

TraC^{ure}
Healthcare made easy

Design Brief

Intent: **To make the medication tracking experience more easy for both the inpatient nursing staff and the patients through digital platforms.**

Situation:

- **With increase in the number of medications of a patient, the nurses have to keep a track on each medication and for other patients as well.**
- **Patients should also be aware about when the medication is to be taken and what is it for.**
- **With healthcare interventions on digital platforms, tracking systems can be made easier through digital devices.**

Assumptions:

- **Nurses are habitual of remembering medications of different patients.**
- **There is a written record of medications in big hospitals if not clinics.**
- **There aren't many similar applications in market that target medication tracking, especially from the nurses end.**
- **Patients eventually remember the medication doses through regular practice.**

Constraints:

- **Every user group doesn't have access to digital platforms.**
- **Nurses may find it hard to adapt to digital means for tracking medications since they have a practice of doing it.**

Target Audience:

Nursing staff

Doctors

Patients

Family members/relatives/caretakers

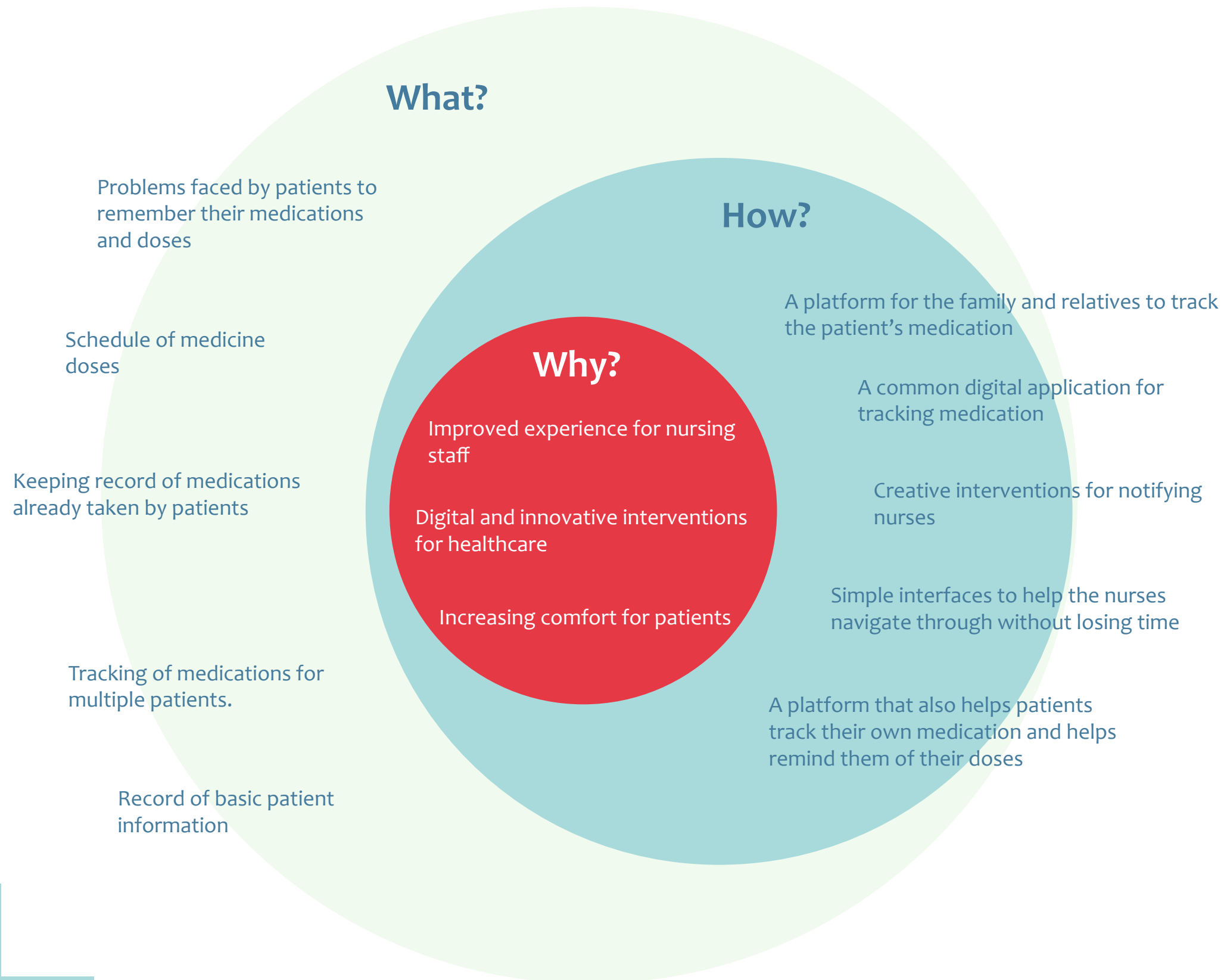
Opportunity statement:

Designing a digital application that helps in tracking medication given to the patients and also letting the patients/users enter the status of the medication. A platform that helps in providing details about the patients, doctors and the medications.



Golden circle

Tool to outline the problems and the directions to solve them in order to achieve the ultimate goals.



Empathize

+ Observe

+ Immerse

+ Engage

Observe

Self observed problems with tracking of medication and doses.

Too many medications



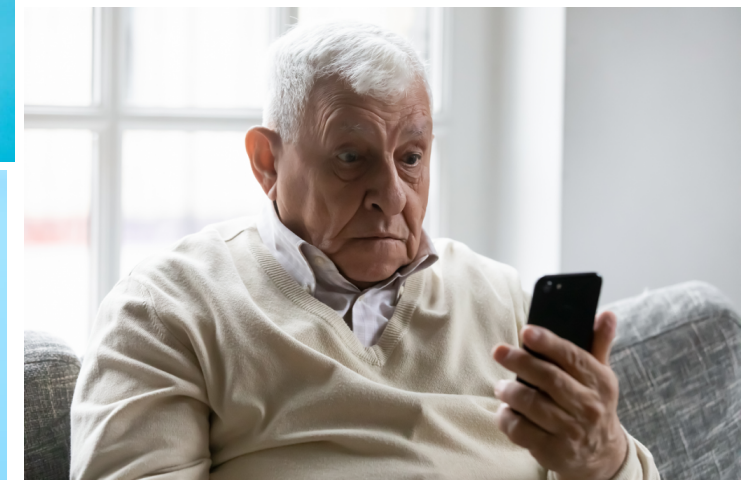
Missing out on doses



Relying on others (family) as reminders



Confused about the timings of different doses

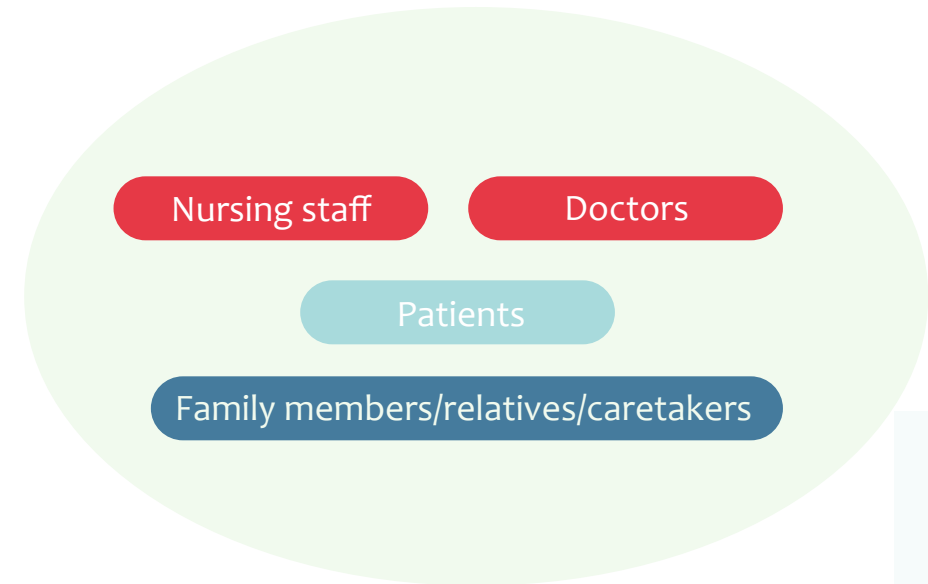


Issues usually scale up among older age groups



Engage

- Getting to know about the users/stakeholders.
- Current problems/issues faced by the users.
- User interviews conducted



Questions for Doctors/Nurses end:

1. How easy/difficult it is to track medications/doses of patients?
2. How do you remember the medications? (Through Written forms, Oral form, digital forms or any other)
3. How often do you make a mistake about a medication? If so, what are the mistakes usually regarding?
4. What are the reasons for the above mentioned mistakes if any?
5. Do you know about any app/software that helps you keep a track about patient's medication? If yes, provide some detail.
6. As per your experience, do the patients face any difficulty understanding the doses when you explain them? What are they usually about?
7. Have patients called/contacted you later to ask about the dose details?
8. How curious are the patients about what a particular medication is for when they have more than 1 dose?
9. Have you tried a different/creative way of remembering patients medication?
10. What is a basic time allowance that is okay if the patient misses/is late for the dose?
11. What do you think will be an easier option for you to remember medications for multiple patients?
Memory, written forms, digital notifications
12. What age group usually receives more than 1 medication?
13. Does a physical nudge about dose helpful or you feel a reminder/alarm is more efficient?
14. Will you be able to remember medications easily through names of the medicine or do you feel that a visual image of the medicine is better along with names?
15. What will you like to add/change to make it easier for you to remember medications/doses?

