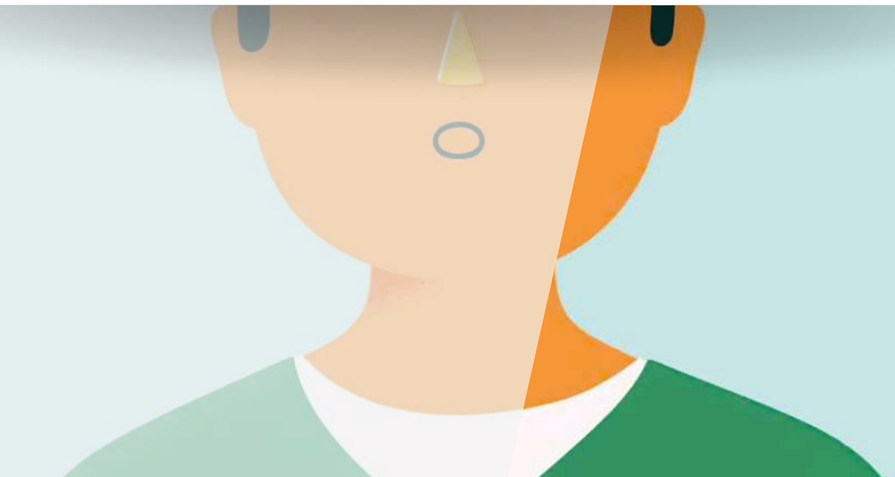
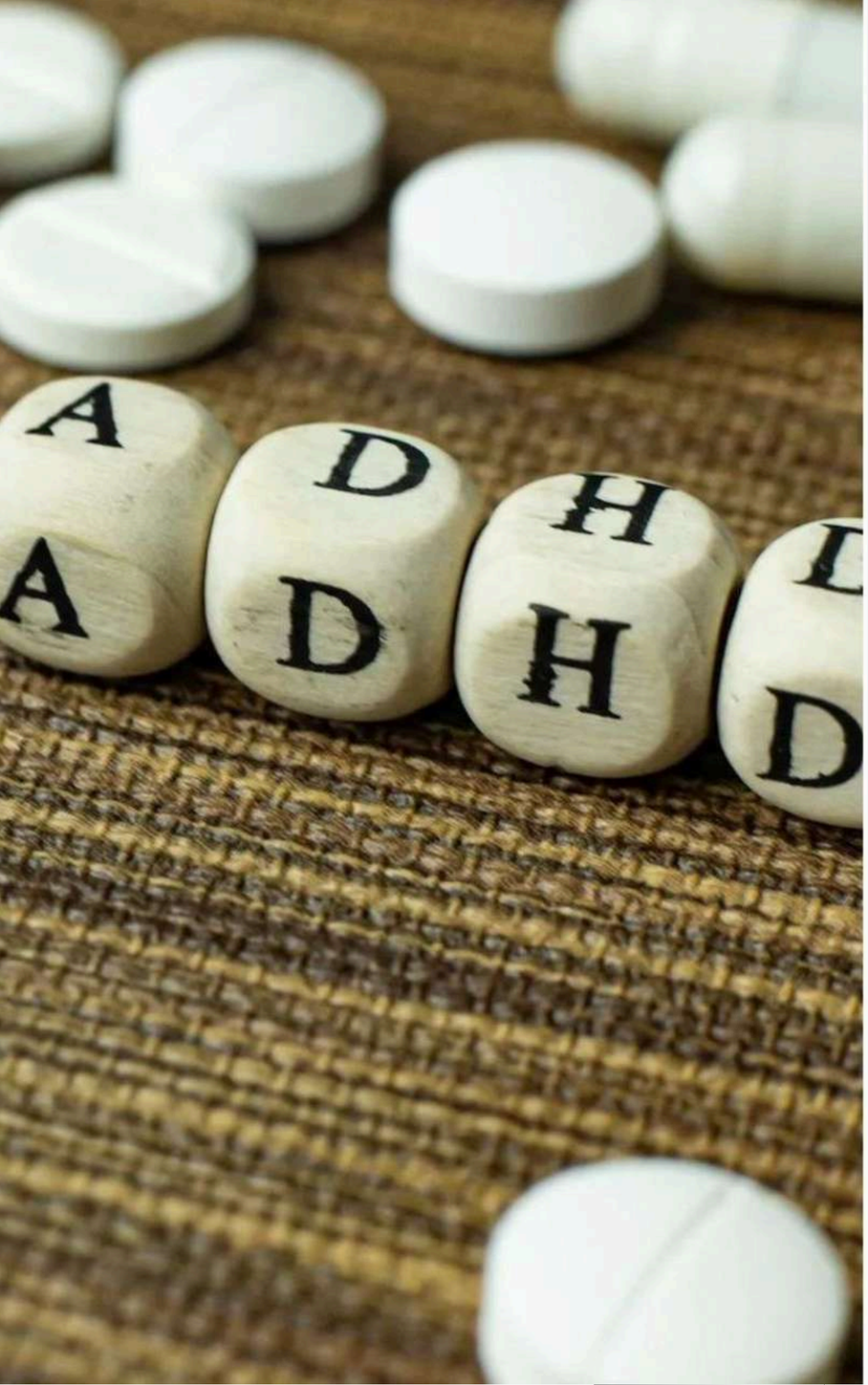
UTM
UNIVERSITI TEKNOLOGI MALAYSIA

