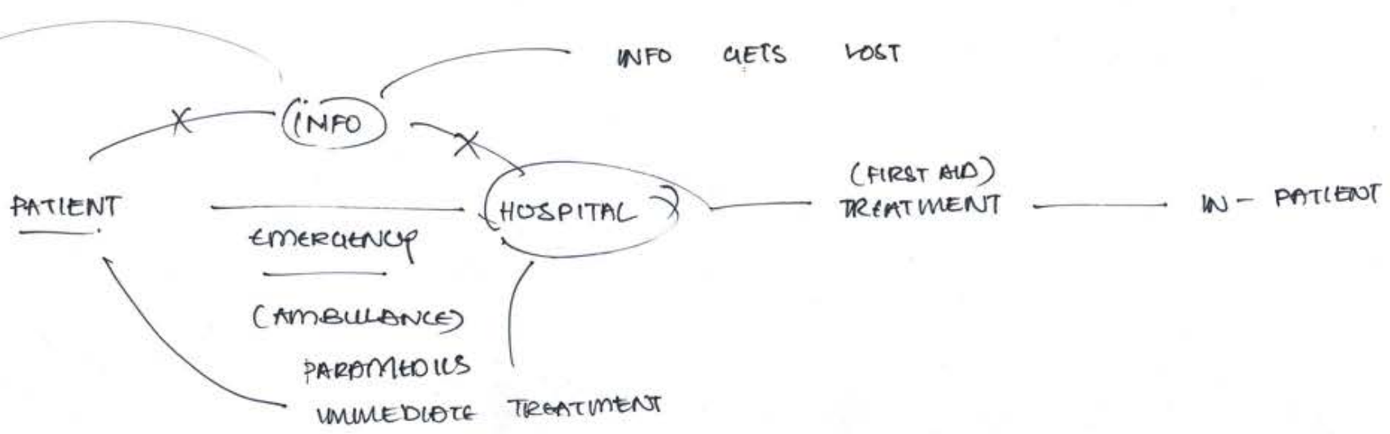
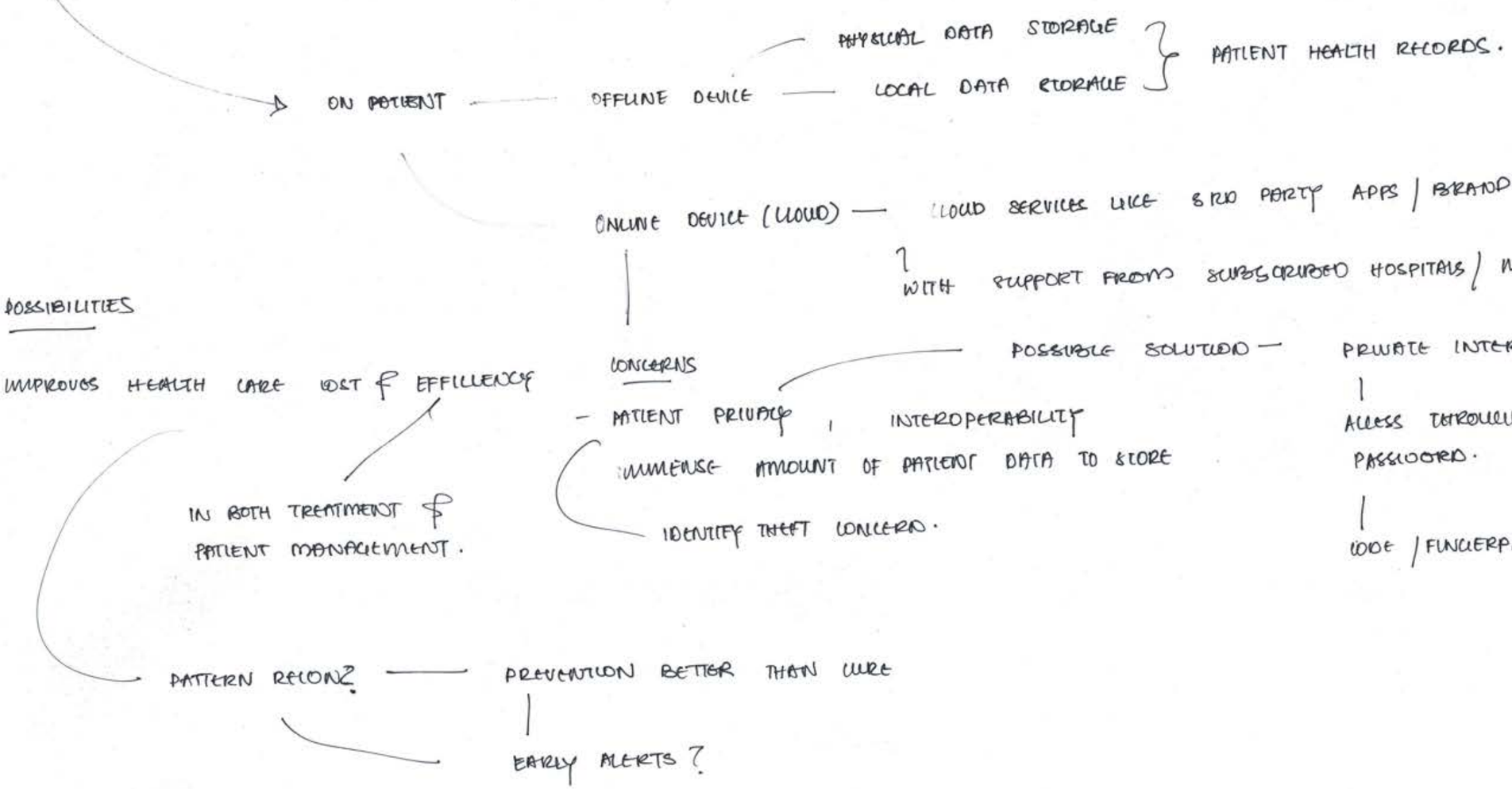
DNB311 DDR

JONAS JOY PATTATH
N11456256

CONCEPT

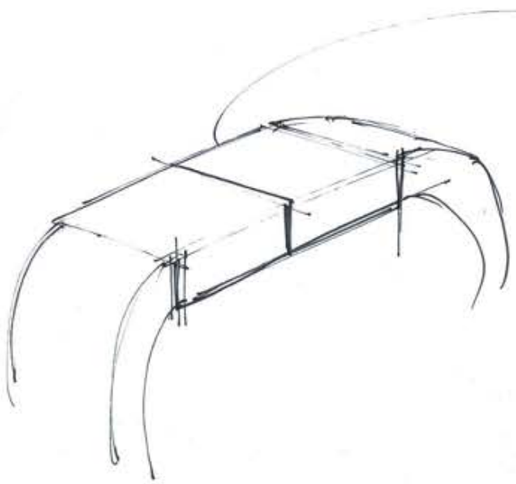

INFO GETS LOST
INFO
PATIENT
HOSPITAL
EMERGENCY
(AMBULANCE)
PARAMEDICS
IMMEDIATE TREATMENT
(FIRST AID)
TREATMENT
IN - PATIENT


ON PATIENT
OFFLINE DEVICE
PHYSICAL DATA STORAGE
LOCAL DATA STORAGE
PATIENT HEALTH RECORDS.
ONLINE DEVICE (CLOUD)
CLOUD SERVICES LIKE 3RD PARTY APPS / BRAND
WITH SUPPORT FROM SUBSCRIBED HOSPITALS / MEDICAL INSTITUTIONS.
POSSIBILITIES
CONCERNS
POSSIBLE SOLUTION
PRIVATE INTERNET CONNECTION
ACCESS THROUGH SINGLE NETWORK
PASSWORD.
CODE / FINGERPRINT.
IMPROVES HEALTH CARE COST & EFFICIENCY
IN BOTH TREATMENT & PATIENT MANAGEMENT.
- PATIENT PRIVACY , INTEROPERABILITY
IMMENSE AMOUNT OF PATIENT DATA TO STORE
IDENTITY THEFT CONCERN.
PATTERN RECOG?
PREVENTION BETTER THAN CURE
EARLY ALERTS ?

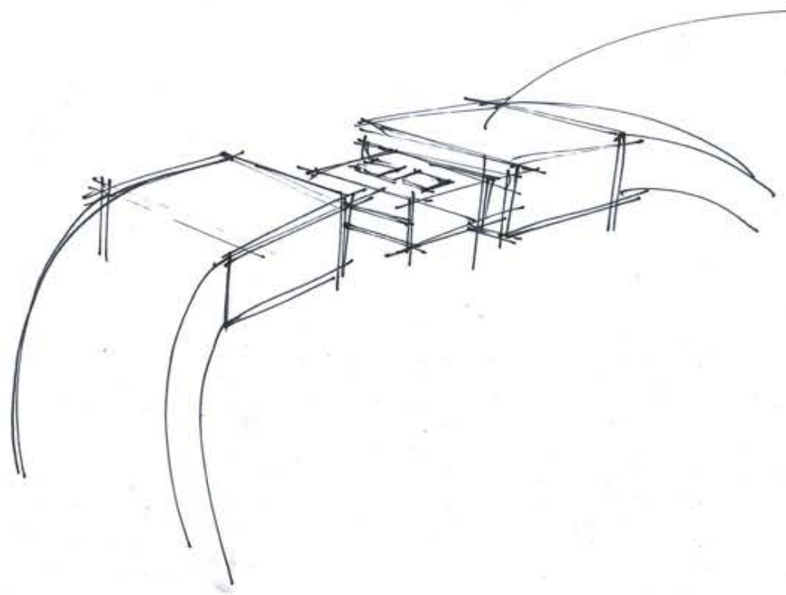
CONCEPT

HELP EMERGENCY STAFF GAIN KNOWLEDGE OF PATIENT INFO & CONDITIONS. —— CURRENT PROBLEM: LOT OF PATIENT INFO IS MISSED WHEN TO TREAT SOMEONE APPROPRIATELY

WRISTBAND WITH USB STORAGE



ALREADY EXIST — ADAPT TO — ?



HEALTH TRACKER —— CURRENT LIVE DATA —— NO PREVIOUS HEALTH RECORD STORAGE

CURRENT DETECTABLE

|

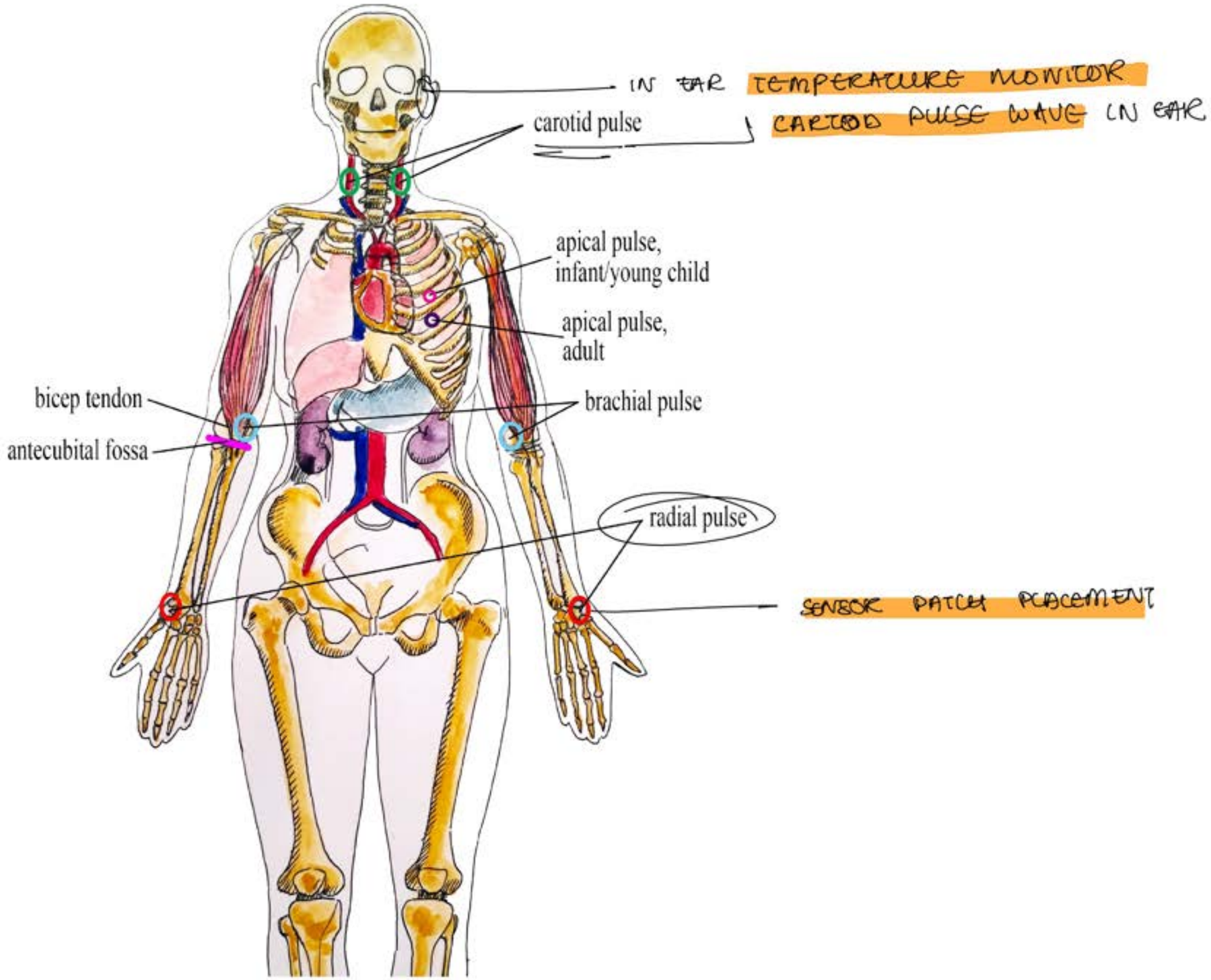
BLOOD PRESSURE

BLOOD SUGAR

SLEEP PATTERN'S

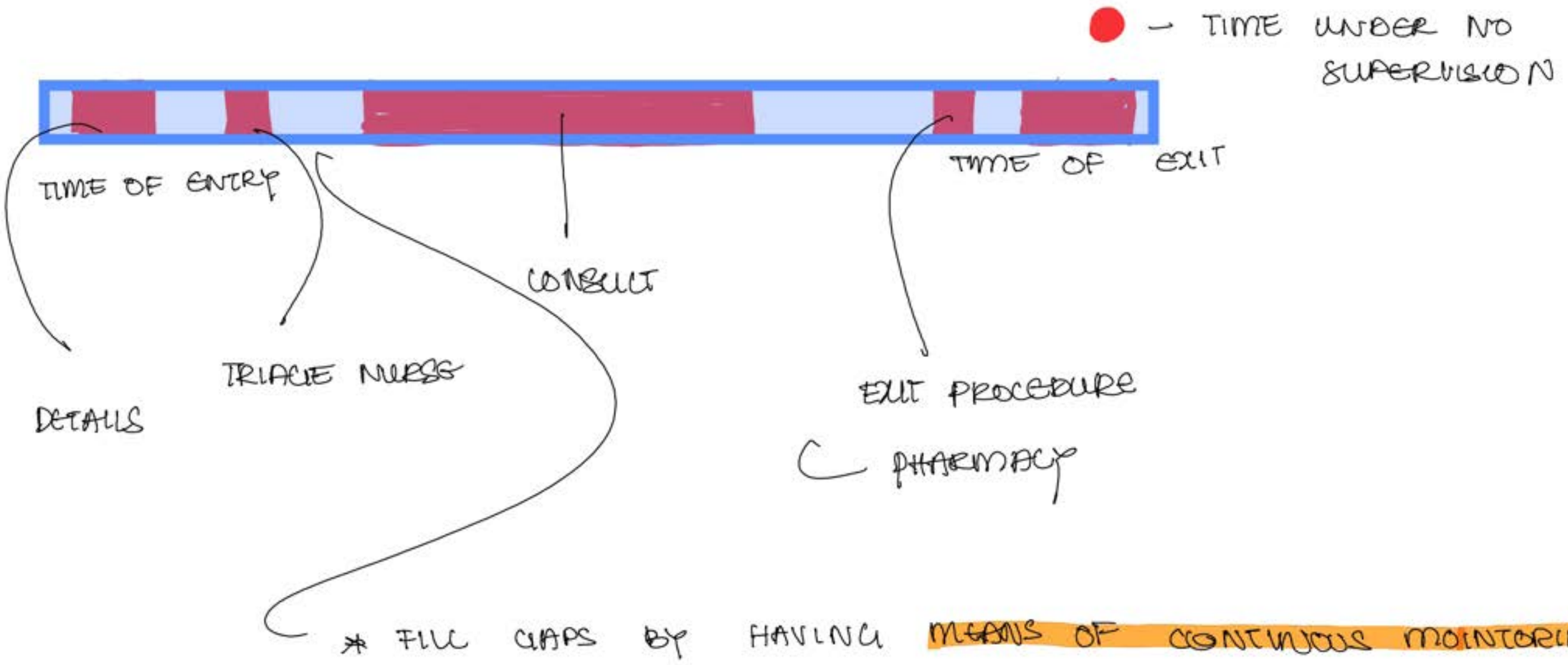
PREVIOUS CONDITIONS — NOT COMMUNICATED TO ANYONE ELSE

SENSOR PATCH PLACEMENT



PATIENT OF ESI LEVEL 3-5

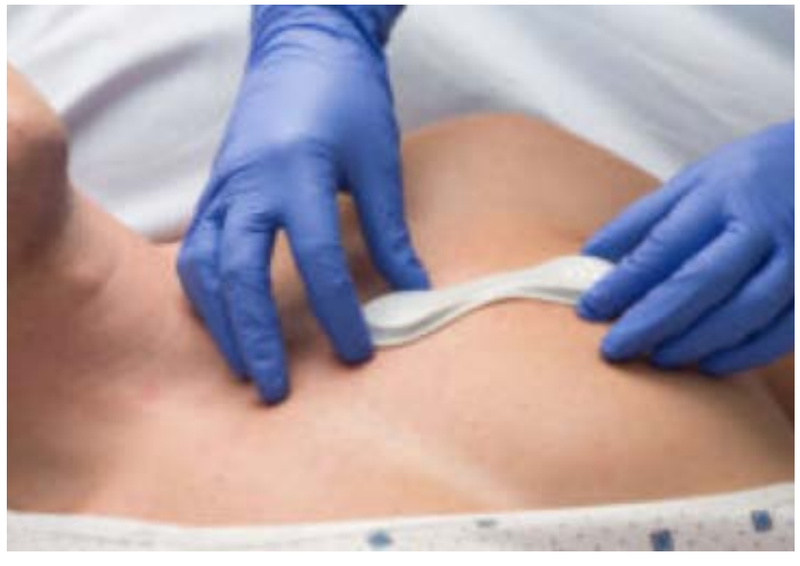
TIMELINE OF BEING UNDER SUPERVISION



BENCHMARKED PRODUCTS

MindRay Mwear

VitalPatch



Visi Mobile

Biotsticker

Benchmarking Insights (Devices Reviewed)

Mindray mWear
Multi-parameter and robust hospital integration.
Not suitable for rapid triage (setup time, comfort issues).

Sotera ViSi Mobile
Excellent continuous monitoring & alerts.
Too large and complex for quick-use in crowded EDs.

VitalConnect VitalPatch
Lightweight and single-use, patient-friendly.
Limited vital tracking, higher running costs.