Design probe asking the users itself to add or suggest changes to solve the problems.

Questions for patient end:

1. How often do you face difficulty while remembering medicine doses?
2. Do you miss your doses? If so, how often?
3. Have you written the doses down/recorded them in some way to make it easy? If so, what are those means?
4. Do you rely on others to remind you of your dose timings?
5. Do you have a clear understanding about what dose is for what purpose?
6. Do you call your doctor to ask about the medications or doses?
7. Do you feel good and comfortable to ask your doctor about your doses verbally/physically? Or do you prefer asking them on text/chat etc?
8. Do you use any means as a reminder for your dose? If so, what are they?

Doctors/Nurses

Found connections
among responses

Highlighted the pain points and Insightful points through colored stickers

- Pain points
- Insightful

Link to the Miro board:

https://miro.com/app/board/uXjVOXMJRoo=?invite_link_id=489571014364

Patient end

| Patient | Interview candidate 1 |
|---|--|
| 1. How often do you face difficulty while remembering medicine doses? | Very often |
| 2. Do you miss your doses? If so, how often? | Once a week |
| 3. Have you written the doses down/recorded them in some way to make it easy? If so, what are those means? | Doctor's prescription and alarms on my phone |
| 4. Do you rely on others to remind you of your dose timings? | No |
| 5. Do you have a clear understanding about what dose is for what purpose? | Yes |
| 6. Do you call your doctor to ask about the medications or doses? | Yes |
| 7. Do you feel good and comfortable to ask your doctor about your doses verbally/physically? Or do you prefer asking them on text/chat etc? | Verbally/physically |
| 8. Do you use any means as a reminder for your dose? If so, what are they? | Alarms on my phone |

Affinity Mapping

Used to collate necessary **Pain points**, **Insightful points** and possible interventions suggested by the user itself.

The pain points, new insights and intervention ideas will be useful while ideating and prototyping.

Key highlights from questionnaire/interviews



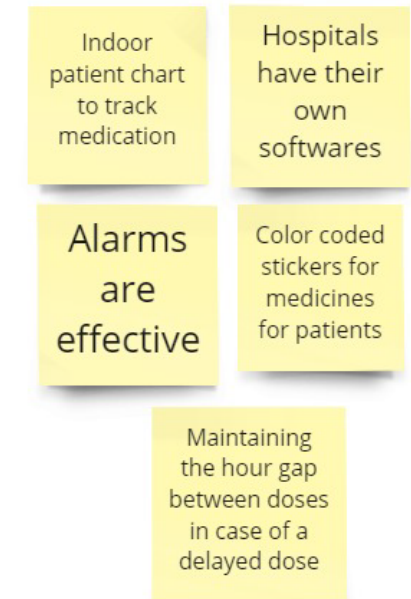
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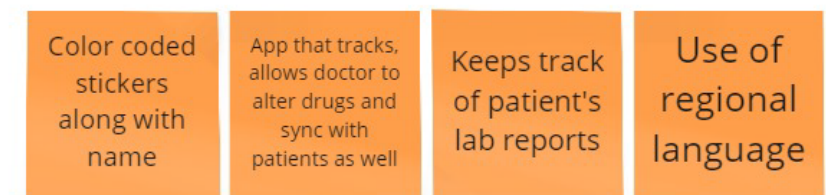
Pain points



Useful insights



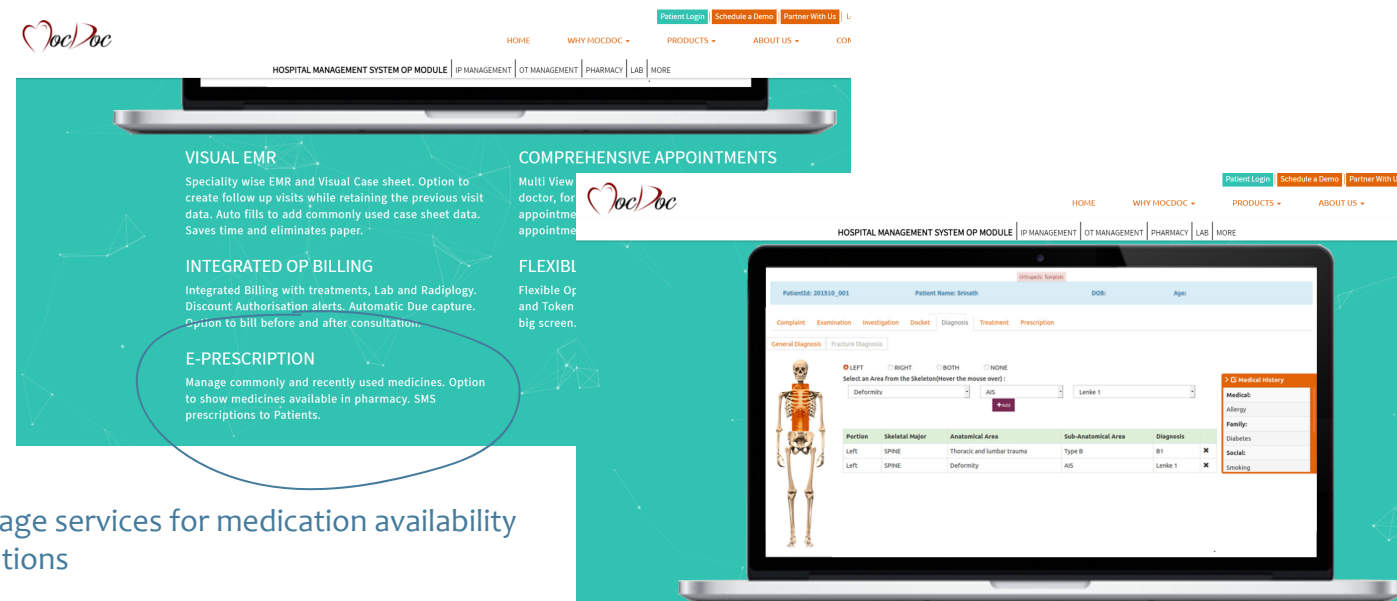
Possible Interventions



Immerse

- **Secondary research** around ways to help nurses track medications
- **Competitor analysis:** Technologies/software that facilitate medication tracking

MocDoc HMS [1]



Use of message services for medication availability and prescriptions

Display of other necessary patient details

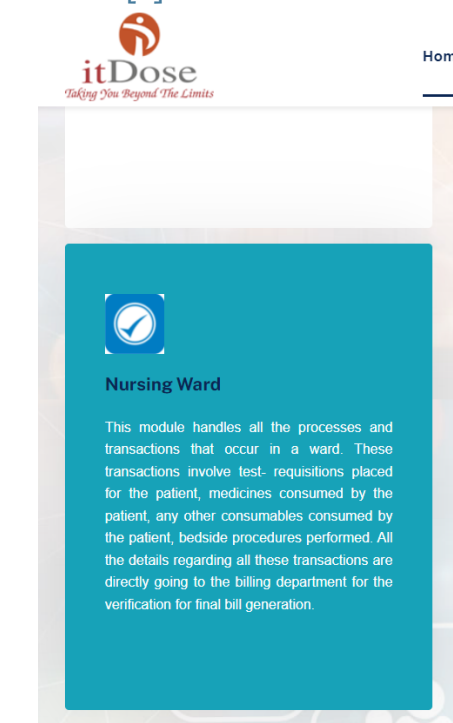
Suvarna Technosoft [3]

Nursing

The nursing management module is tightly integrated into the total HIMS system at every level. The nursing management module offers nurses a totally automated solution for managing their day-to-day functions in an effective manner. These include patient history management, Test orders, and report validation, drug indenting and returns, patient-specific alerts for specific medical procedures. The nursing module can also be integrated with a knowledge base to provide information access for nurses and staff on floor duty which increases their knowledge level and awareness.

Patient history, test orders, reports, medications, patient specific alerts

itDose [2]



Facilities for medicines, tests and bedside procedures

PharmTrac.PD (Plus Delta Technologies, Durham, NC) is one example of MDTT. This mobile tool offers barcode-enabled medication tracking and collects data via a web-based portal viewable by authorized staff members. [4]

Secondary research insights

In-basket messaging provides nursing staff with the **ability to send typewritten messages to pharmacy staff** through the EHR and is the primary method of communication regarding medication requests. [4]

The Institute of Medicine estimated hospital patients are subjected to an average of at least one medication administration error per day. [7]

Medication safety [5]

Ask **another nurse to perform an independent double check** and rectify any discrepancies BEFORE administering the drug.

Be aware of the ISMP's and your facility's list of **confused drug names**, which includes sound-alike (such as Zocor and Cozaar) and look-alike (such as vinblastine and vincristine) name pairs. Take extra precautions when administering drugs from these lists. Your facility may also have extra safeguards in place, such as **requiring both the brand and generic name be recorded, including the purpose** of the medication with all orders, or **setting up computer selection screens** to prevent look-alike names from appearing near each other.

Pay attention to **Tall Man lettering**, a visual safety feature that highlights a section of a drug's name using capital letters to help distinguish look alike name pairs from each other, such as BuPROPion (an antidepressant) from BusPIRone (an anxiolytic)

Educate and provide written instructions to the patient and family (or caregiver) regarding prescribed medications for use when at home and **verify their understanding** prior to discharge.