CARESENSE

BY GROUP 8





BACKGROUND PROJECT

- **Attention-Deficit/Hyperactivity Disorder** is a neurodevelopmental condition commonly associated with hyperactivity, impulsivity and difficulties in emotional regulation.
- Individuals with ADHD often show physical signs such as excessive sweating, increased heart rate or feelings of restlessness.
- It is hard for parents and caregivers to recognize early stage of overstimulation or hyperactive episodes.
- These signs are easily confused with normal factors like physical movement or hot weather.
- Therefore, this situation proves that a supportive system that helps ADHD caregivers better understand of the ADHD people phycological changes and respond earlier.

OBJECTIVES

01 To provide early detection of overstimulation

02 Help parents and caregivers to have early preparation if there are any sign of possible episodes

03 Help parents and caregivers understand ADHD physiological changes and respond effectively.

SOLUTION

CareSense

A wearable device that can connect to mobile application.

Target users .
CareSense device : Individuals with ADHD
CareSense apps : Parents or caregivers (siblings) .

01 Detect when ADHD will be triggers via sweat response, motion and skin temperature (physiological & behavioural indicators).

02 Real time alert system to notify parents / caregivers to allow early intervention.

03 Can differentiate ADHD overstimulation or normal factor by identifying abnormal pattern .

04 Free mobile application for monitoring easily that can save previous data for future reference.

ADHD VS NORMAL FACTOR

Behavioural Indicators	ADHD	Normal
Sweat	Prone to sudden spikes from sensory input or frustration	Stable, responds proportonally to physical and mental stress
Motion	Constant fidgeting “driven by motor” or shifting positions frequently	Can sit still in long period without conscious effort if the task requires it.
Skin temperature	Often feels hot or cold more intensely and drop sharply at night to signal sleep.	More consistent, body temperature regulats smoothly with the environment and sleep schedule.

DEVICE FEATURES

01 Adhesive With Skin Interface Layer

- Secure the patch to the forearm comfortably.
- Forms the base for all sensor layers and ensures stable contact with skin.

02 Microfluidic Layer

- Directs sweat towards biosensors using wicking pads.

