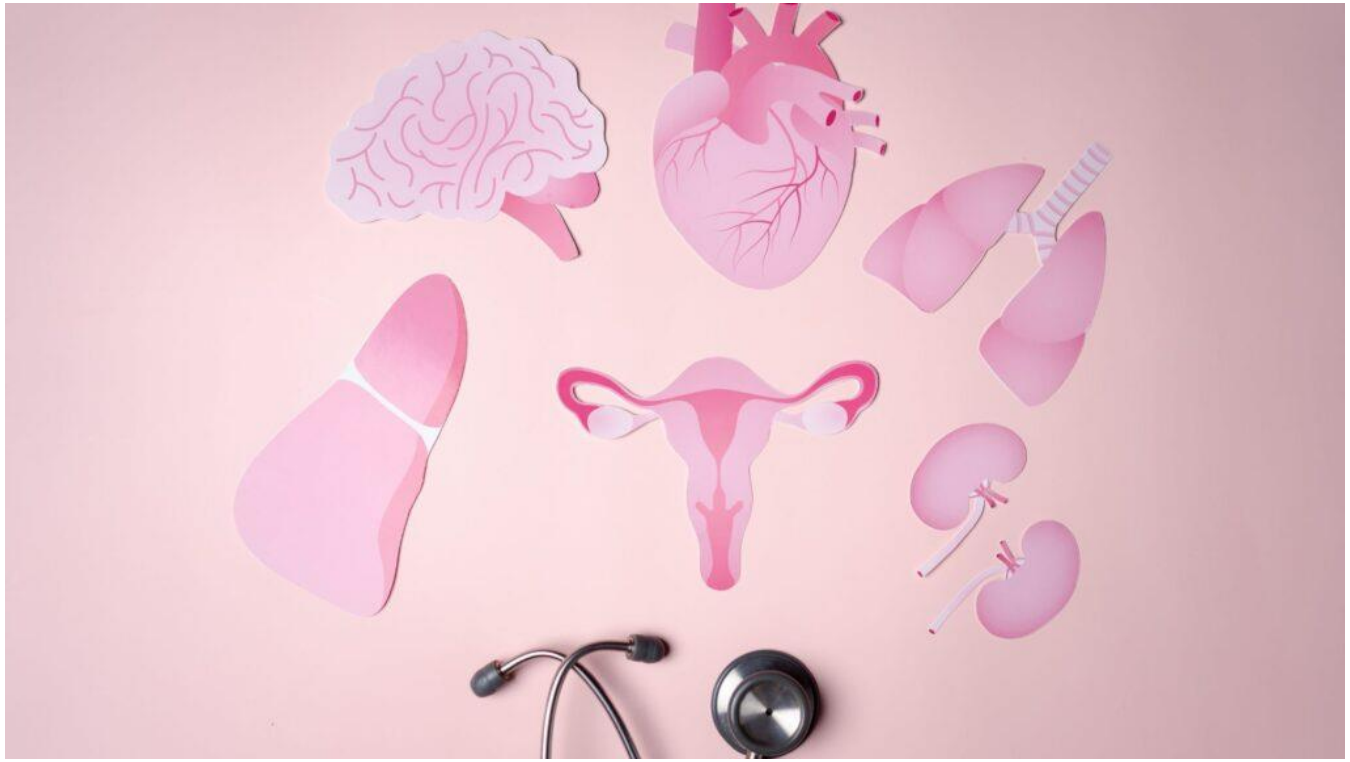
EndoTrack

By: Upneet Kaur Singh &
Noopur Sureshpuri Gosai

Healthcare Issue

- Endometriosis is a chronic condition
- Takes 7-10 years to diagnose
- Absence of early diagnostic instruments and unspecified symptoms
- Many women experience years of pain, misdiagnosis and don't have much support
- Solution: EndoTrack

