Parkinson's disease

GROUP 3

Chiara Rosanna Fichera

Johanna Matero

Kanniga Lakshmi Jagadeesan

Shivani Ravichandran

Supervisor : Seyed Moein Pishnamaz
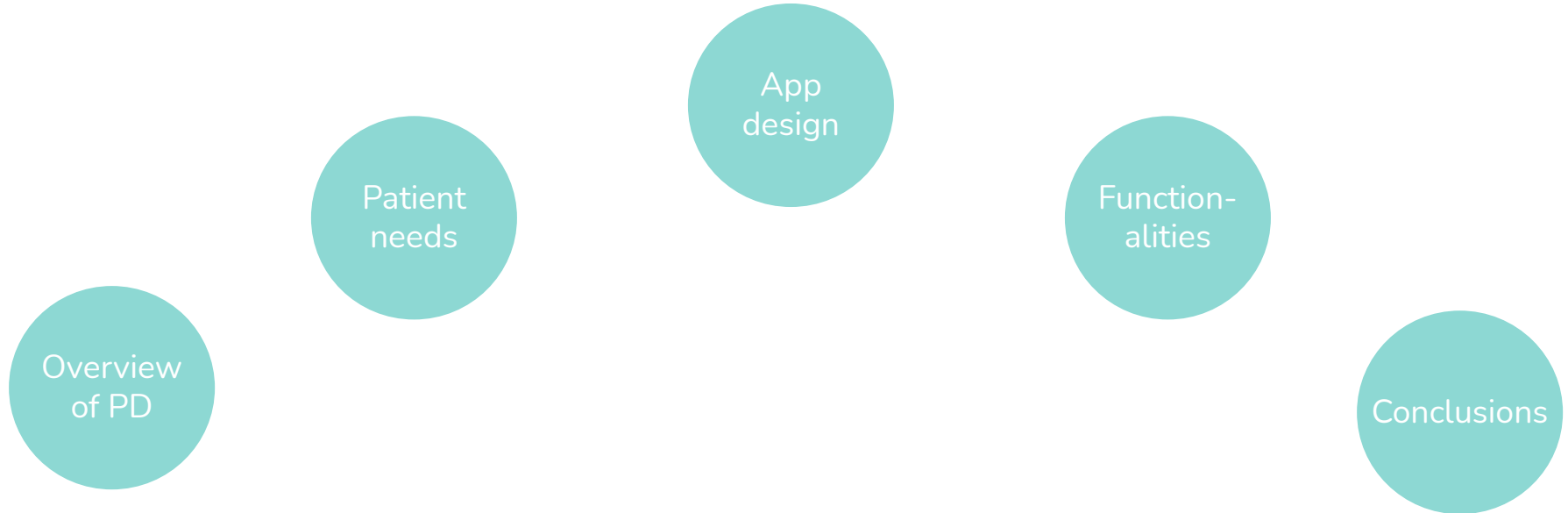
Chiara   Johanna   Kanniga   Shivani

Agenda

intelliPD

An application aimed for people diagnosed with Parkinson's disease, providing preventive care and at home tracking of the progression of the disease