03 Sensor layer

- Electrochemical sensors: Function for selective detection.
- EDA electrodes: Measure electrodermal activity for autonomic arousal.
- Motion sensors: Helps connect sweat response with physical activity or stress

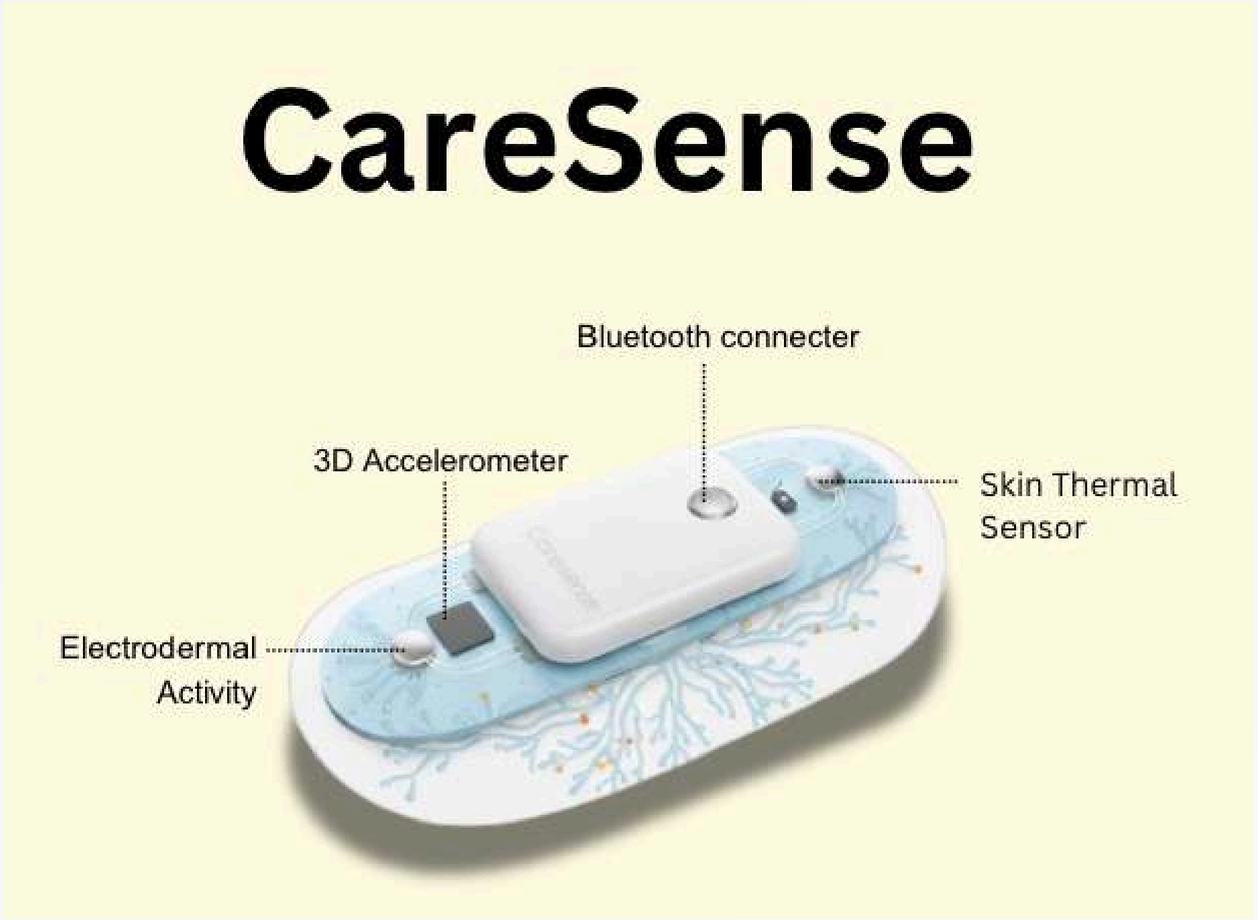
04 Electronics Layer

- Handles signal conditioning, filtering and calibration.
- Manages real-time data acquisition and prepares it for transmission.

05 Wireless Communication Layer

- Enables Bluetooth transmission to external devices.
- Streams processed data to the CareSense app for visualization and alerts.