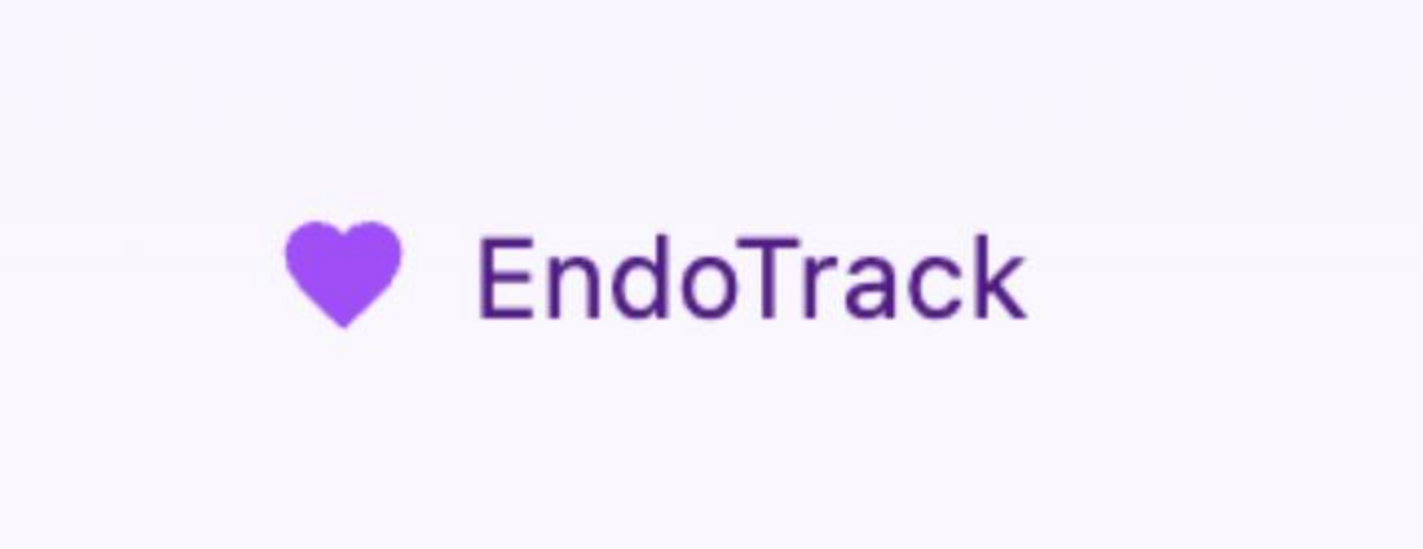


Gaps in Current Tools

- Current applications focus on symptom logging and not interpreting or analyzing data
- They don't include wearable data or lifestyle factors
- No integration of evidence-based recommendations or clinical connection

EndoTrack

- EndoTrack integrates symptom, wearable, and lifestyle data to detect flare risks
- Uses AI and rules that are aligned with NICE guidelines
- Supports both patient use and clinician interpretation through summaries



Design Approach

- Conceptual model built using different data and guidelines
- Focus: feature engineering, data integration and designing app
- Design is based on real clinical and digital health frameworks.

Data Sources Used

- Symptom data: pain scores, menstrual history, fatigue levels.
- Wearable data: HRV, resting heart rate, sleep, temperature.
- Lifestyle data: stress levels, sleep hours, physical activity.
- Clinical guidelines: NICE NG73 flare thresholds and treatment recommendations.

