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Architecture and organization of a computational system
for the management of data from individuals
with Parkinson's disease

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Introduction

World Congress on Medical Physics & Biomedical Engineering

June 3–8, 2018, Prague, Czech Republic, www.iupesm2018.org

Introduction

Electroencephalogram (EEG)

Reference: <https://goo.gl/2csEFK>

Electromyography (EMG)

Reference: <https://goo.gl/2jzyNq>

A lot of data is
being generated

Electrocardiogram (ECG)

Reference: <https://goo.gl/nojwrD>

Inertial sensors

Reference: <https://goo.gl/C29nhQ>

Introduction

- In 2020, it will be 6.58 devices generating data per individual
- In the health area, the amount of data is increasing 48% per year up to 2020

People and Devices
(In billion - 2020)

Data in Health Area
(EB – Exabytes)

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Introduction

SIDABI - Integrated Biomedical Data System

- Data organization
- Prevention of data loss
- Understanding the progress of the disorder
- Data mining to seek hidden patterns
- Share data among researchers
- Integration of clinical centers and hospitals with the research area

SIDABI - Integrated Biomedical Data System

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localhost/sidabi/adm/controller/ctrl_tela_modulos/telaModulos.php

NIATS

SIDABI

Integrated Biomedical Data System

Joao Folador

Exit

BIODATA

Biomedical File Management

PARKINSON

List of symptoms of Parkinson's disease

INOVA

Innovative ideas for health

UPDRS

Patient Management and Evaluation Questionnaire

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IUPESM
PRAGUE 2018

BIODATA

Main

Management

About

Exit

Management

Equipment

Study

Study Group

Participant

Participant-Study Group

Protocol

File collection

Download Files

File Collection

Study group

Hand tremor assessment

Participant

Marcella Souza Dias

Equipment

Intan sasblo

Protocol

Experimental IHM protocol

Collection date

06/19/2017

Time

4:30 pm

Medication

File

3e48f31d8d723702f3fa1dcec2599814.zip x

Observation

Send

Cancel

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INOVA

Sector

Responsible

Idea

Exit

This application is used to promote technological innovation in the area.

The user register ideas or problems faced by individuals with PD.

These ideas / problems are analyzed and considered in research proposals and technological development.

Quantity of ideas by sector

Can be installed on:

- Hospitals
- Therapy clinics
- Research centers
- Universities

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UPDRS [Home](#) [Main](#) [Assessment](#) [Management](#) [Tutorial](#) [About](#) [Exit](#)

Management

Group

Question title

Alternatives

Build the question

Application type

Question-Application type

Medicament

Patient

Patient-Medicament

Report

Export data

3.3 RIGIDITY

Alternatives

0: Normal	No rigidity
1: Slight	Rigidity only detected with activation maneuver
2: Mild	Rigidity detected without the activation maneuver, but full range of motion is easily achieved
3: Moderate	Rigidity detected without the activation maneuver; full range of motion is achieved with effort
4: Severe	Rigidity detected without the activation maneuver and full range of motion not achieved
	Not apply

Application Type

☐ R	☐ L	☒ RUE	☒ LUE	☒ RLE
☒ LLE	☐ Lip/Jaw	☐ S	☒ Neck	☐ NA

- Generic questionnaire
 - Create questions
 - Create alternatives
- Control patients
- Manage medicines
- Report about assessments applied in a patient
- Export data (.csv)
- Learn how to apply the UPDRS

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PARKINSON

Symptoms

Management

About

Exit

Motors

Gait

As anormalidades da marcha podem incluir claudicação e redução ou ausência do balanço dos braços (em estágios iniciais da doença). À medida que ocorre a progressão da doença, o paciente perde o passo normal, o calcanhar dificilmente é encostado no chão durante a marcha, há a tendência de andar na ponta dos pés e/ou os pés tendem a deslizar ao longo do chão. Outra característica é ter giros em bloco (falta de rotação do tronco ao virar-se). Congelamento de marcha também é muito comum entre os principais sintomas da doença. Alterações da marcha é um dos fatores mais importantes que afetam a qualidade de vida dos pacientes acometidos.

[Mais informações](#)

bradykinesia

A bradicinesia é pobreza ou lentidão de movimentos. Nas extremidades, isto resulta em redução na amplitude e na velocidade do movimento. Com incidência de 100%, a bradicinesia é considerada um dos principais sintomas da doença. Em estágio inicial da doença a bradicinesia pode ser sutil, mas pode ser observada na redução da oscilação dos braços durante a marcha e durante hesitação para iniciar o movimento. Pode ser identificada através da avaliação física, solicitando ao paciente para bater o dedo indicador contra o polegar, fechar e abrir os punhos ou bater o calcanhar.

- Category control
- Manage the symptoms
- Learn about Parkinson's Disease
- Practical understand of symptoms by video

Discussion and Conclusion

- There is **lack of integrated technologies** emphasizing the possibilities of research
- Web-based and **responsive** application
- The development of the software modules of **SIDABI** is focused on **organizing, seeking and finding information** from people with PD

Discussion and Conclusion

- SIDABI facilitates:
 - Different applications sharing information
 - Reuse of data
 - Increase the efficiency for **managing the information of patients**
 - Enabling the automation of processes to find hidden information for objective PD diagnosis and follow-up
- In the future:
 - It will be done a **usability test**
 - All data will be assessed through additional modules integrated in the platform, to **seek patterns for grouping and classification**

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Thank you very much

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