DEVICE FEATURES & PROTOTYPE



APP FEATURES

01 Login Screen

- Ensures only authorized users can access personal health data and begin monitoring sessions.

02 Live Dashboard

- Provides live feedback on physiological changes, help users track stress, hydration and activity levels.
- Sweat rate display
- Graph of the sweat rate
- Alert banner

03 Compare Screen

- Enables comparative analysis for research or clinical insight into behavioral and physiological patterns
- Comparison between normal vs ADHD
- Three comparison: sweat, motion, temperature

04 History Screen

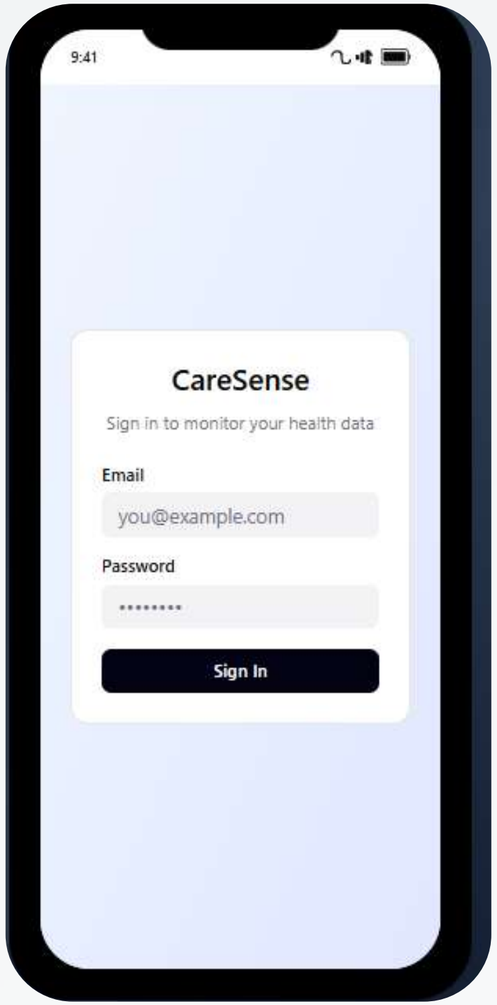
- Allows users to review past sessions, track trends and identify recurring spikes

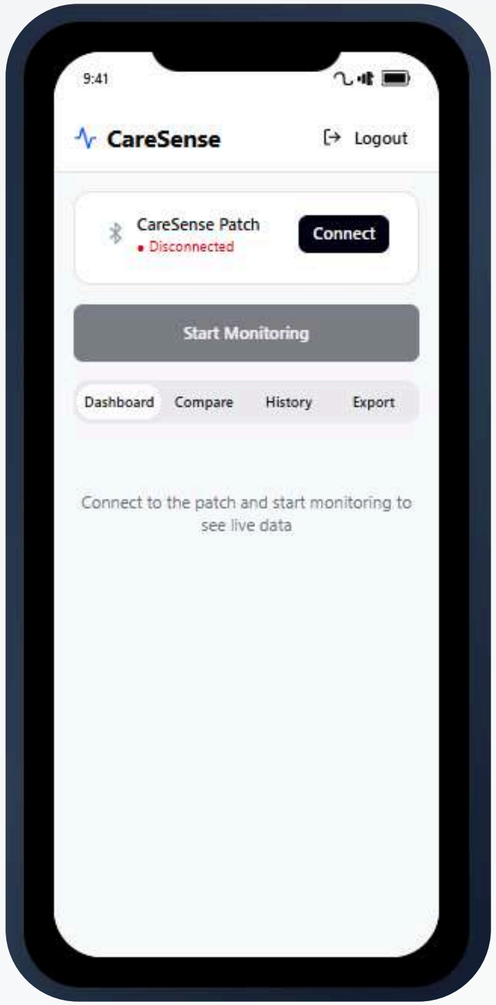
05 Export Screen

- Enables secure sharing of health data for clinical use, research or personal records.
- PDF Report
- Email to healthcare provider
- Generate share link