BioSticker
Strong connectivity and multi-environment capability.
Optimized for post-discharge/home monitoring, not ED triage.

Research Background

Overcrowding in the Emergency Department (ED) leads to delayed monitoring, patient anxiety, and safety risks.

Nurses play a central role in managing patient flow and prioritization (Benjamin, 2020).

Process improvements alone (Van der Linden et al., 2021) are insufficient — system-level innovations are needed.

Long waiting times increase anxiety and confusion, especially before triage (Sedgman et al., 2022).

Oppurtunities for Innovation

- Fast, single-step application wearable (within seconds).
- Continuous, real-time monitoring (HR, RR, SpO, temp, BP trends).
- Seamless integration into hospital dashboards/EHR.
- Comfort-focused, minimal design suited for all ages.
- Single-use / easy sterilization for infection control.
- Reliable performance during high traffic and patient movement.

Key Findings

Clear link between ESI levels and waiting times — lower-acuity patients (ESI 3–5) experienced significant delays and greater anxiety.

Manual vital checks every 20–30 minutes left gaps in patient safety and detection.

Patients reported discomfort with wired devices and stress from lack of updates.

Staff identified workload strain, triage overload, and monitoring inconsistencies, especially for mobile patients.

Identified Needs

Continuous, non-invasive monitoring to reduce missed detections.

Improved communication systems to reduce uncertainty and enhance reassurance.

Streamlined patient flow and more efficient triage management.

Concept Directions

Body Monitoring Patch for continuous, mobile vital sign tracking.

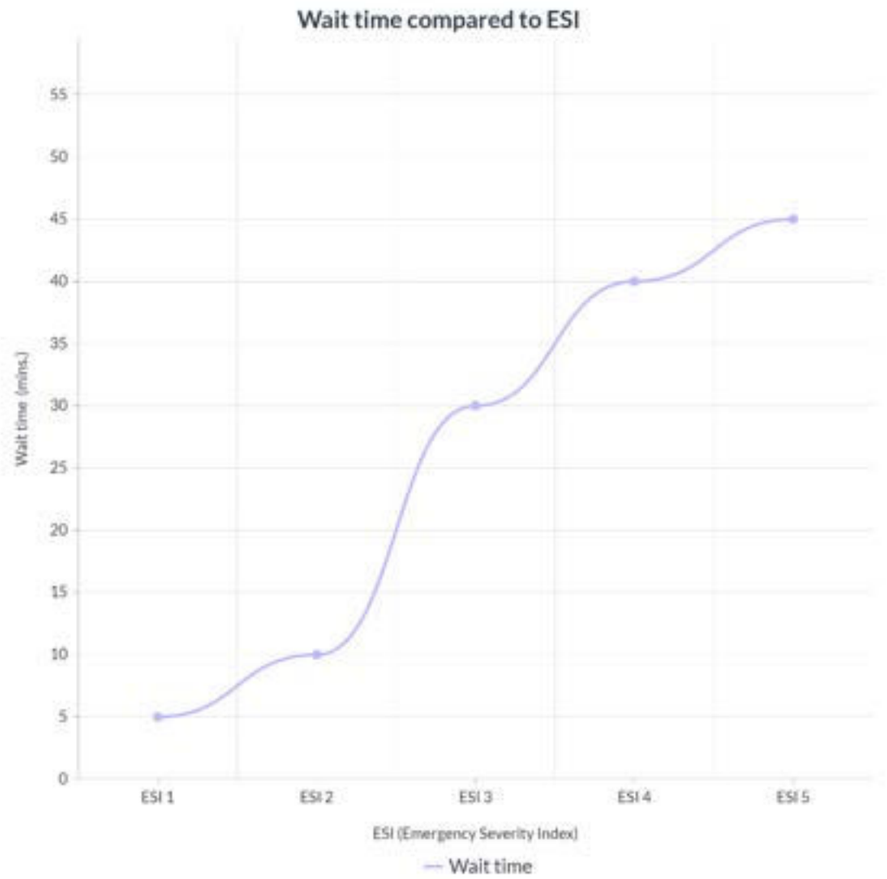
In-ear Sensor with Transponder to provide discreet and real-time monitoring.

Isolation Chair with pull-up sides and display for updates and vitals.

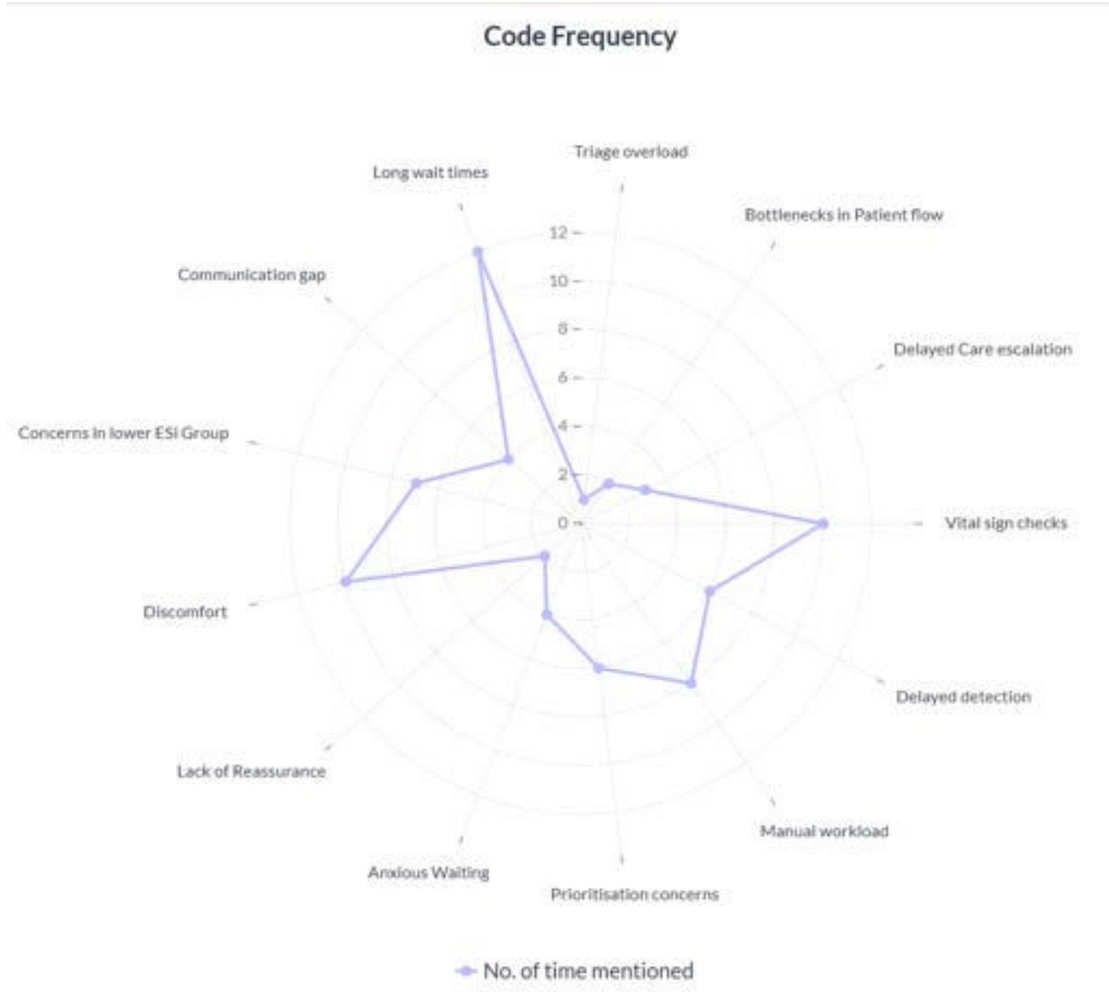
Navigation Transponder guiding patients and sending call-up alerts.

Wrist SpO⊠ Sensor integrated with a vital monitoring patch for full readings.

INSIGHTS FROM QUESTIONARE & INTERVIEW

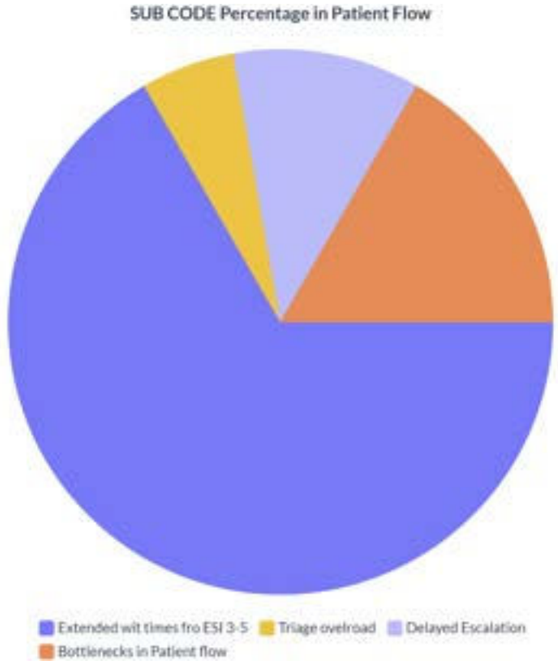


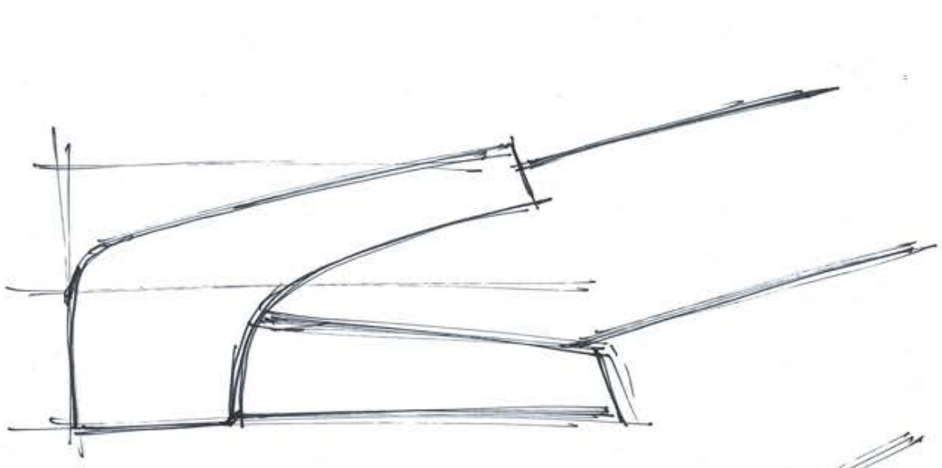
Patients with higher ESI urgency (1–2) were attended to within 5–15 minutes, while lower-acuity patients (ESI 3–5) often waited 30–60 minutes or more. This extended wait directly correlated with increased anxiety and dissatisfaction, especially among those experiencing pain or shortness of breath.

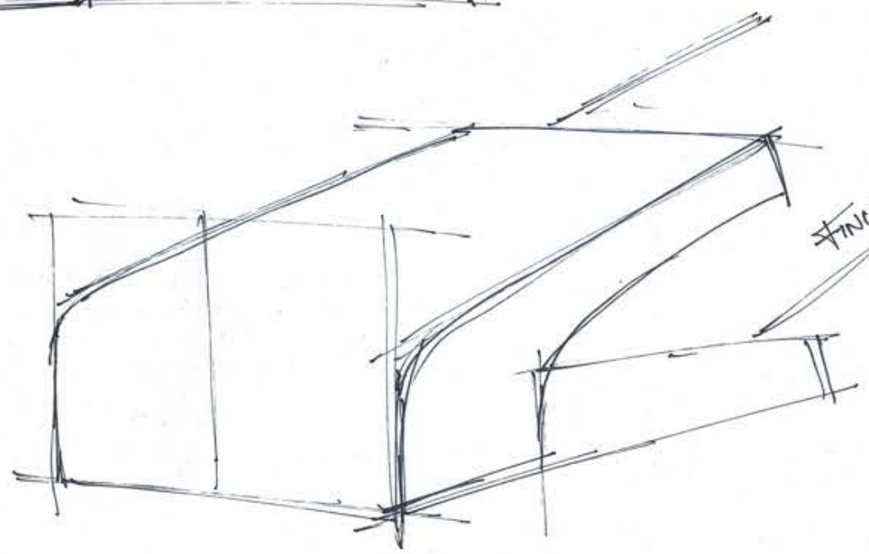


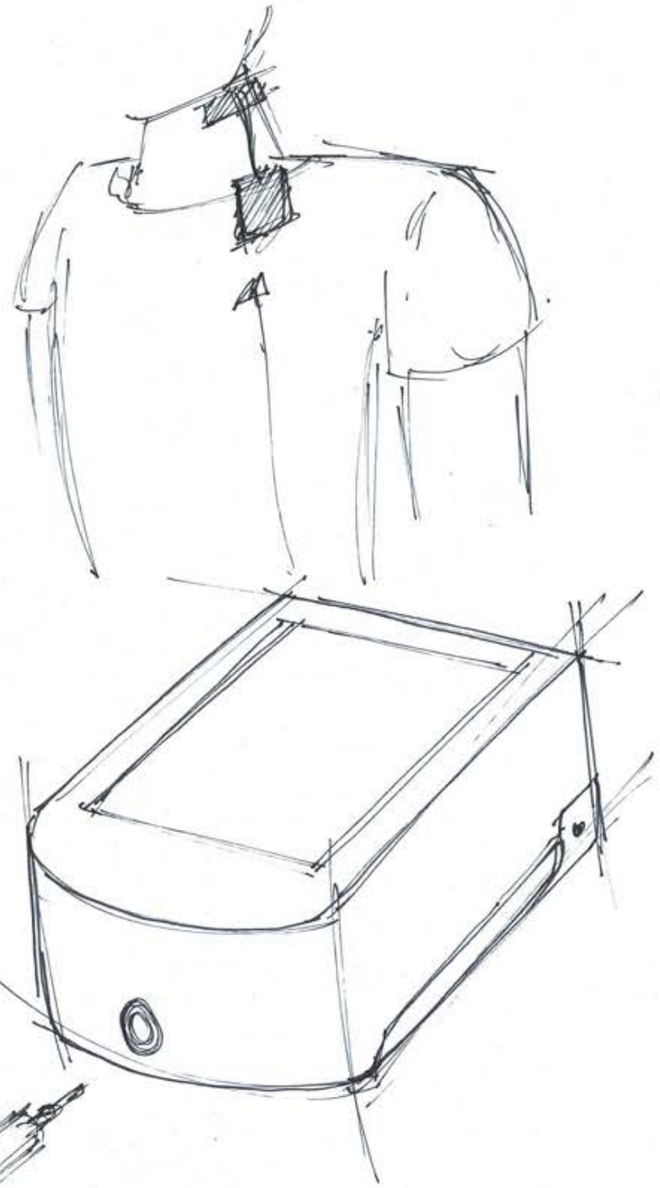
Interview coding showed that monitoring challenges and manual workload were the most reported issues, followed by delayed detection (19%) and prioritisation concerns. From the patient perspective, discomfort, long wait times, and anxiety during waiting were key recurring themes.