App
design

Patient
needs

Function-
alities

Overview
of PD

Conclusions

Parkinson's Disease *- overview*

- Neurodegenerative disease
  - Neurons lose function/structure

- Incurable

- Cause is unknown
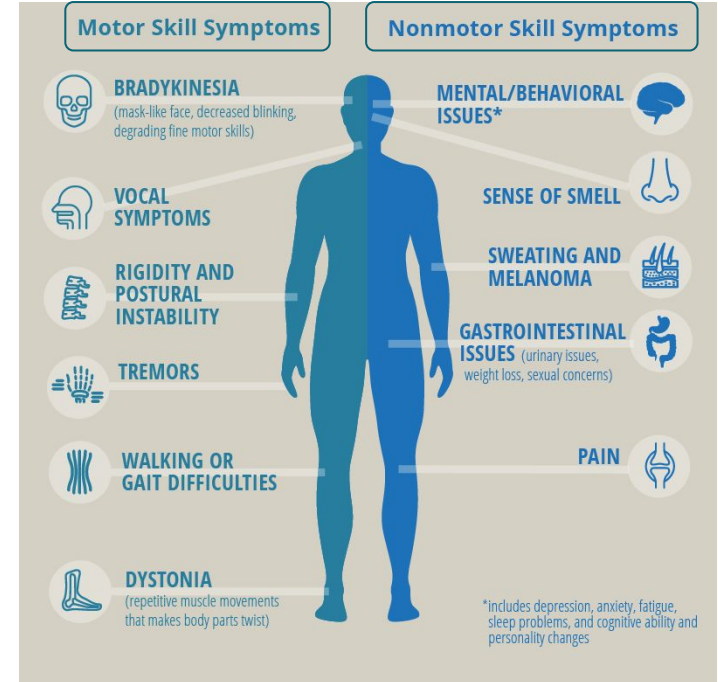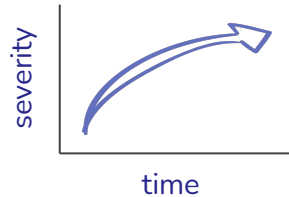 - tobacco & coffee
  - age
  - sex
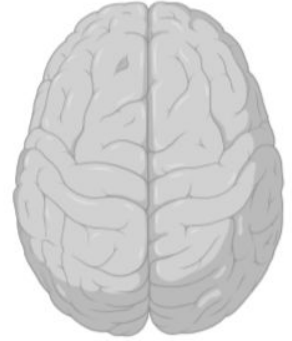
When is the Parkinson's Disease awareness month?

APRIL

Symptoms

Motor skills

T   Tremors *shaking*

R   Rigidity *stiffness*

A   Akinesia/Bradykinesia *absence/slowness of movement*

P   Postural instability *imbalance*

Persona

Lars Andersson.
65 Years Old, from Göteborg.

Diagnosed with PD in 2016.

Recently retired, married, has one son.

Health issues:
Lars has some difficulties in walking and daily activities such as writing and talking..

Needs:
He is looking for a solution that helps him to control his tremor and other symptoms as well as to keep record of his medical history.

- Primary **symptoms**: Visible tremors. (Deviation in other motor skills)

- Current situation:
  - Worsening of motor symptoms.
  - Early signs of cognitive deterioration.
  - Feeling of not being in control, anxiety.

- Hobbies:
  - Painting
  - Walking
  - Yoga

Pathway

App users

Option 1

Log data

**Hospital,
Health care centre**

Option 2

Caregiver
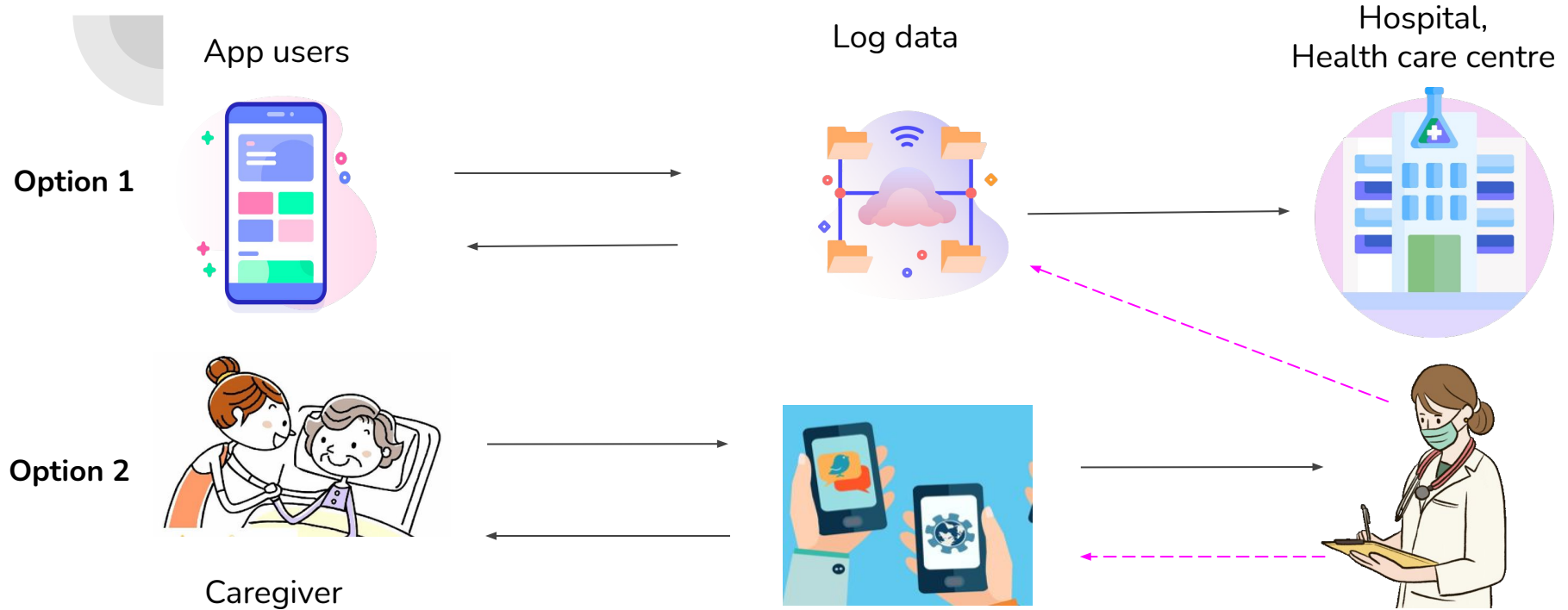
Analyze information, suggest treatment / medication,send notification in the app / directly to patient.

