ABBY SCHEER

Portfolio 2021

ABBY SCHEER

CONTACT / abigailscheer@gmail.com / 402.540.6923 / www.abigailscheer.com

DESIGN EXPERIENCE

Cambridge Design Partnership

Industrial Design / Human Factors Intern
MAY 2021 - AUG 2021, Raleigh NC

Single-port, surgical robot project
- Central Drive Unit Team
- Collected + analyzed anthropometric data
- Applied HE 75 Standards to design parameters
- Conducted rapid prototyping + user testing of ergonomic designs
- Collaborated with mechanical + electrical engineers

Other
- Created pre-formative usability IFUs
- Design + prototyped injectable flat packaging
- Participated in early concept exploration for HIV injectable home kit

Trig

Industrial Design Intern
FEB 2021 - MAY 2021, Raleigh NC

Soft Goods Product
- Conducted ideation + concept exploration
- Conducted material exploration and specification
- Exectued flat pattern development
- Fabricated + tested prototypes (client facing)

Internship Project - Concept Exploration Modalities
- Defined problem space + conducted early phase research
- Prepared asynchronous problem presentation via video format
- Created virtual white boards with challenge questions and visuals
- Facilitated concept exploration sessions with entire Trig team
- Synthesized concept exploration and selected two directions
- Created testable illustration concepts for client evaluation

Valdese Weavers

Textile Designer
DEC 2012 - NOV 2018, Valdese NC

Vertical Jacquard Weaving Mill
- Designed high performance seating, panel, wallcovering for corporate + hospitality
- Created artwork + provided art direction
- Collaborated with sales and clients
- Engineered weave structure and fiber specifications
- Developed new yarn + dye colors
- Adhered to industry testing standards

R&D
- Art directed + distributed quarterly collections for targeted customer segments
- Participated in new yarn development
- Participated in color development
- Participated in new finish development
- Led warp structure development

EDUCATION/ SKILLS

North Carolina State University

Masters of Industrial Design
AUG 2019 - EST. MAY 2022

Parsons School of Design

Design Leadership + Business Certificate
JAN 2018 - DEC 2018

Rhode Island School of Design

Bachelors of Fine Arts - Textile Design
Honors, English Concentration
SEPT 2008 - JUN 2012

Digital

- SolidWorks (+ surfacing)
- Keyshot
- Adobe Creative Suite

Human Factors Psychology Research

- Task analysis and user needs analysis
- Cognitive walkthroughs
- Heuristic evaluation
- Testable prototypes
- Validation methods + testing
- Analysis of performance outcomes
- AAMI/ANSI HE-75 Standards

Biomedical Product Development + Management

- Verification + validation
- Risk documentation
- Intellectual property analysis
- dFMEA
- Design history file tracking
- Packaging + labelling

Textiles + Manufacturing

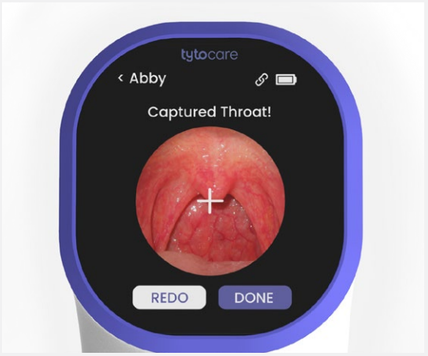
- Woven + knitted engineering structures
- Fiber + finishes
- Sales + marketing collaboration
- Customer + sales force collaboration
- Vertical manufacturing processes

01
Biofiltration Device

02
SLP Face Shield

03
Postnatal Communication

04
Telemedicine at School



01 **Air Purifier**

Eco-design strategy/
Home consumer electronic

Indoor air pollutant exposure has the greatest health impacts on humans.

How can we sustainably improve indoor air quality for users who spend the majority of their time inside?

The problem with current filters...

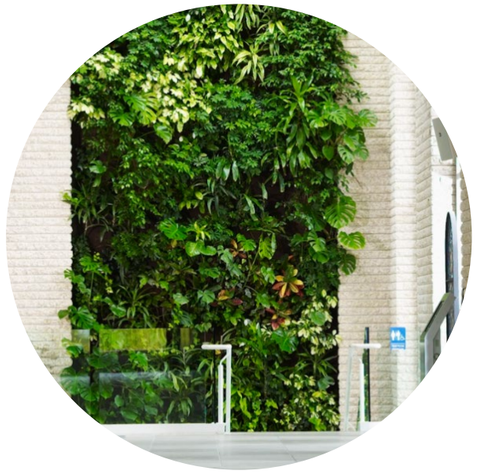
15 million air filters
were purchased in 2019.

6,000 tons of HEPA filters are sent to landfill every year.

Biofiltration

Increasing root surface area + mass improves biofiltration

mechanical pre-filters (biodegradeable)



greenwalls can have a filtration efficiency of 65-90% of particulate matter

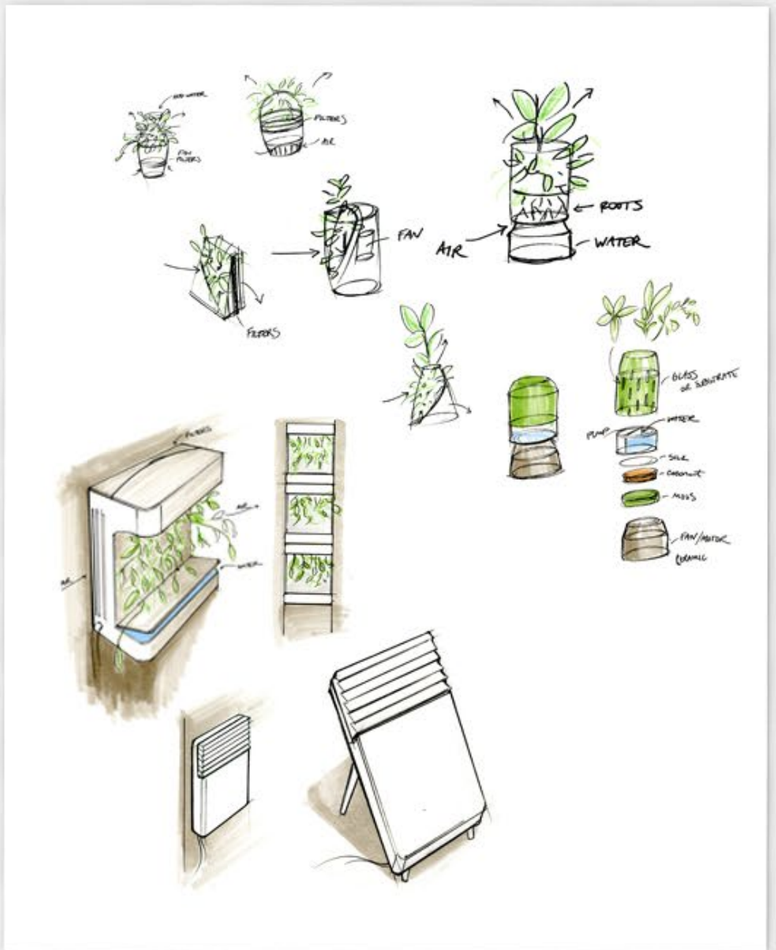
Plants positively impact social/pscyhological well being + work productivity

Active air flow through roots

Substrate filtration

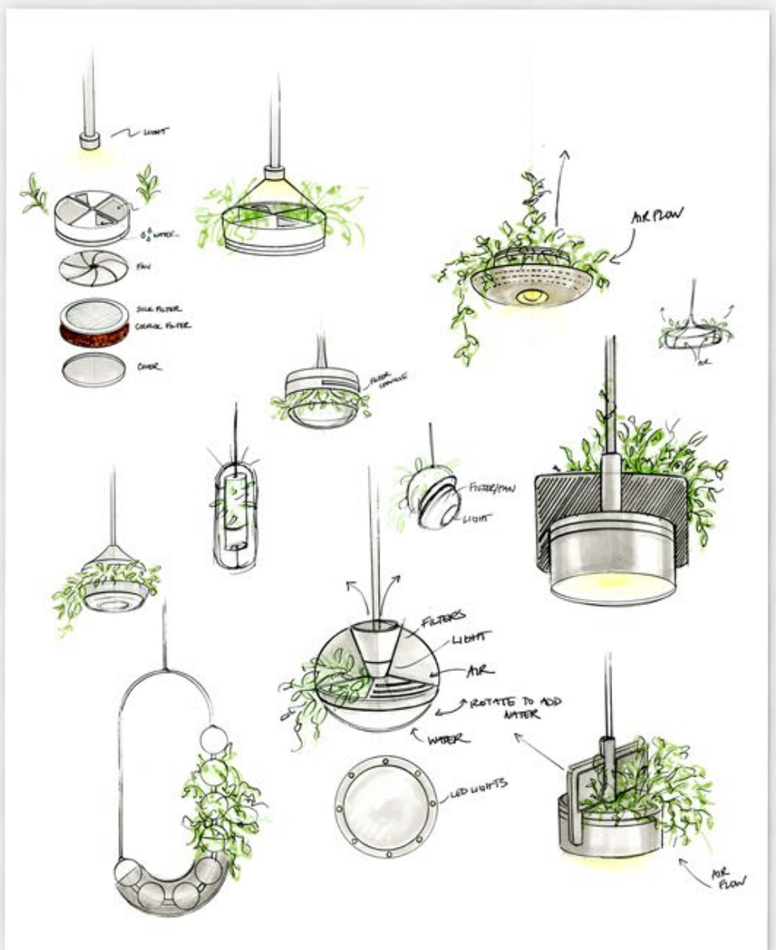
Specific plant species

Emotional well-being

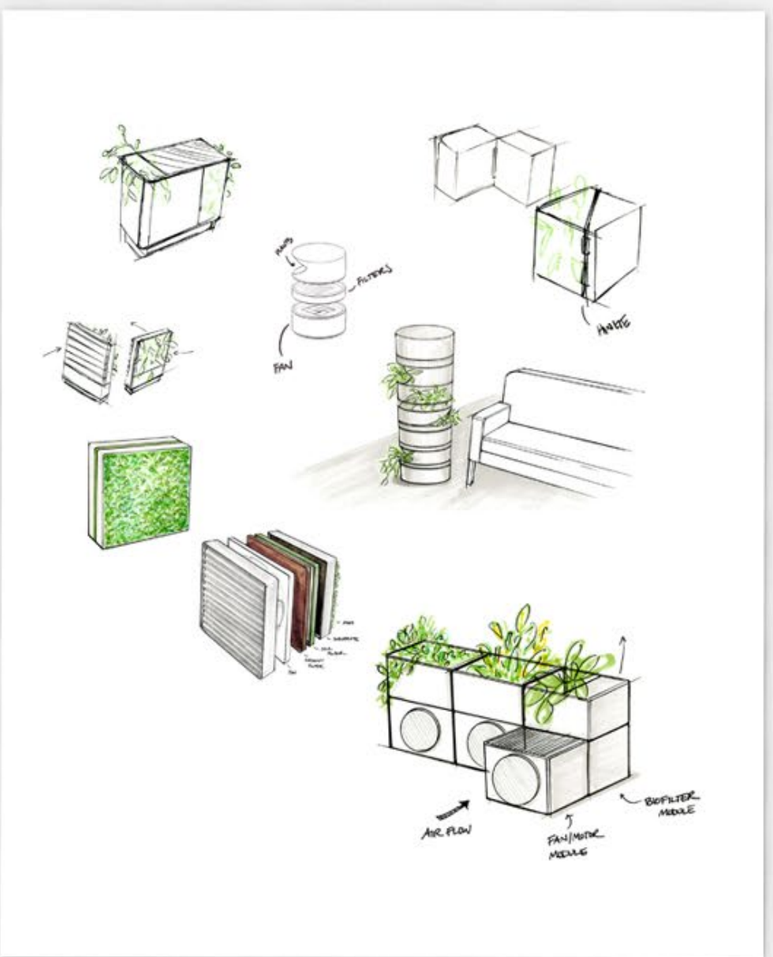


On the wall.