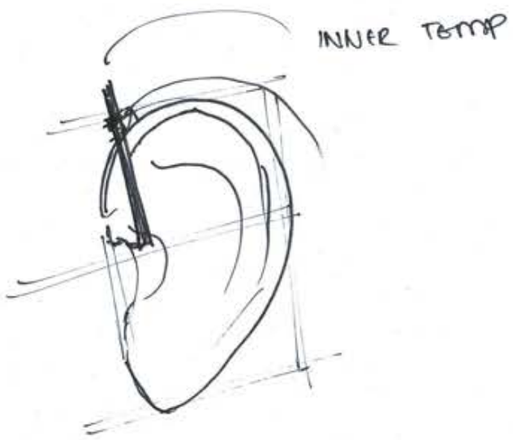
SUBCODES FROM INTERVIEW

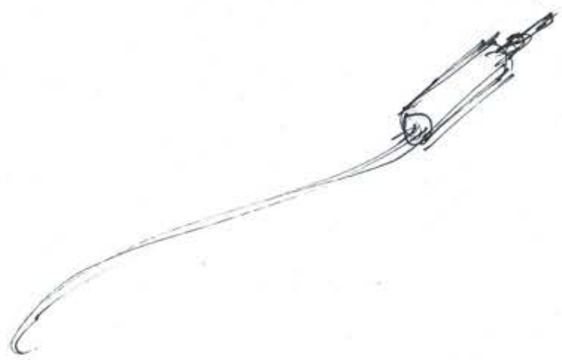


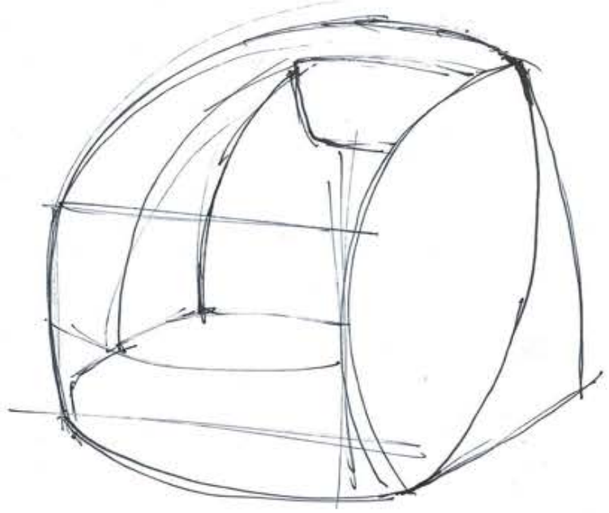


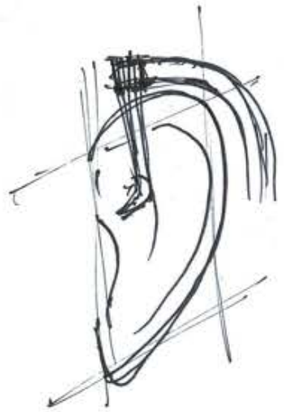

FINGER

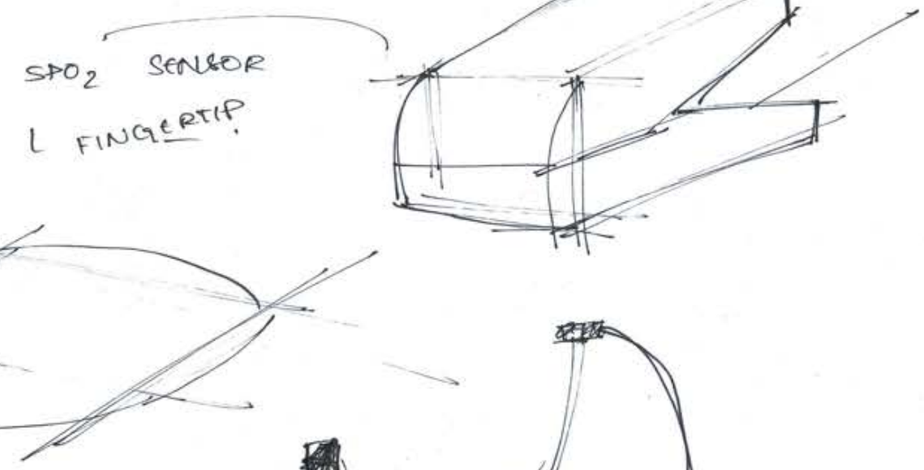


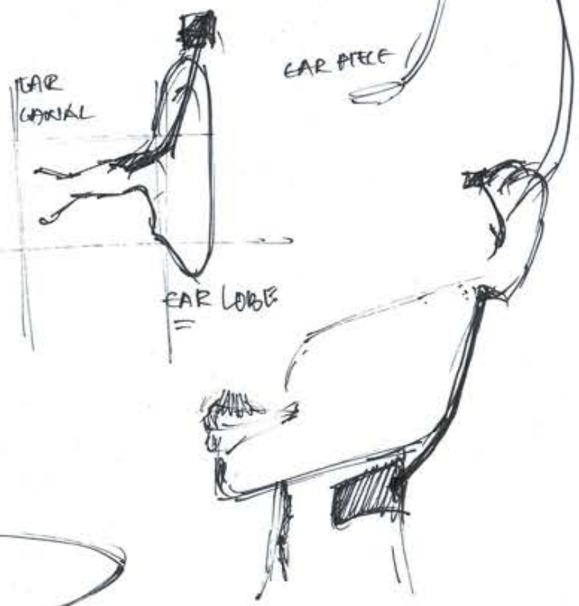

INNER TEMP

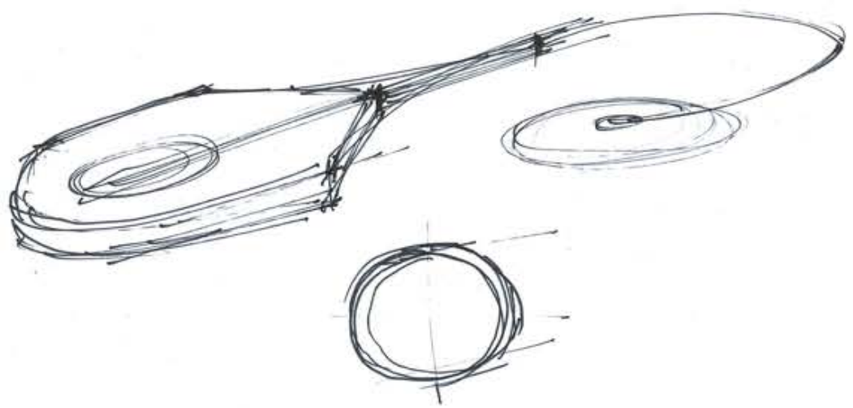


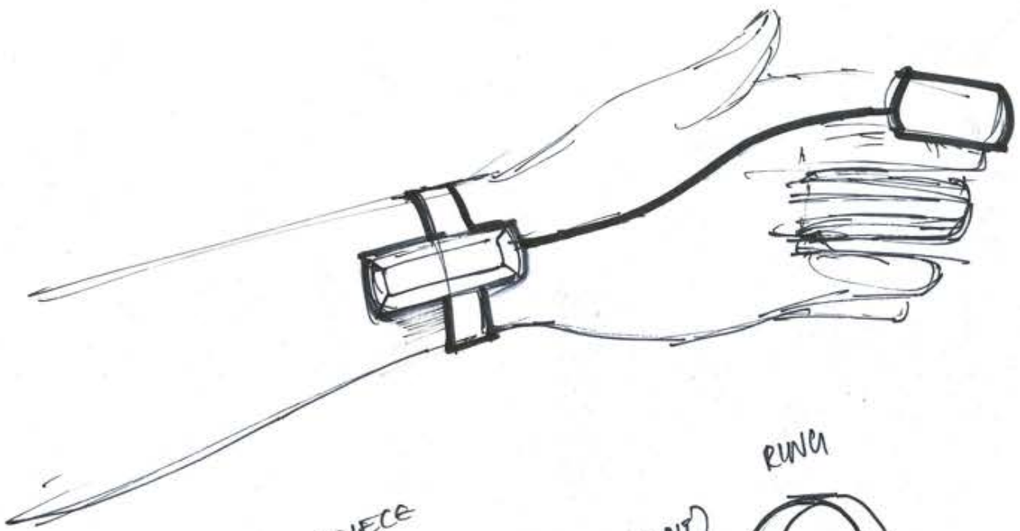




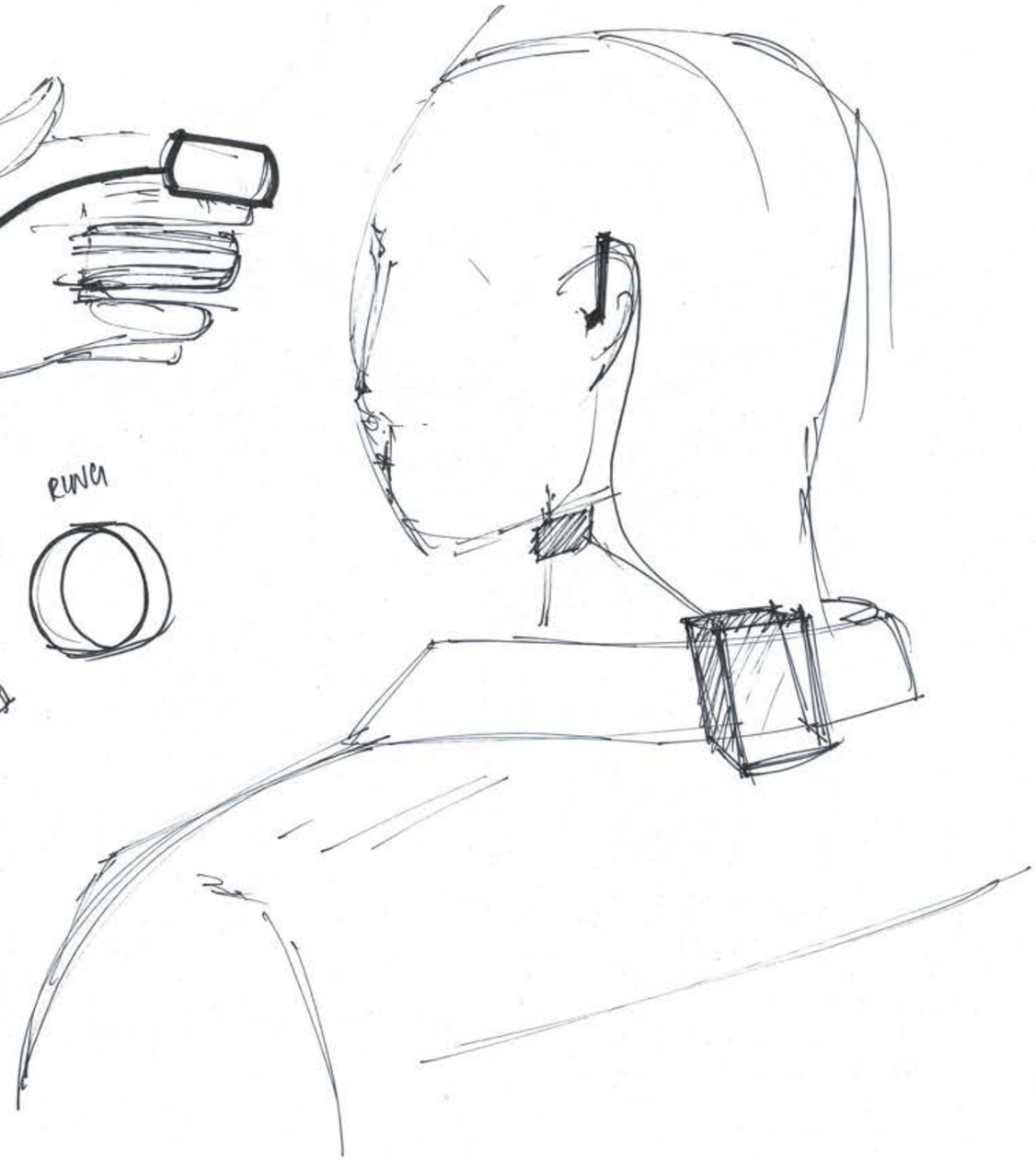

SPO2 SENSOR
L FINGERTIP


EAR CANAL
EAR PIECE
EAR LOBE

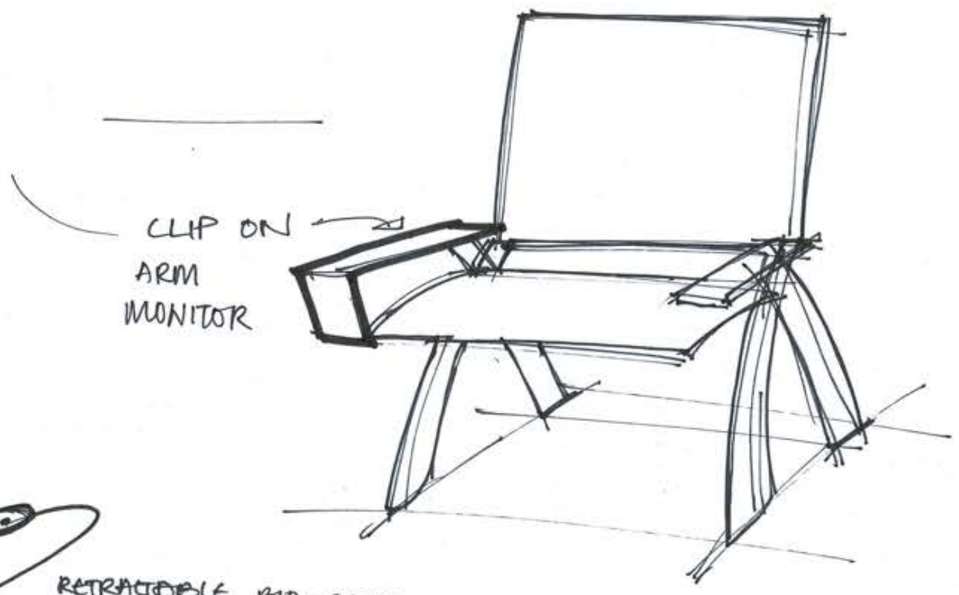


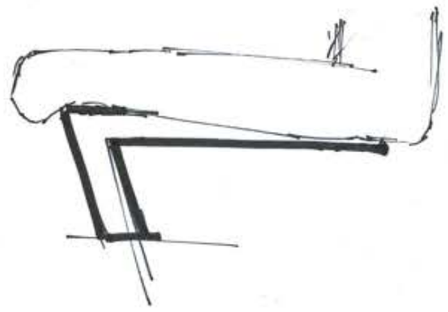



EARPIECE
HUB / COMMON MOUNT
RING

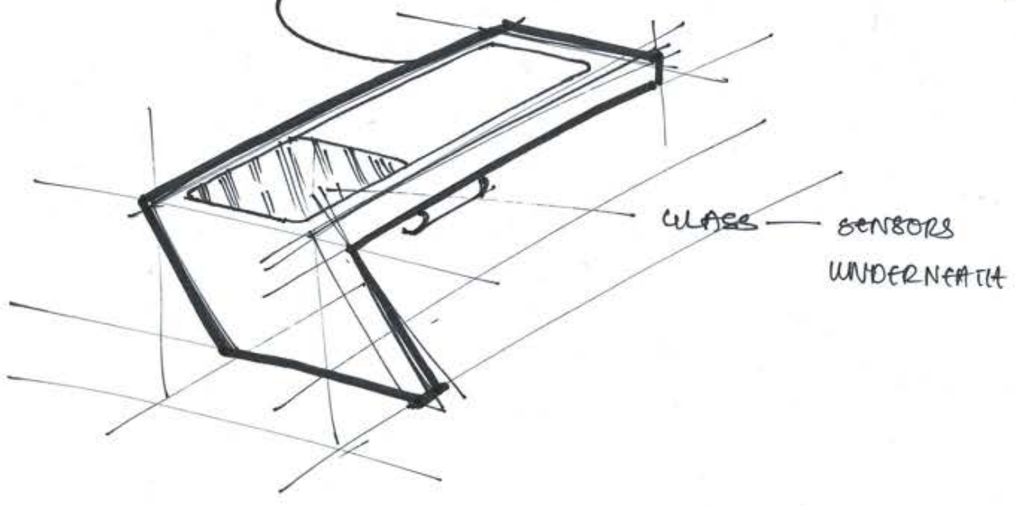


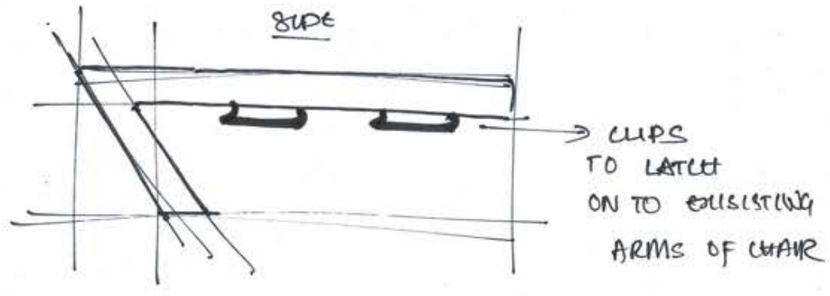
EXISTING WAITING ROOM CHAIR

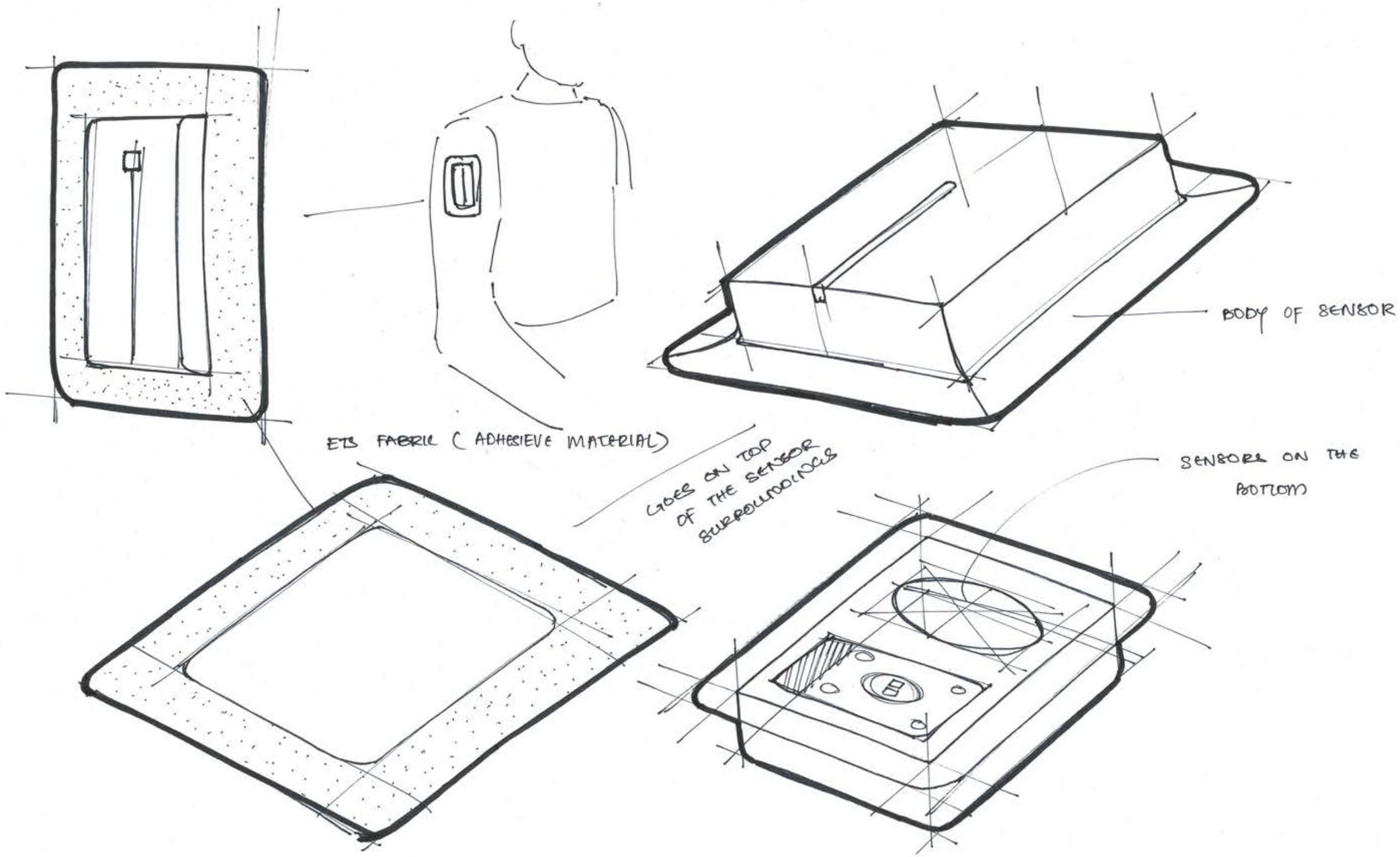


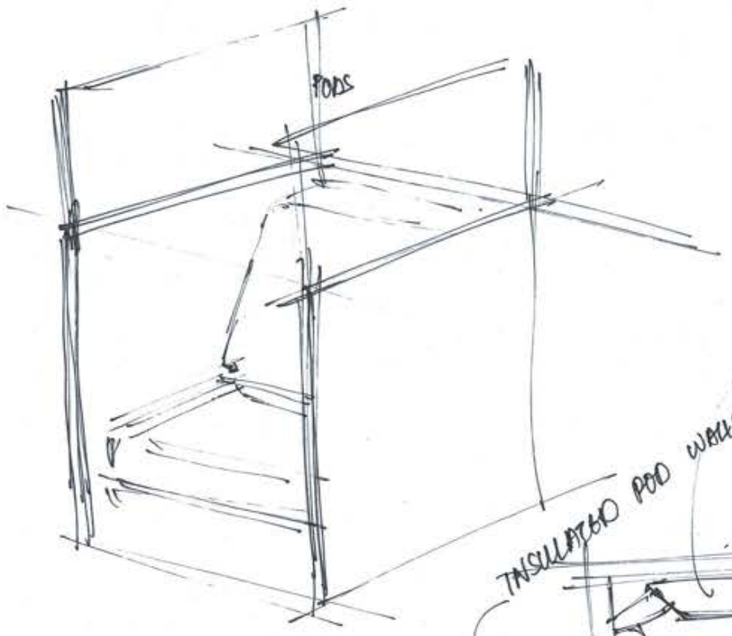


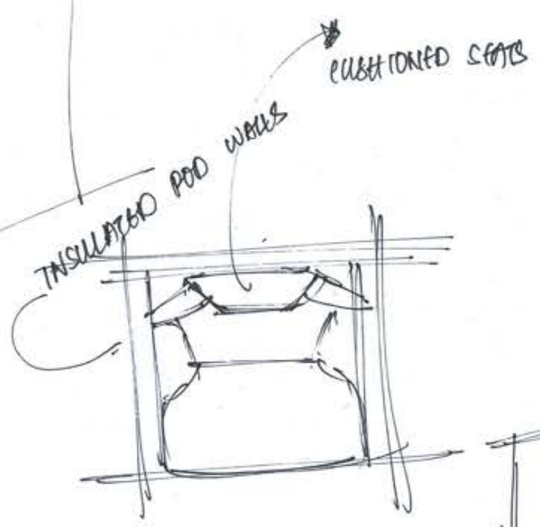
RETRACTABLE BLU-SENSOR FOR ADDITIONAL CONTACT POINT.

