptoms, making it harder for people to manage everyday activities.

Motor Symptoms:

- Tremors (shaking)
- Bradykinesia (slowness of movement)
- Rigidity (muscle stiffness)
- Postural instability (balance issues)
- Dystonia (involuntary muscle contractions)

Non-exhaustive list

Non-Motor Symptoms:

- Sleep disorder
- Depression
- Cognitive changes (memory issues)
- Fatique
- Constipation
- Hyposmia (decreased sense of smell)

Non-exhaustive list

Causes of Parkinson disease?

A combination of factors: **age**, **environmental** and **only 10% of genetic.**

Among the main environmental factors, exposure to **toxins** such as pesticides stand out.

Who is affected ?

- Age - **over 60 years**
- Sex - **men 2X** more affected than women
- Family history of Parkinson

What are the treatment options nowadays?

Medications:

- Levodopa (most common) - to replace dopamine
- Dopamine agonists - to mimic dopamine
- MAO-B inhibitors - to preserve existing dopamine

What are the treatment options nowadays?

Therapies:

Physical therapy - personalized exercise programs to improve mobility and balance and reduce stiffness.

Occupational therapy - tools and strategies to enhance independence in everyday tasks.

Speech therapy - help with voice volume and clarity and also swallowing difficulties.

Living with Parkinson’s Disease

Exercise Programs: Regular physical activity can improve overall health, reduce symptoms, and enhance mood.

Support Groups: Connecting with others facing similar challenges can provide emotional support and practical advice.

Nutritional Counseling: A good diet may help manage symptoms and overall health.

Living with Parkinson’s Disease

Cognitive Behavioral Therapy (CBT):

To manage anxiety and depression, which are common in Parkinson’s disease.

Mindfulness and Relaxation

Techniques: Practices like meditation, deep breathing, and tai-chi can help reduce stress and improve mental well-being.

Recent Advances and Research

- Importance of **Early Detection**: Research on biomarkers for earlier diagnosis.
- **Ongoing Studies:** Focus on neuroprotective therapies and gene therapies.

Effective **treatments are desperately needed** to improve quality of life for patients.

The LIRM is a non-profit organisation dedicated to **improving patients quality of life** in the areas of **neurodegeneration and aging.**

LIRM - Lemanic Institute for Regenerative Medicine

What’s can be used to diagnose Parkinson?

- Lesions or scars in the brain and spinal cord;
- markers of inflammation;
- specific proteins e.g. oligoclonal bands.