Nursing Technologies Transforming Patient Care [6]

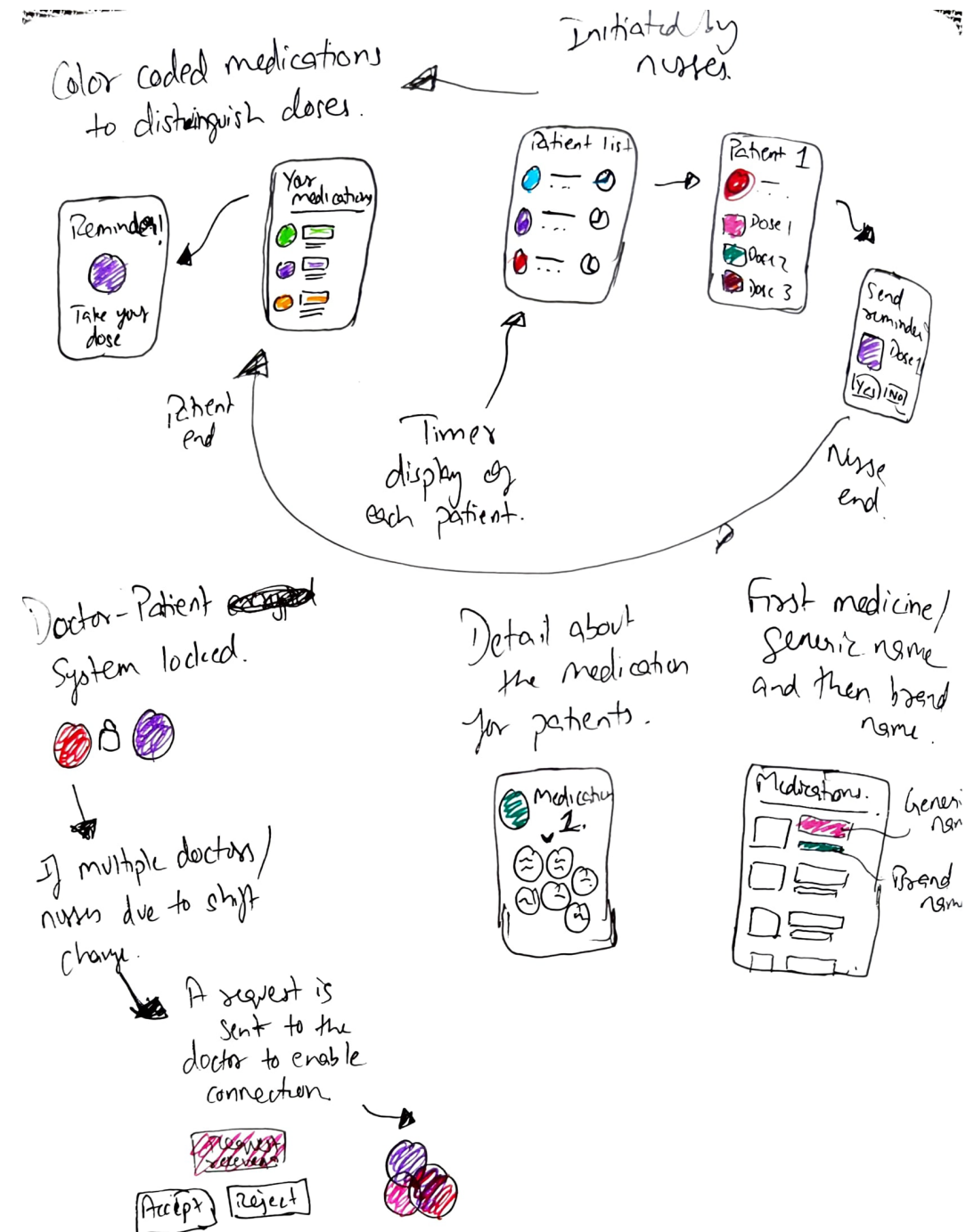
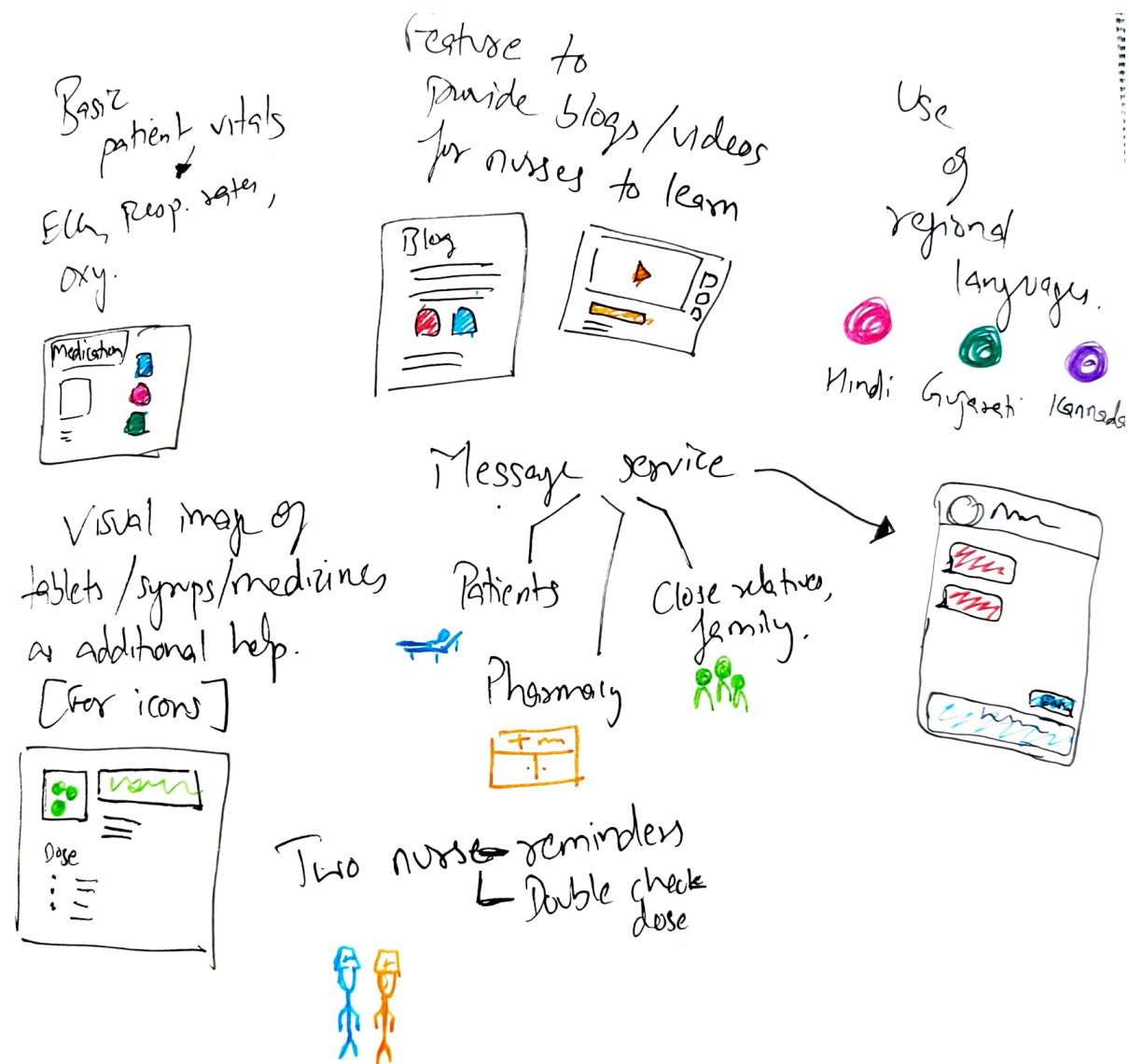
Portable monitor equipment allows nursing professionals to check on patients, even if they're on the move or busy helping someone else. Portable devices monitor vital signs like **ECG, respiratory rates, and oxygen saturations** while transmitting the information **back to a central monitor**. This means that nurses will get an alarm notification if there's an emergency.

With the advancements of new technology in the healthcare industry, it's crucial for nurses to keep abreast of these innovations and elevate their capabilities to match what both patients and the industry require for exceptional care. **Education** is key to navigating these new waters.



Ideation

- Brainstorming for ideas on features to be included in the application.
- Using the TRIZ tool for problem solving



TRIZ (Theory of Problem Solving) tool

- From the 39 parameter, selecting the **worsening** and **improving** features regarding the problem at hand.