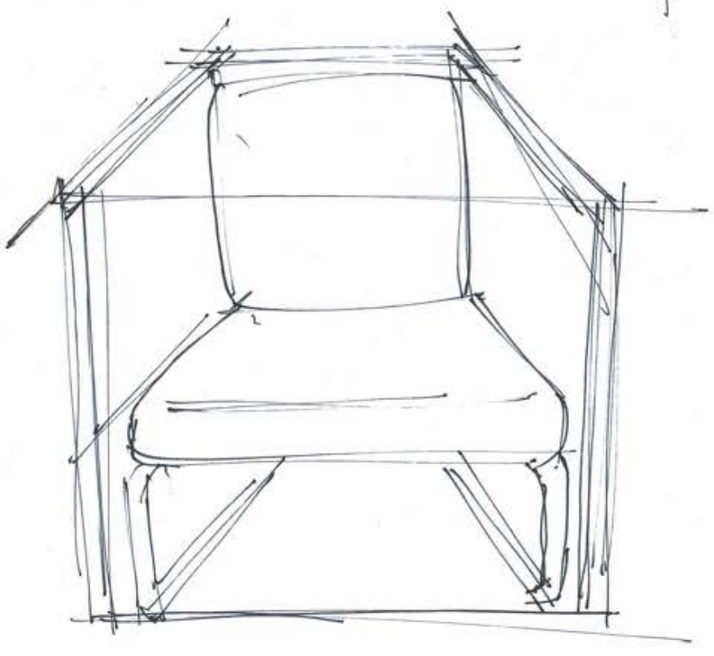




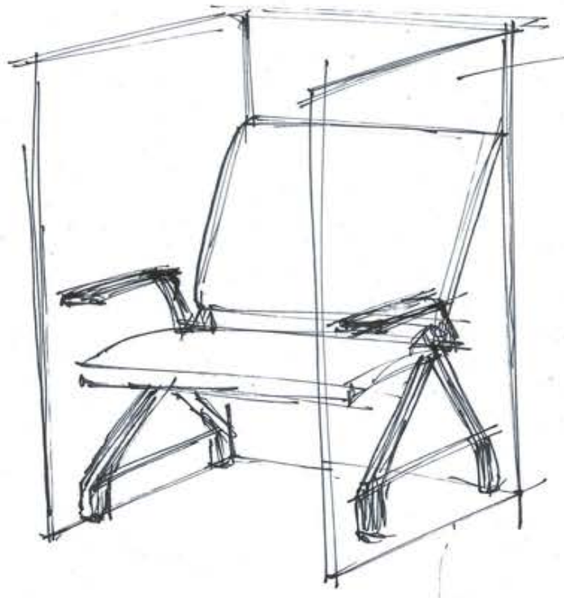

BODY OF SENSOR
ETS FABRIC (ADHESIEVE MATERIAL)
GOES ON TOP OF THE SENSOR SURROUNDINGS
SENSORS ON THE BOTTOM

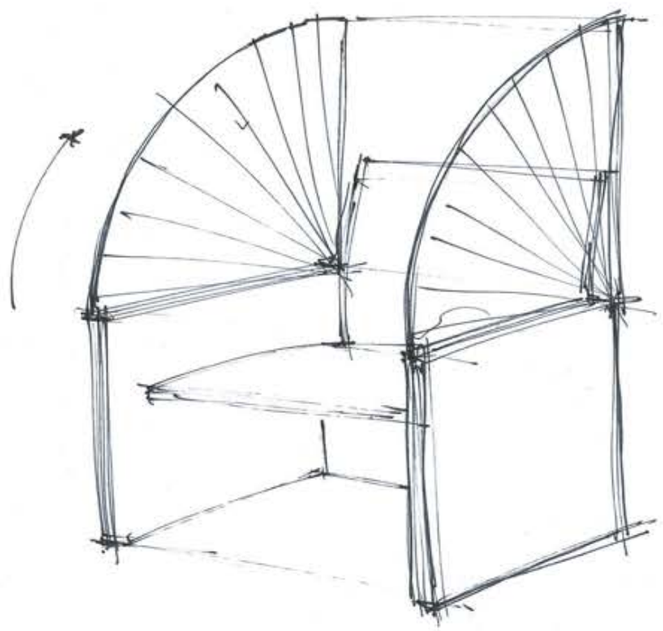

PODS

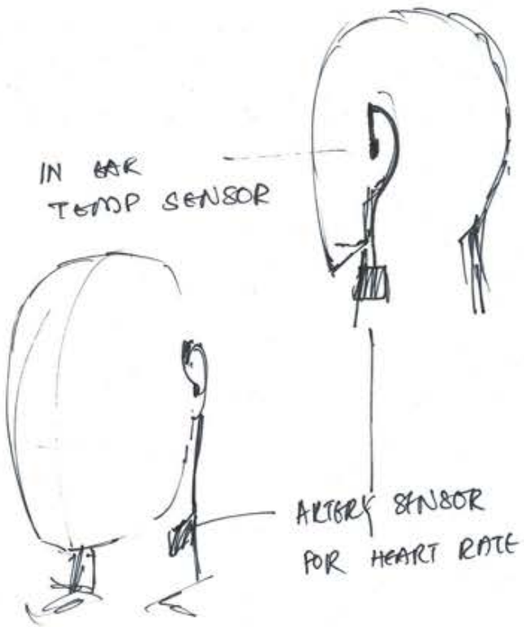

INSULATED POD WALLS
CUSHIONED SEATS

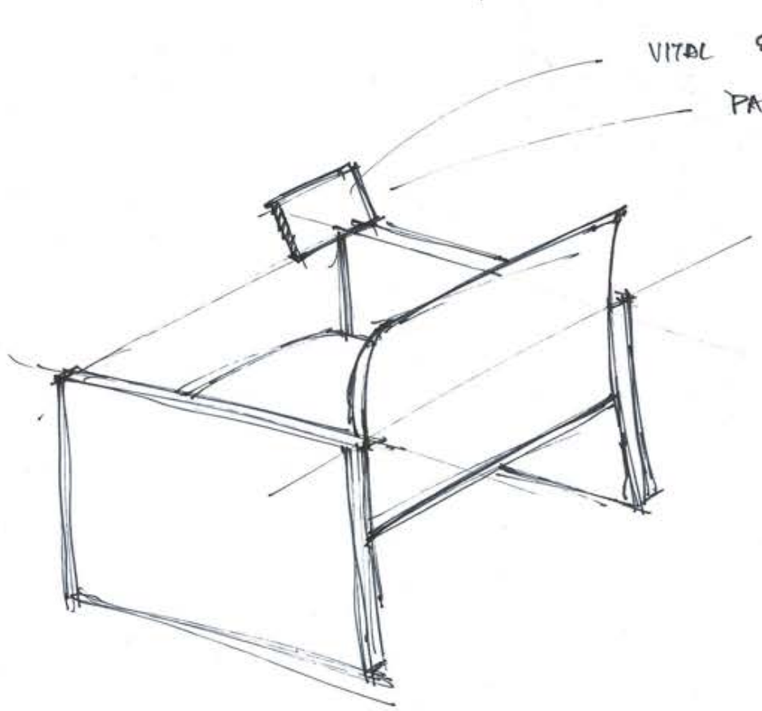


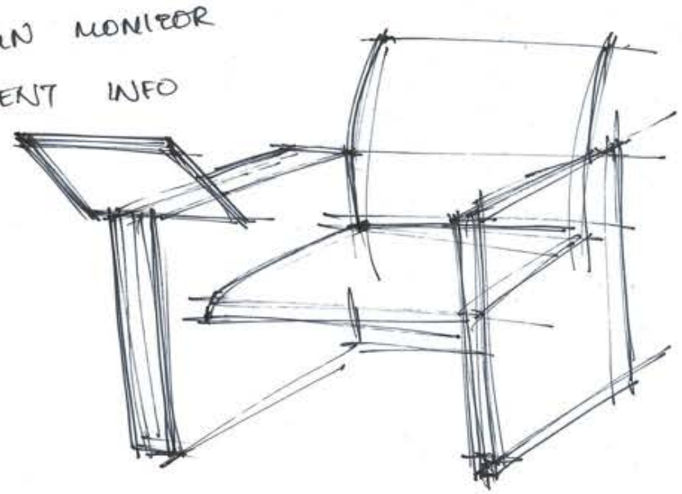

ADD ON BUILDERS
EXISTING CHAIRS

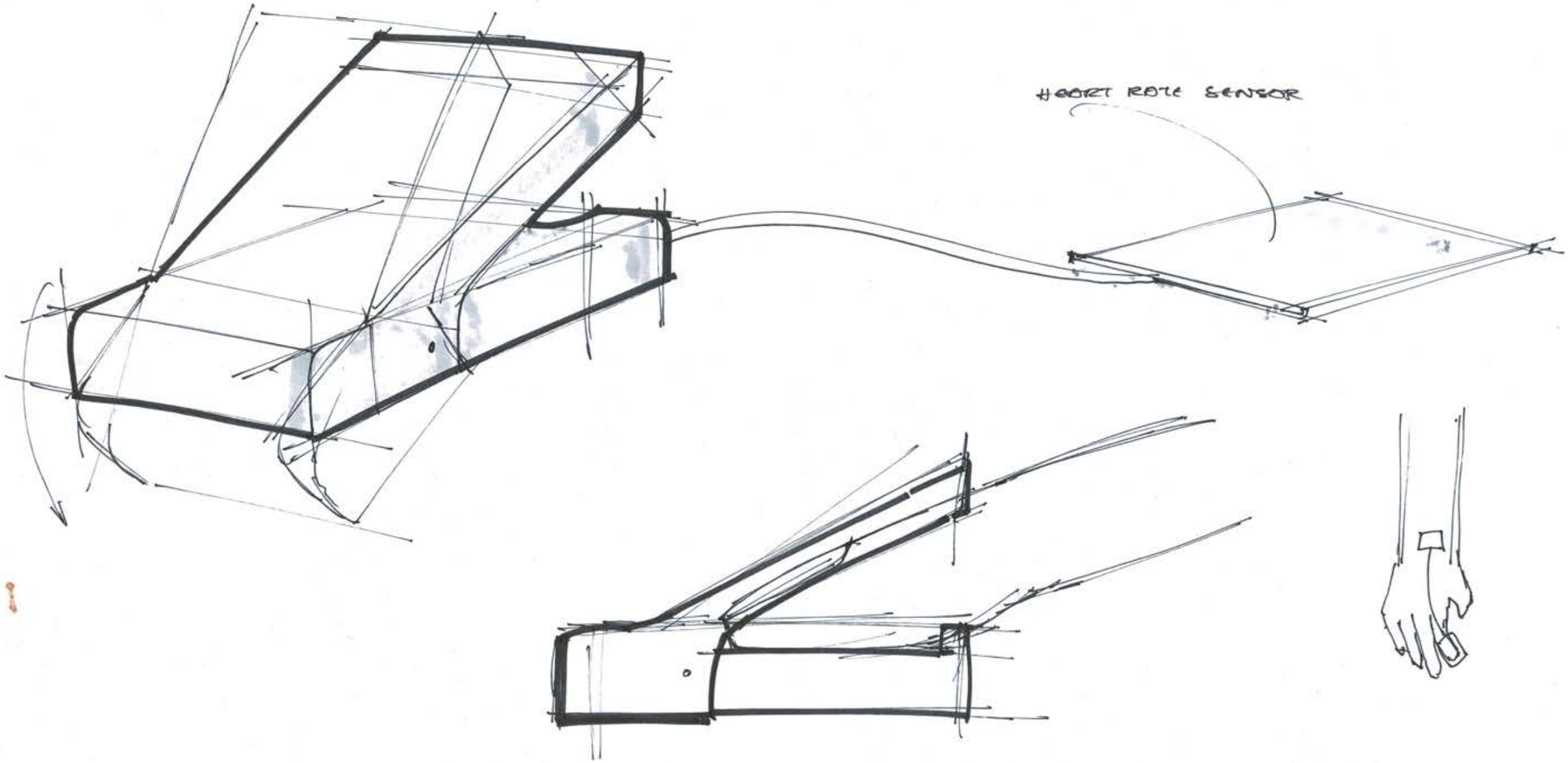

GENERIC CONCEPT

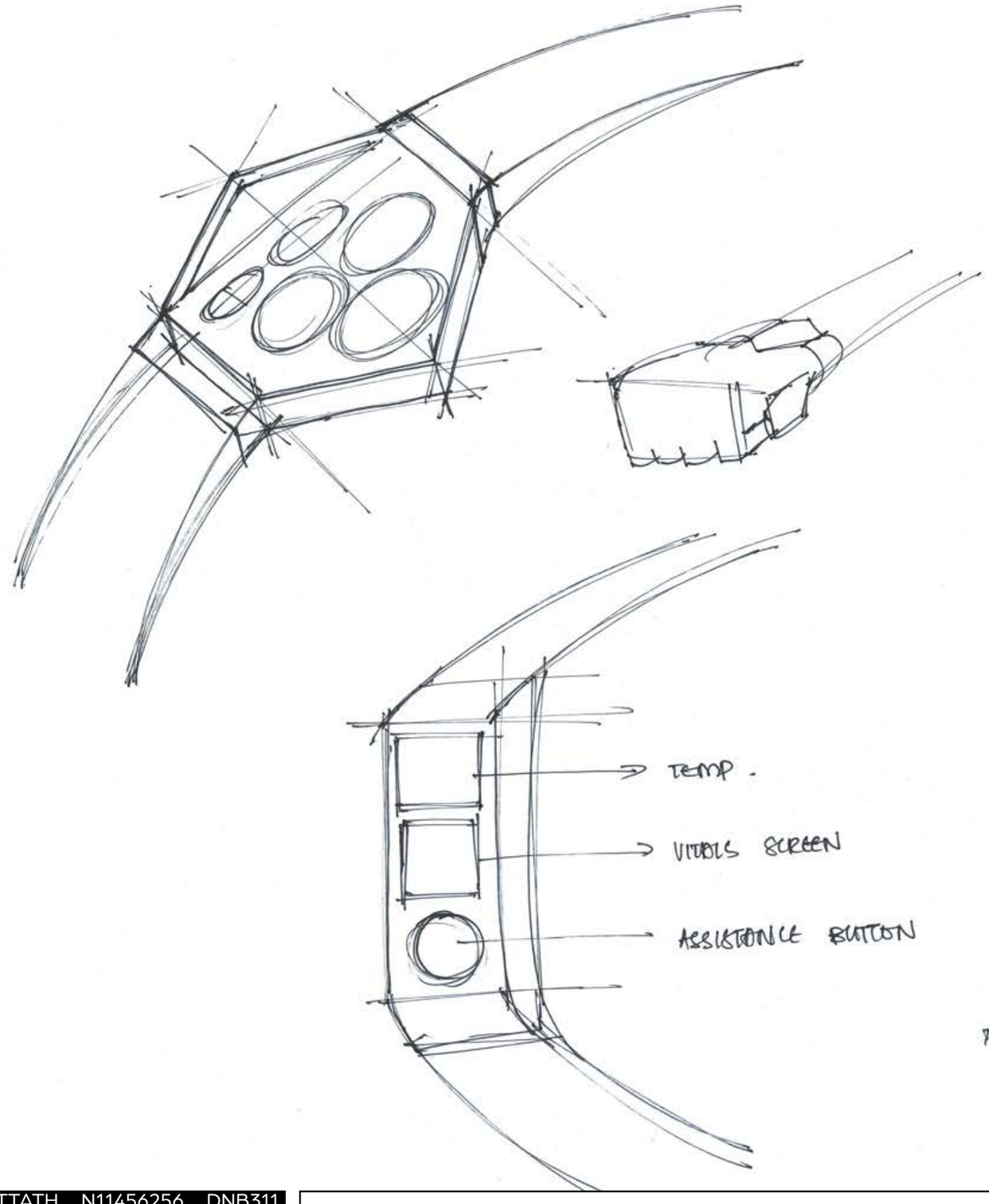


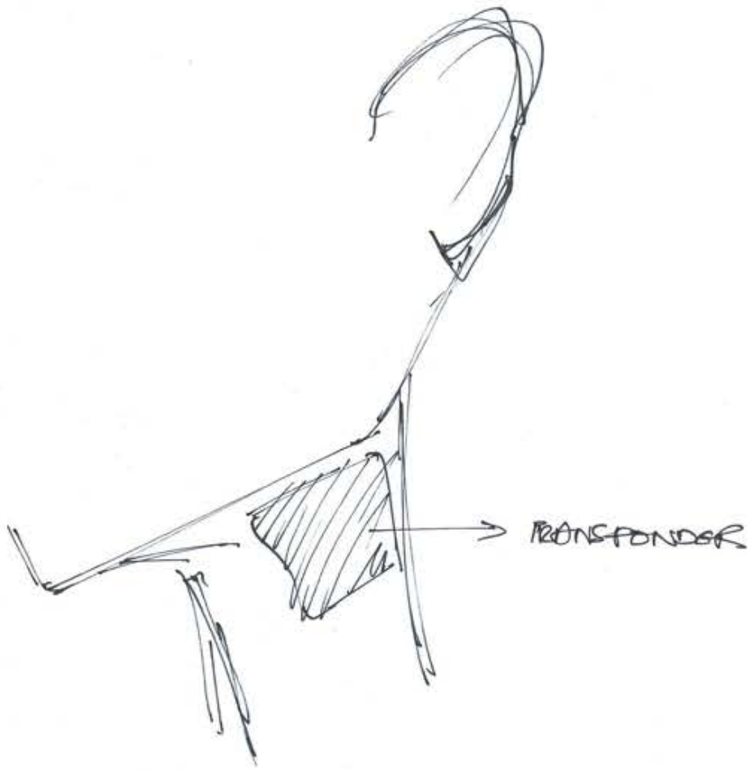