Functionalities

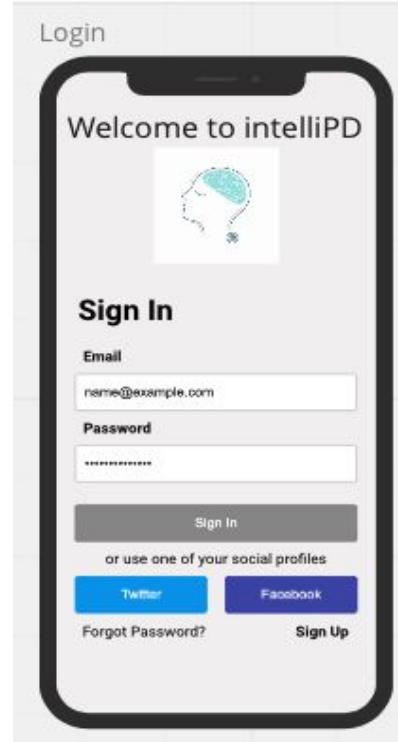Make **personal account** using mobile bankID, personal ID number or e-mail.

Give **access** to care personnel
doctor, relatives etc

Personal **medical information**
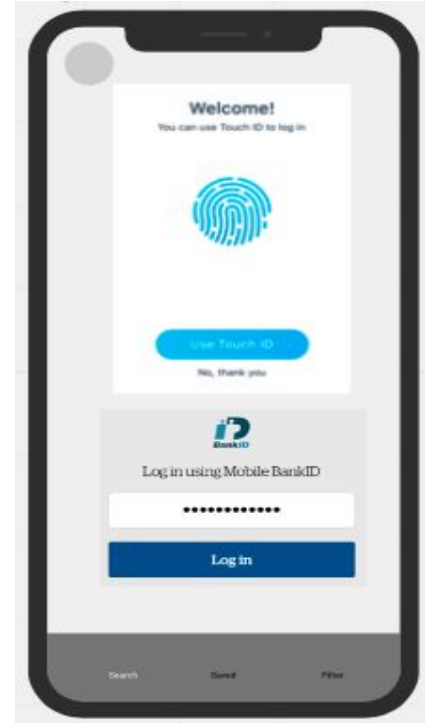
Keep track of **important events**
- renew prescriptions
- upcoming hospital appointments

Option 1

Option 2

Functionalities

Personalised **push notifications**

Quick **tests** measuring **motor skills** and **speech** impairments

Discussion forum to talk to others suffering from the same disease

FAQ and links to external useful **information about the disease**

Basic account:

- trial period with less features

Premium account :

- more features with paid services.