Worsening feature, 24: **Loss of Information**

Improving feature, 37: **Difficulty of detecting and measuring**

- Referring the TRIZ contradiction matrix to mark the principles for resolving the design contradictions, which are:

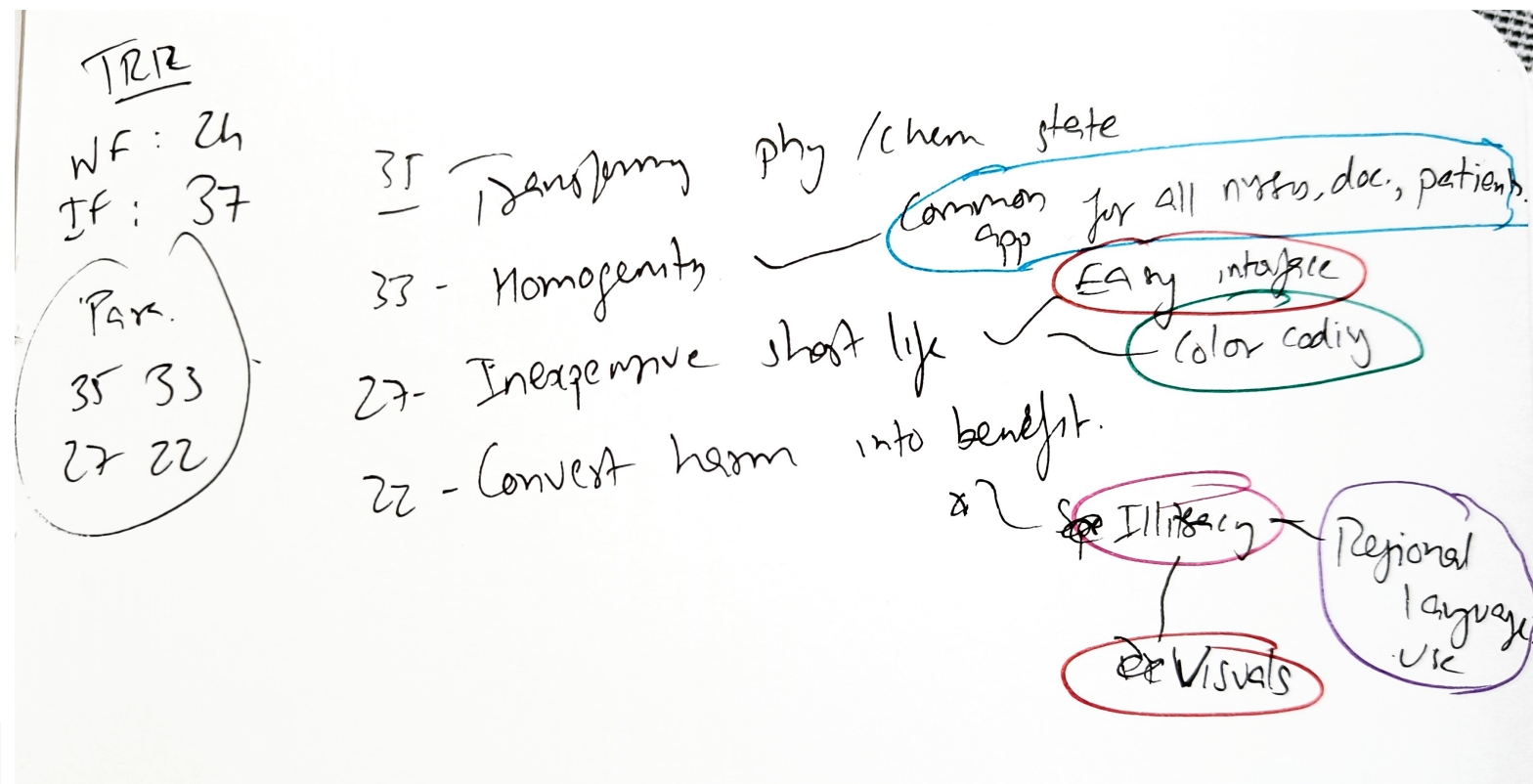
35: Transforming the physical or chemical state of the object

33: Homogeneity

27: Inexpensive short life

22: Convert harm to benefit

- Laying out ideas on these principles for the application.

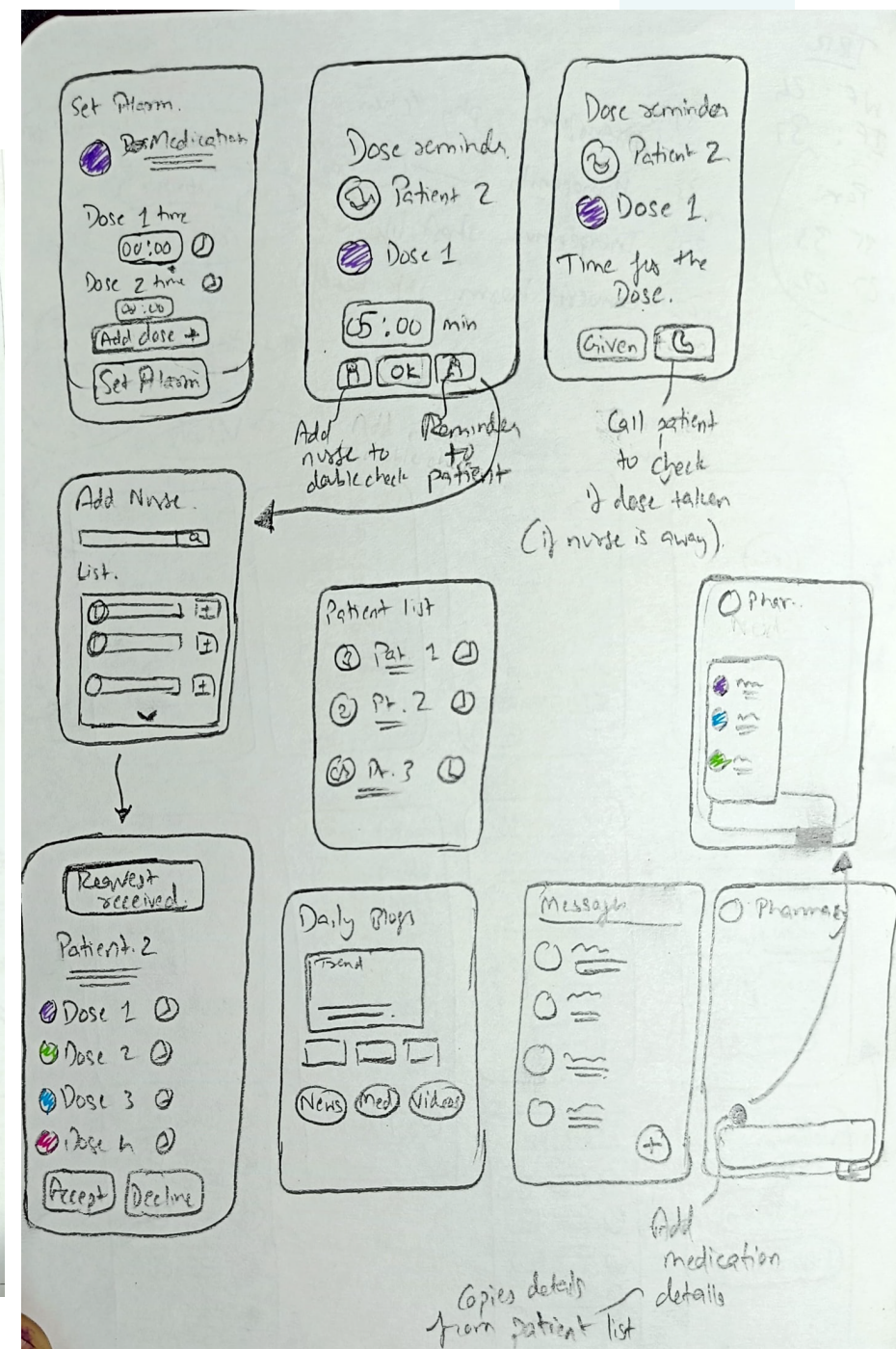


- **Rough wireframes** for the main content pages of the app that highlights concepts from ideation.
- **High fidelity** app interface on Figma

The image displays a series of hand-drawn wireframes for a mobile application, organized into a grid. The wireframes are as follows:

- Top Row:**
 - Screen 1:** A screen with a "Logo" and "Login" / "Sign Up" options.
 - Screen 2:** A "Sign Up" screen with fields for Name, Age, Gender, Ph. No, Mail, and Language pref., followed by a "Next" button.
 - Screen 3:** A "Sign in As" screen with radio buttons for Patient, Doctor, and Nurse, a "Location / Hospital" field, and a "Next" button.
 - Screen 4:** An "Id. No." screen with a "Department" field, a "Scanned copy of Id" field, and a "Sign Up" button.
- Middle Row:**
 - Screen 5:** A "Welcome, NAME" screen with buttons for "New Patient", "Patient list", "Messages", "History", and "Daily Blog".
 - Screen 6:** A "Find your patient" screen with fields for Name, Department, and Date of admission, followed by a "Find" button.
 - Screen 7:** A "Patient Details" screen with fields for Name, Date of Birth, Age, Problem, Treatment, Doc., Lang., Ph. no., Ward No., and Floor, followed by buttons for "Unit", "Call Doc", and "Call Patient".
 - Screen 8:** A "Name" screen with fields for Prob., Treat., and Lang., and a "Medication" button.
- Bottom Row:**
 - Screen 9:** A "Welcome Name," screen with buttons for "Find Patient" and "Find Doctors".
 - Screen 10:** A "Patient list" screen showing a list of patients with "Open" buttons.
 - Screen 11:** A "Medications" screen showing a list of medications with "Medication details" buttons.

Arrows indicate the flow between screens, starting from the "Welcome, NAME" screen and moving through the "Find your patient" screen, "Patient Details" screen, "Medication" screen, and "Medications" screen.