On the table.



On the ceiling.



On the ground.

Sustainable materials, methods of use, manufacturing.

Create a residential aesthetic not currently on market.

Reduce filter waste.

Penetrate a user market of plant owners.

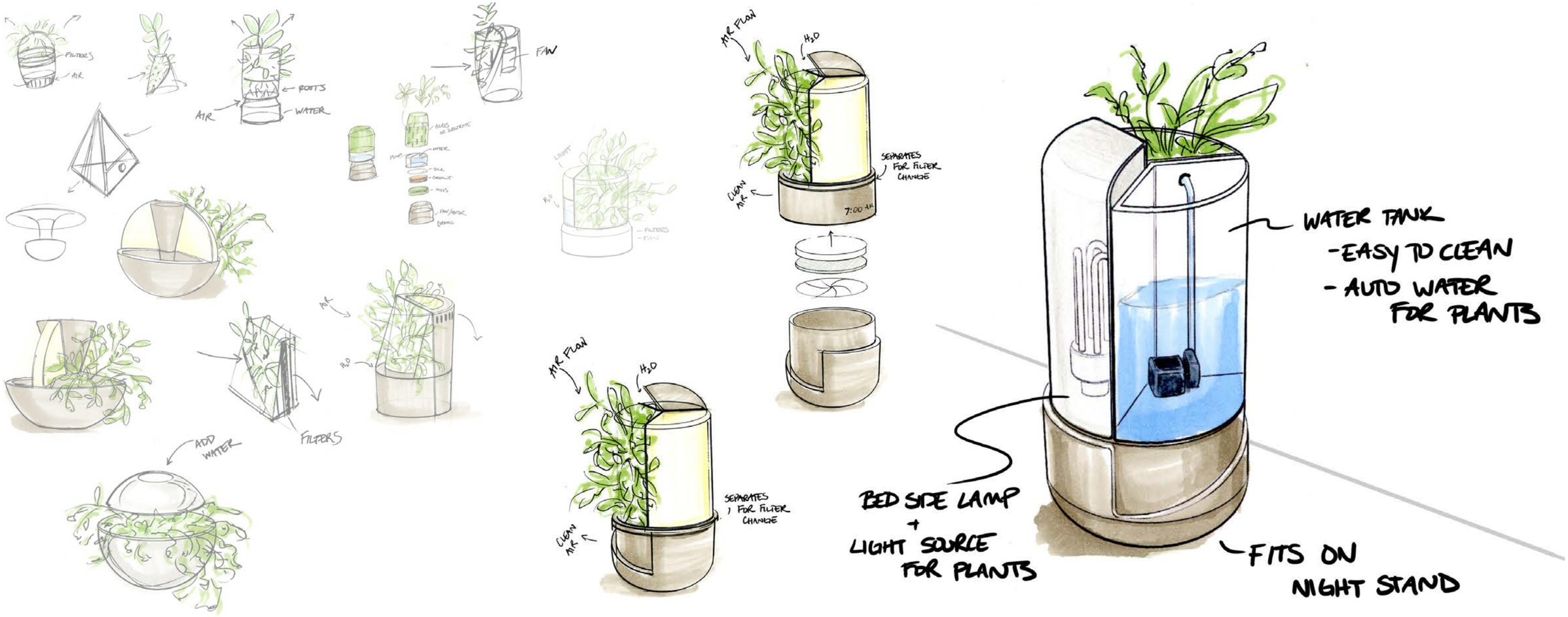
User Follow-Up Survey Results

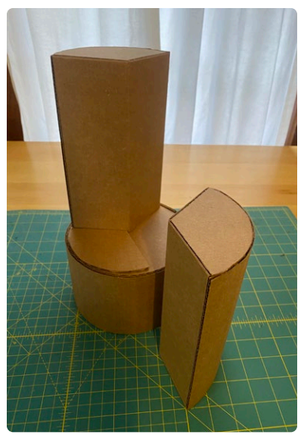
Place in the **bedroom.**

Place **on a table.**

Want device to **blend into the environment.**

Chief complaint --
does NOT fit into home's aesthetic.

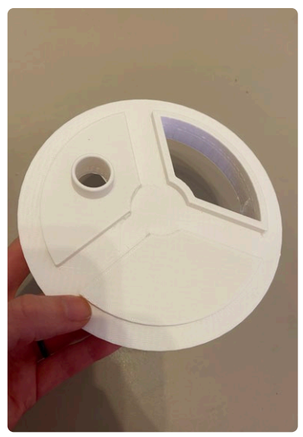



Testing scale with cardboard model.


Scale approved.


CNC Renshape for assembly.


Assembled Renshape model.


FDM 3D printed base plate.


Proportion, scale, usability confirmed.


Tested access to water tank with lid simulation.

Plantosphere

Dirty air

VOCs	PM0.3	PM5	PM10
Harmful gases	Harmful fine particulate	Bacteria, mold spores	Pollen, allergens

Clean air

Water flow

Organic Grow Substrate
PM 10
Pollen, allergens

Variety of Plant Species
VOC's
Harmful gases

Submerged Peristaltic Pump

LED Grow Bulb

PCR Plastic Triad

PCR Plastic Lid

Biodegradable Cocolok Filter
PM 5.0
Bacteria, Mold Spores

Fan

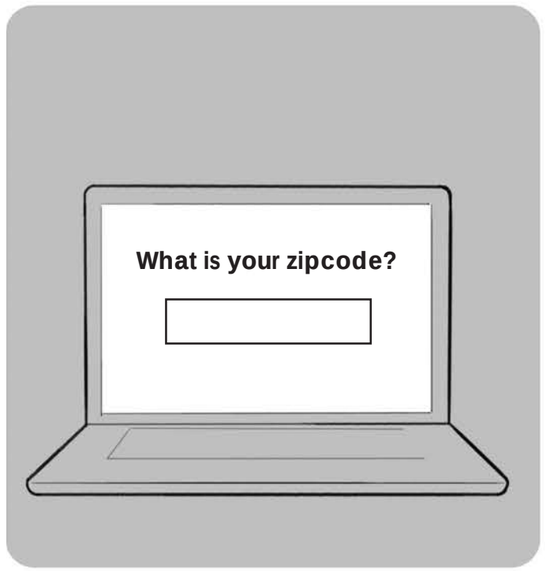
PCR Plastic Housing

Metal Mesh Housing

Biodegradable Silk Filter
PM 0.3
Harmful fine dust

305 mm

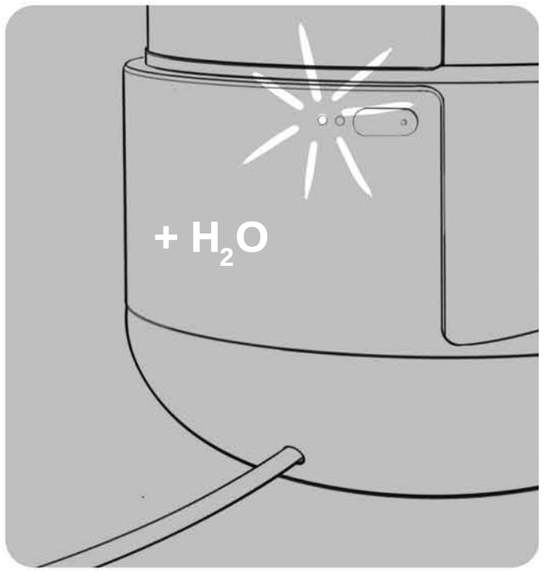
How Plantosphere works:



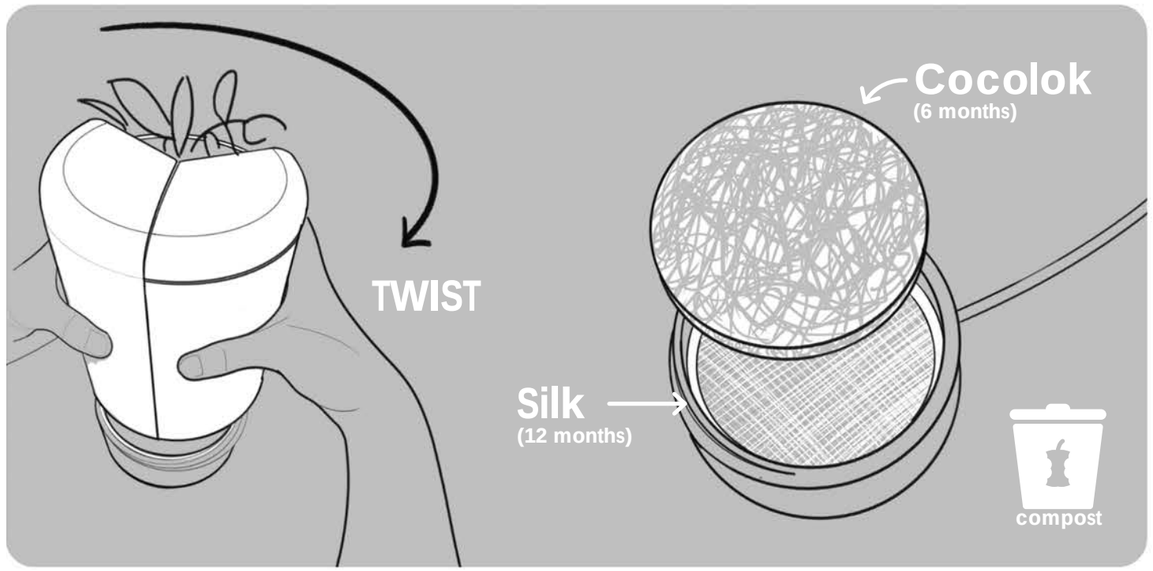
1 Take our quiz to find out your optimal mix of plants.

2 Buy plants locally or have them shipped. Arrange in purifier.

3 Add water and fertilizer to water tank.

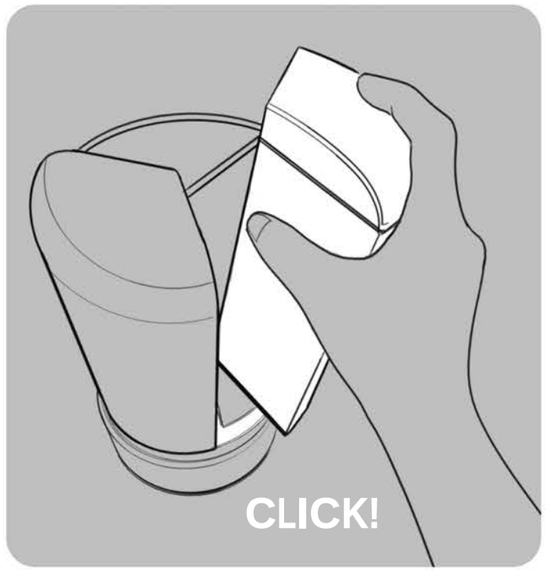


4 Add water when light turns on. Approximately every 2 months.

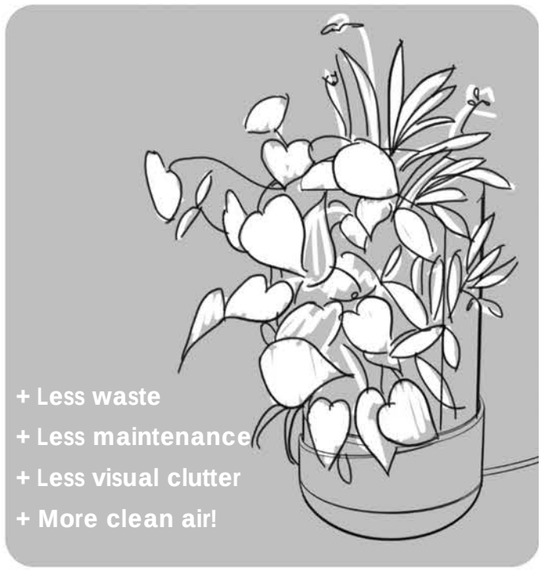


5 For filter change, twist off top.

6 Change Cocolok every 6 months; silk once/year.



7 Remove + clean water tank as needed.



8 Enjoy your growing plants and clean air!

CMF Inspiration

Don’t forget the packaging.