IN EAR
TEMP SENSOR
ARTERY SENSOR
FOR HEART RATE

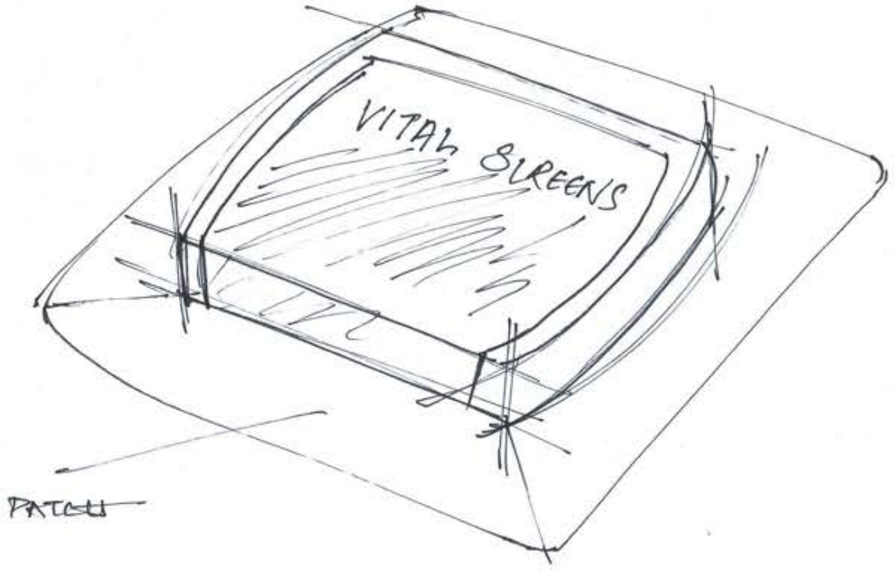

VITAL SIGN MONITOR
PATIENT INFO



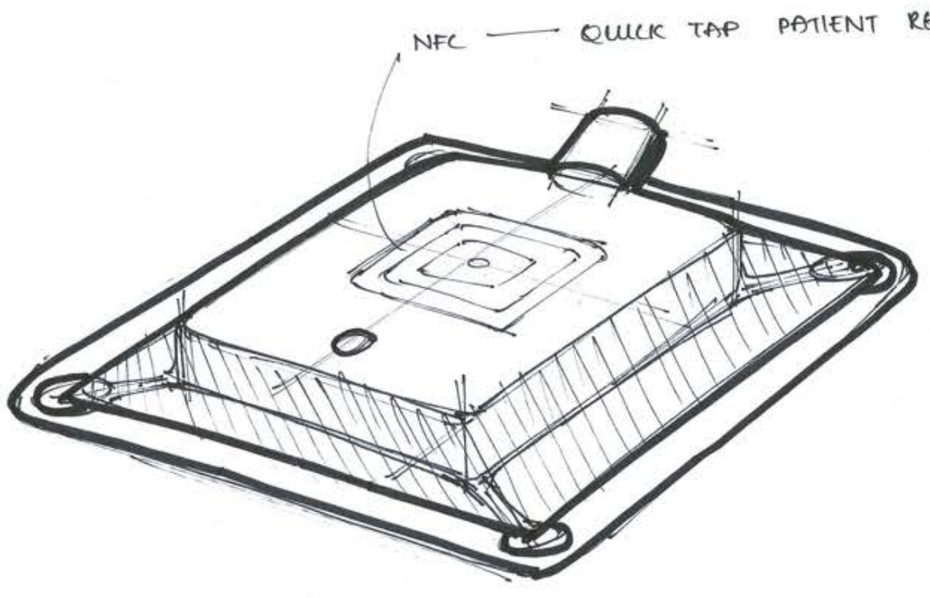

HEART RATE SENSOR

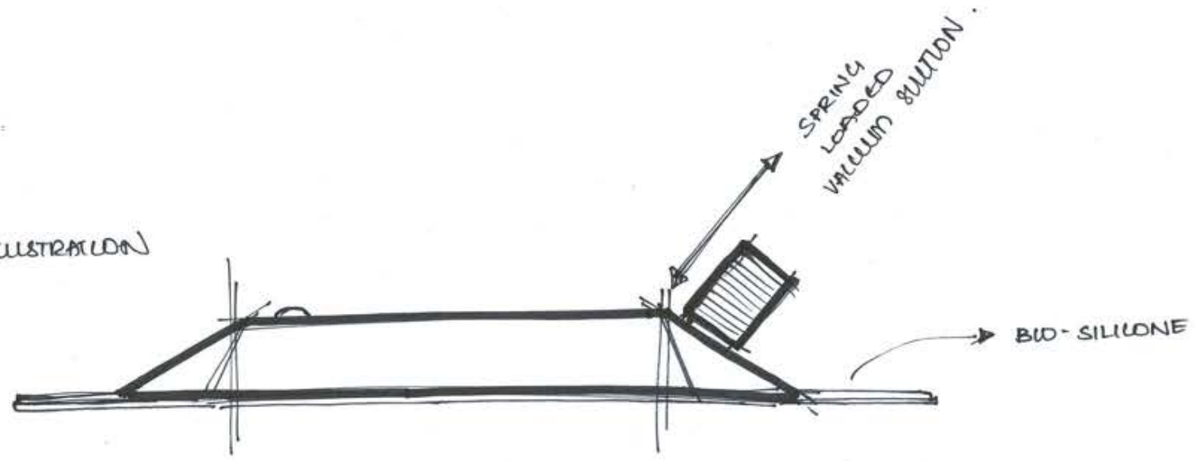

TEMP.
VITALS SCREEN
ASSISTANCE BUTTON

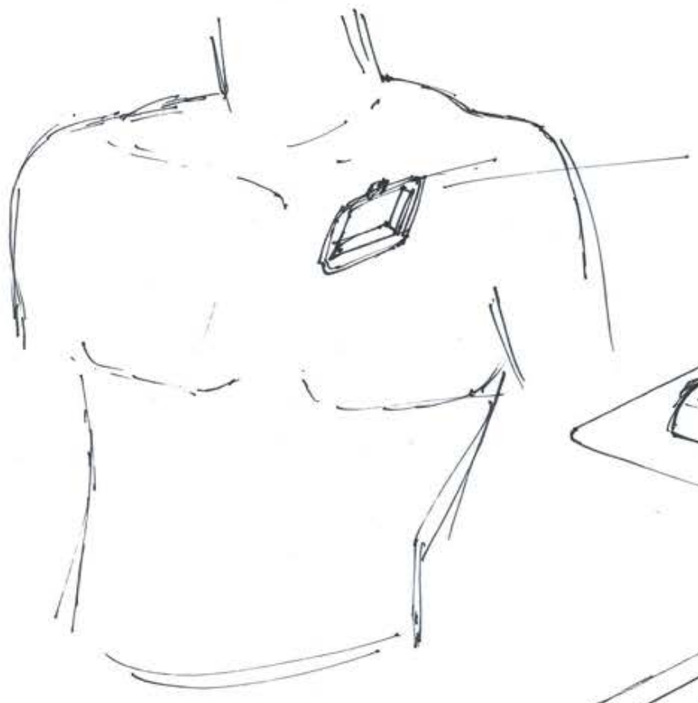

TRANSPONDER

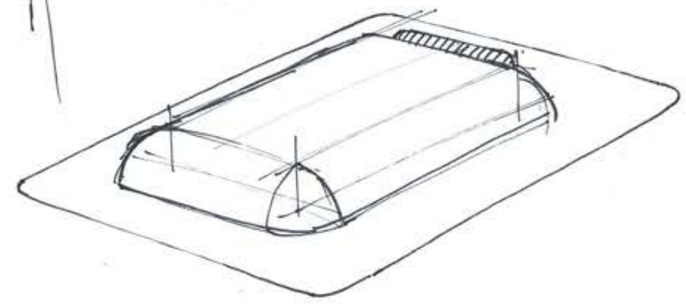

VITAL SCREENS
PATCH

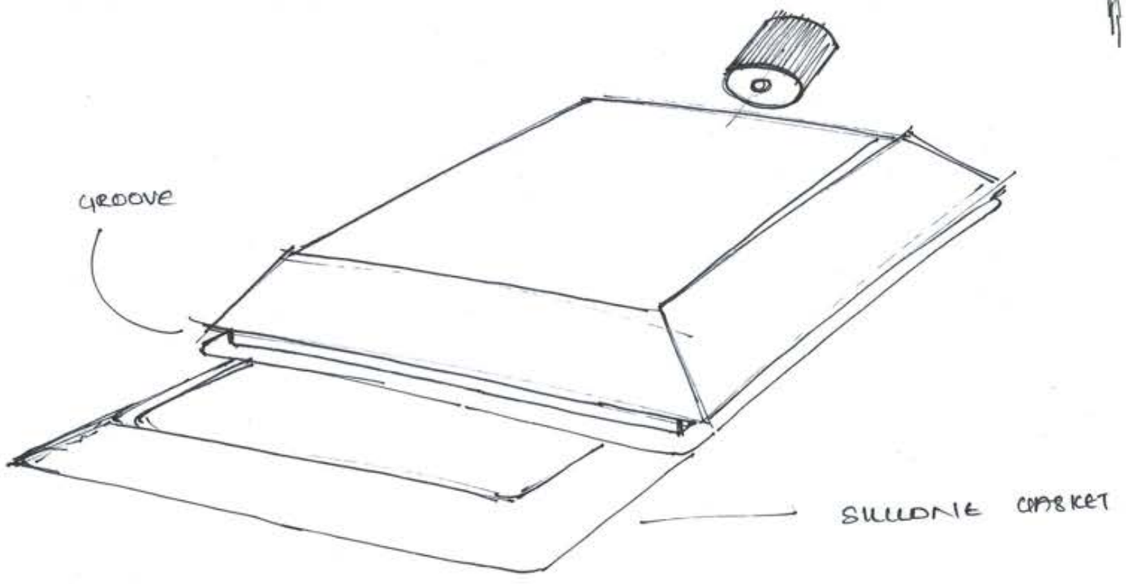
WEARABLE BIOSENSORS

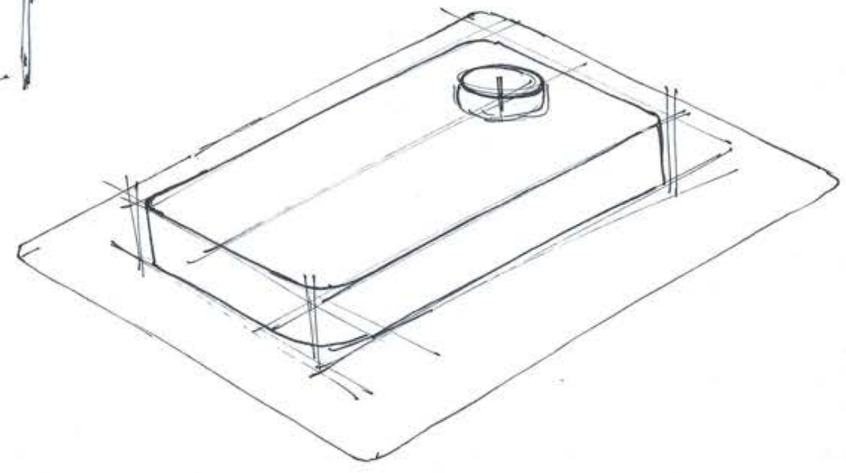


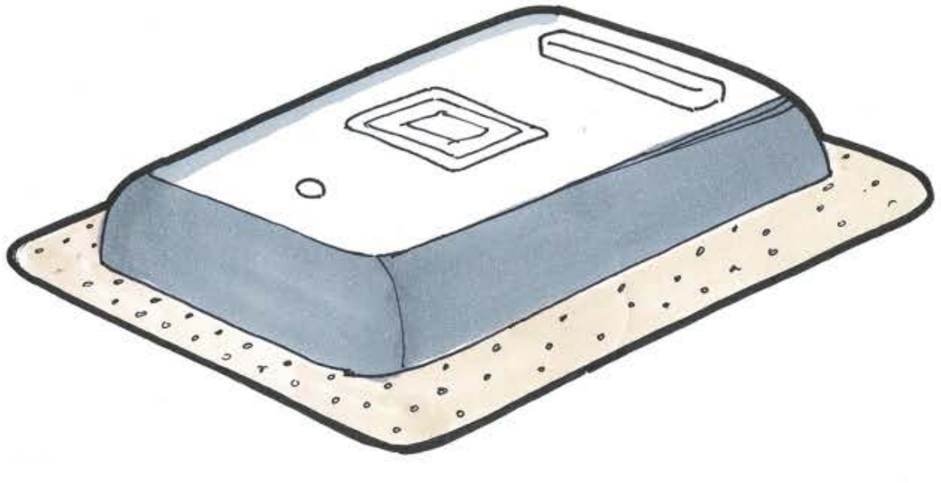


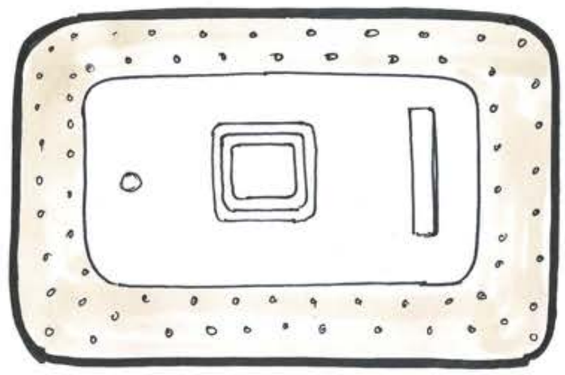