Profile page

Lars
Göteborg

Personal Information
Notifications
Reminders
Goal
Discussion forum
Activities
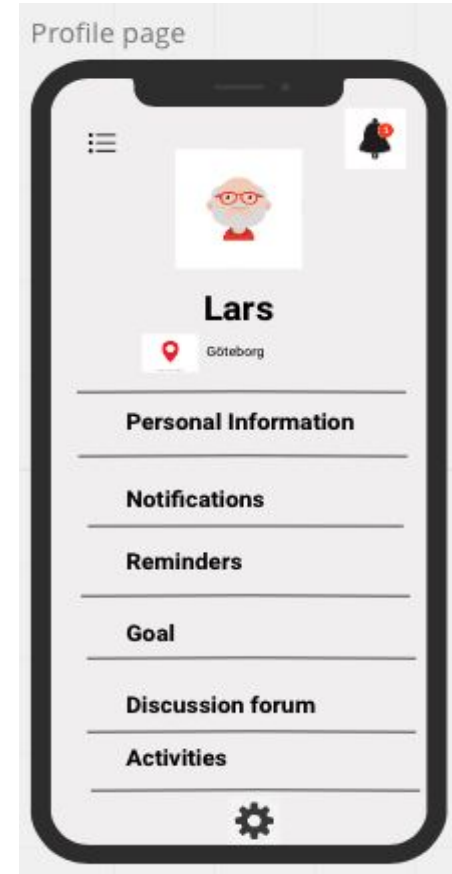
Data collection and analysis

- No personal information will be shared with third parties.

- Usage of Artificial Intelligence technique.

- Compared against the data obtained from App users.

- Any deviation in the obtained data, get the data again.

- If fast progression of PD detected, send data for analysis, neurologist will decide upon further.
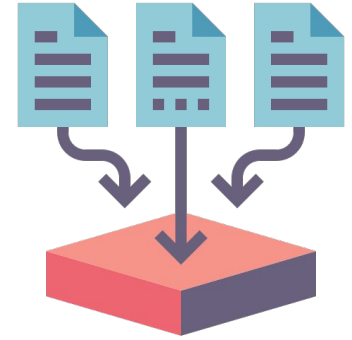
Post analysis:

➔ Recommended medication, exercises to be fed into the app.

Push notifications *(optional setting)*

"It's a beautiful day, why not take a walk? ☀️"

Daily exercise can be efficient to decrease the progress of slowness of movement and imbalance

Continuous logging information can be used to determine if the current treatment is working

"It's time for your monthly check up, take a quick test to maintain the progression tracking 🧩"

"Check your calendar, you have an appointment with your doctor next week! ⏰"

Reminders of important meetings and tasks can be useful for patients experiencing some degree of memory loss

Quick tests mockup

Level: simple

Level: complex

SELECT CATEGORY

Tremors

Stiffness

Speech

Reaction time

Draw a circle

Instructions

Scoreboard

Latest score!!
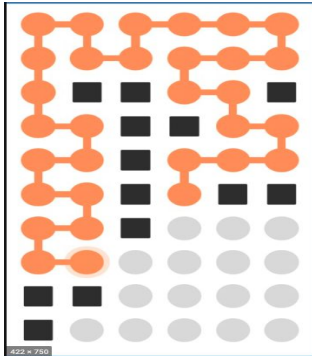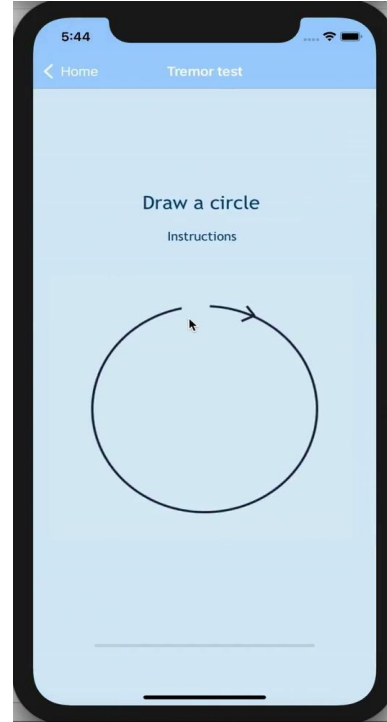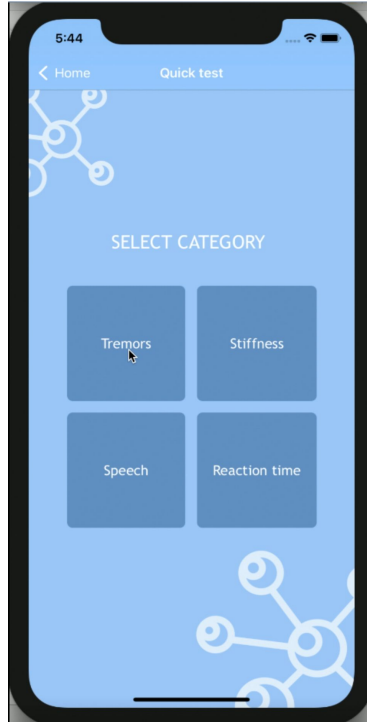
One of the simple test to detect _____ is conducted by drawing a spiral as shown on the left when a person is diagnosed with Parkinson's Disease. What could it be ?