30% of consumers are willing to pay a premium for products that deliver on sustainability claims.

Biodegradable
When exposed to light, air, moisture and microbes, this product breaks down to natural elements found in nature.

Certified wood
Made from paper pulp that’s sourced from responsibly managed forests and mills.

Clean air policy
Utilize manufacturers that remove toxins and pollutants from the air during their processes.

Compostable
Disintegrating into natural elements while in a specific environment, leaving no toxicity in the soil.

Local fabrication
Centrally located or multiple manufacturers, meaning freight emissions and transit costs are cut.

Plastic-free
Contains no petroleum-based plastics.


LIVING IN MEXICO
TASCHEN
A ROSE FOR VIRTUE
Norah Lofts
DOUBLEDAY
a stolen life
jaycee dugard
Outliers
MALCOLM GLADWELL
HELENA JANECZEK · The Girl with the Leica
beautiful boy

02 **Protective Equipment**

Speech Language Pathologist
Face Shield

Covid-19

Greatly impacted access and delivery methods for pediatric SLPs.

Speech Language Pathologists

Pediatrics: Schools, clinics + hospitals

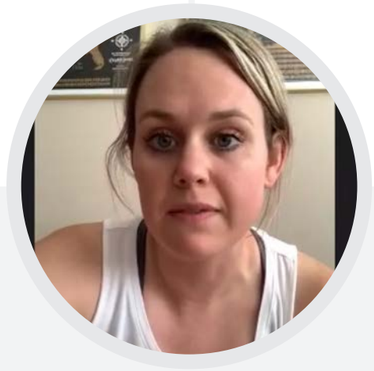
Group therapy in school helps children by **saying it and hearing it from others.**

Pam, CCC-SLP
(school system)

We **follow the children's lead** for better engagement with articulation.

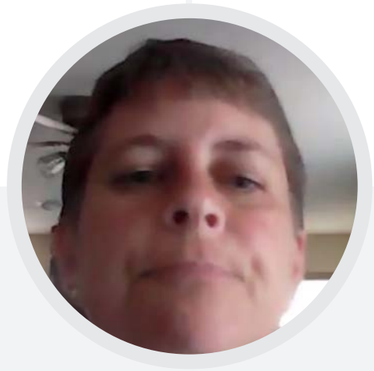
Anna, CCC-SLP
(school system)

Seeing facial expressions and movements are super important.



Meredith, CCC-SLP
(hospital)

I miss the physical interaction and participation due to covid.



Staci, CCC-SLP
(clinical)







51%

of pediatric **patients cannot tolerate wearing a mask.**

25%

of the time pediatric **SLPs report removing their masks during therapy** for delivery purposes.

The Problem

Due to Covid-19 Protocols

COMFORT

SLPs have little input on PPE they are given so sizing and comfort are a problem.

VISUAL ACCESS

SLPs are removing their masks and using face shields for better visual access for modeling + adjusting tools/toys for new cleaning protocol.

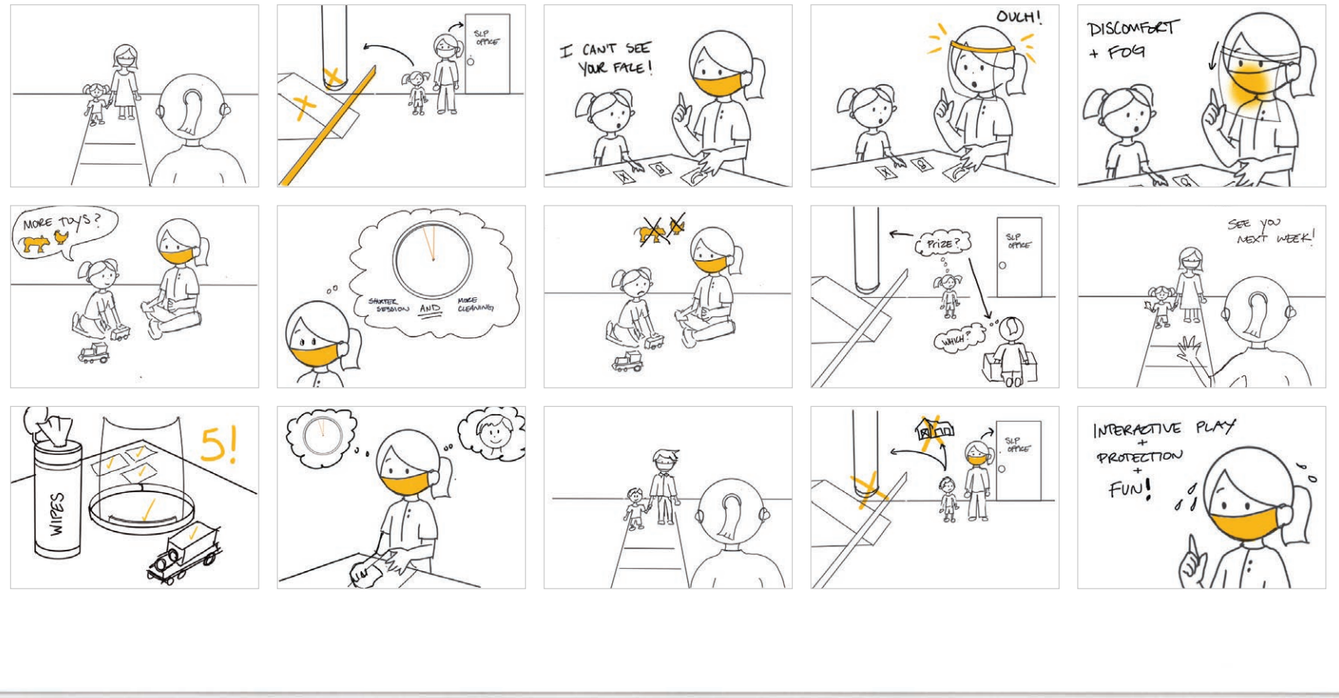
INTERACTION

Physical interaction, play, and emotional closeness have become difficult due to protective equipment and discomfort.

SANITATION

Cleaning requirements and time consumption have impacted session times, tool and toy choices, as well as prep work for SLPs.

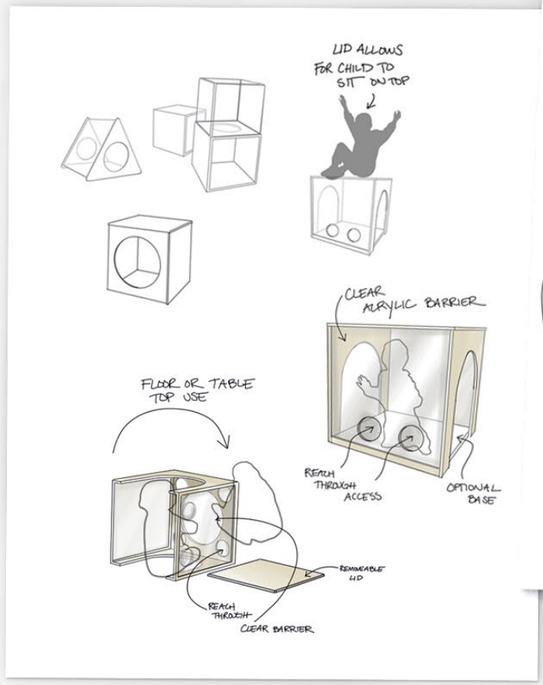
STORYBOARD



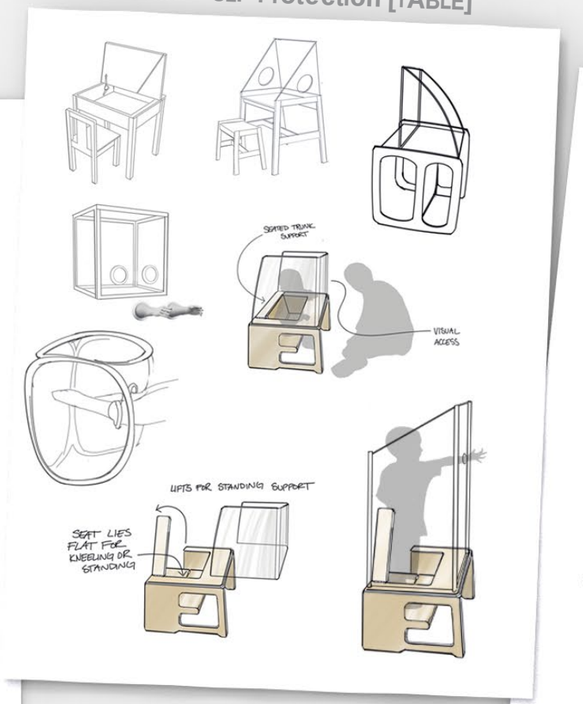
Pediatric Speech Pathologists need a way to **physically interact with visual clarity** with patients who do not wear masks while conducting play-based therapy during the Covid-19 pandemic.

Peer-to-Peer Protection [FLOOR]

Child - SLP Protection [FLOOR]

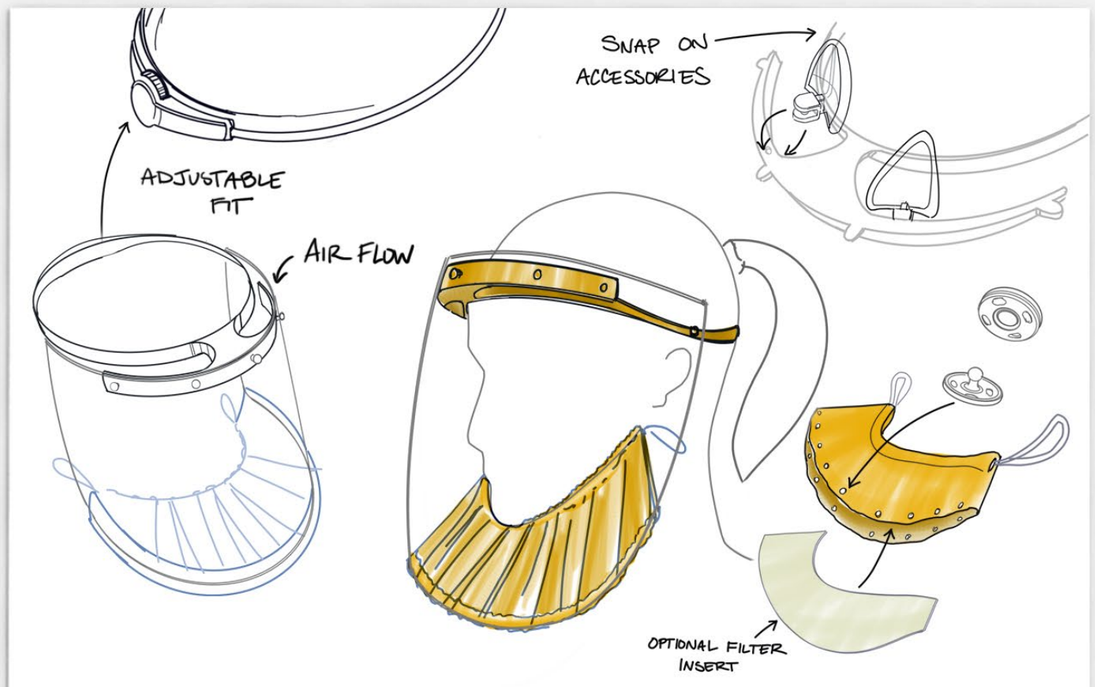


Child - SLP Protection [TABLE]



Child - SLP Protection [WEARABLE]

USERS' FAVORITE DIRECTION



"The shield is too large and would hit my chest.