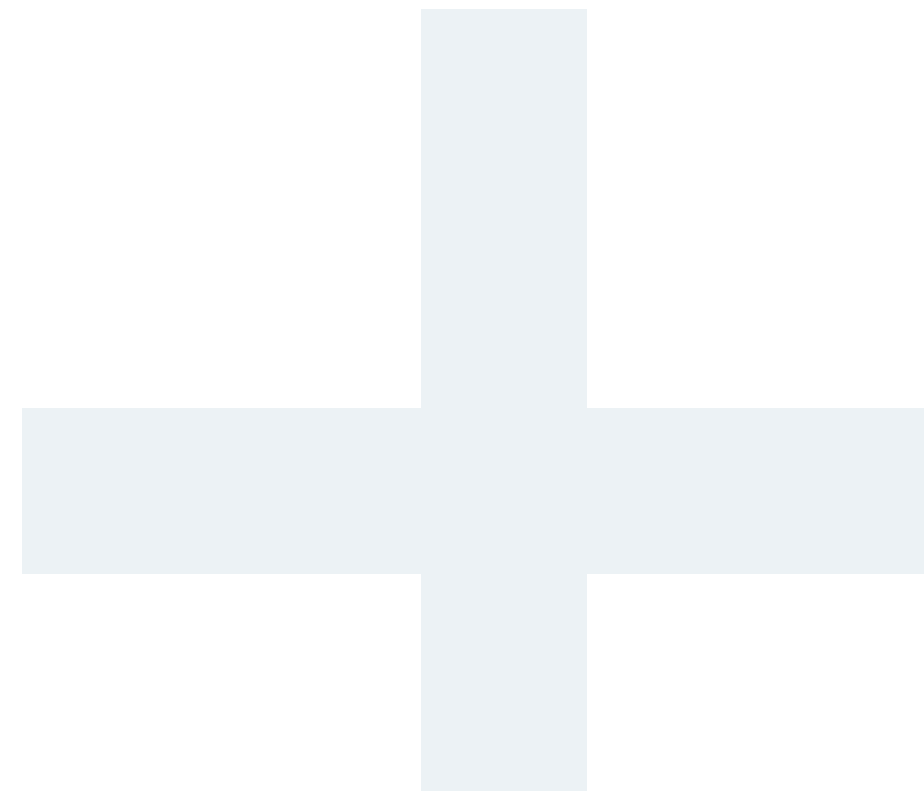
Brand name for the Application: **Tracure**

Track + Cure

Track your/the cure

Logo:

TraC^{ure}

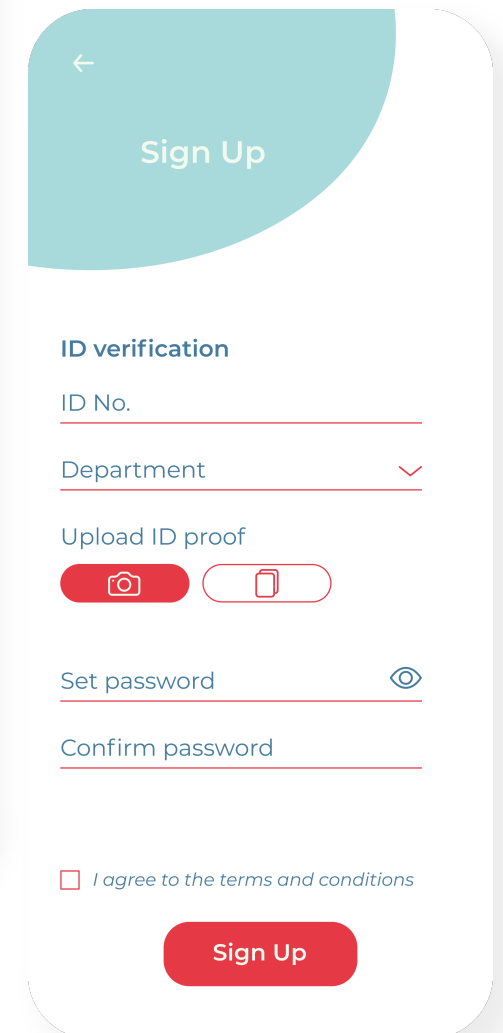
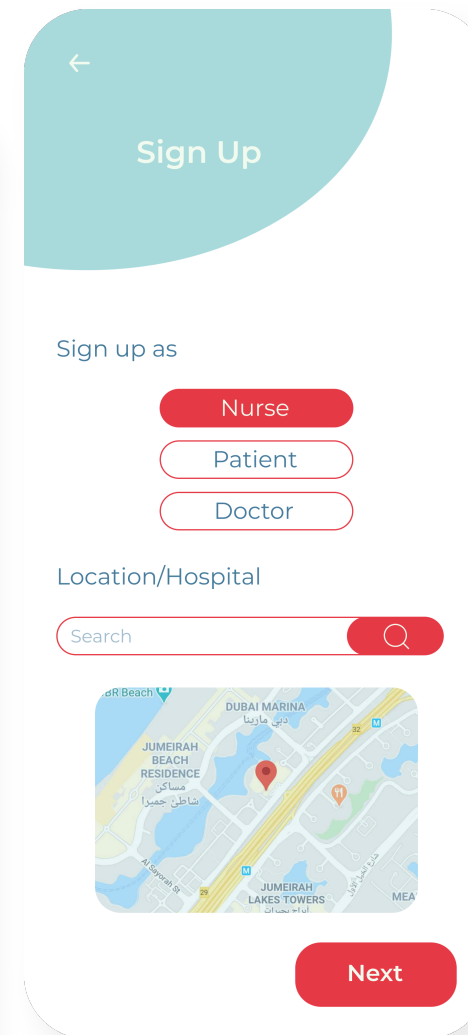
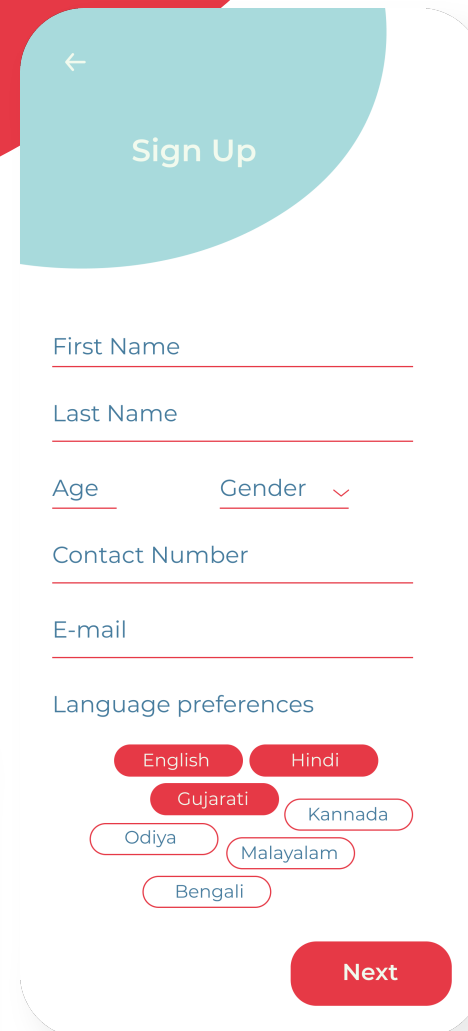
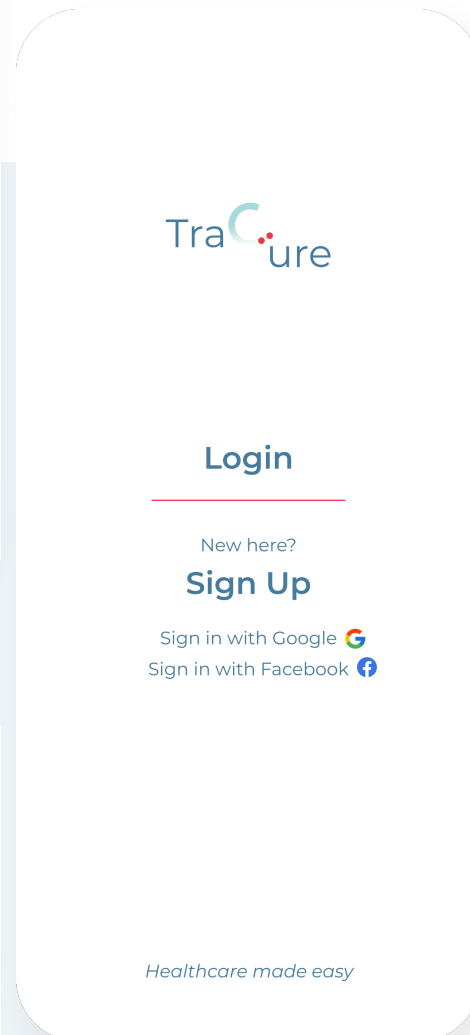