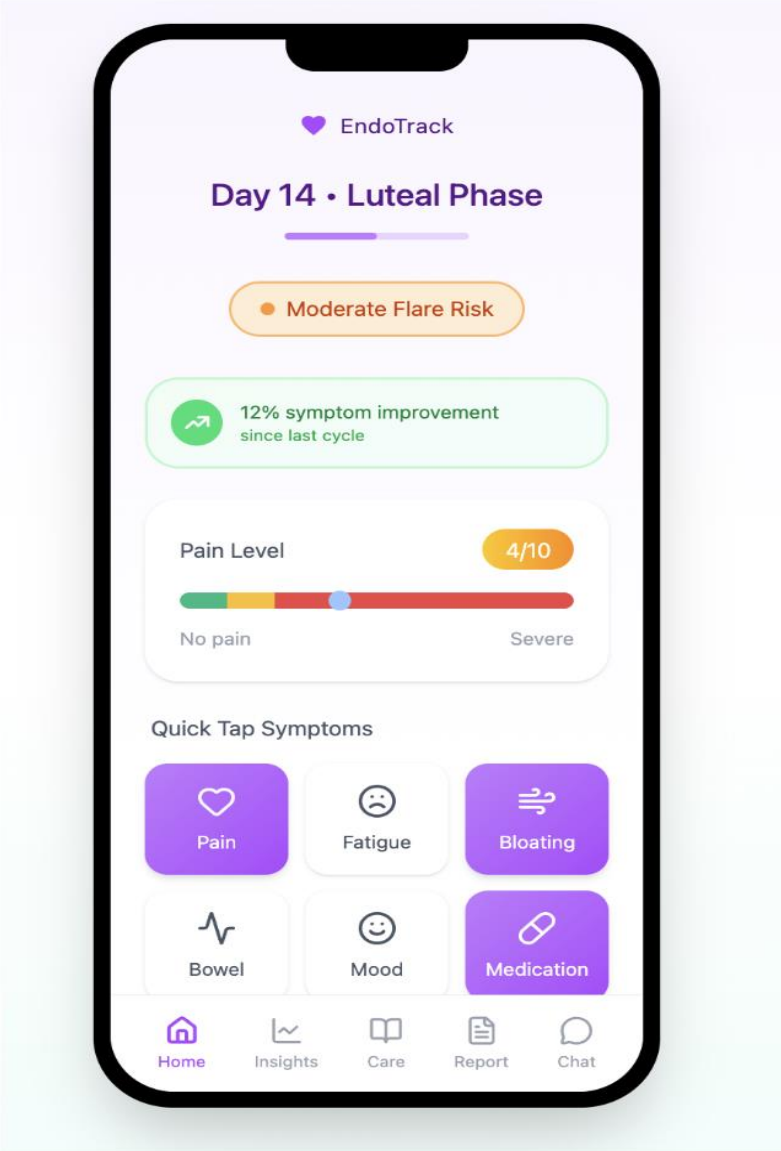
Feature Engineering

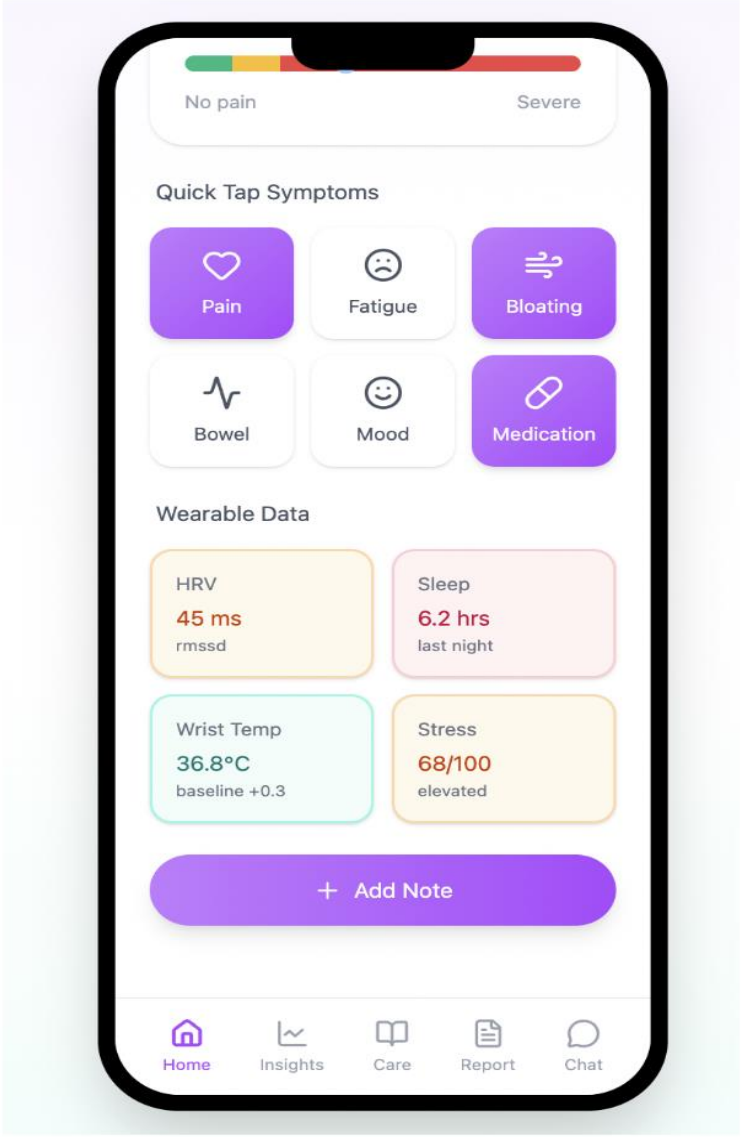
- Flare Risk Index: HRV drop + pain ≥7 for at least 3 days.
- Sleep Disruption Flag: sleep <5 hours linked to flare intensity.
- Cycle-Based Pain Pattern: pain correlated to menstrual phases.
- Features drive alerts, dashboards & clinician summaries