Is it comfortable?

Does it fog?

Will it stop transmission?

Add playful customization that is removeable."

Low-fi Prototyping

Off-the-shelf components and simple fabrication

1. Cut away at the purchased face shield for greater flexibility and reduced weight.

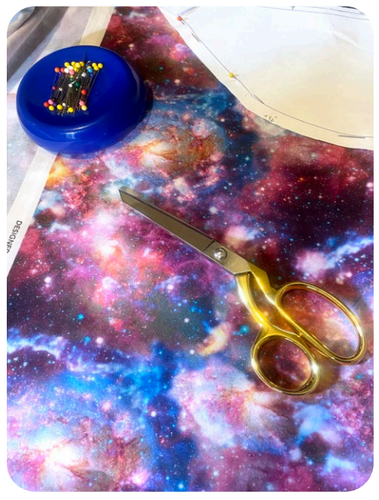
2. Testing a bike helmet adjustment system.

3. Thinner plastic band created a better fit at the back of the head.

4. A sample was sewn for the fabric gusset with black cotton fabric.

5. Several patterns were drafted for the best shape and size.

6. Elastic was added and test fits were done with clips.



7. The final gusset was sewn and assembled.

8. Snaps were added as an attachment mechanism for the shield.

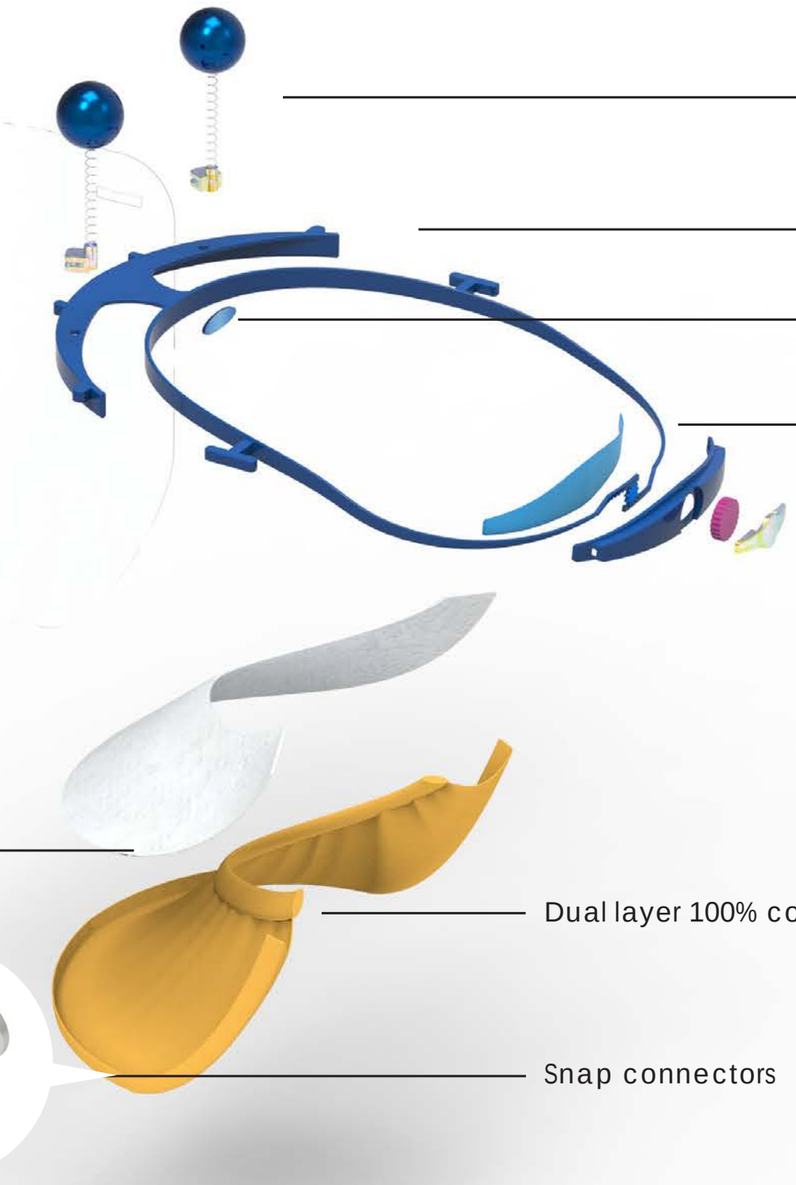
9. Holes were added to the shield for snap placement.

10. Snaps and holes detail.

11. Open gusset design allows for a PM2.5 filter insert.

12. Test fit! A silicon pad was found for added comfort. Will add to final design.

FunbrellaShield



Snap-on accessories

Polypropylene head piece

Comfort silicone grip

Comfort elastomer pad

Dial fit system

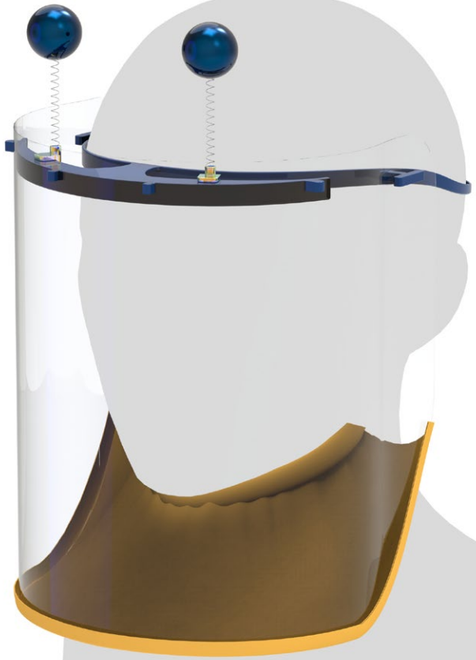
Polycarbonate shield

PM2.5 filter:

- Provides mechanical and electrostatic barrier
- Multi-layer, non-woven, activated carbon
- Reduces airborne particles by 90%

Dual layer 100% cotton chin guard

Snap connectors



FunbrellaShield

UNC HEALTH

03 **Postnatal Communication**

A device for monitoring
critical milestones

How can we provide the UNC postnatal unit a **patient facing intervention** that provides patients and health care team members with a **shared reference for critical milestones**?

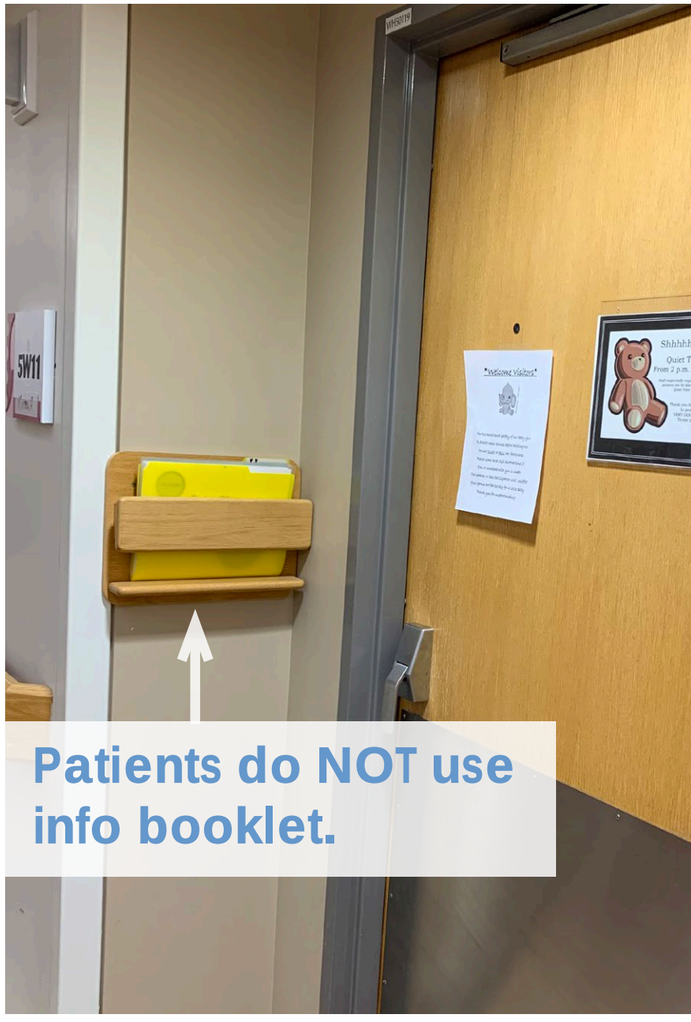
The Couplet
Mom + Baby

Family Members
Partners/family

Healthcare Team
Nurses, midwives, obstetricians, lactation, residents, doulas, family medicine, medical techs, social workers...

When do I get to go home?

What information has already been given to the patient?



> So many critical milestones - no easy communication method.

BABY ← **MILESTONES** → MOM

- Hearing Test
- Blood Draw
- Biliruben
- Bath
- Diapers
- Vaccines
- Doctor
- Medication
- Car Seat
- Education
- Lactation
- Vaccines

UNC HEALTH

Less Verbal Communication

Staff has difficulty coordinating information that is given to patient.

Less Written Communication

Moms and families have varied levels of English literacy (average 5th grade reading level) and language proficiency.