App interface on Figma

<https://www.figma.com/file/XJLUFZCd7S1WOW-FYgkqAoo/Untitled?node-id=0%3A1>

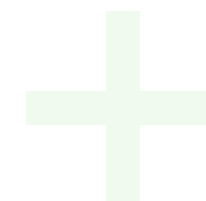


Splash screen

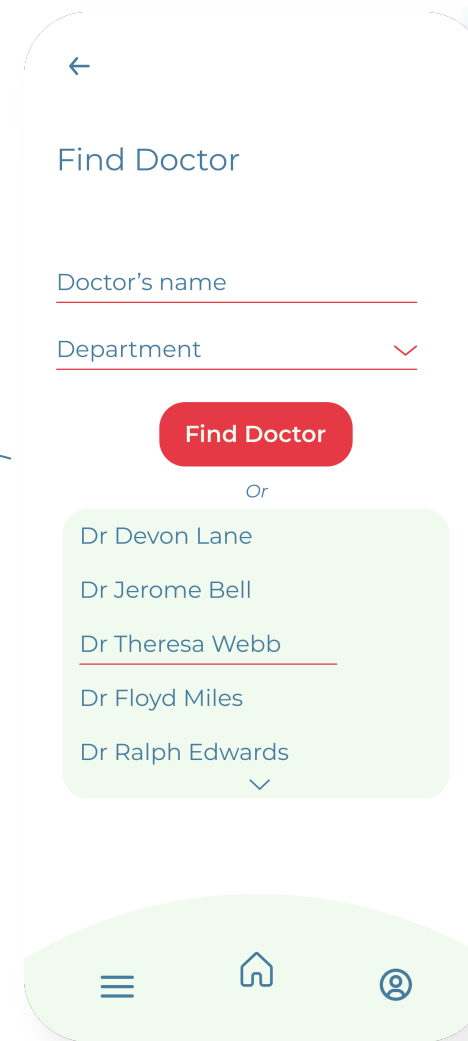
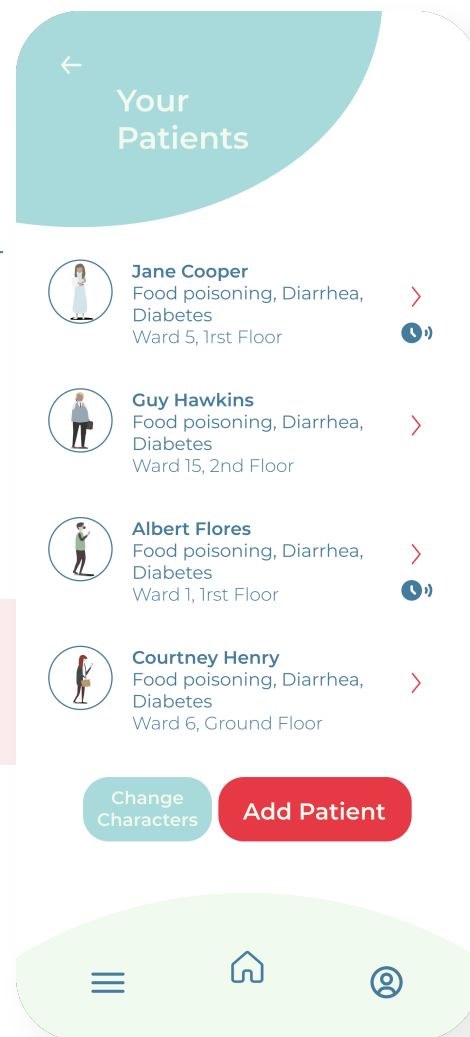
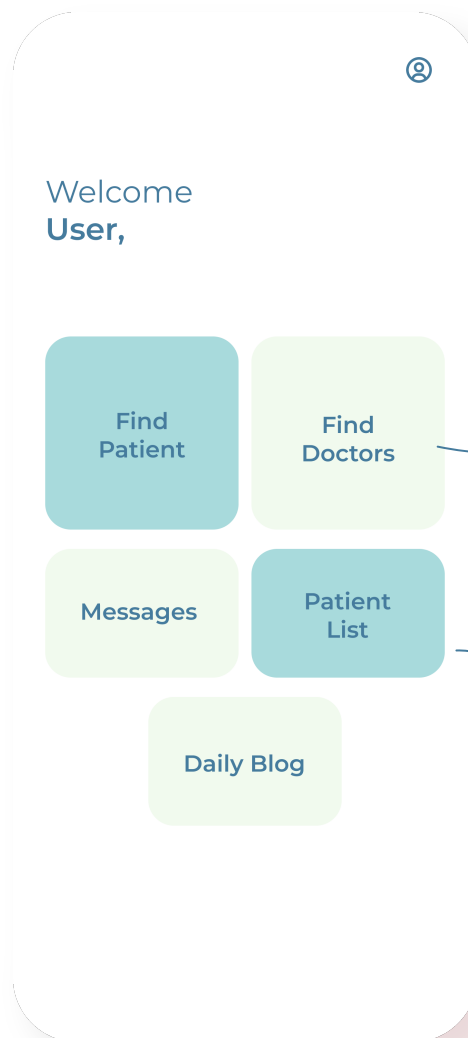


Sign up pages

Asks for location details and ID since the app being a common platform for multiple hospitals



Home Page



Finding Doctors

Patient list

- Shows basic patient details.
- Alarm icons indicate the dose reminders.
- Characters are assigned to each patients to help nurses remember patients.
- Patient photos can also be used if permitted but may get tedious for large number of patients.

Home Page

Welcome
User,

Find Patient

Find Doctors

Messages

Patient List

Daily Blog



Find Your Patient

Patient name

Department

Date of admission

dd/mm/yy

Find Patient



Finding patient

Connecting to the patient

Patient
Detail

Jane Cooper, 50

Illness
Food Poisoning, Severe
Diarrhea, Diabetes

DoA
12/05/21

Treatment
Medication, Saline drip for food
poisoning

Doctor incharge
Dr Ronald Richards

Language preferences
English Hindi

Contact no.
9998887776

Ward No. 5 Floor First

Connect Patient

Call Doctor

Call Patient



You have successfully
connected to
Jane Cooper

You will be handling the
patient's profile

Patient detail

←

Patient Detail

Jane Cooper, 50

DoA
12/05/21

Illness

Food Poisoning, Severe Diarrhea, Diabetes

Treatment

Medication, Saline drip for food poisoning

Doctor incharge

Dr Ronald Richards

Language preferences

English Hindi

Contact no.

9998887776

Ward No.

5

Floor

First

Call Patient

Call Doctor

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Nurses can access patient's vitals and medications after connecting to the patient.

Patient Detail

Jane Cooper, 50

DoA
12/05/21

Illness

Food Poisoning, Severe Diarrhea, Diabetes

Treatment

Medication, Saline drip for food poisoning

Doctor incharge

Dr Ronald Richards

Language preferences

English Hindi

Contact no.

9998887776

Ward No.

5

Floor

First

Call Patient

Call Doctor

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Patient Vitals

37.9 C

110/70

80 BPM

ECG

5 secs ago

The medications are **color coded** to give the nurses a clear distinction among them to reduce errors.

Patient Detail

Jane Cooper, 50

DoA
12/05/21

Illness

Food Poisoning, Severe Diarrhea, Diabetes

Treatment

Medication, Saline drip for food poisoning

Doctor incharge

Dr Ronald Richards

Language preferences

English Hindi

Contact no.

9998887776

Ward No.

5

Floor

First

Call Patient

Call Doctor

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Medications

Tolbutamide 500 mg
2-3 times daily

Bismuth subsalicylate link
2-3 times daily

ibuprofen (Advil)
2-3 times daily

←

Medications

Tolbutamide 500 mg
Brand

More info

🕒

Bismuth subsalicylate link
Brand

More info

🕒

ibuprofen (Advil)
Brand

More info

🕒

Change Color Code

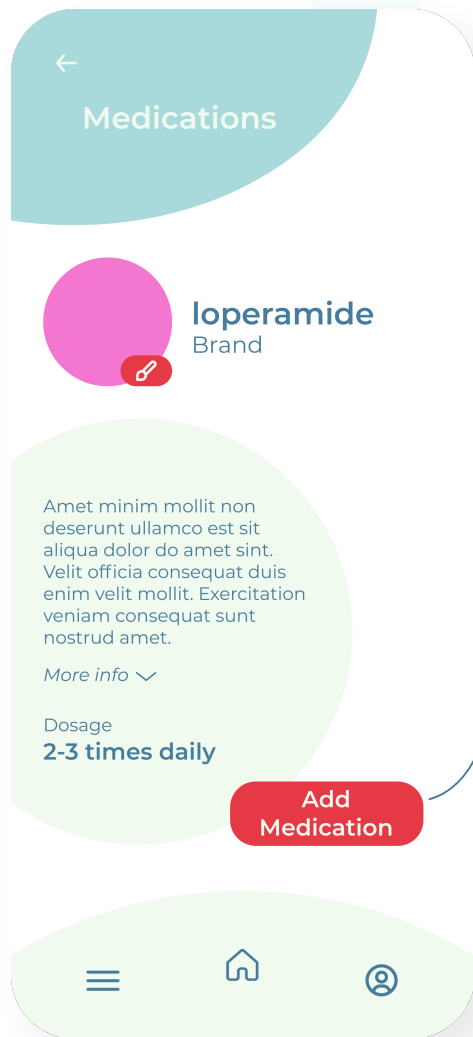
Add Medication

≡

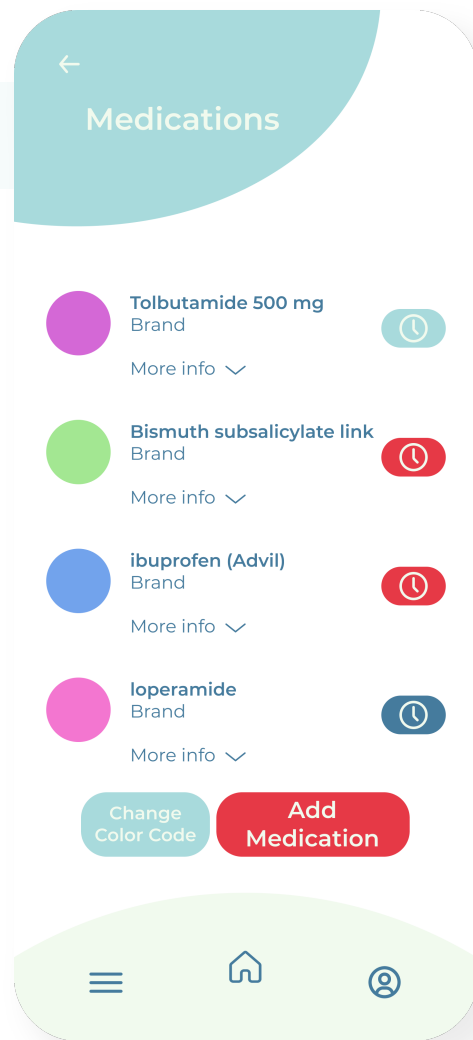
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Nurses can access the medication info, dose alerts and also add medication if required
They have an option to choose the color code they want to assign to any medication