Data Analytics

- HRV, pain, stress and sleep correlation analysis
- Trend visualization across menstrual phases to see symptom timing.
- K means clustering = symptom phenotype groups
- Alerts through guidelines and rules

EndoTrack: Home Screen

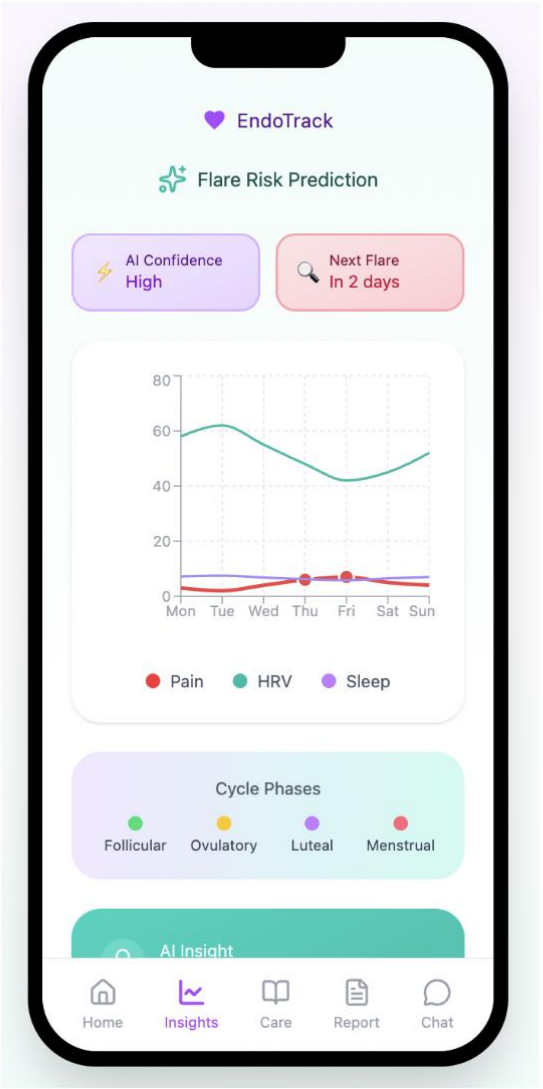