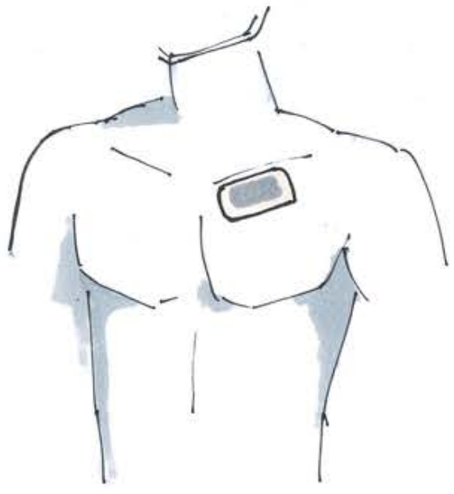


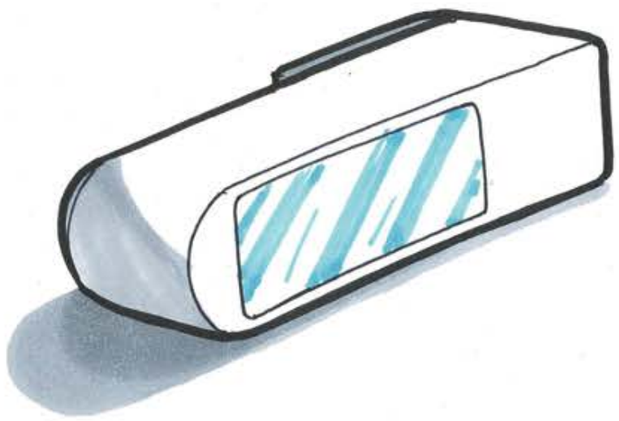


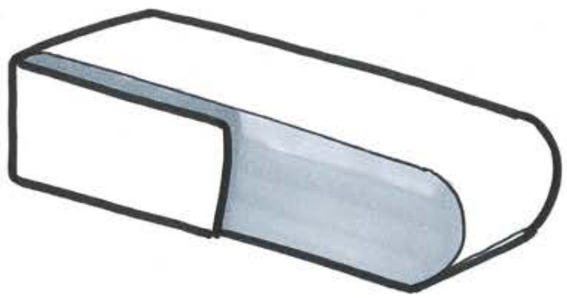


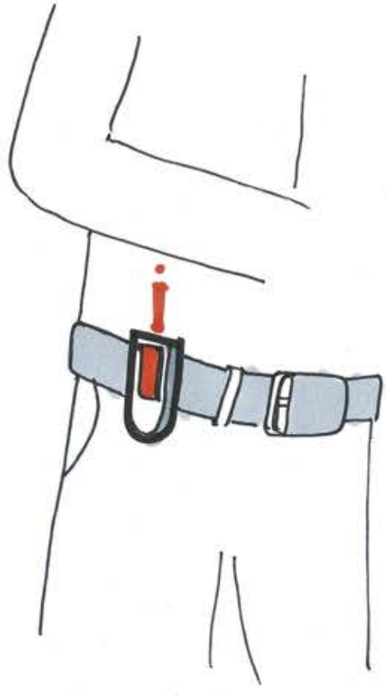


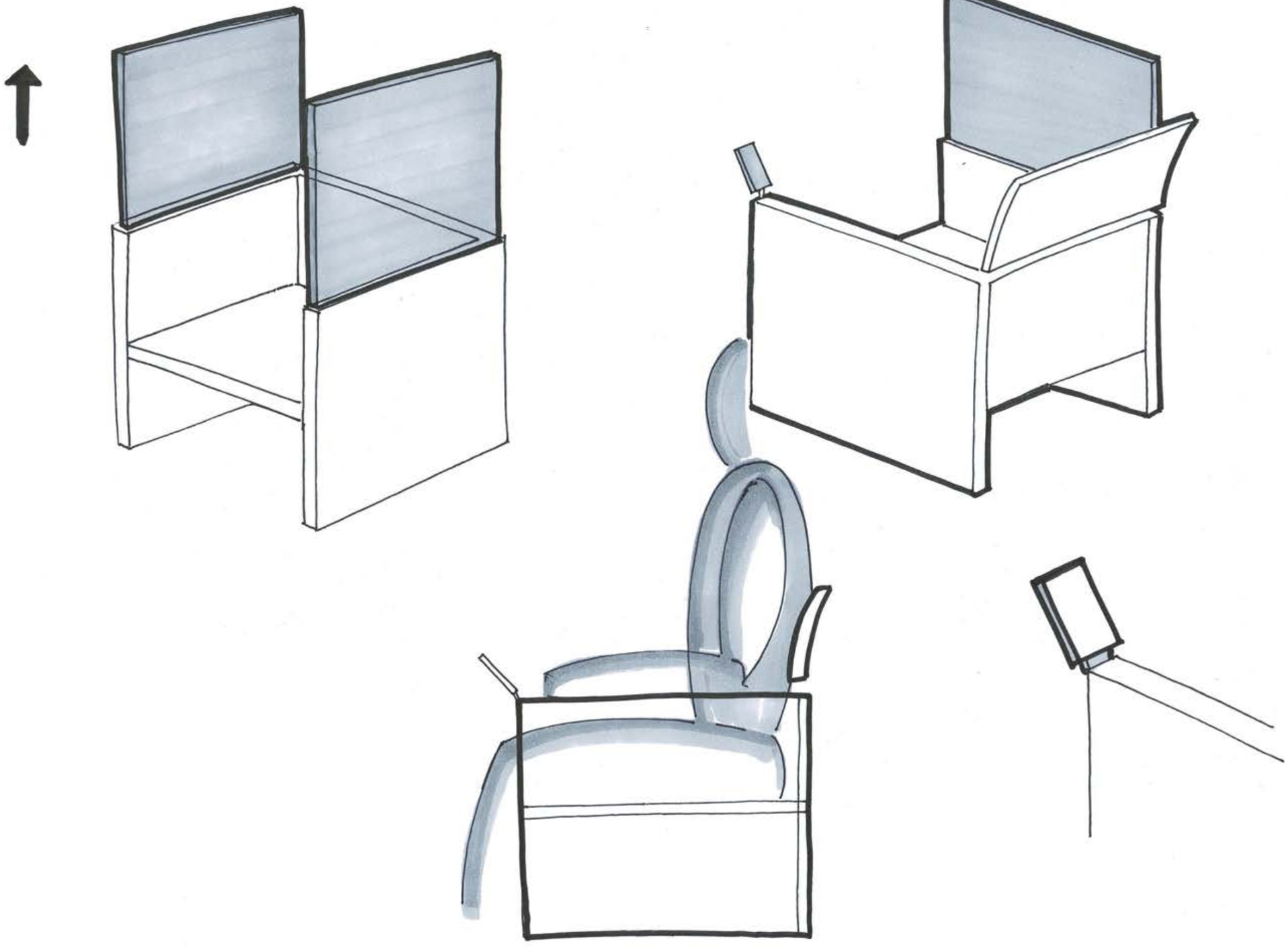


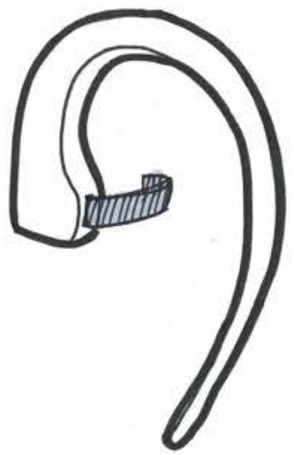


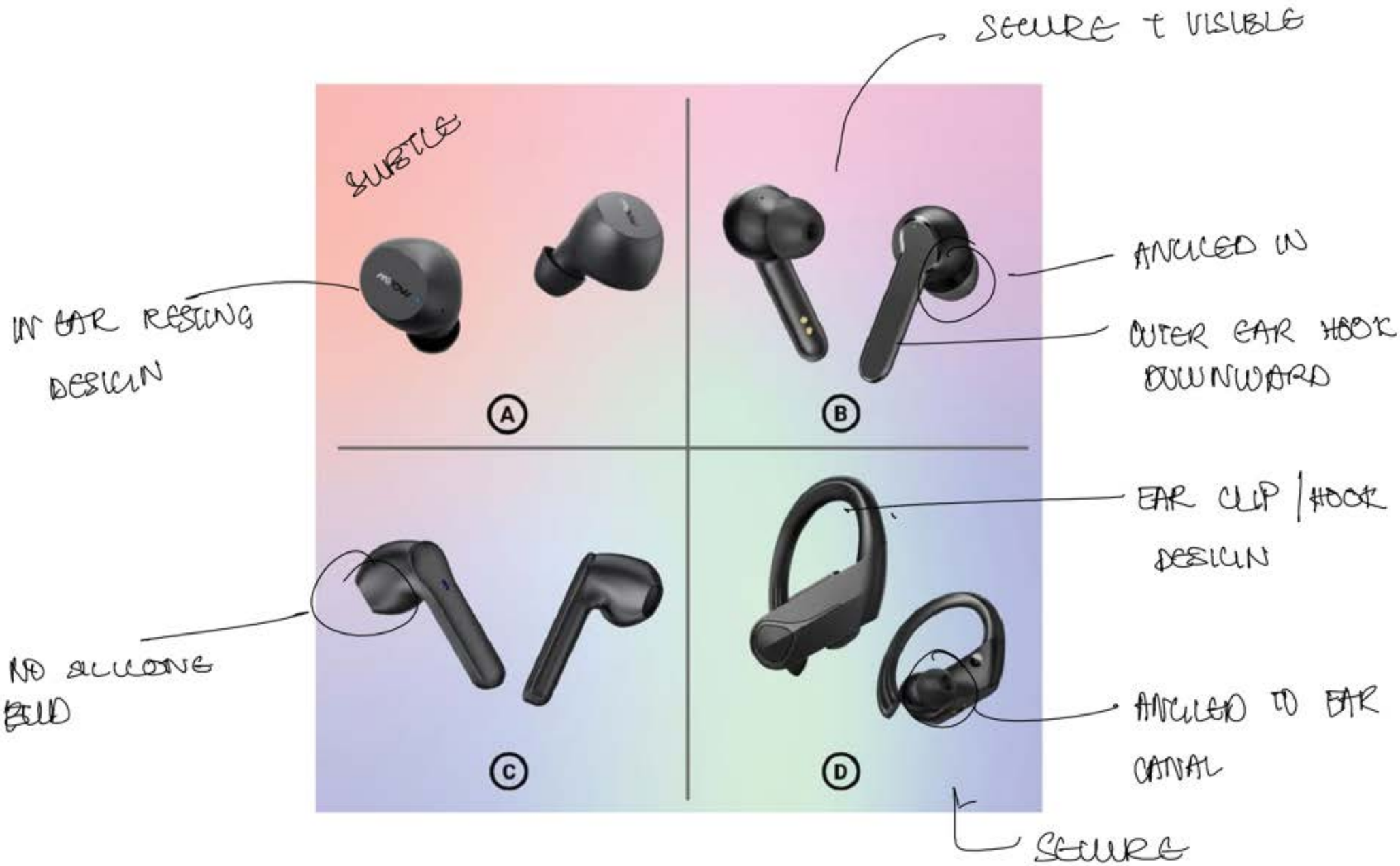






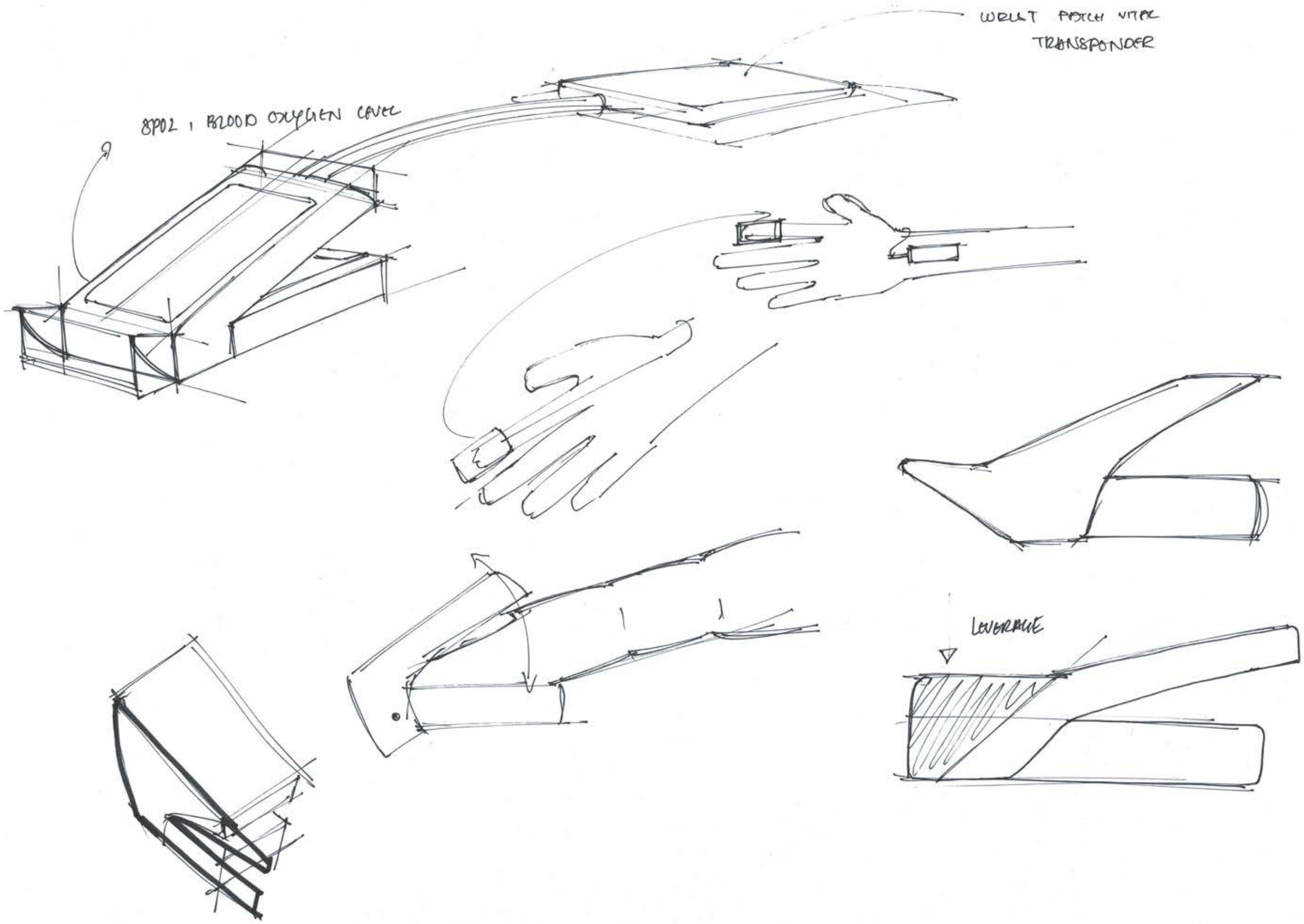


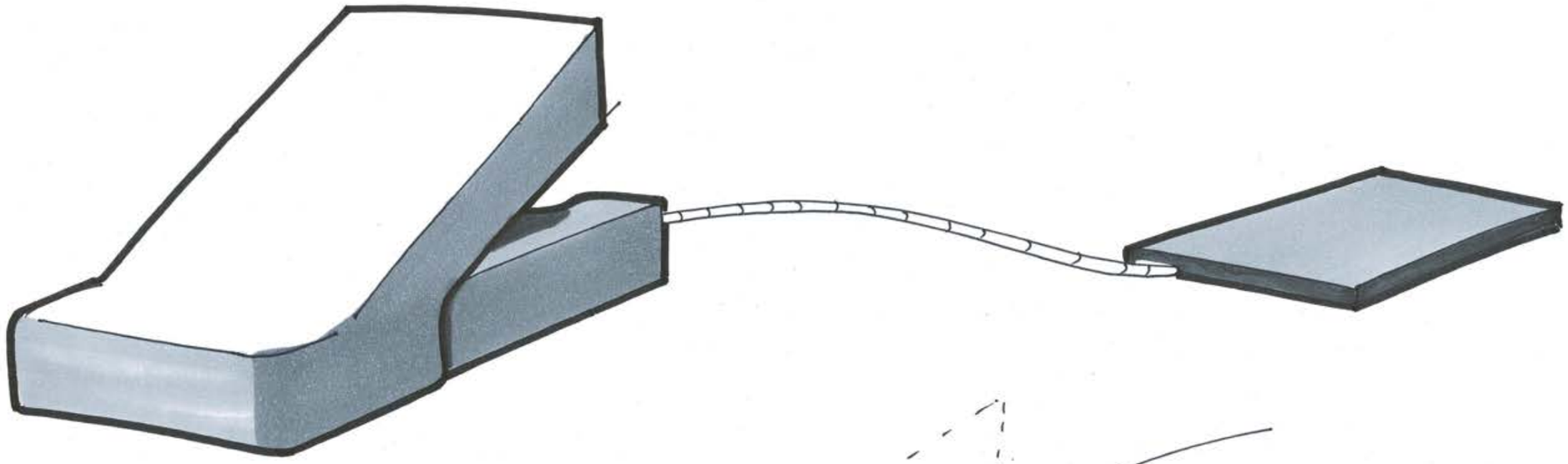


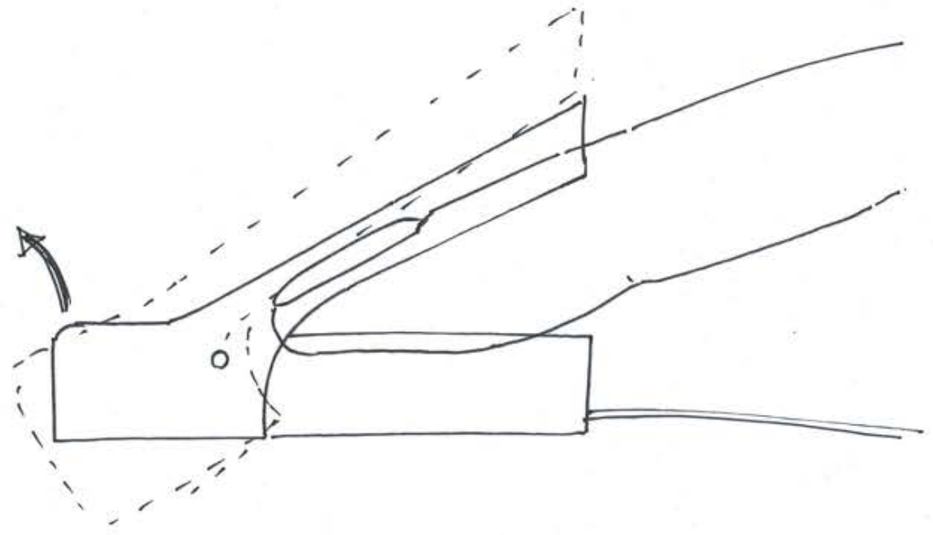

SUBTLE
SECURE & VISIBLE
A
B
C
D
IN EAR RESTING DESIGN
ANGLED IN
OUTER EAR HOOK DOWNWARD
EAR CLIP / HOOK DESIGN
NO SILICONE BUD
ANGLED TO EAR CANAL
SECURE

