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# IF I COULD INVENT SOMETHING NEW

Arthritis is the swelling and tenderness of one or more joints which causes pain and restricted movement in the human body. Watching my maternal grandmother wince in pain helplessly has been hurtful. Therefore, if I could invent something new, it would be a portable wearable device that could detect the possibility of a person developing arthritis later in life called **Osteoarthritis Risk Detector** (OAD).

There are different types of arthritis such as osteoarthritis, rheumatoid, gout etc. However, osteoarthritis happens to be the most common as it is estimated, according to the data released by World Health Organization (WHO) in 2019, that about 528 million people worldwide are living with arthritis of which 73% is osteoarthritis and more prevalent in women as 60% of the affected are females. While the knee is the most frequently affected joint, the hip and hand could also be affected and a prediction of a billion people will be affected by 2050.

Key among factors that can contribute to an individual developing osteoarthritis include a history of joint injury or overuse, old age, obesity, unhealthy lifestyle etc. It is noteworthy that there is yet to be a cure for osteoarthritis; once a person is confirmed with this medical condition after diagnosis, it can only be managed with exercise, healthy eating and medication to reduce symptoms. In extreme cases however, surgery is carried out to replace the affected joint with a view to reducing pain and regaining mobility. Unfortunately, this comes at a price only the extremely few can afford. When the pain becomes chronic, people with the disease often experience restrictions in participating in meaningful activities, and experience psychological distress which leads to decreased well-being.

The invention of a non-invasive, wearable device that uses sensors and AI to detect the likelihood of a person developing osteoarthritis would be a groundbreaking success in the field science and health. This device, otherwise known as OAD, would have the ability to track joint movement and stiffness, and monitor inflammation levels through biomarkers in sweat. It would also analyse gait and balance to identify subtle changes, and use machine learning to analyse transmitted data in identifying patterns and ultimately predict risk. Important features of the device would include sensors whose function is to measure joint movement, muscle activity, and biomechanical factors. Another is an advanced imaging technology such as ultrasound to assess joint tissue which could potentially provide data for personalized *osteoarthritis risk score*. Potential

benefits include early detection and prevention, personalized treatment planning, improved joint health monitoring, and enhanced quality of life.

In conclusion, it is our collective responsibility to find solutions to this stealer of joy in old age. The invention of OAD would be a huge victory in combatting osteoarthritis as it would help individuals to take proactive steps in preventing or delaying its onset. This automatically would enable improved quality of lives and provide a relief to health care systems.