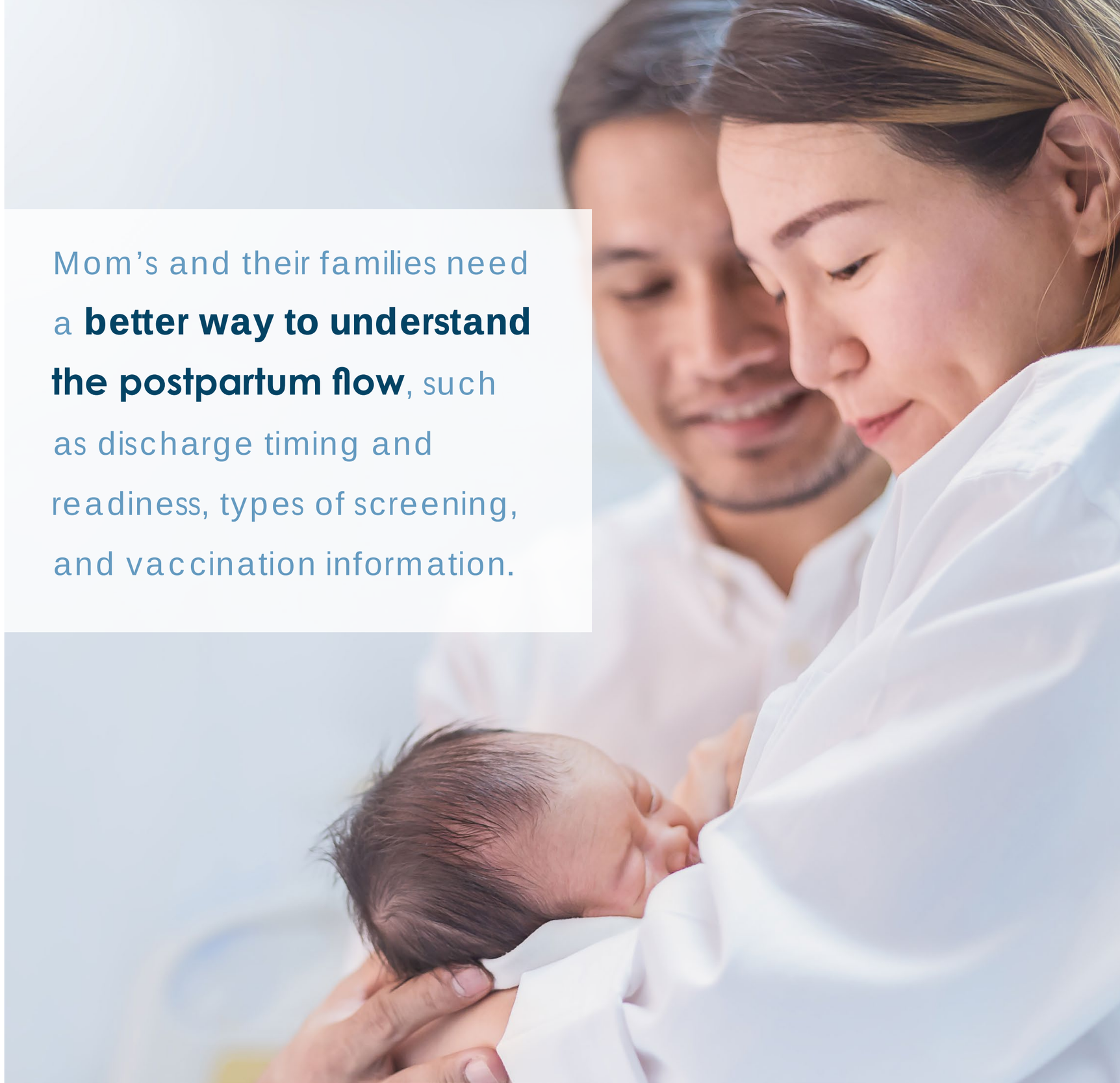
Flexible + Scalable

Allow for flexible patient experiences and acuities.

Visualization of Stay

Moms and families need to understand postpartum flow by seeing what is done and what needs to be done.

Mom's and their families need a **better way to understand the postpartum flow**, such as discharge timing and readiness, types of screening, and vaccination information.

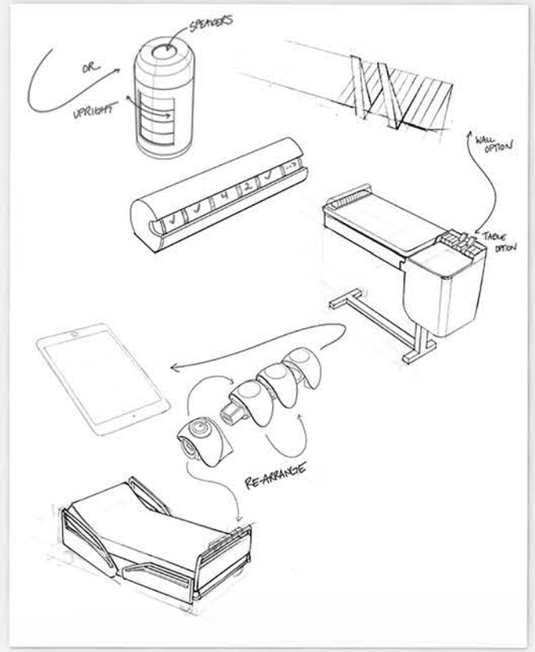


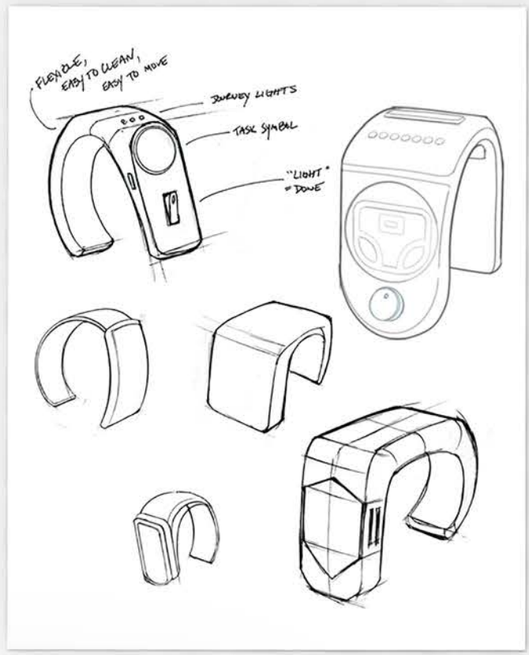
UNC HEALTH

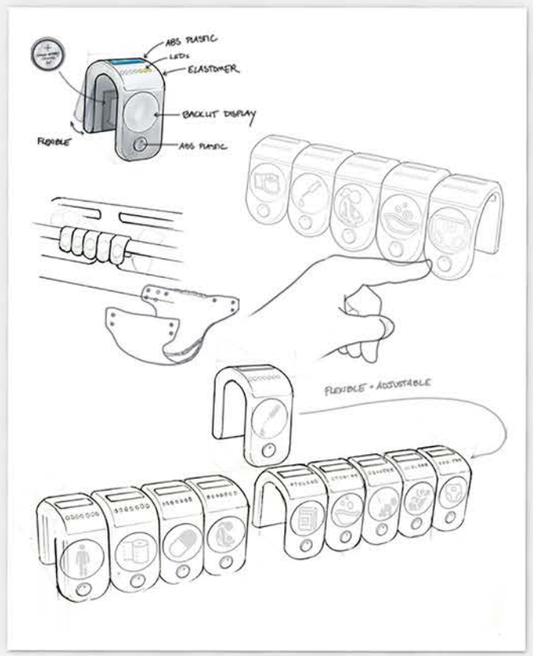
Presentation 1

Team Concepts

1. Sticker System
2. **Modules**
3. App + IoT Diaper Counter

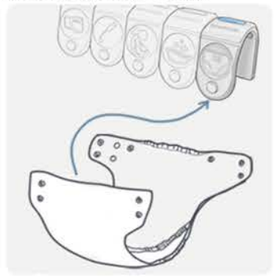






1. Device location convenient to mom and clinicians

2. Baby's first stool occurs. Mom locates baby stool module.



3. Mom records baby's first stool by pushing front switch.

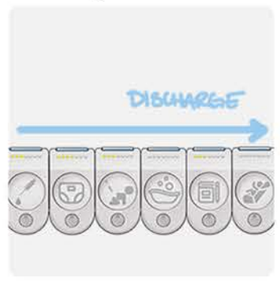
4. Baby's second stool occurs. Mom pushes switch, two lights indicate.

5. Lactation nurse arrives. Conducts consultation with couplet.

6. Lactation completes consult; Back lit icon and dot LEDs indicate "complete" on module.

7. Mom can indicate questions by pressing top blue button. Next clinician that enters room is aware.

8. Mom and clinicians can see milestone journey progress through indication lights.



UNC Feedback Round 1

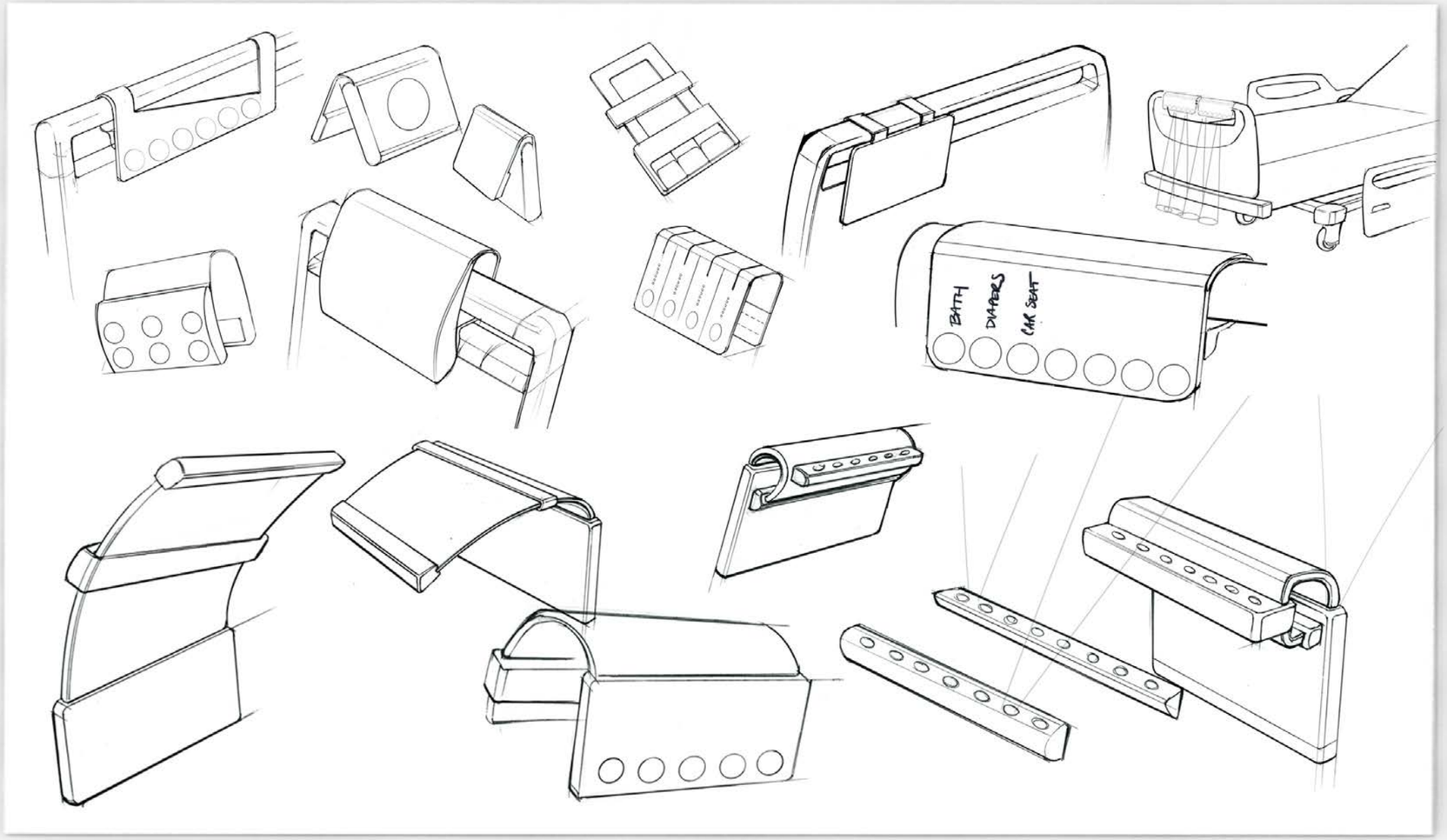
1. **Place on end of the bed.**
2. **Fewer components.**
3. **Must be visible in the dark.**