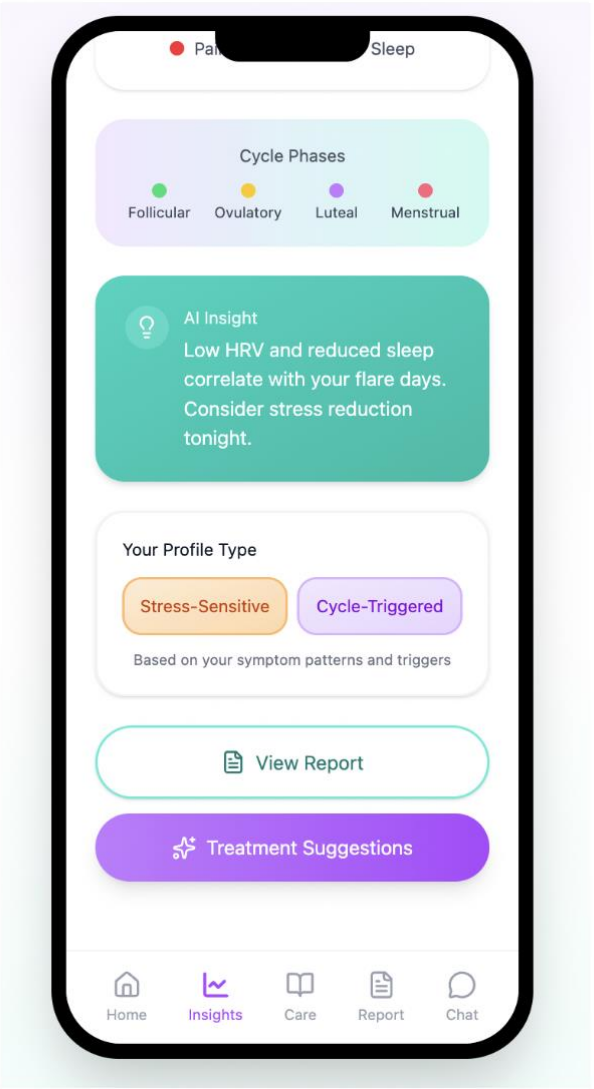


- Log symptoms and wearable data integrated

EndoTrack: Insights Screen

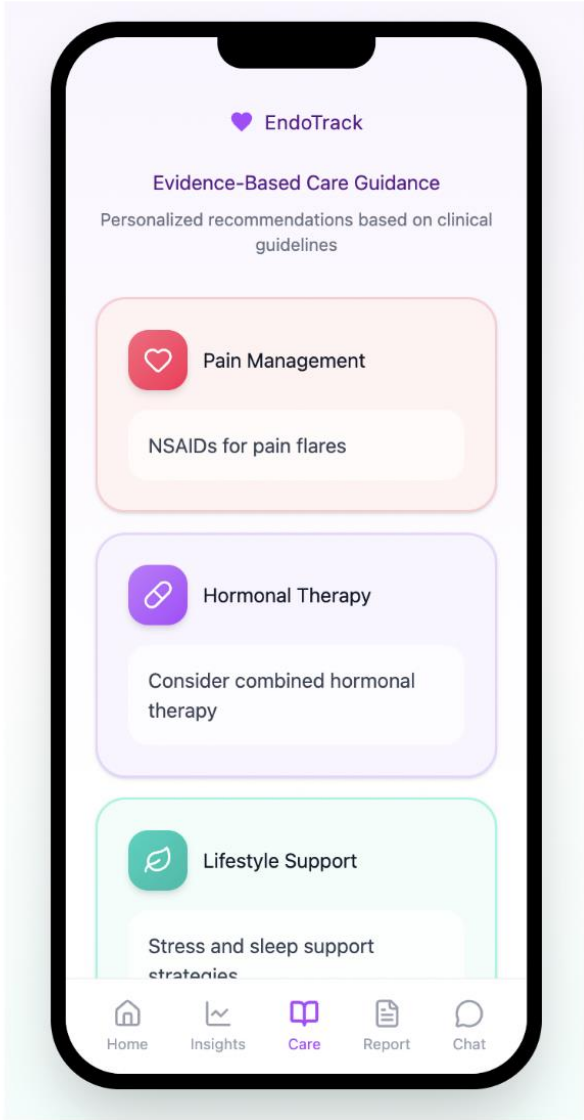
- AI identifies flare risk based on data patterns and cycle phase.
- Displays personalized profile type
- Gives insights and recommendations based on detected patterns.