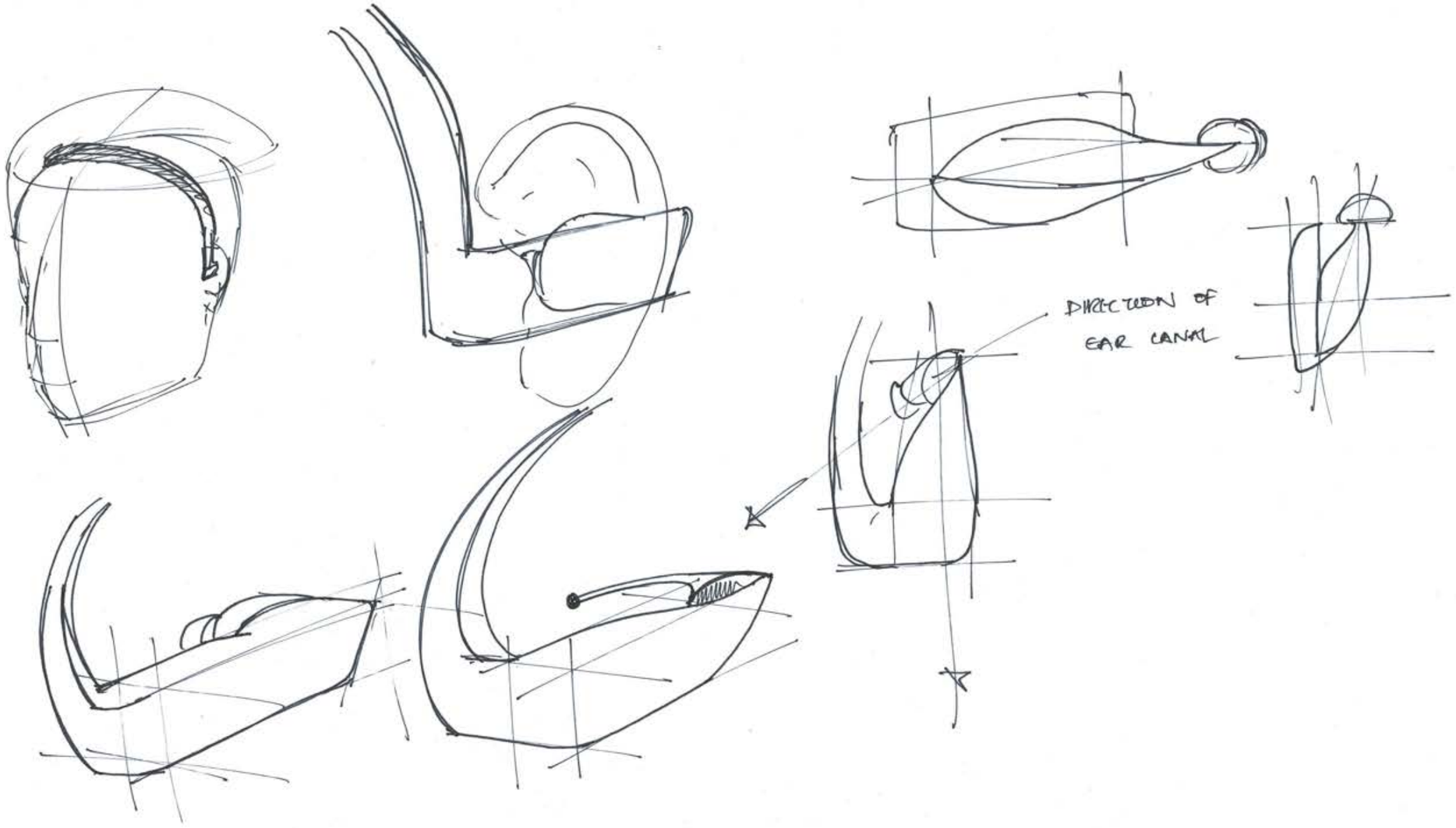
WRIST PATCH VITAL TRANSPONDER

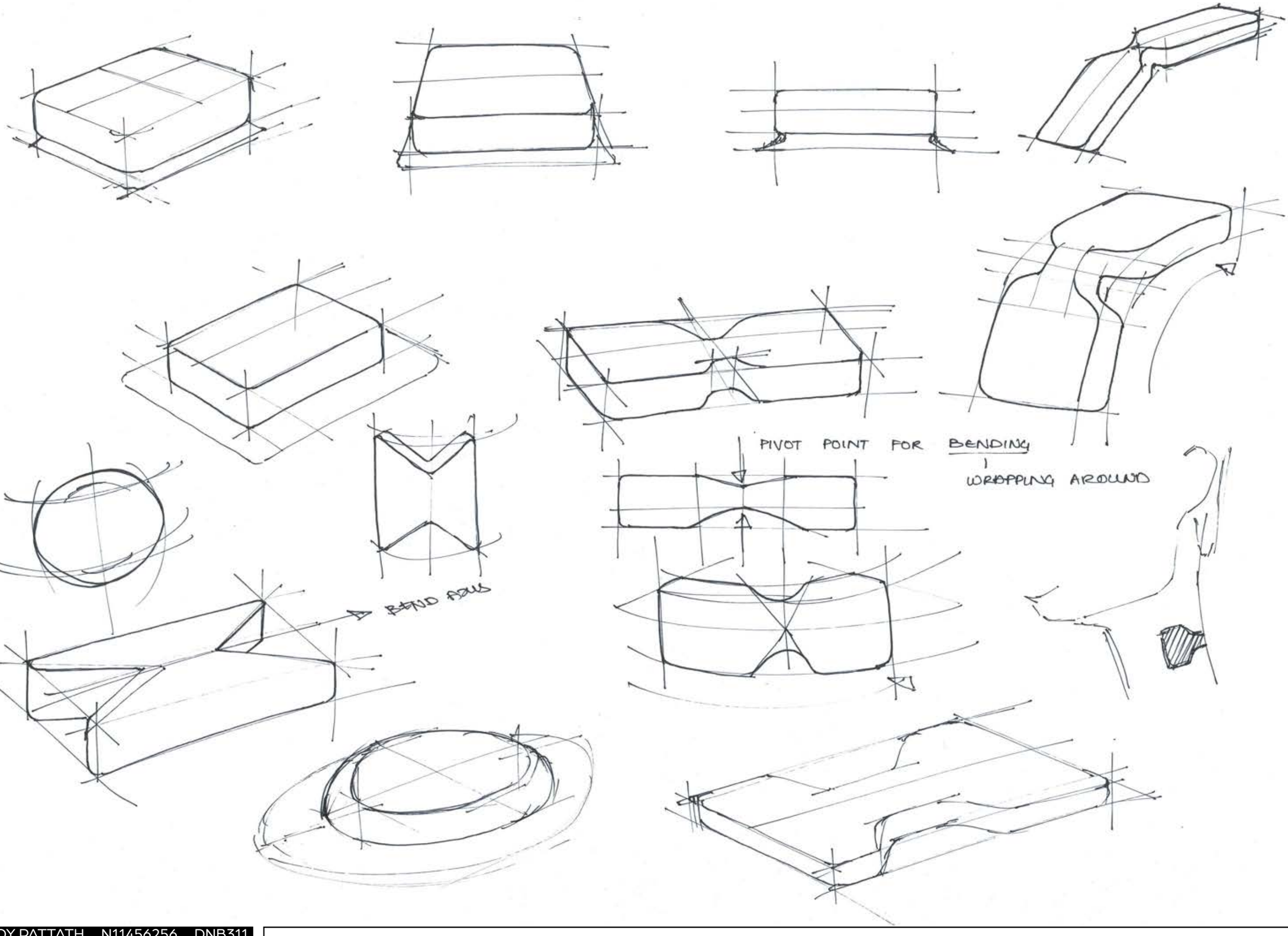
SPO2 : BLOOD OXYGEN CAPSULE

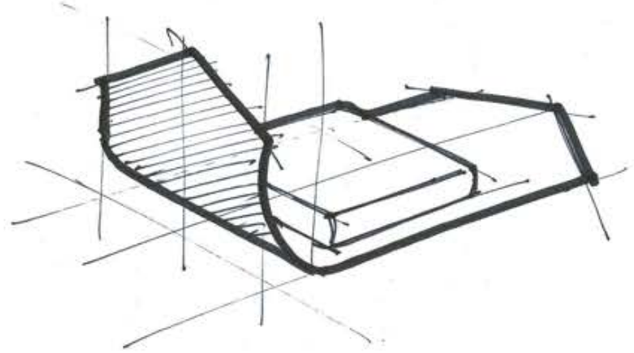


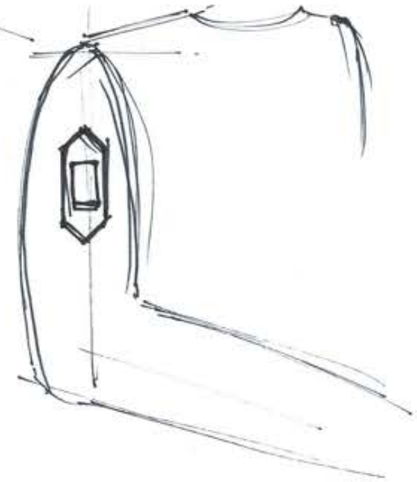


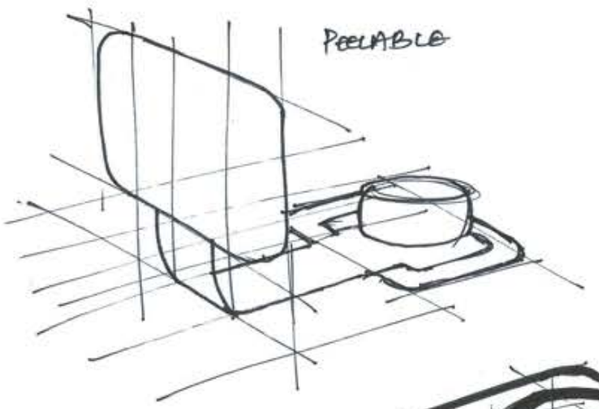


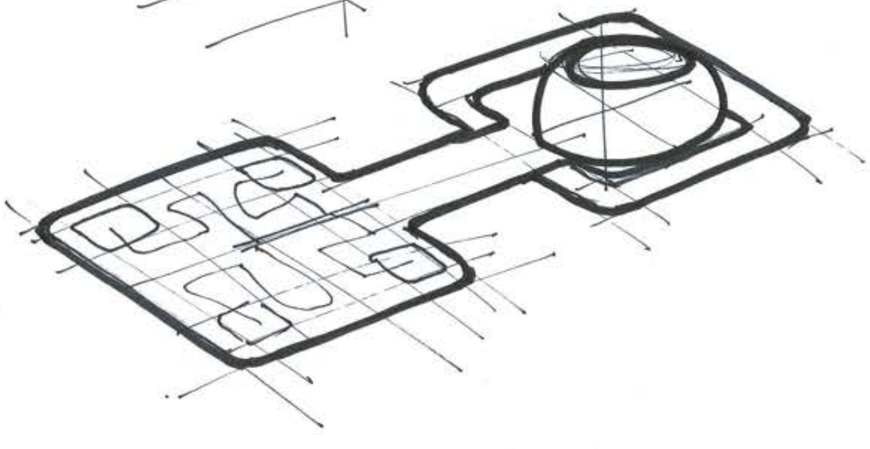

DIRECTION OF
EAR CANAL

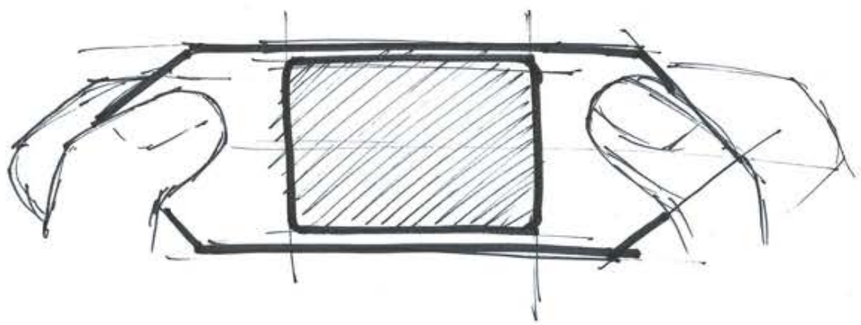

PIVOT POINT FOR BENDING
WRAPPING AROUND
BEND AXIS

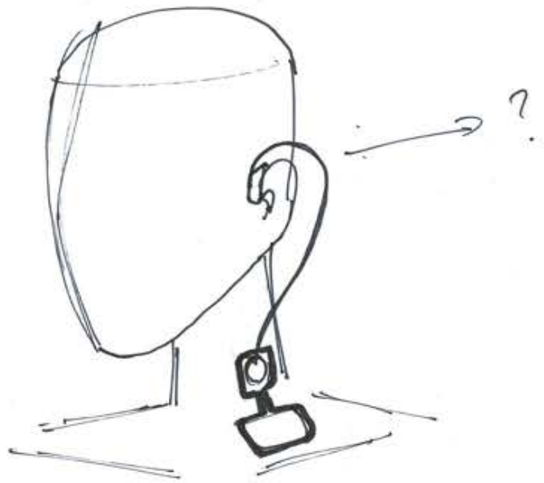





PEELABLE



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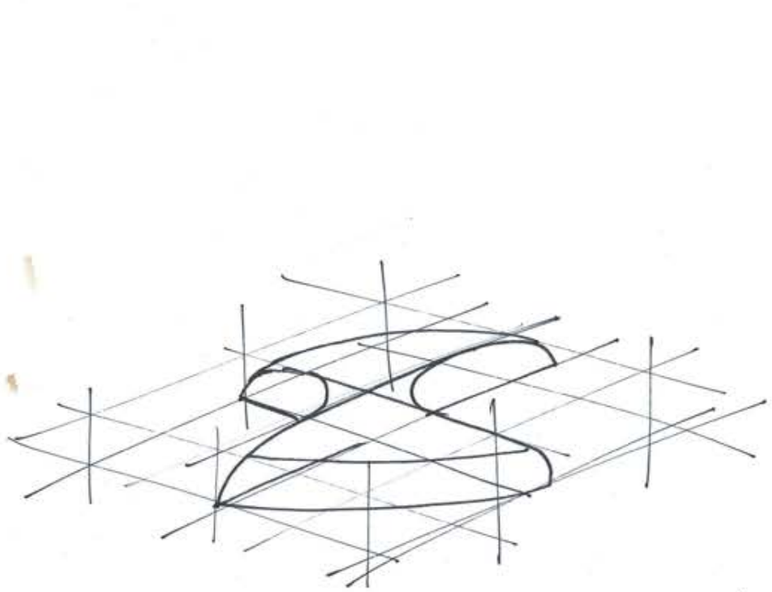
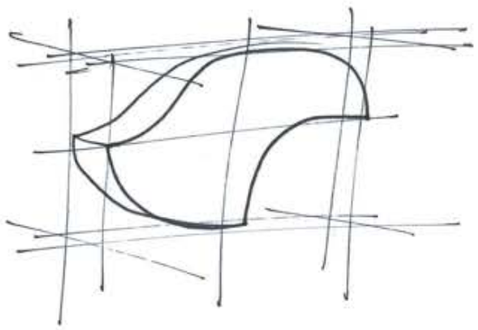
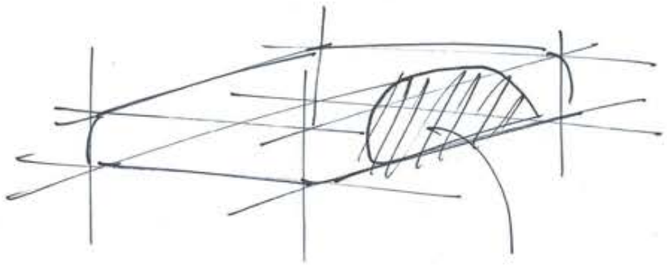
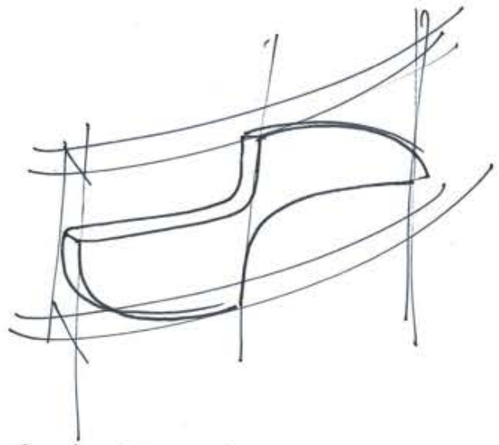
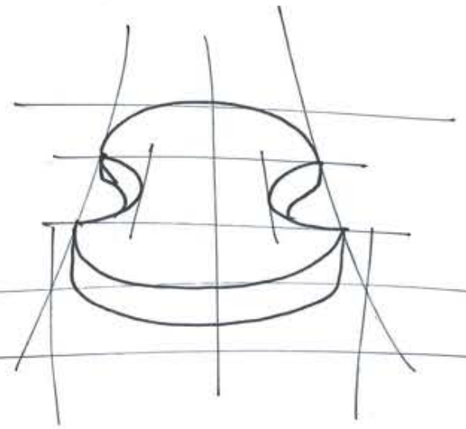