Is it Tremor, Rigidity or Postural instability?

Rigidity	X
Tremor	✓
Postural instability	X

Legal remarks

- Data collection, transfer as per **GDPR** guidelines.

- **CE marking** of the app is essential to enable data transfer to health care for diagnosis. *(Medical Device Software category)*

- Complies with Medical Device Regulation (**MDR**)

Discussion forum

- **Information** about the disease
- **Discussion** among users
- FAQ
- Activities , recommendation, advices
- Feedback and monitoring of new treatment among users

Further Improvements and Development

- Make it **user-friendly** for senior citizens.
- Accessible in **rural areas**, developing countries using cloud services.
- Provide a high quality image.
- **Emergency alert** when patient is in critical situation.
- Embed with existing devices to measure rigidity factor, posture analysis, speech analysis etc.,
- Usage of app without network connectivity with preloaded tests and reminders for a short duration.
- Addition of VR services.
- Development of the app for Pd **detection**.
- Compatible with **multi-languages**.

Conclusions

- **Easy self-assessment** in any environment.

- Diagnosis of early onset of Parkinson's disease with symptoms.

- **Assist** with healthy lifestyle.

- Discussion **forums** helps patients to wade off their mental stress.

- Unnecessary visits to health care centres may be avoided.

DID YOU KNOW ?
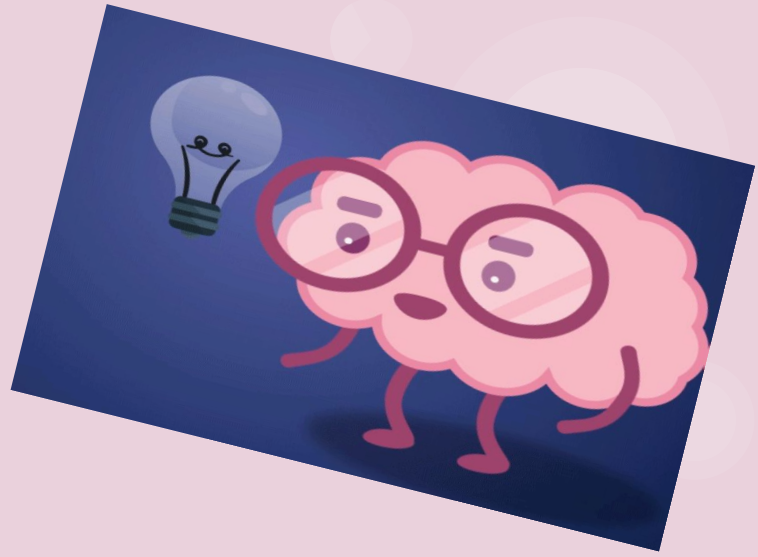
- Parkinson's disease is twice as likely to affect men than women.

- The youngest recorded case of Parkinson's was a 12-year-old patient.

Thank you for your attention!

References

Information

https://www.nia.nih.gov/health/parkinsons-disease#:~:text=Parkinson's\%20disease\%20is\%20a\%20brain,have\%20difficulty\%20walking\%20and\%20talking