APP FEATURES & PROTOTYPE

01





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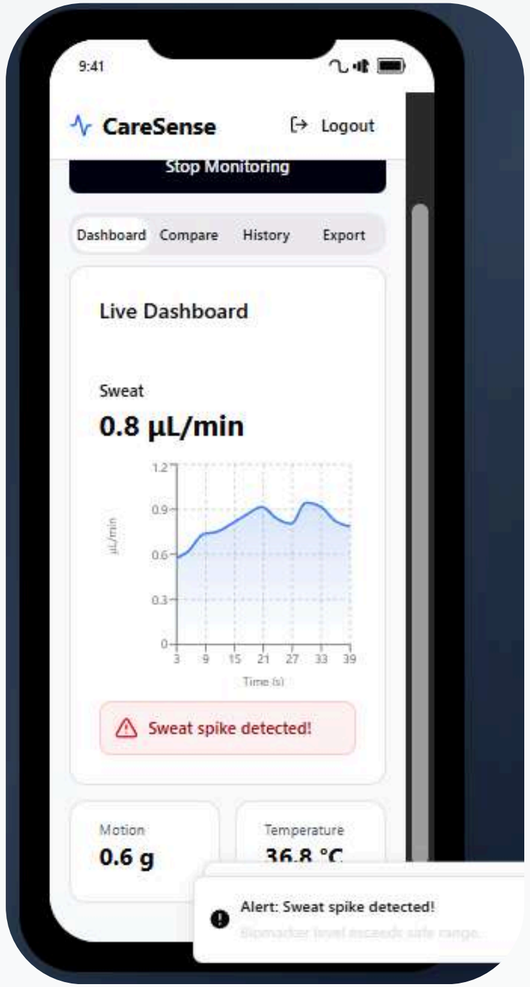