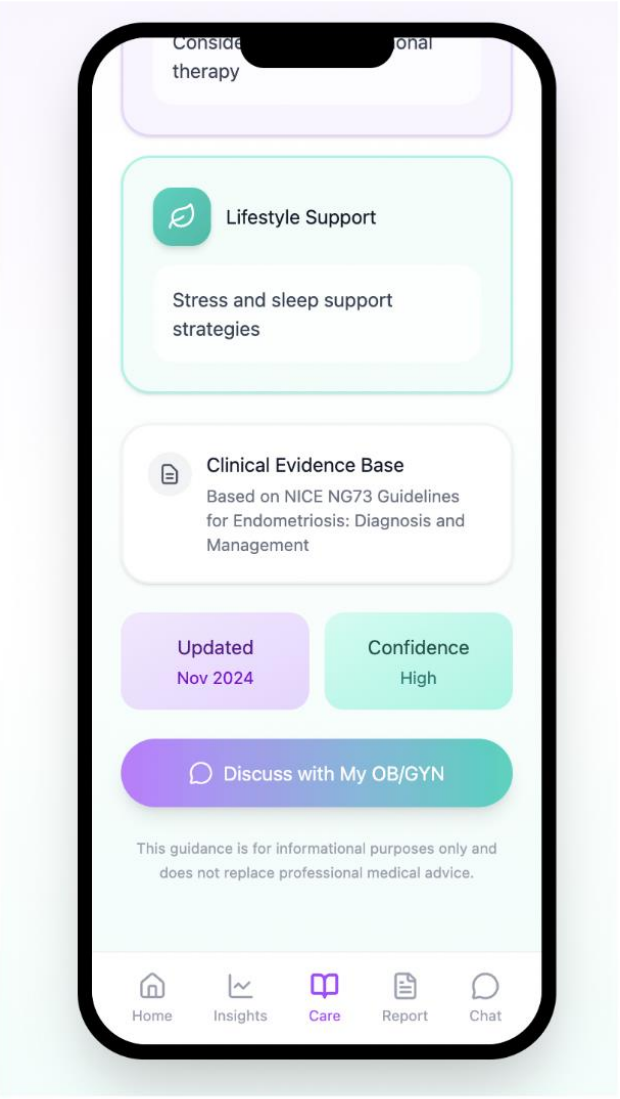




EndoTrack: Care Screen

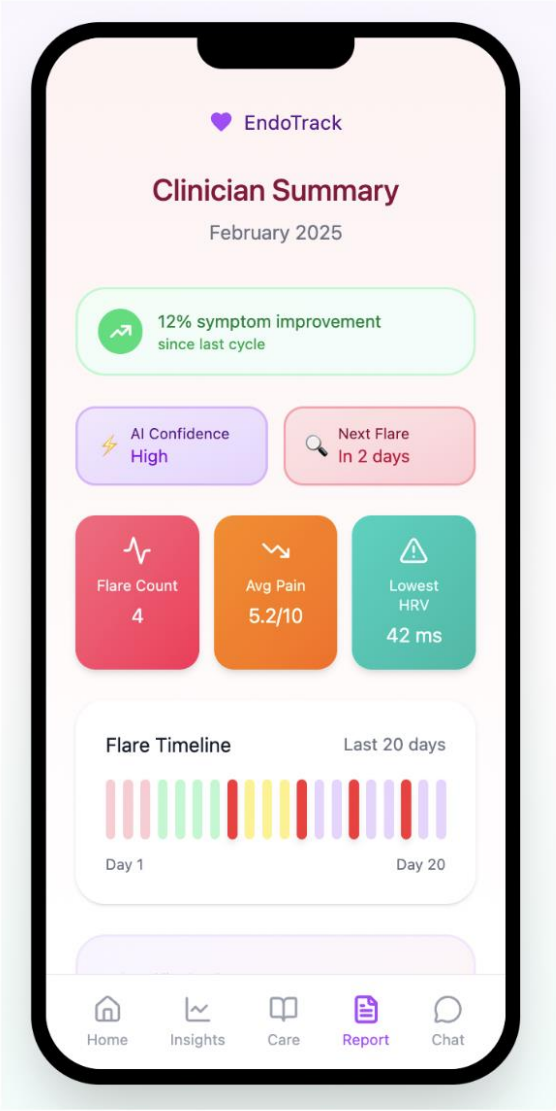
- Shows evidence-based treatment suggestions using NICE guidelines.
- Can securely share recommendations with clinicians.