Figures

Slide 6: https://www.drprempillay.org/brain/parkinsons-disease/
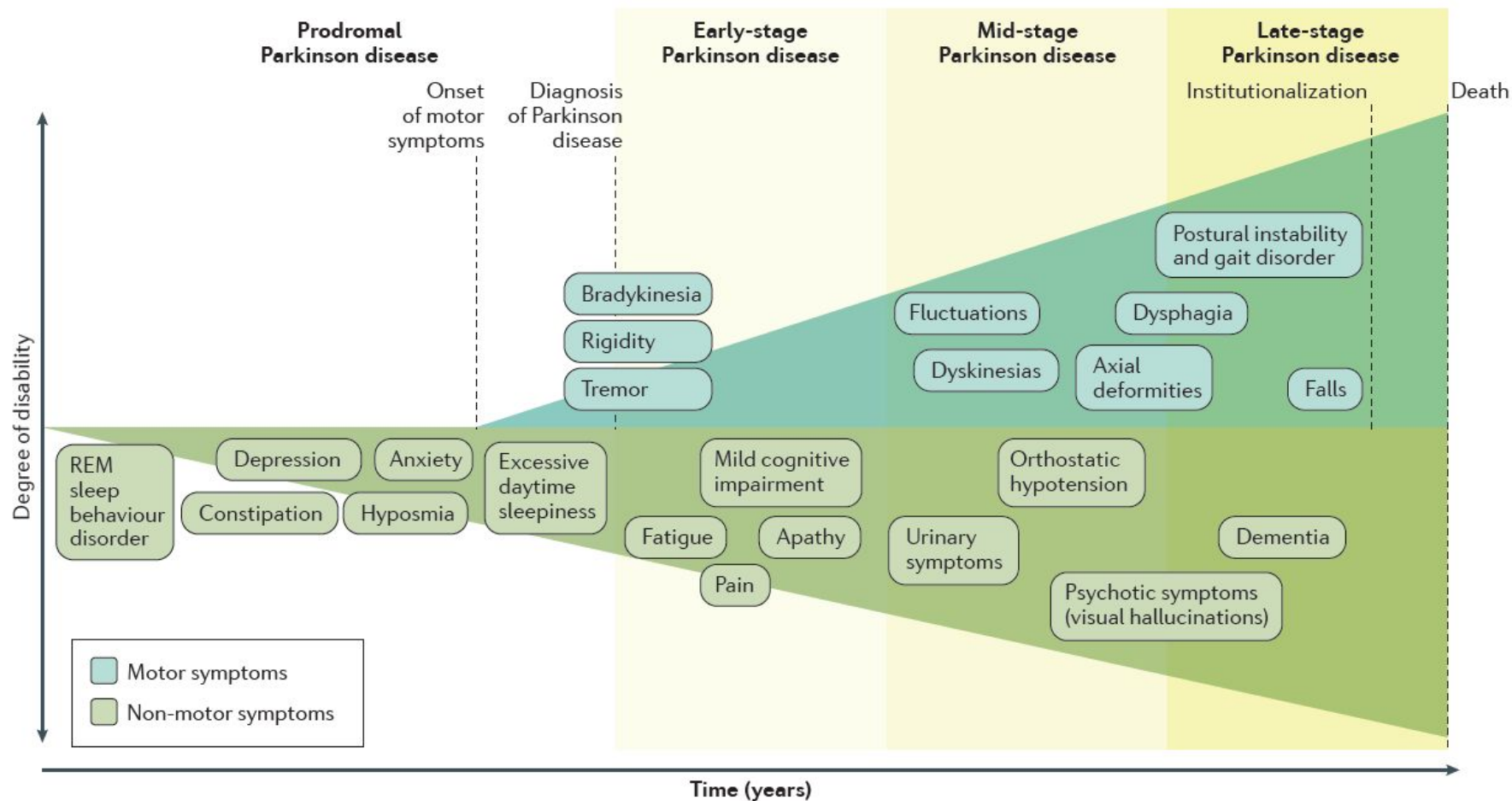
Slide 15: https://www.skyttesport.se/Information/GDPR/

https://www.company360.in/blog/ce-marking-and-ce-certification-what-is-it-why-you-need-

It-who-can-appy

https://www.mastercontrol.com/gxp-lifeline/6-tips-for-a-successful-transition-to-the-eu-mdr/

Slide 20: https://parkinsonsnewstoday.com/2017/08/03/11-facts-parkinsons-may-not-know/

Degree of disability

Prodromal Parkinson disease

Onset of motor symptoms

Diagnosis of Parkinson disease

Early-stage Parkinson disease

Mid-stage Parkinson disease

Late-stage Parkinson disease

Institutionalization

Death

Bradykinesia

Rigidity

Tremor

Postural instability and gait disorder

Fluctuations

Dysphagia

Dyskinesias

Axial deformities

Falls

REM sleep behaviour disorder

Depression

Anxiety

Constipation

Hyposmia

Excessive daytime sleepiness

Mild cognitive impairment

Orthostatic hypotension

Fatigue

Apathy

Urinary symptoms

Dementia

Pain

Psychotic symptoms (visual hallucinations)

Motor symptoms

Non-motor symptoms

Time (years)

Integrate with smartwatch for efficient tracking