**ALS Tool For Data Collection and Caregiving Assistant AI Agent**

Problem Statement : To Develop an AI agent linked to the Open Minded Individuals (OMI) protocol or the Reclaim protocol that assists in collecting patient data and supports caregiving for individuals with Parkinson's disease & Amyotrophic Lateral Sclerosis (ALS). The agent should streamline data collection processes and provide actionable insights to caregivers for improved patient care onchain.

Key Features Include:

Data Collection Integration:

Implement connections to the OMI & Reclaim protocols to securely and efficiently collect health data from ALS patients.

Ensure data is collected in a way that respects patient privacy and adheres to regulatory standards.

Use collected data to create comprehensive patient profiles that update in real-time as new data becomes available.

Caregiving Assistance:

Provide caregivers with tailored advice based on the collected data, including daily care tips, symptom management strategies, and emergency procedures.

Implement alerts and notifications for caregivers about significant changes in patient conditions that require immediate attention.

Analytical Dashboard:

Develop a dashboard that displays real-time data and analytics, helping caregivers and medical professionals to monitor patient health trends and respond accordingly.

Include features like data visualization tools and customizable reports to make the data accessible and useful.

Research Contribution:

Allow for anonymized data to be used for ALS research purposes, contributing to the broader understanding and development of ALS treatments.

Facilitate partnerships with research institutions to ensure data utility and relevancy.

User Experience and Accessibility:

Design the agent to be user-friendly for both technical and non-technical caregivers.

Ensure full accessibility compliant with the best practices, making the tool usable for all caregivers, regardless of their physical abilities.

Success Criteria:

Effective integration with OMI & Reclaim protocols, demonstrated by seamless data flow and security.

Positive feedback from caregivers on the utility of the caregiving advice and the usability of the dashboard.

Measurable improvement in caregiving efficiency and patient comfort reported within the first year of implementation.

Considering the Inputs For Patient assessment form

**Patient Demographics & Medical History**

Name, Age, Gender

Diagnosis Date & Stage (Hoehn & Yahr Scale for PD, ALS Functional Rating Scale (ALSFRS-R))

Medical History

- (Comorbidities, previous hospitalizations, allergies)

Current Medications & Dosages (Levodopa, Riluzole, Edaravone, etc.)

Family History of Neurodegenerative Diseases

Caregiver Information (Primary caregiver, emergency contact)

**Motor & Physical Function Data**

Gait & Balance Metrics (Stride length, step count, fall frequency)

Tremor Intensity & Frequency (PD-specific, collected via wearables)

Muscle Weakness & Atrophy (ALS-specific, grip strength, mobility tests)

Dyskinesia/Dystonia Incidents (Uncontrolled movements, cramping)

Handwriting & Fine Motor Skills (For early PD monitoring)

Assistive Device Usage (Walker, wheelchair, speech device)

**Speech & Swallowing Function**

Speech Clarity & Volume (ALS bulbar symptoms, PD hypophonia)

Swallowing Difficulty (Dysphagia) (Choking frequency, modified diet)

Facial Muscle Control (ALS-specific, expression limitations)

**Respiratory & Sleep Health**

Breathing Patterns (ALS patients—monitor for respiratory decline)

Sleep Quality & Disruptions (PD—REM sleep disorder, ALS—nocturnal hypoventilation)

**Cognitive Health**

Memory & Cognitive Decline (PD—dementia risk)

Hallucinations/Psychosis Episodes (PD-specific, medication-induced)

**Medication Adherence & Side Effects**

Daily Medication Schedule & Reminders

Side Effects Tracking (Dizziness, nausea, confusion, fatigue)

Missed Doses Alerts

**Emergency & Alert Triggers**

Falls & Loss of Consciousness (Real-time fall detection)

Choking or Breathing Emergency

Severe Cognitive Confusion Episodes

Panic Button for Immediate Caregiver Alert

**Caregiver-Specific Data & Support**

Caregiver Stress & Burnout Levels (Surveys, AI sentiment analysis)

Recommended Care Adjustments (Based on patient trends)

AI-Generated Daily Care Plans & Task Reminders

Educational Materials & Emergency Protocols

Resources for PD Caregivers (pulls articles from each link and displays in tips box)

https://www.parkinson.org/resources-support/pd-library (Parkinson’s foundation)

https://www.apdaparkinson.org/resources-support/ (American Parkinson disease Association)

https://med.stanford.edu/parkinsons/caregiver-corner/caregiver-resources.html ( Stanford Parkinson’s community outreach)

Resources for ALS Caregivers

https://www.als.org/navigating-als/for-caregivers/caregiver-resources (ALS Association)

https://www.caregiver.va.gov/Tips\_by\_Diagnosis/ALS.asp ( VA Caregiver support program)

https://www.atsdr.cdc.gov/emes/ALS/training/page527.html (CDC)

Solution Presented with Python Code and Solidity Code as Follows

1. **Python Code**:
   * Fetches patient data from the OMI/Reclaim protocols.
   * Generates tailored caregiver tips based on the patient's diagnosis.
   * Displays an analytical dashboard with real-time data and visualizations.
2. **Solidity Code**:
   * Stores patient data on the blockchain for transparency and security.
   * Allows adding and retrieving patient data using a unique patient ID.

Integration Steps

1. Deploy the Solidity contract on a blockchain (e.g., Ethereum, Polygon).
2. Use the Python agent to interact with the smart contract for data storage and retrieval.
3. Connect the Python agent to wearable devices and health APIs for real-time data collection.
4. Build a frontend (e.g., using React or Flask) to display the dashboard and caregiver tips.

Next Steps

* Implement API integrations with wearable devices and health platforms.
* Develop a user-friendly frontend for caregivers.
* Conduct testing and gather feedback from caregivers and patients.