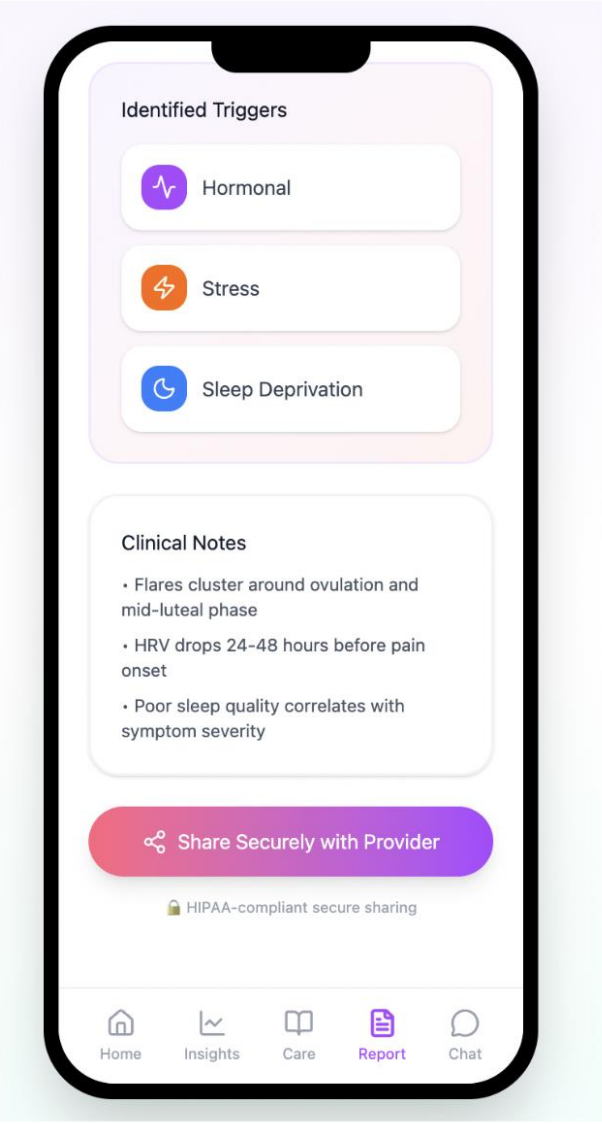




EndoTrack: Report Screen

- Clinician summary shows flare timeline, triggers, and physiologic trends.
- AI-generated notes help highlight clinically relevant insights.
- Enables HIPAA-compliant sharing with healthcare providers.



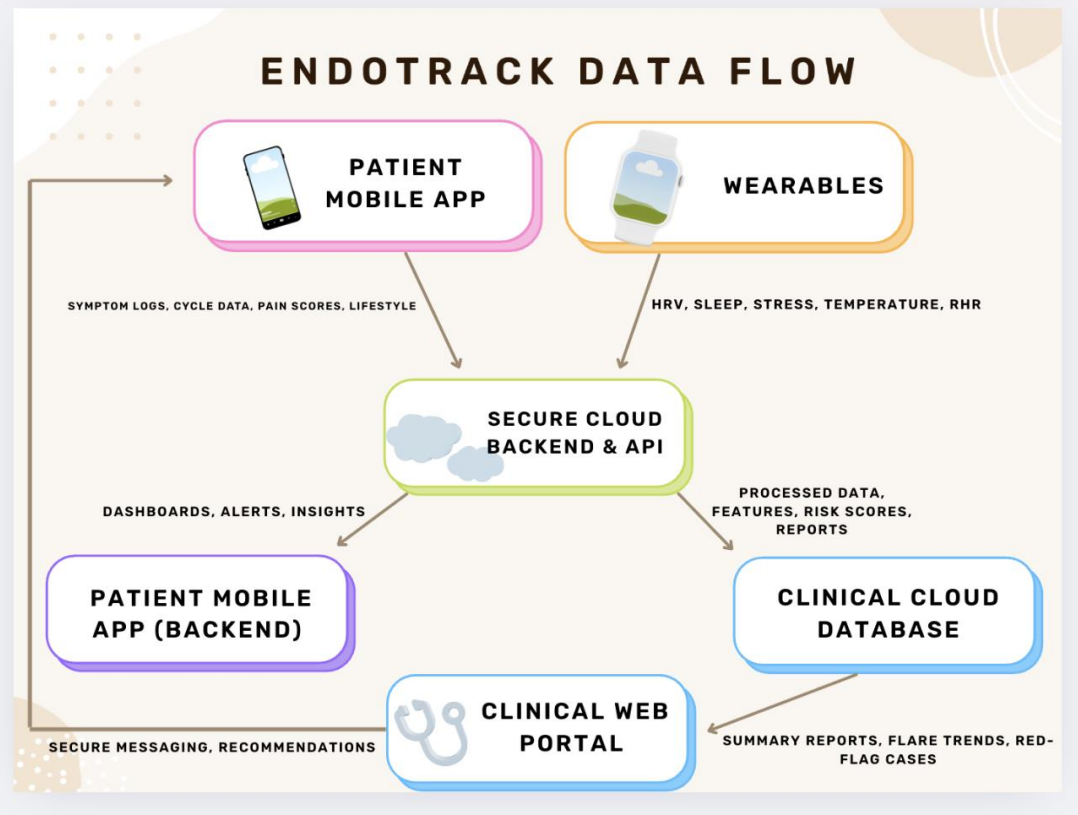


EndoTrack: Clinician Portal Screen

- Enables clinicians to view summaries, monitor patient progress, and receive reports.
- Allows secure messaging and remote guidance for treatment adjustments.

Data Flow

- Mobile app and wearables send data securely to cloud backend and API.
- Cloud processes data into reports, alerts, patterns, and dashboards.
- Results sent back to patient app and clinician portal for shared decision-making.