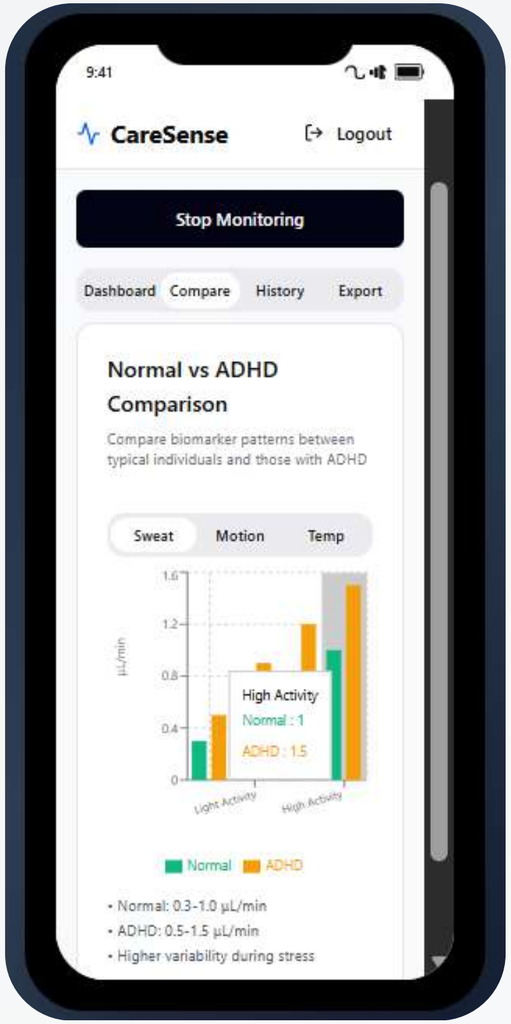
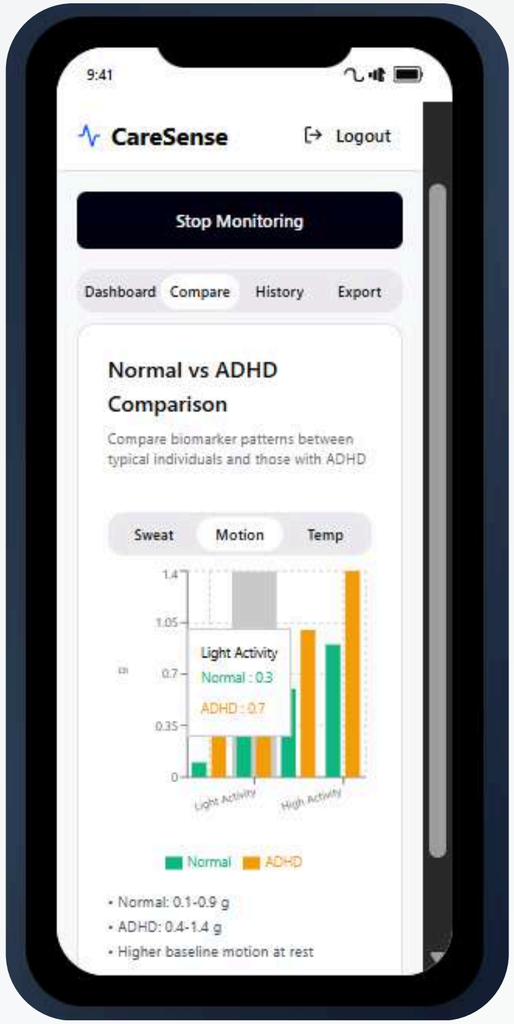
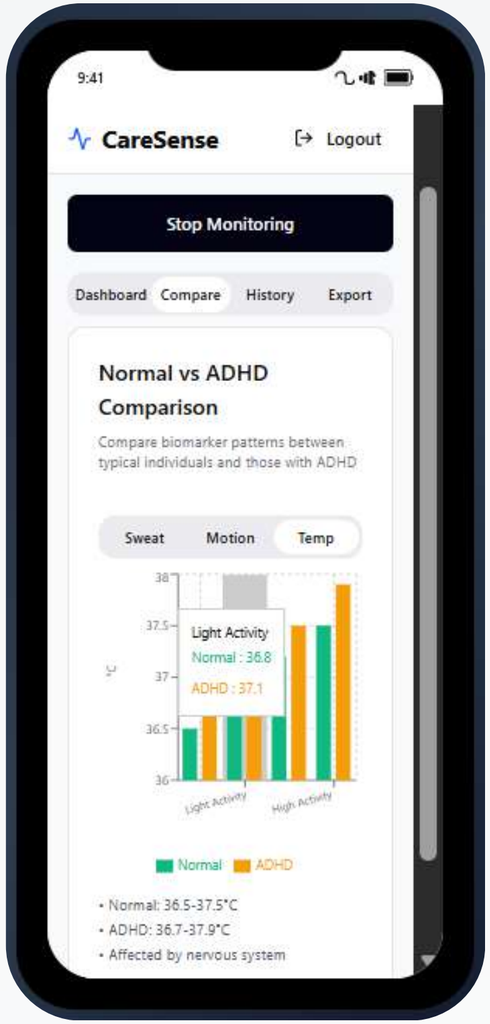


