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Q5

Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in the healthcare?

UPSC Civil Services Mains 2023 · GS III · 10 marks · Indian Economy

Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

Core demand of the question

- Introduce Artificial Intelligence
- Explain how it helps clinical diagnosis
- Examine privacy threats when AI is used in healthcare

Revision summary

AI is software that learns patterns and proposes an action; in clinics it is a narrow tool, not a general doctor.

It helps diagnosis through imaging, pathology, ECG, and triage support.

The clinician remains responsible for the call.

Privacy threats are re-identification, extra training on records, breach, insurer misuse, and biased models.

DPDP Act 2023, **ABHA** consent, and ethics rules must bind hospitals and vendors.

Introduction

Artificial Intelligence (AI) is software that finds patterns in data and proposes an action without being fully hand-coded for every case. In a clinic it can read a scan or a lab trail faster than a tired shift. The same data trail can **expose a patient's body and history** if consent, storage and law are weak.

Body

What AI is

- AI includes **machine learning** (models trained on examples) and narrower **expert rules**.
- **In medicine the useful form is usually a narrow tool:** classify a chest X-ray, flag a diabetic retina photo, triage a symptom list - not a general doctor in a box.
- India already uses elements of this in public programmes (for example **tuberculosis** screening on X-rays and **diabetic retinopathy** pilots) under clinical oversight.

Help in clinical diagnosis

- **Imaging:** models highlight likely tumours, bleeds, TB cavities or fractures and queue the radiologist's time.
- **Pathology and labs:** slide and ECG pattern recognition reduce missed calls on high volume.

- **Triage and decision support:** history plus vitals suggest a differential so a primary centre can refer earlier.
- **Public health:** outbreak and shortage signals from many clinics, if data are standardised.
- The clinician still **owns the diagnosis**. AI is a second reader and a speed tool, not a licence to skip examination.

Privacy threats

- **Health data are sensitive:** diagnosis, genetics, location of clinic visits, and Aadhaar-linked IDs can re-identify a person.
- Cloud vendors, device firms and hospital chains may **train models** on records beyond the purpose of care.
- **Breach, sale, or employer and insurer misuse** can deny a job or a policy.
- Bias in training data can mis-label women, poorer groups, or rare diseases, which is a clinical harm as well as a fairness harm.
- The **Digital Personal Data Protection Act, 2023**, **Ayushman Bharat Health Account (ABHA)** consent layers, and Indian Council of Medical Research ethics guidance are the present Indian frame. They work only if hospitals treat a model vendor as a **data fiduciary**, not as a free research partner.

Flow diagram

Artificial Intelligence -> Clinical diagnosis
Clinical diagnosis -> Imaging labs triage
Artificial Intelligence -> Records and scans
Records and scans -> Privacy threats
Privacy threats -> DPDP ABHA consent

Conclusion

AI is pattern-finding software. In diagnosis it speeds imaging, labs and triage under a doctor's responsibility. In healthcare it is a privacy threat unless purpose, consent, breach duty and the 2023 data law actually bind the hospital and the vendor.

Facts & figures

Narrow medical AI

Most clinical tools classify one task, such as a chest X-ray or a retina photograph, under a doctor's review.

ABHA

Ayushman Bharat Health Account: a health ID meant to travel with consented electronic records.

DPDP Act 2023

Digital Personal Data Protection Act: consent and fiduciary duties for personal data, including health records held by clinics and apps.

ICMR guidance

Indian Council of Medical Research has issued ethical guidance for AI in biomedical research and healthcare.

TB and eye pilots

Public programmes have tested AI-assisted X-ray screening for tuberculosis and retinal screening for diabetic eye disease.

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