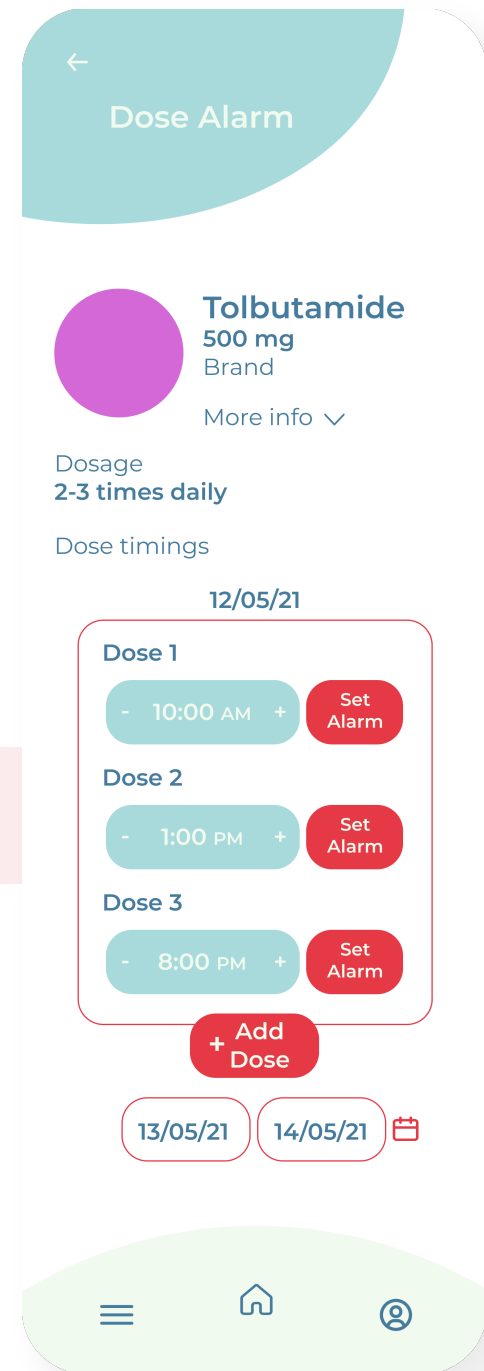
Each medication description page contains a detailed explanation of the same



The alarm alert icons are highlighted in colors of dose taken, dose time near, adequate time for dose

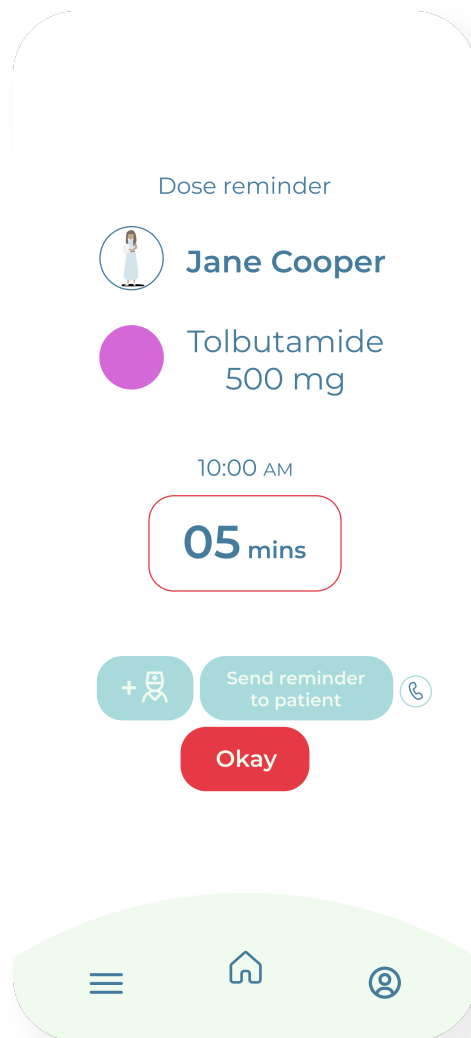
-  Dose time near
-  Dose taken
-  Adequate time for dose

Setting dose alarm



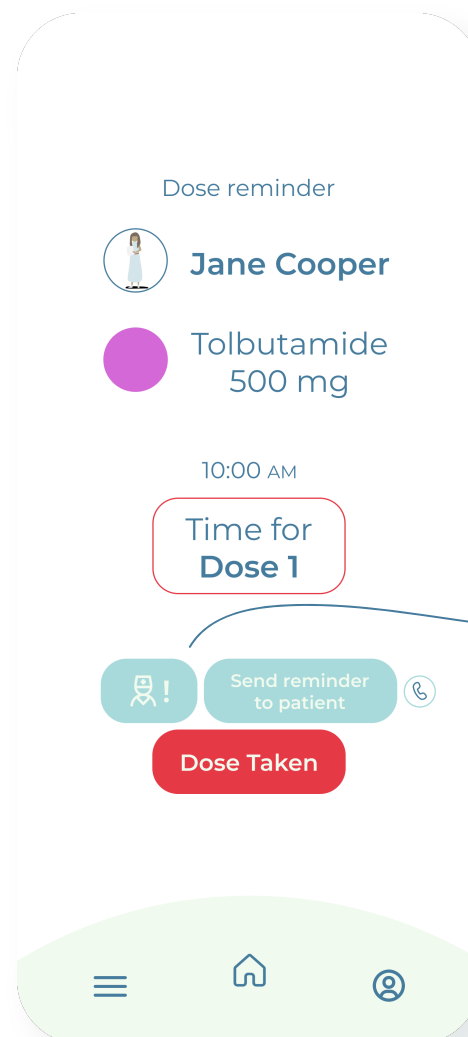
Each dose alarm can be set across the day, can add multiple doses and can add dose alerts for other dates.

Dose reminder



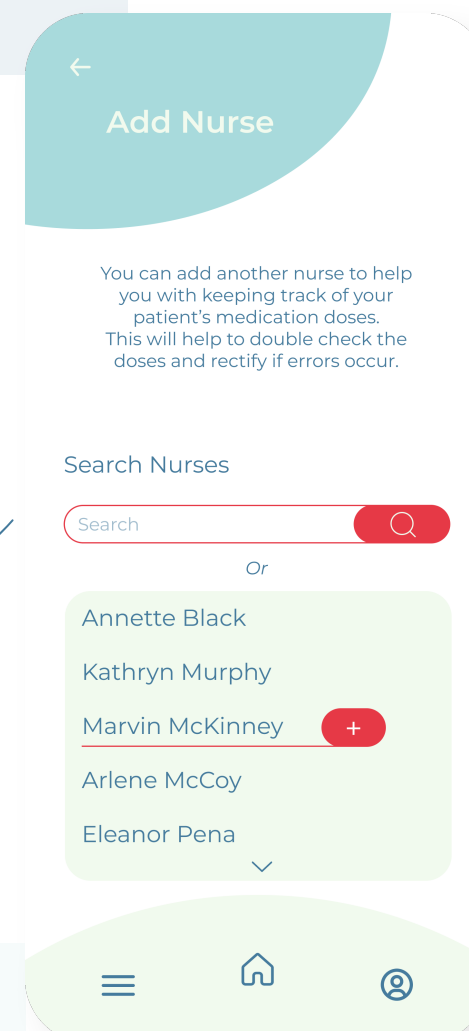
The app reminds the nurse of the dose timings a few minutes before the dose time is set.

Nurses can add a second nurse as a help to avoid errors.

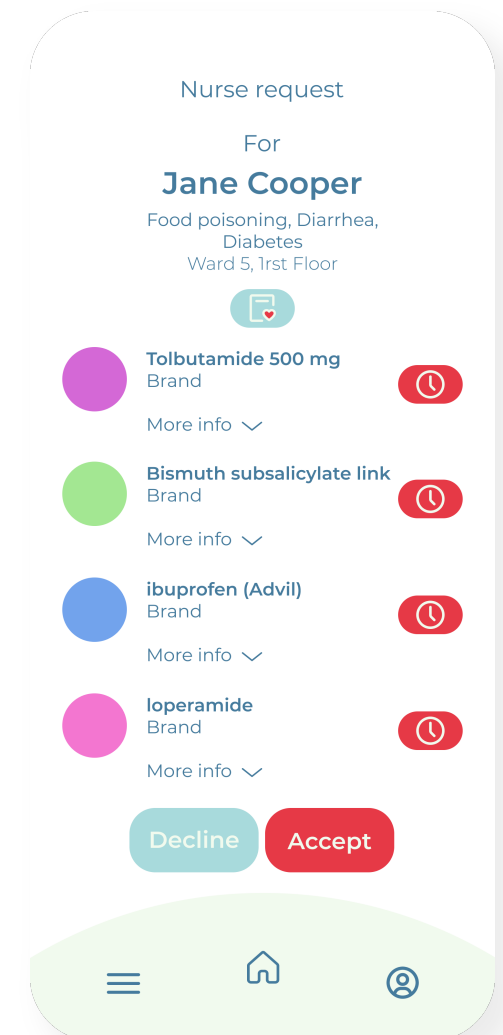


It also has options for sending the dose reminder to the patient.