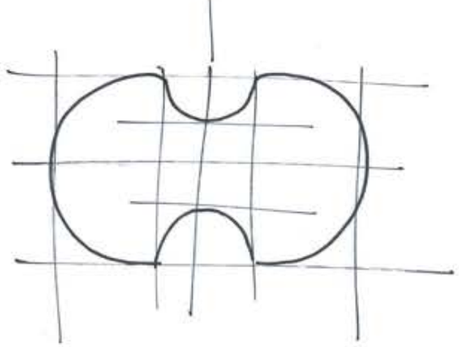


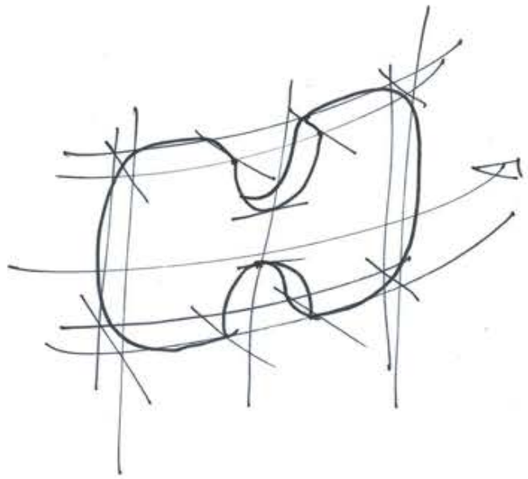


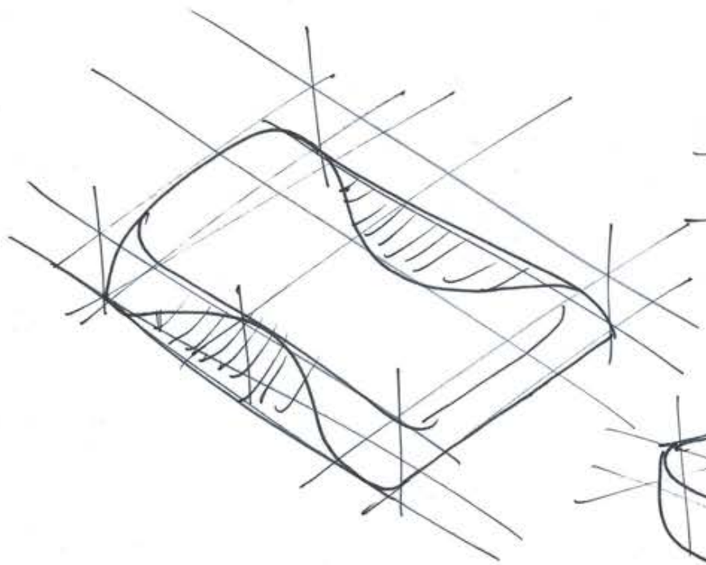
CONTACT POINT

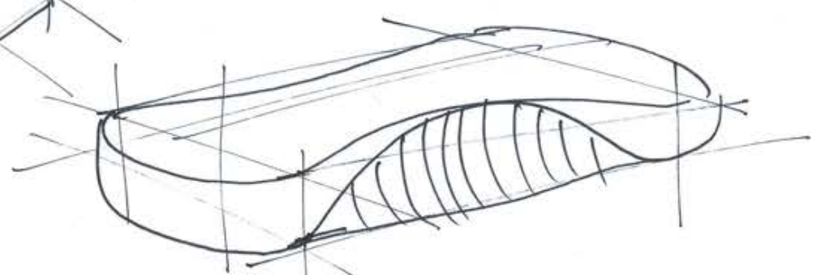








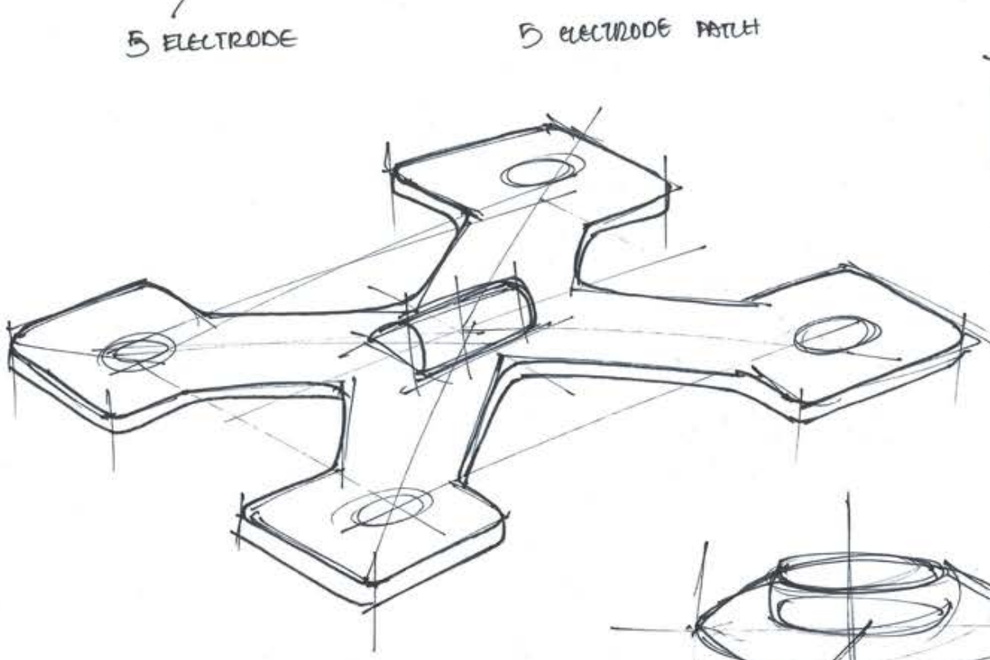


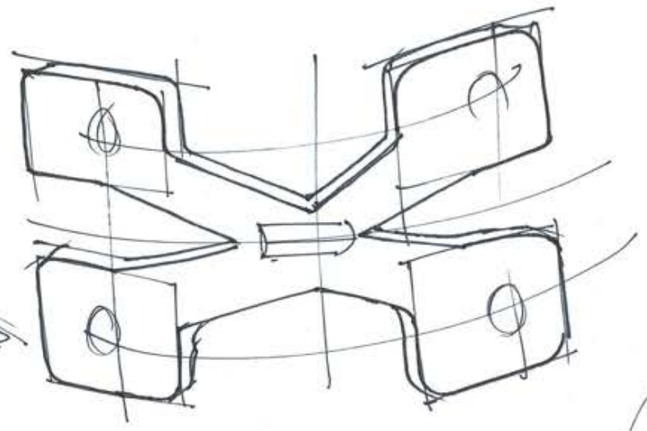


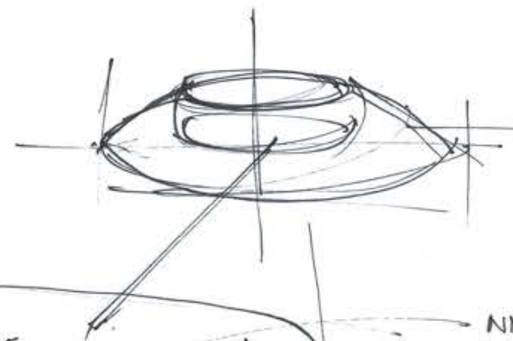
IN PATIENT MONITORING SYSTEM

5 ELECTRODE

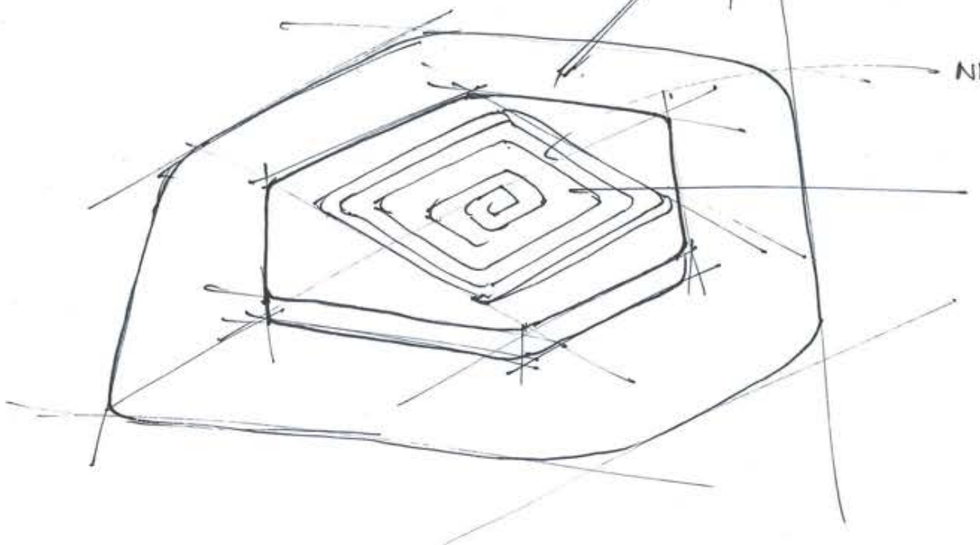
5 ELECTRODE PATCH





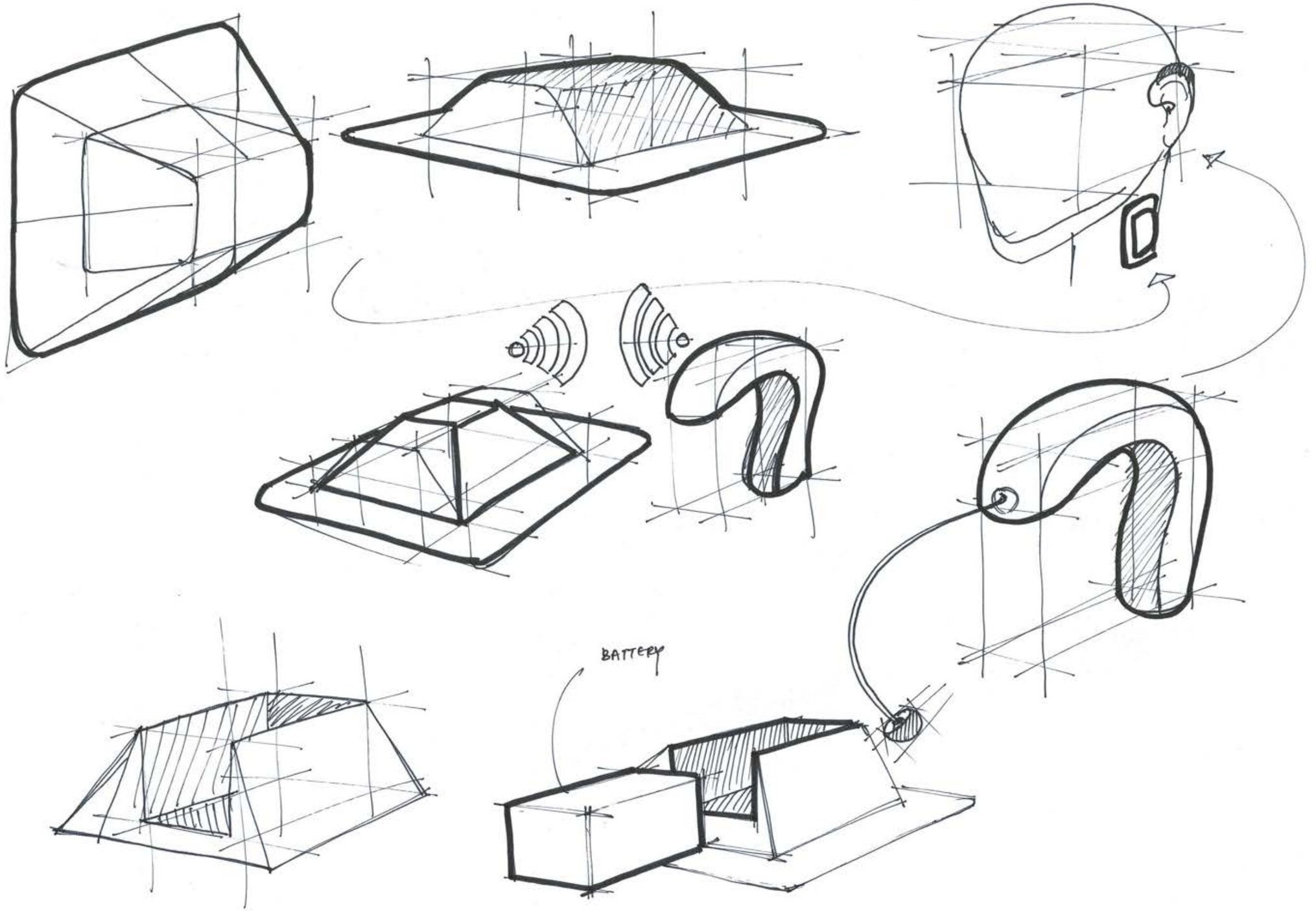


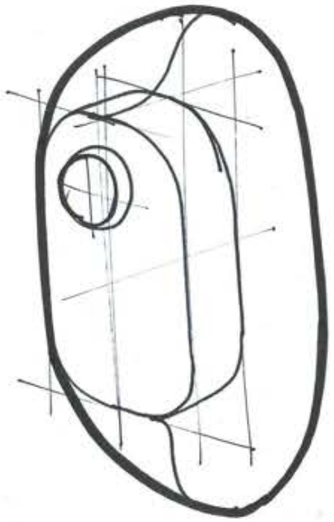
SUGGESTED ELECTRODE

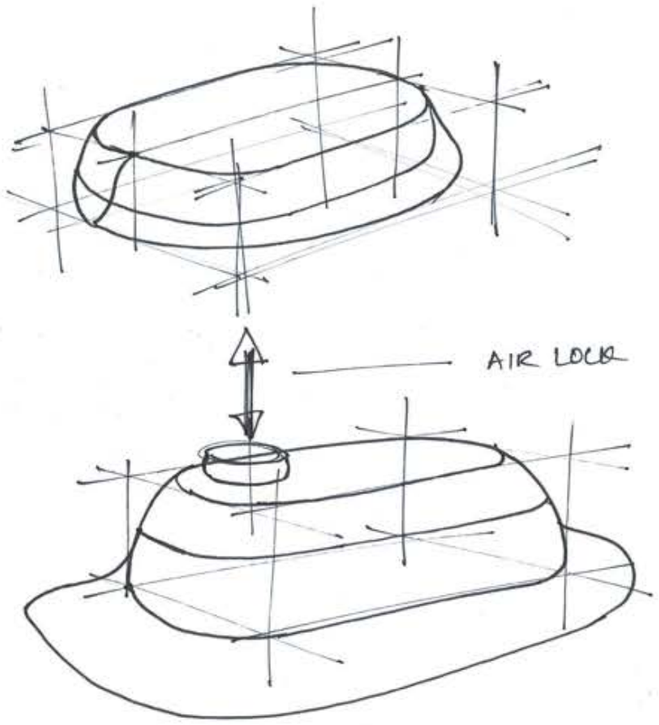


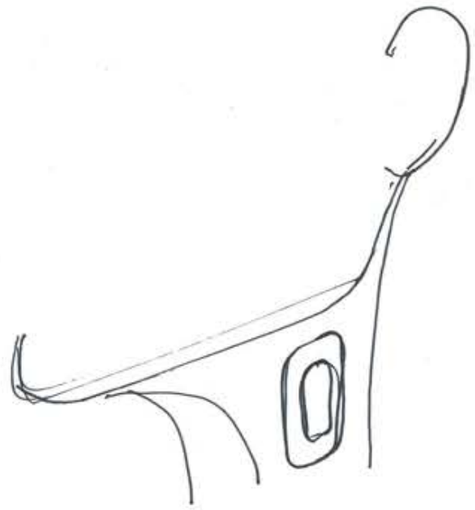
NFC TAG

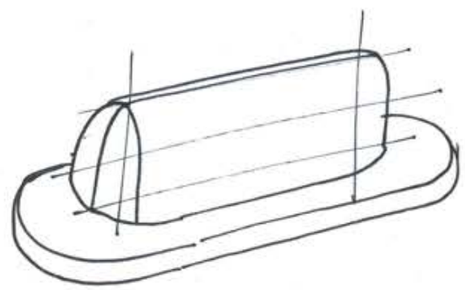
TRANSPONDER WITH ELECTRODE

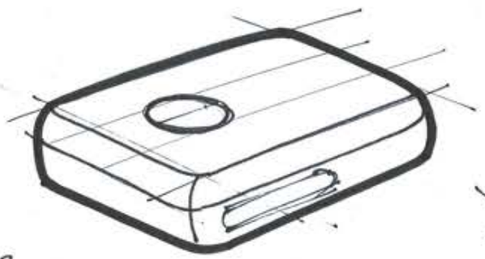

BATTERY

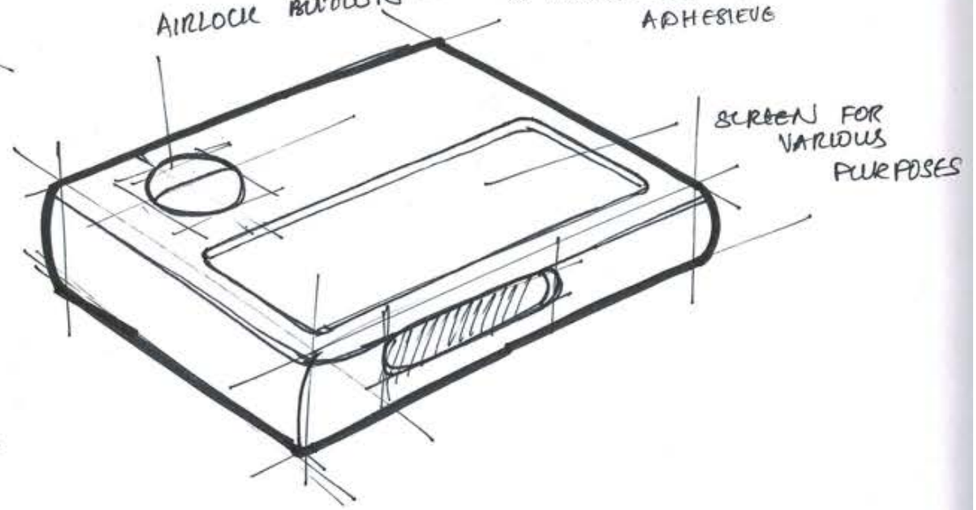


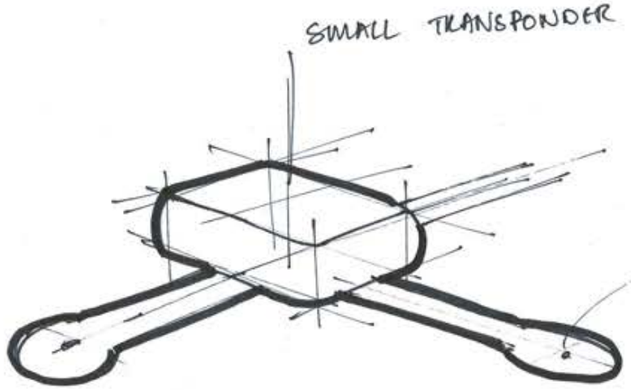

AIR LOCK



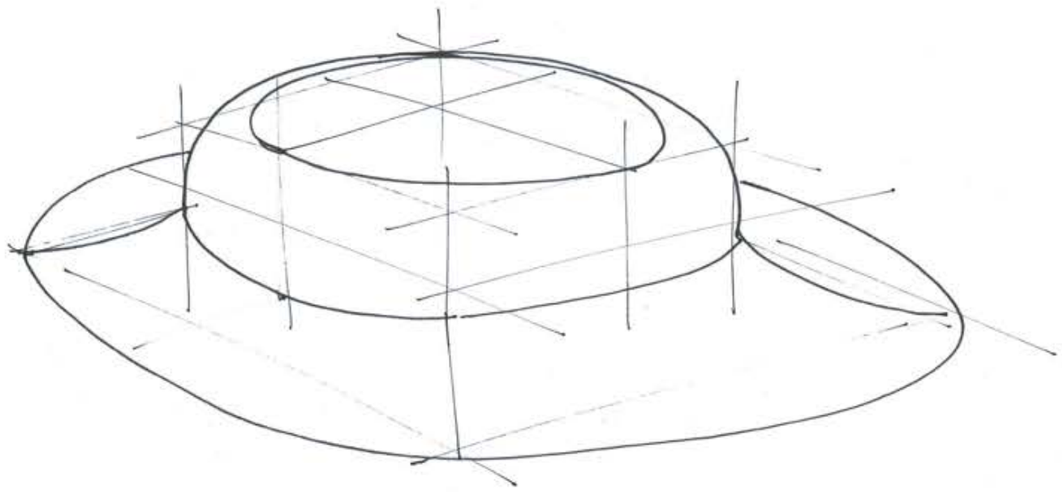


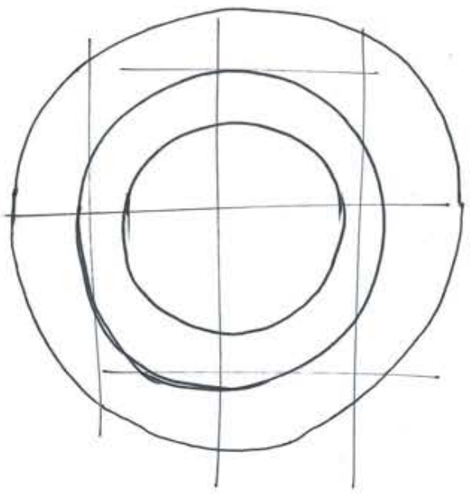


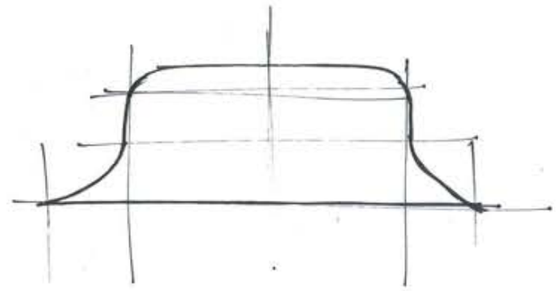

AIRLOCK BUTTON — TO AVOID USING A ADHESIVE
SCREEN FOR VARIOUS PURPOSES

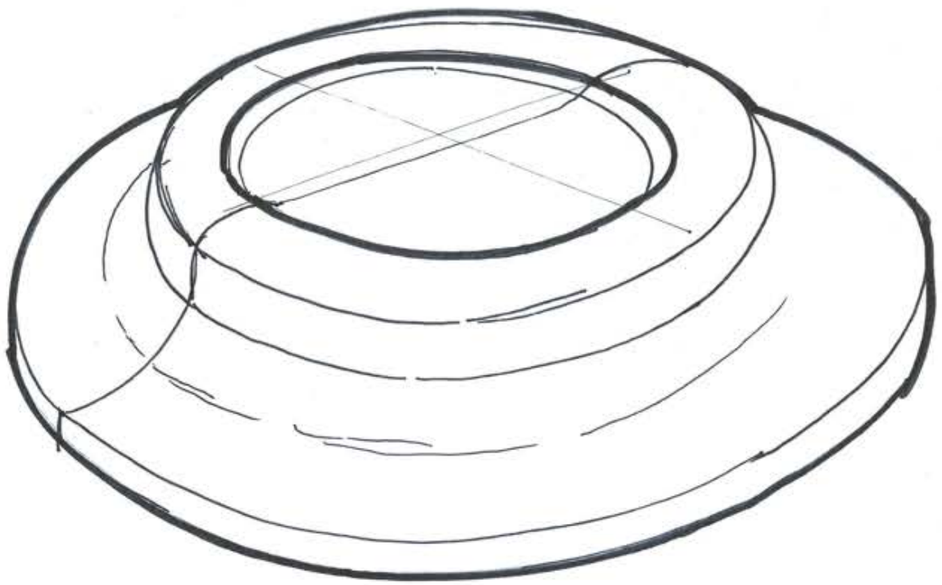

SMALL TRANSPONDER
ELECTRODES

BIOSENSOR WRIST PATCH !



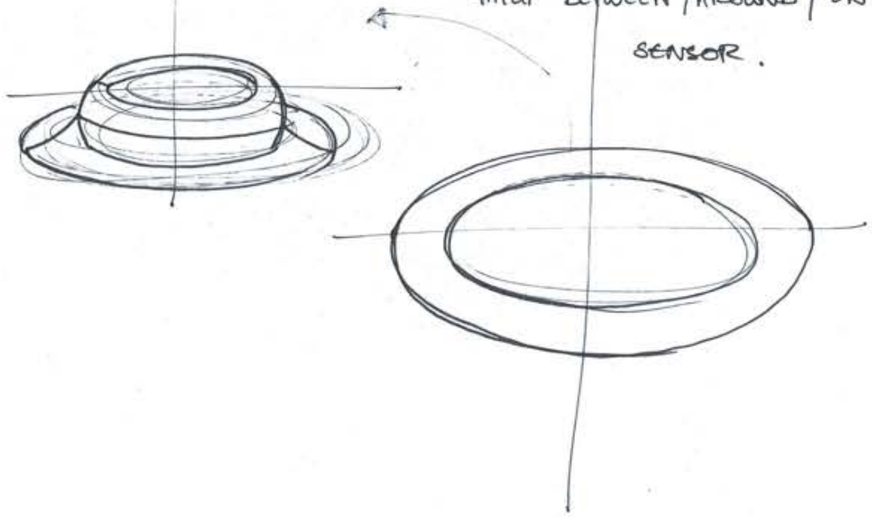


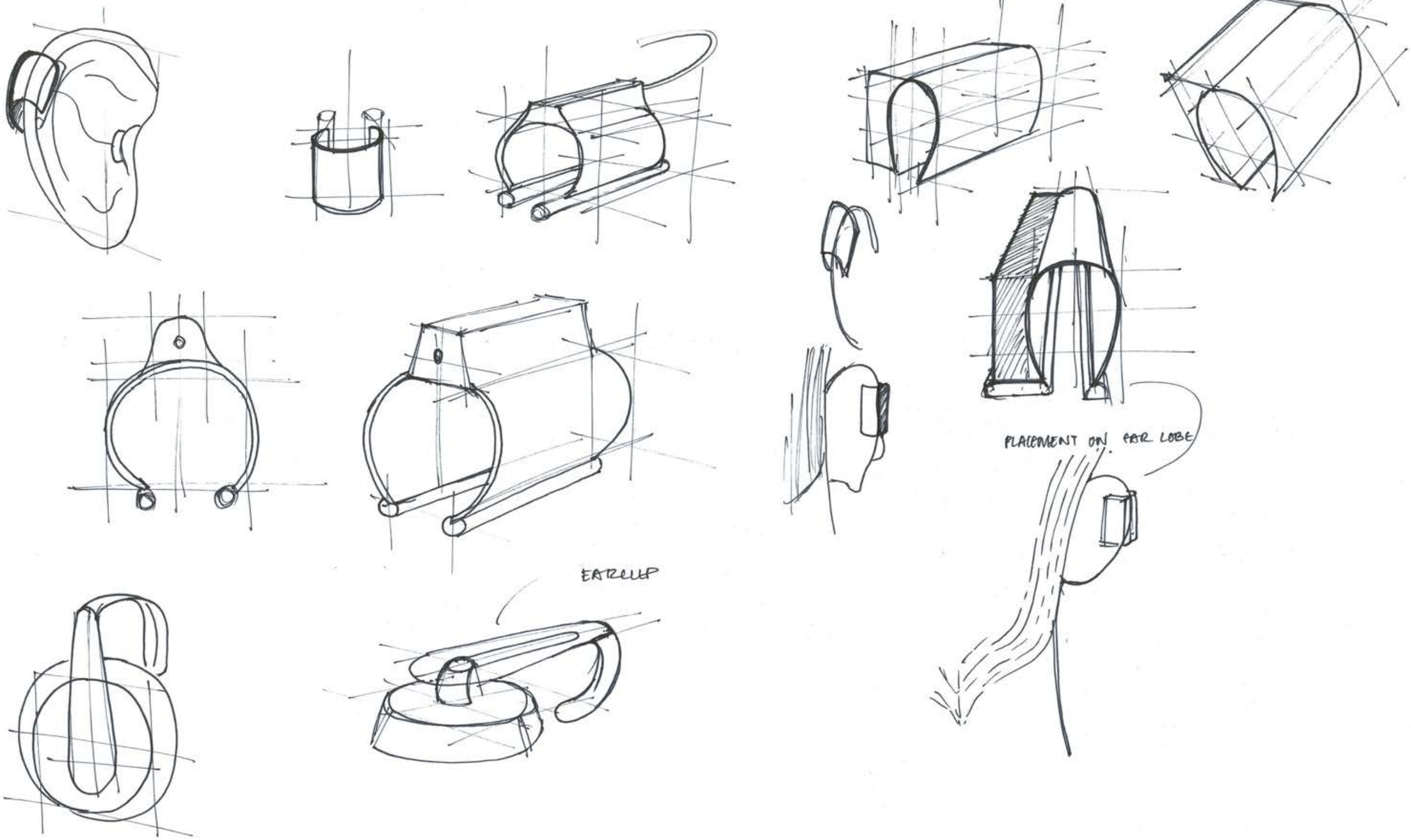




PATCH BETWEEN / AROUND / ON TOP

SENSOR.




EARCUP
PLACEMENT ON EAR LOBE