UNC HEALTH

Presentation 2

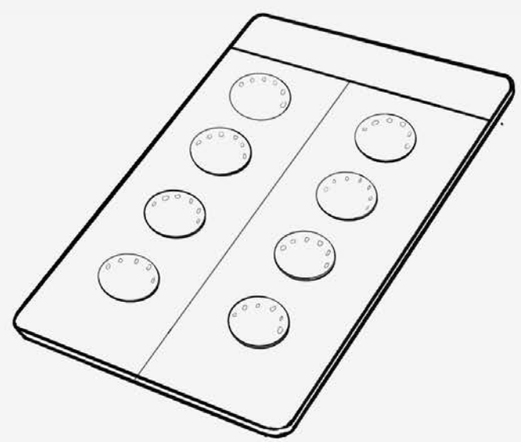
Modules

1. Visual indicator.
2. No writing required.
3. For mom and clinicians.
4. Visible in the dark.
5. Fewer components.



Feedback Round 2

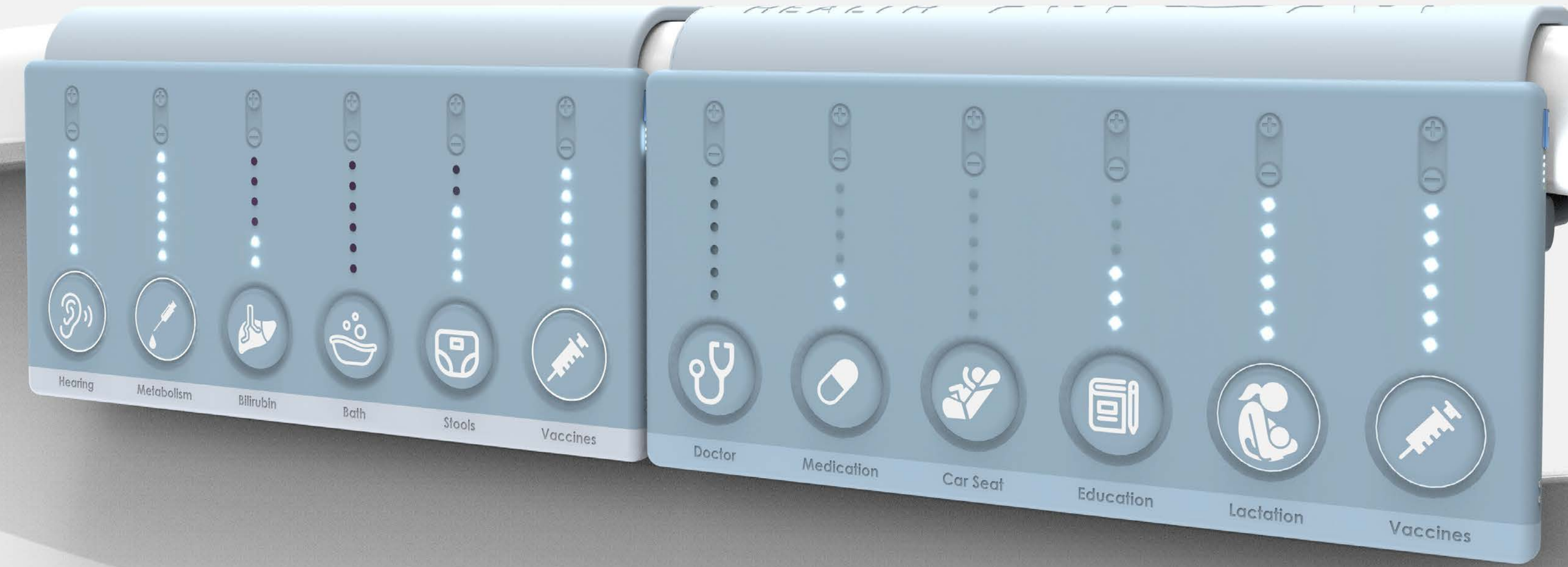
1. “We like the simplicity.”
2. “We like the night view.”
3. “Add module outside the room?” (visual display only)

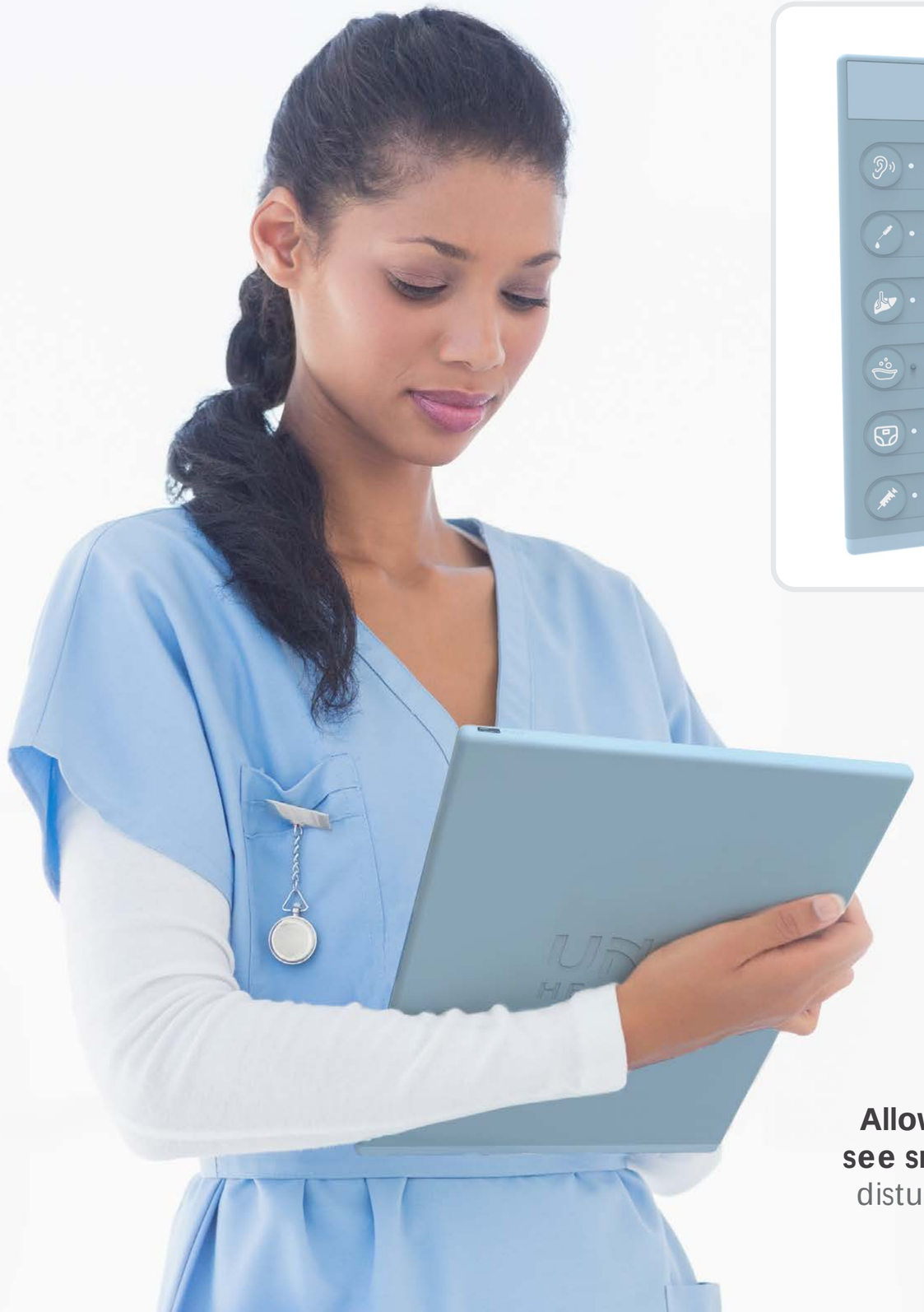


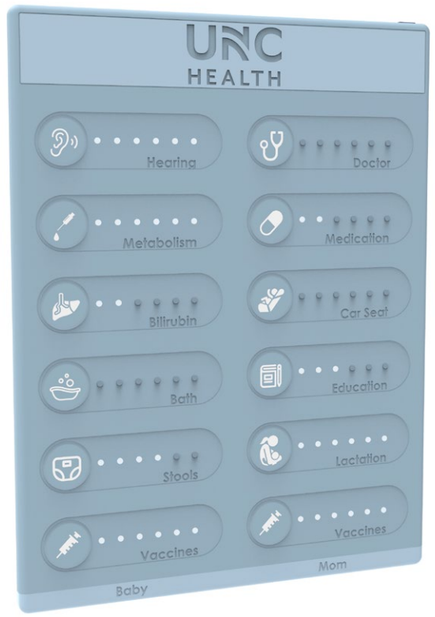
Postnatal modules

Mom and baby modules help clinicians and mom track changes and understand progress of the postnatal stay.

Customizable. Expandable. Adaptable.





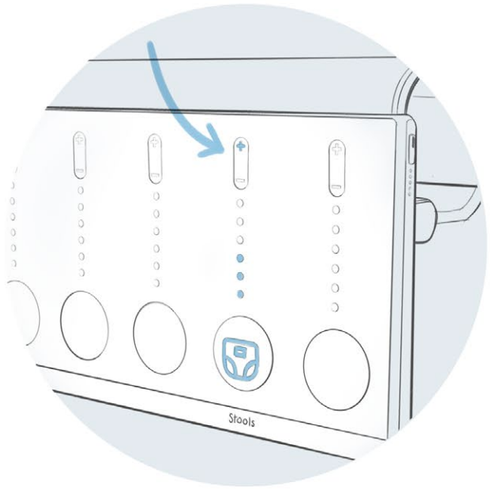


Allows clinicians to see snapshot without disturbing/entering.

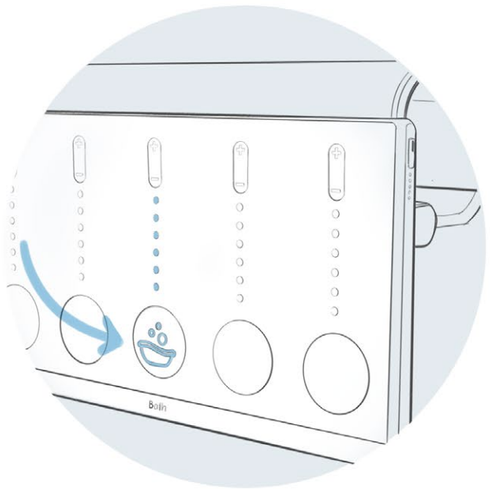
Easily visible for staff and mom.

How does the system work?

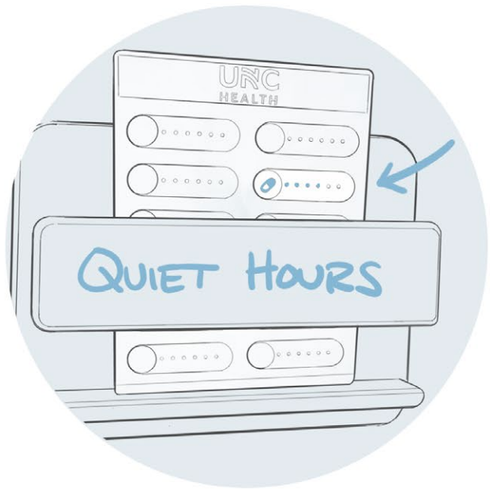
Mom: It is much easier to count diaper changes and my own voids.