Results: Symptom Patterns

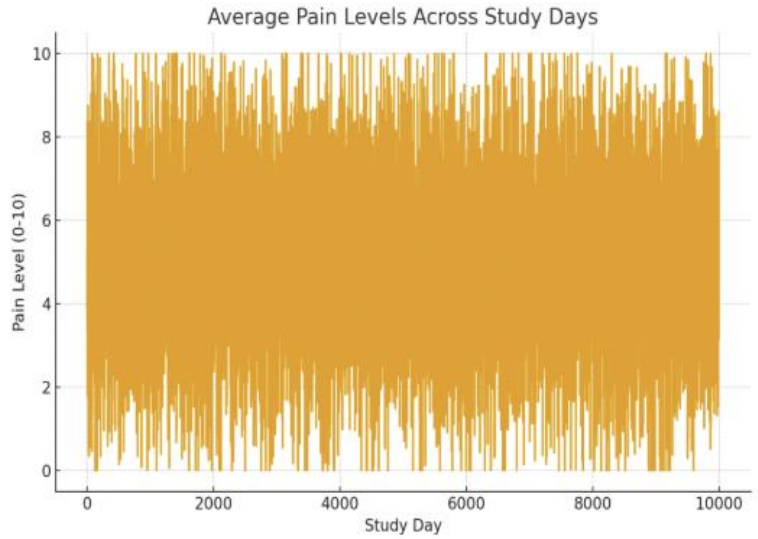


Figure 1

Average Pain Levels Across Study Days (Conceptual)

- Pain, tiredness and mood peak in luteal and menstrual phases
- Graph shows pain levels across study days
- Aligns with clinical research on hormonal flare influence.

Physiological Patterns

- Reduced HRV before flare indicates autonomic imbalance
- Increase in temperature during flare = linked to inflammation
- Body signals can help predict flares early

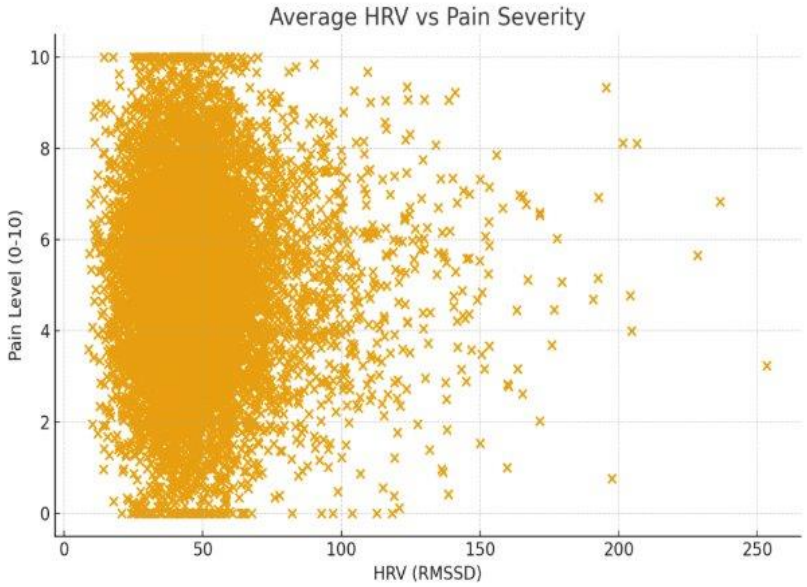


Figure 2

Relationship Between HRV Decline and Pain Severity (Conceptual)

Symptom Profile Grouping

- Stress-Sensitive: HRV drop and stress before flare.
- Cycle-Triggered: Pain linked to menstrual phases.
- Chronic High-Pain: Constant symptoms with less variation.
- Helps personalize treatment and interpretation.

Privacy, Ethics & HIPAA

- EndoTrack encrypts data when sending and storing
- Messages and access follow HIPAA standards
- Users decide when to share data and who sees it

HIPAA COMPLIANT

Future Work

- Introduce machine learning = improved accuracy and prediction
- Integrate with real Electronic Health Records (FHIR/HL7).
- Include sensors to detect hormones, inflammation, and stress markers.

Conclusion

- This app focuses on early diagnosis and preventing delays
- Allows for patient clinician communication
- Empowers women through data, insights, and personalized care.