Science & Technology · GS - III

Examine the potential of wearable neurotechnology in improving early detection and monitoring of neurological disorders. Discuss the scientific, ethical and regulatory challenges associated with its adoption.

EXAM YEAR	PAPER	SUBJECT
DAILY PRACTICE 10/11/2026	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Wearable sensors, EEG, cerebral blood flow, neurological biomarkers, early diagnosis, clinical validation, data privacy, medical regulation, healthcare accessibility.

Model Answer

Introduction

Wearable neurotechnology uses sensors to monitor physiological signals associated with brain functioning. Emerging devices aim to make neurological monitoring more accessible through continuous or periodic data collection.

Potential Applications

- **Early detection:** Monitoring neurological biomarkers may help identify changes requiring clinical investigation.
- **Continuous monitoring:** Wearables can track selected physiological parameters outside hospitals.
- **Personalised healthcare:** Longitudinal data may support clinical assessment and treatment monitoring.
- **Accessibility:** Remote monitoring can improve healthcare access in underserved areas.

Challenges

- **Scientific validation:** Sensor accuracy and clinical usefulness must be established through rigorous studies.
- **Diagnostic limitations:** Abnormal readings do not necessarily indicate a specific neurological disorder.
- **Data privacy:** Brain-related information raises sensitive questions about consent and ownership.
- **Regulatory oversight:** Medical claims require appropriate safety and effectiveness assessment.
- **Digital inequality:** High costs and limited healthcare infrastructure may restrict access.

Conclusion

Wearable neurotechnology offers promising possibilities, but its integration into healthcare must remain evidence-based, privacy-conscious and supported by clinical supervision.

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