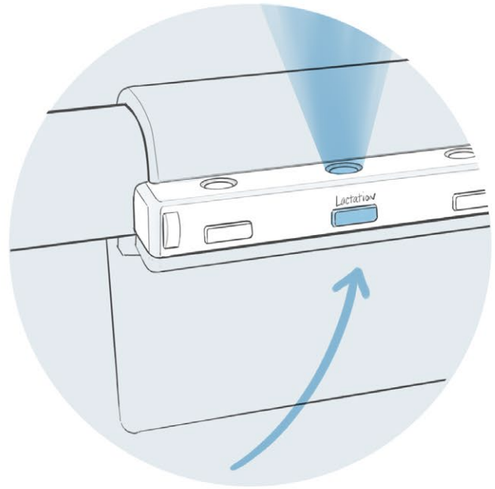
Staff: I can record or see that a bath has happened with a single glance or touch.



Staff: I can see what is done without entering the room and disturbing the mother.



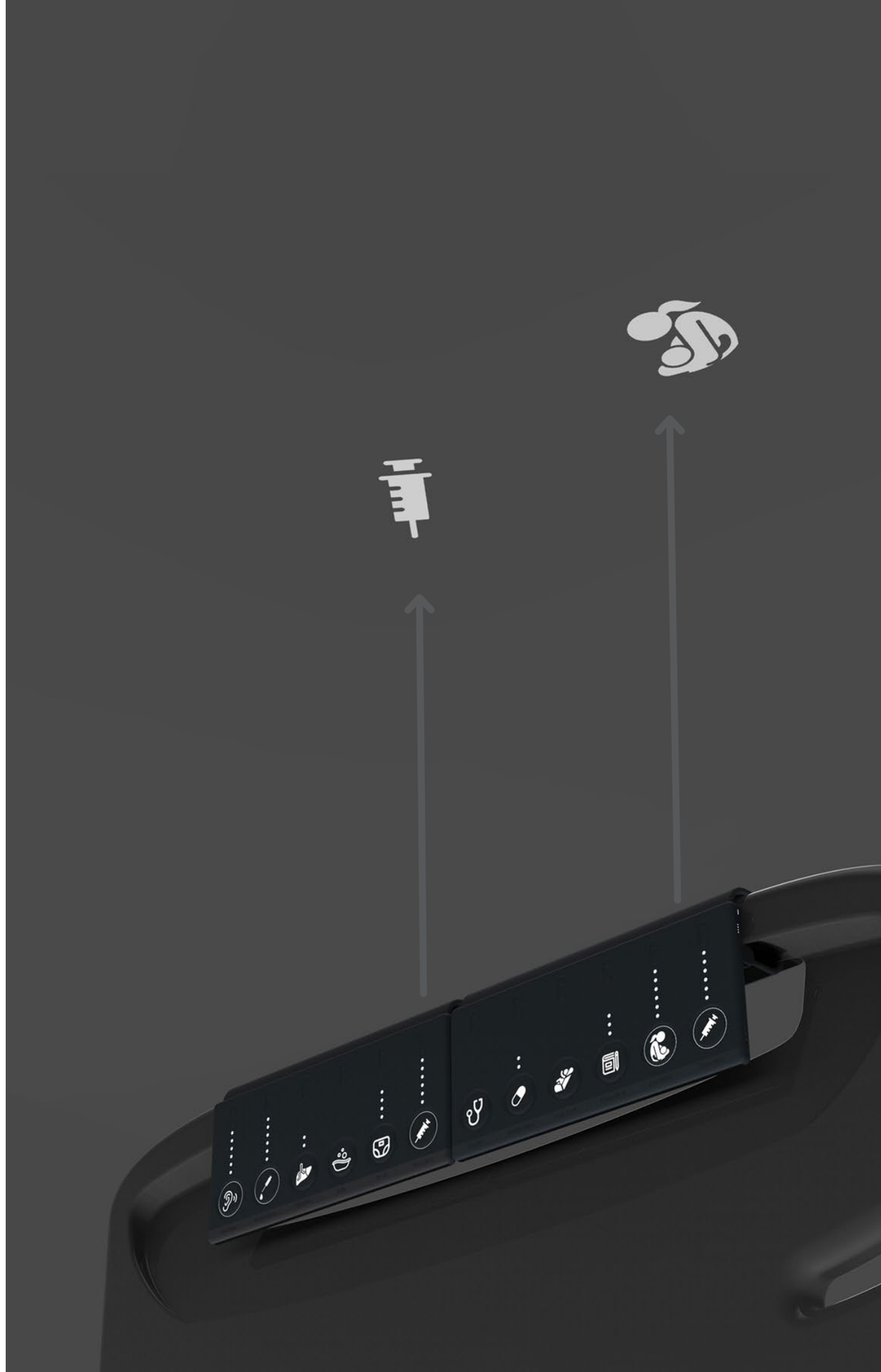
Mom: I can easily indicate I have a question to the next person who enters my room.



Staff + Mom: I can see what milestones have been done and what else needs to happen in order to go home.

Night Mode


Hearing
Metabolism
Bilirubin
Bath
Stools
Vaccines
Doctor
Medication
Car Seat
Education
Lactation
Vaccines



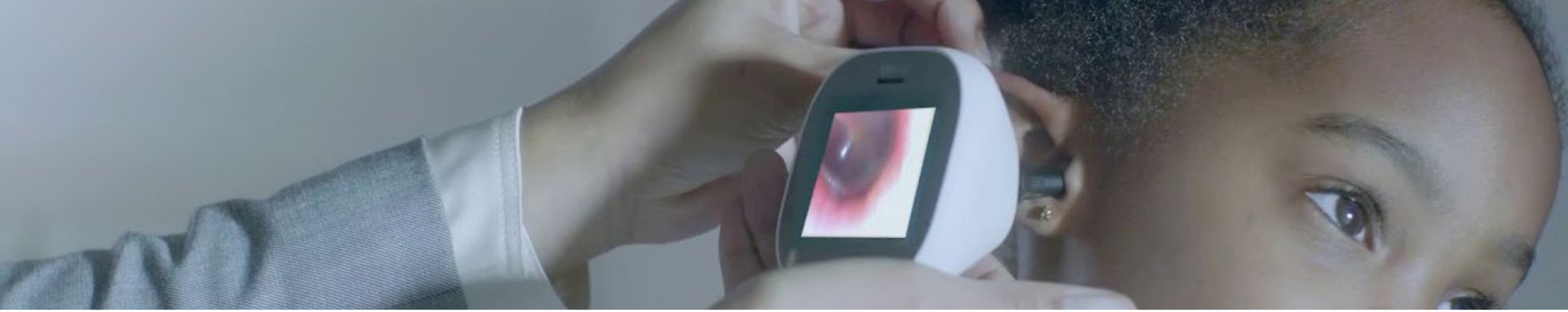
Branding opportunity.

Surface still allows use of **hand railing.**

Mom can push when she has **questions.**

Adjust projection
brightness.

Adjust projection
focus.



04 **Telemedicine Device**

For pediatric care
in schools

Telemedicine Model

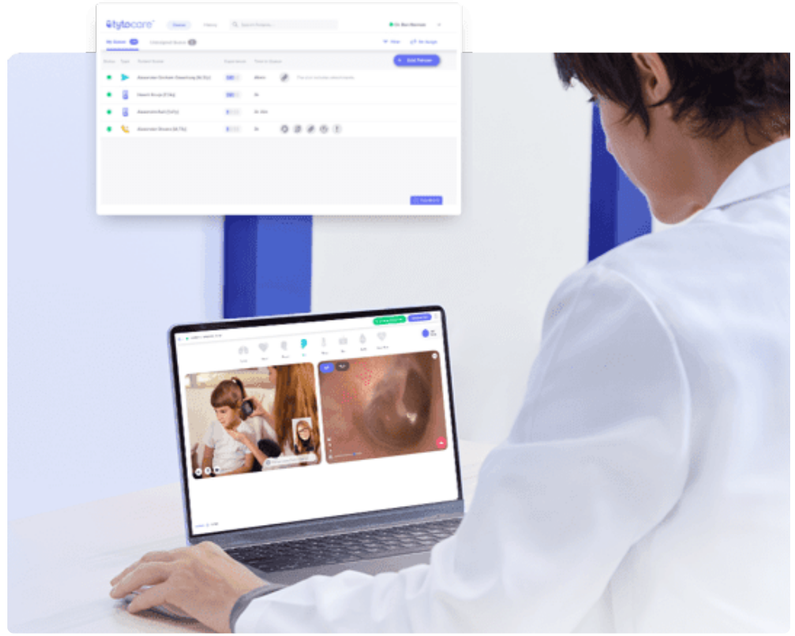
Center for Rural Health Innovation (western North Carolina)

> **School telehealth removes these barriers [access to clinicians, economic hardship]** and provides great value for our children within an academic framework.

36% of NC students attend Title 1 Schools (low-income)

Telemedicine at School

tytocare



A t**elemedicine** system that includes an **otoscope, stethoscope, tongue depressor.**

School nurses can connect to a physician at a hub facility to perform **virtual exams.**

Reduces need for pediatric office visits without sacrificing quality of care.

Stakeholders

Nurse Practitioner

Child

Parents

User

School Nurse

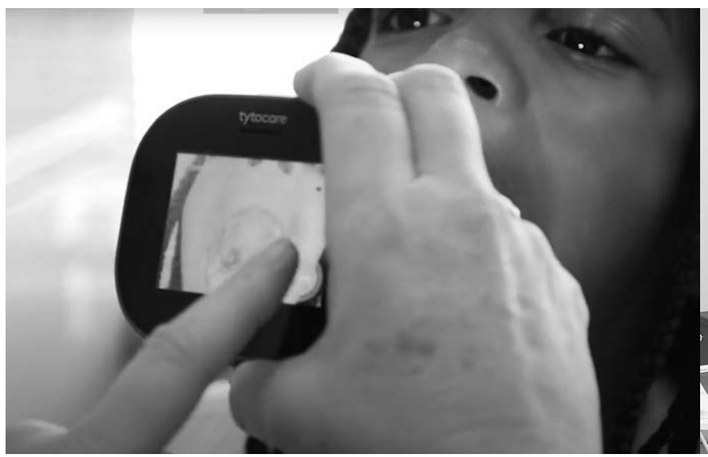
No handle.

Blocks sight line to ear.

tytocare

Usability Challenges

Inaccurate temperature.

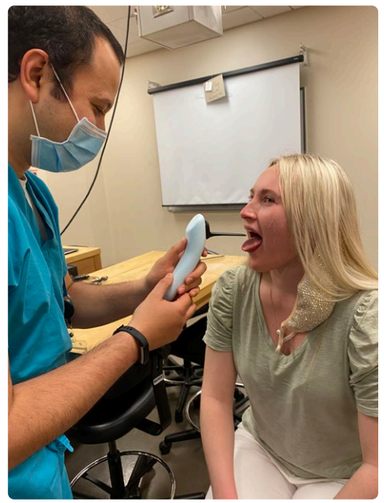


Requires two hands.

ipad screen is best.

Limited storage.