APP PROTOTYPE & FEATURES

03

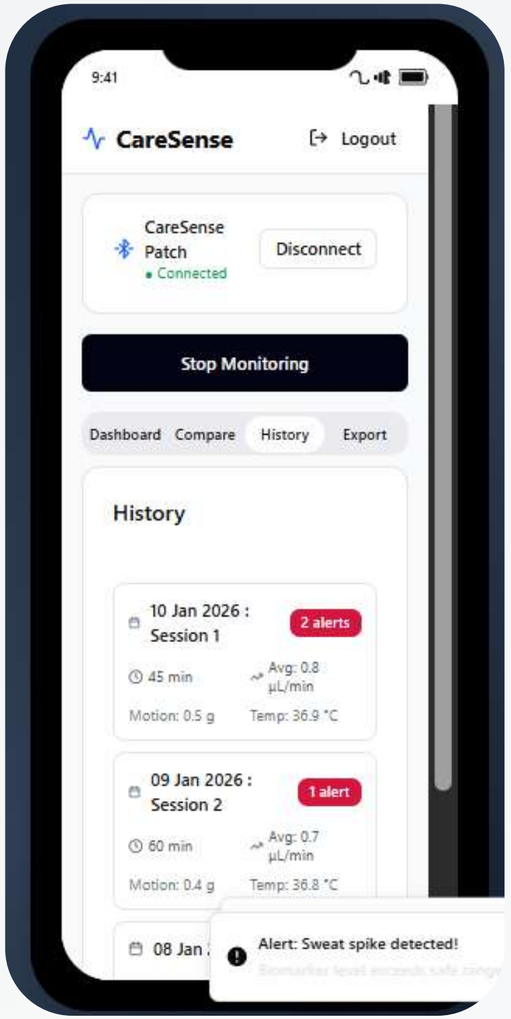






APP PROTOTYPE & FEATURES

04



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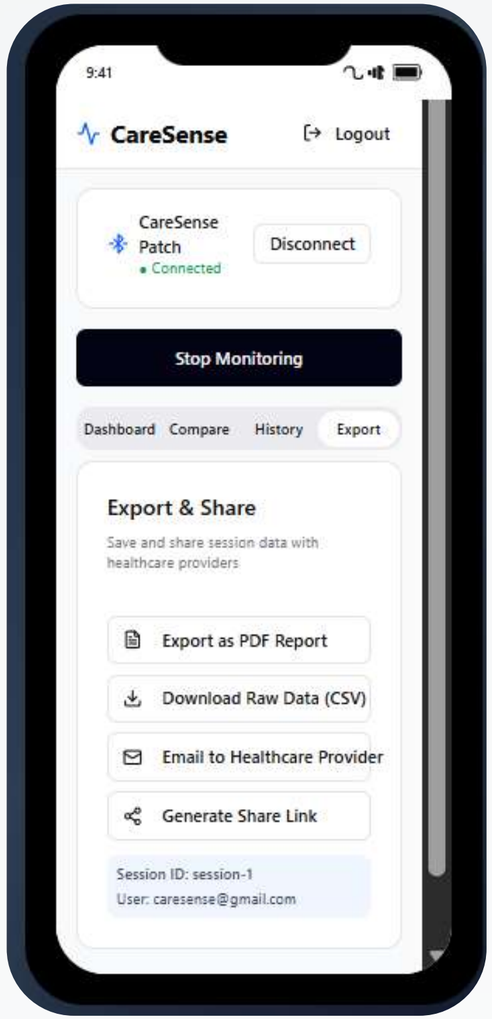


HOW TO USE DEVICE AND APP

STEP 1: SETUP

- User installs the Caresense app
- user needs to log in
- attached the sweat-sensing patch to the skin

STEP 2: CONNECT

- Turn on the Bluetooth
- The apps connect to the patch via Bluetooth
- confirmed the connection