EDIBLE
ROUND
ORGANIC
BLOCKY
FLAT



A next-gen redesign

tytocare 2.0

power button

top light

alignment dot

camera

sensor

charging indication

rear trigger button

smaller screen size

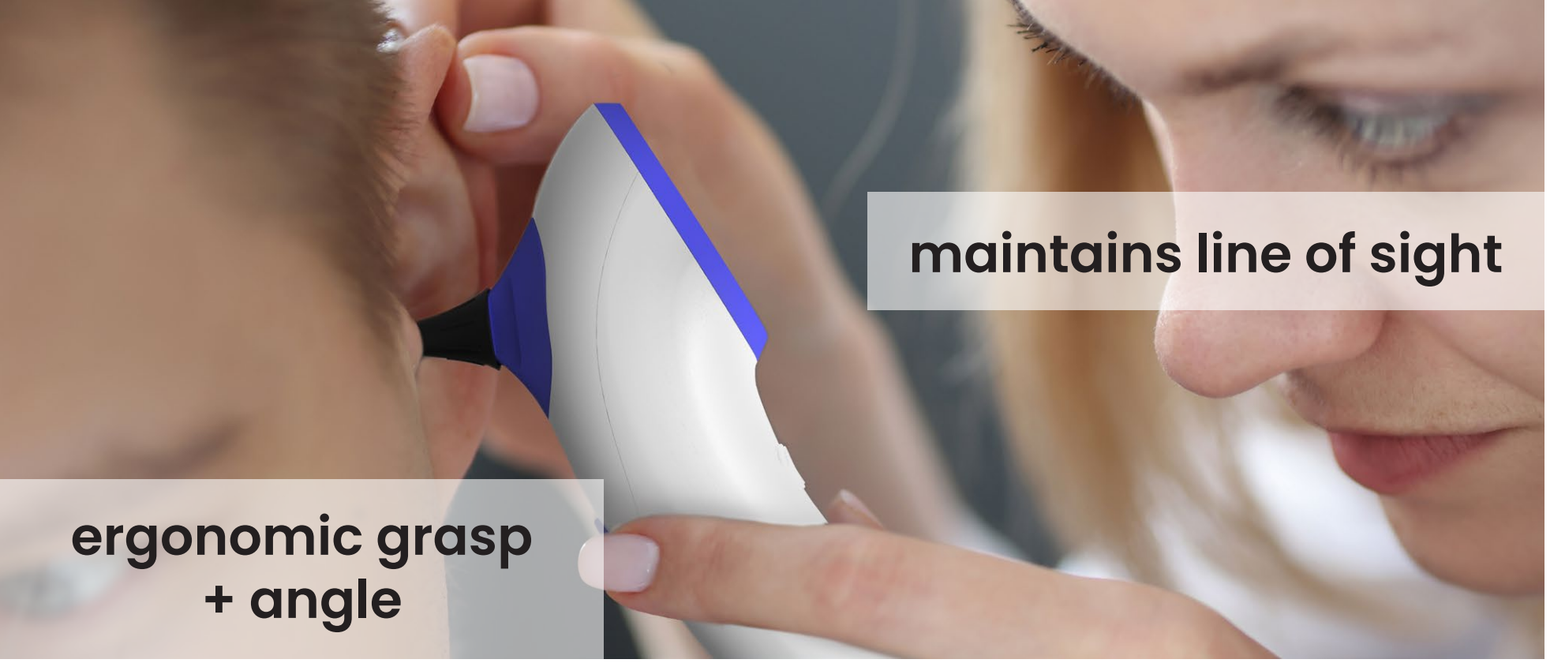
charging contact

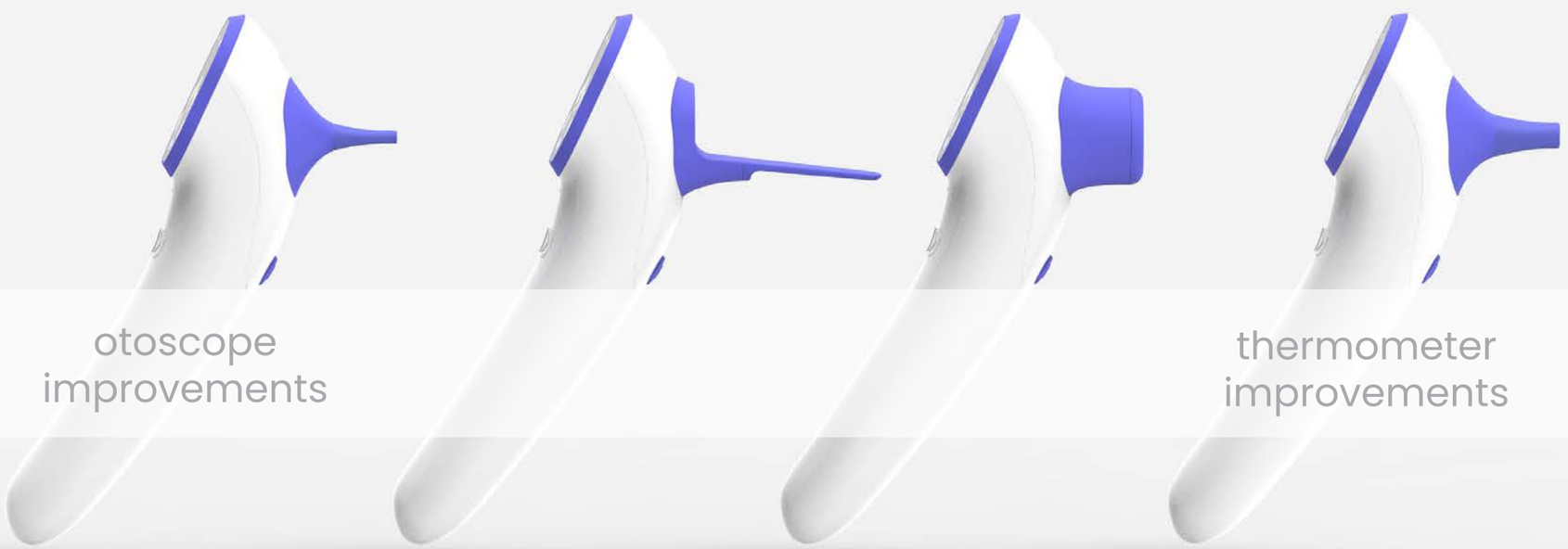
navigation buttons

improved storage

charging case

travels easily school-to-school



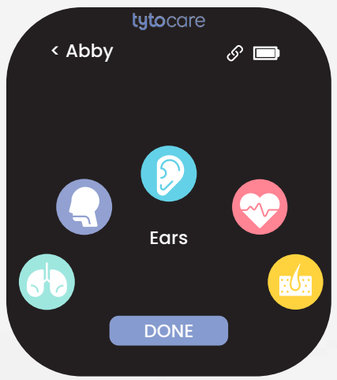


otoscope
improvements

thermometer
improvements

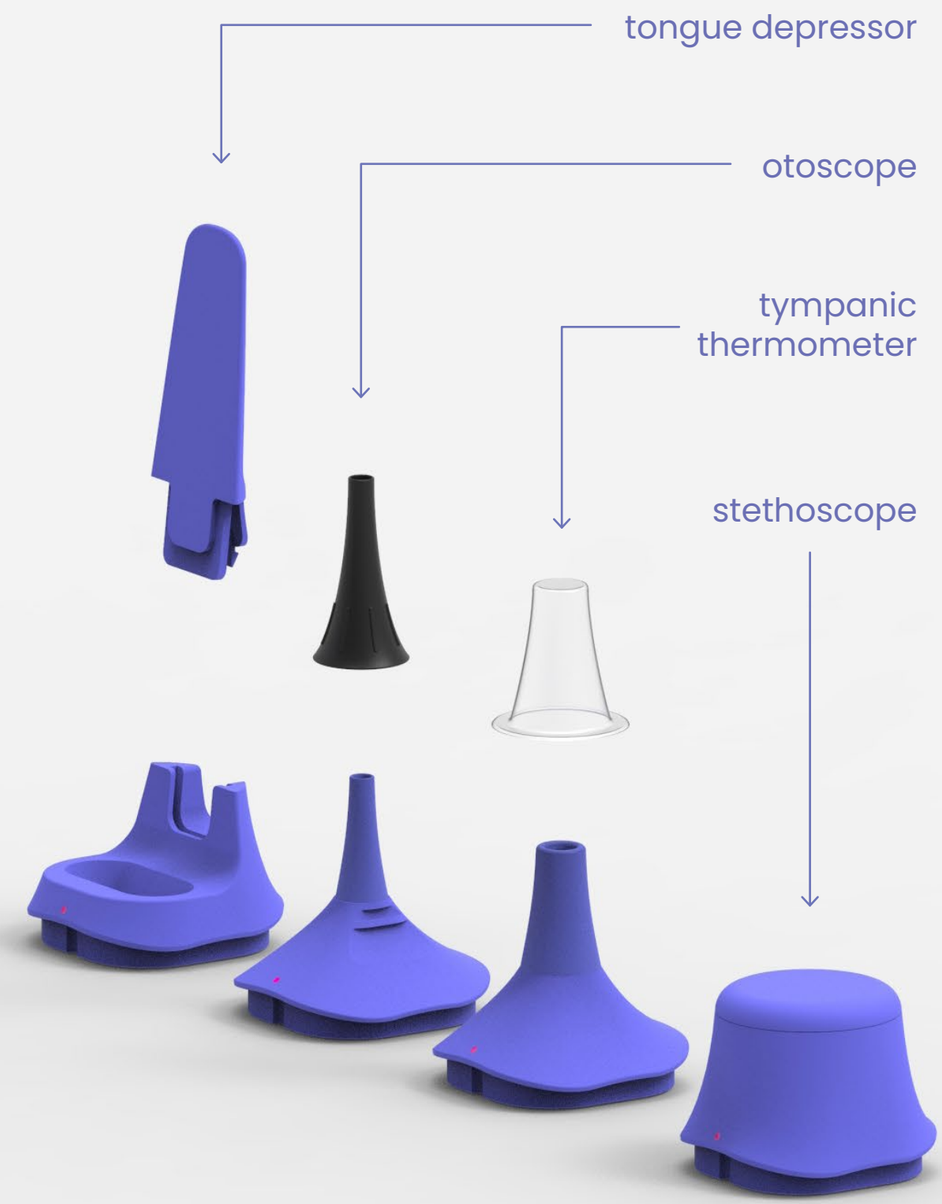
Tongue Depressor UX

Otoscope UI



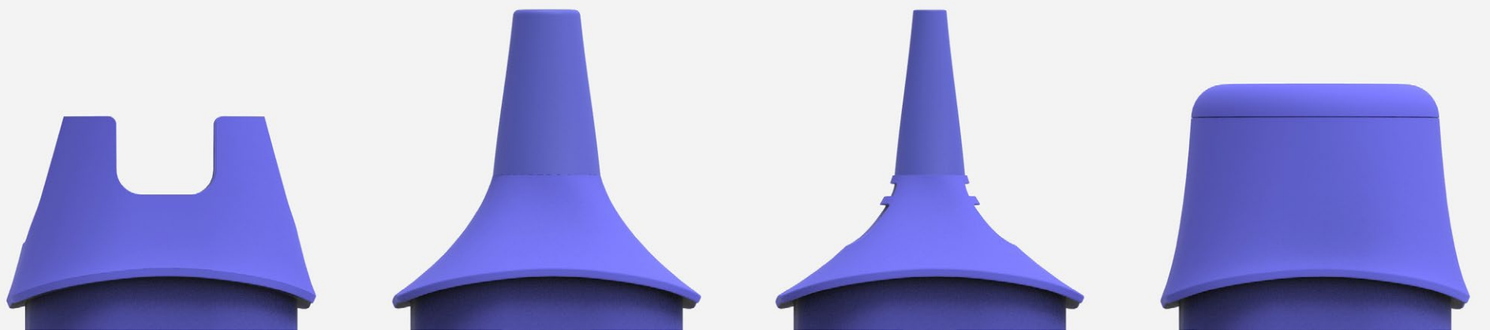
set-up


tytocare
Abby
Lungs
DONE


tongue depressor
otoscope
tympanic thermometer
stethoscope

tytocare 2.0

- Better ergonomics
- Improved line of sight
- Single-hand operation
- More accurate temperature
- Wireless charging



tytocare

Thank You

I look forward to hearing from you.

Abby Scheer // abigailscheer@gmail.com