STEP 3: MONITOR

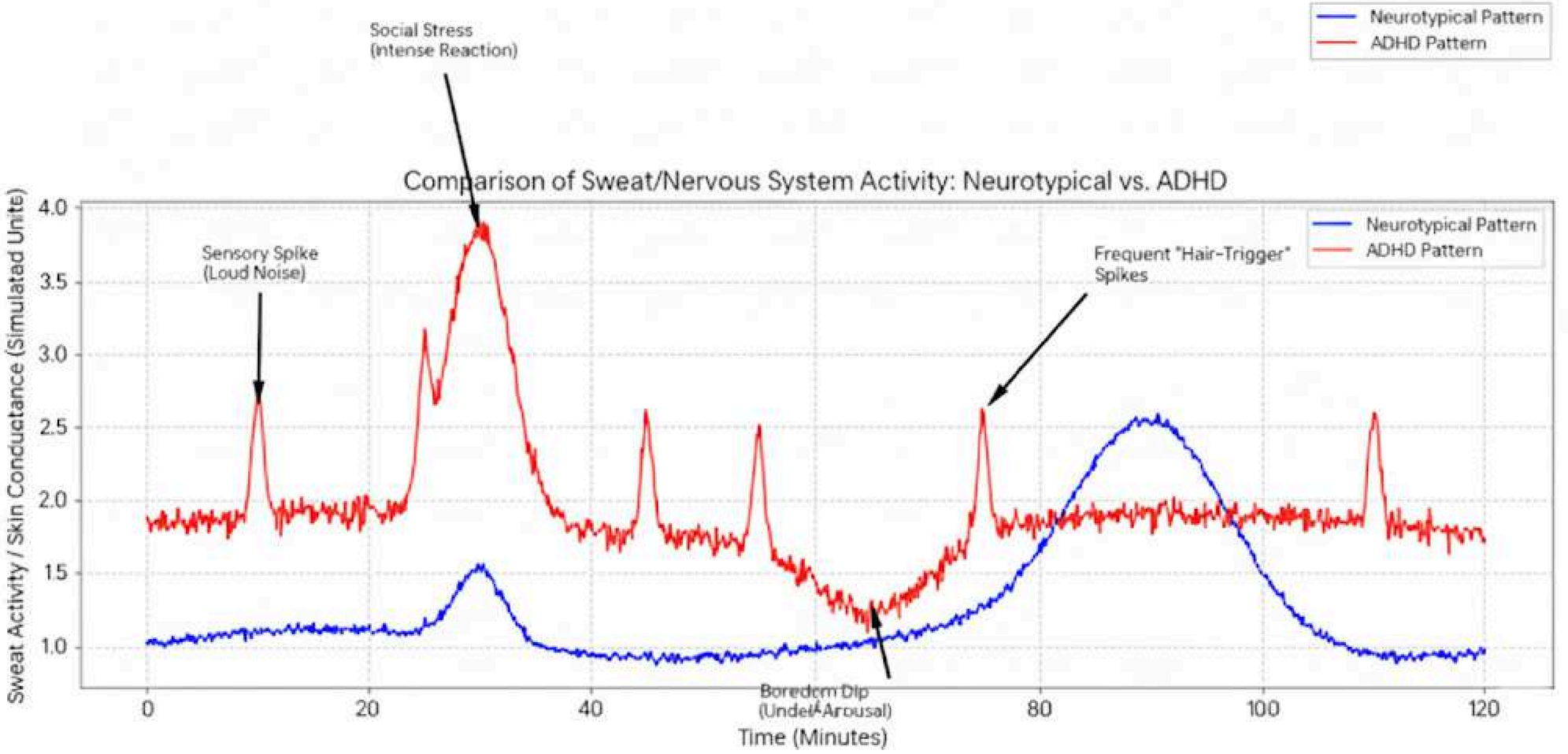
- The patch will detect
  - sweat
  -skin temperature
  -motion
- The data sent to the app

STEP 4: ANALYSE

- The app will analyse the data from the patch
- check data
  -normal: continue monitor
  -abnormal: sent alert to user

STEP 5: REVIEW

- Data is saved automatically
- The user can review records to compare


Social Stress
(Intense Reaction)
Neurotypical Pattern
ADHD Pattern
Comparison of Sweat/Nervous System Activity: Neurotypical vs. ADHD
Sensory Spike
(Loud Noise)
Frequent "Hair-Trigger"
Spikes
Boredom Dip
(Under-Arousal)
Sweat Activity / Skin Conductance (Simulated Units)
Time (Minutes)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0
20
40
80
100
120

The End

THANK YOU FOR LISTENING

GROUP 8