Adding nurse

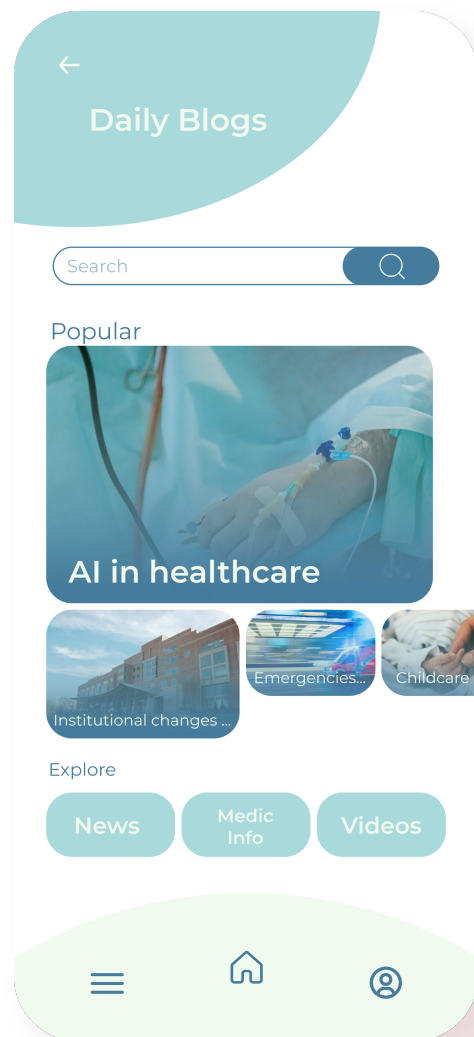


Nurse request



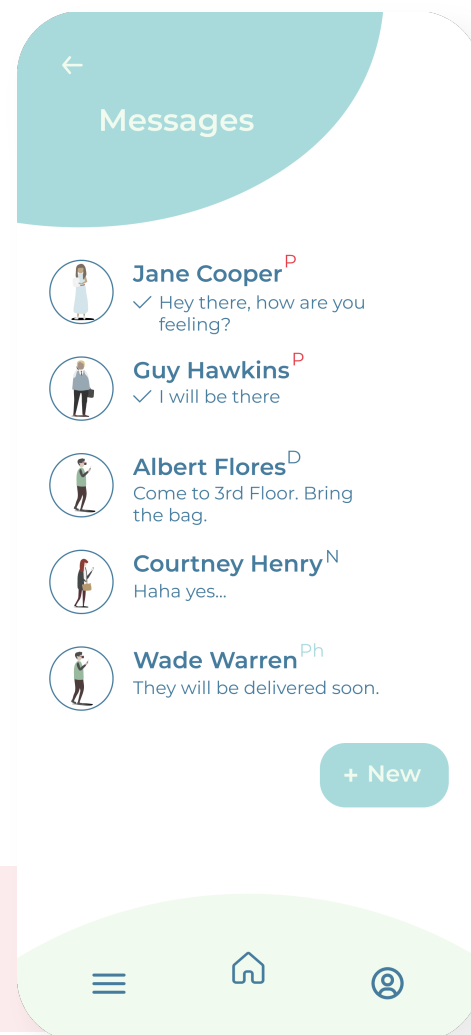
A nurse request will be sent to the new nurse. The nurse can study the patient details and medications.

Daily Blogs

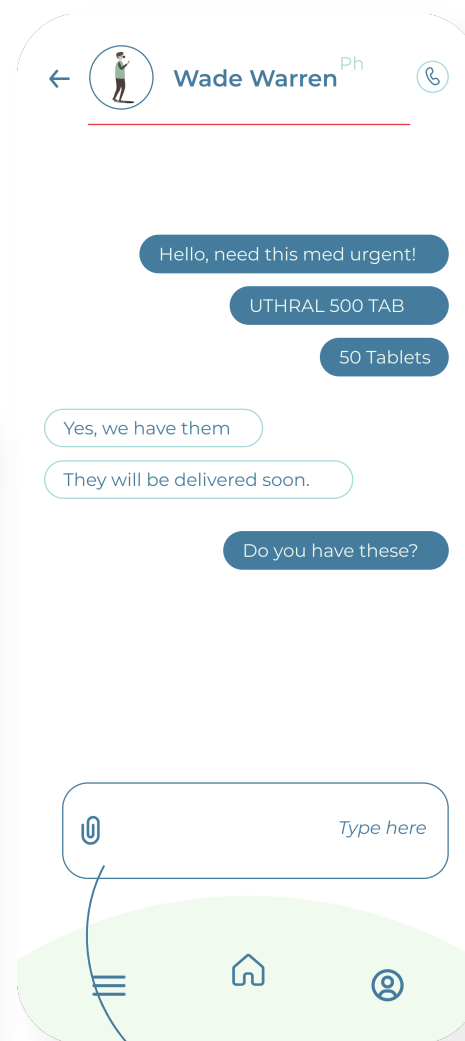


Latest medical blogs for nurses to read. Options of daily news, medical information and video content.

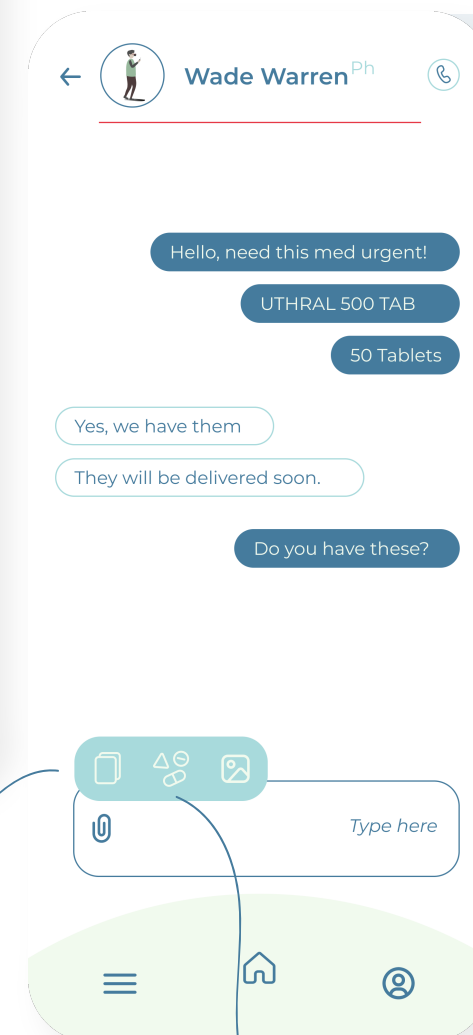
Messages



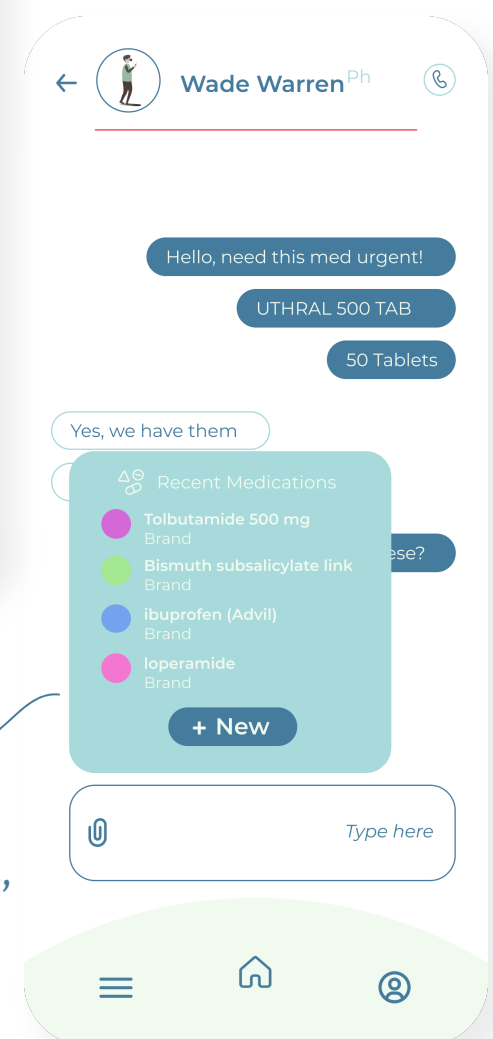
Message any patient, nurse or doctor registered with the app. One can also access the linked pharmacies to give orders for medications.



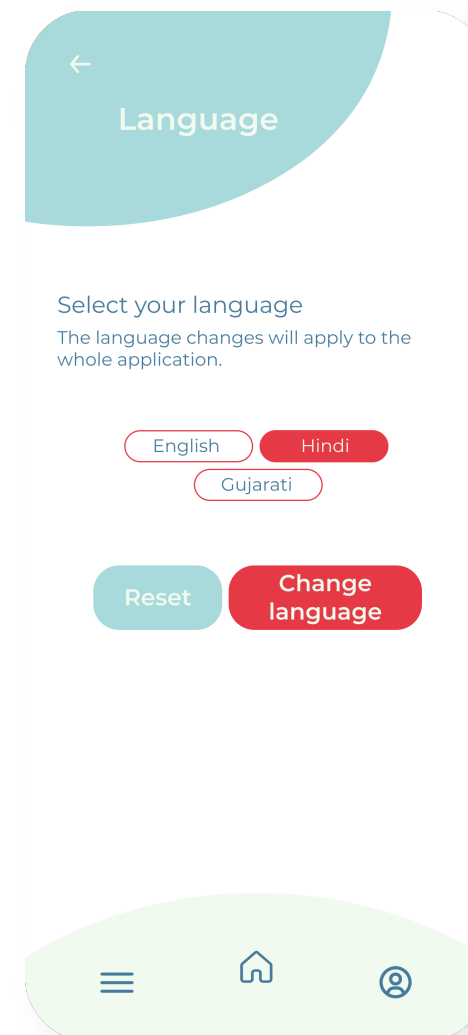
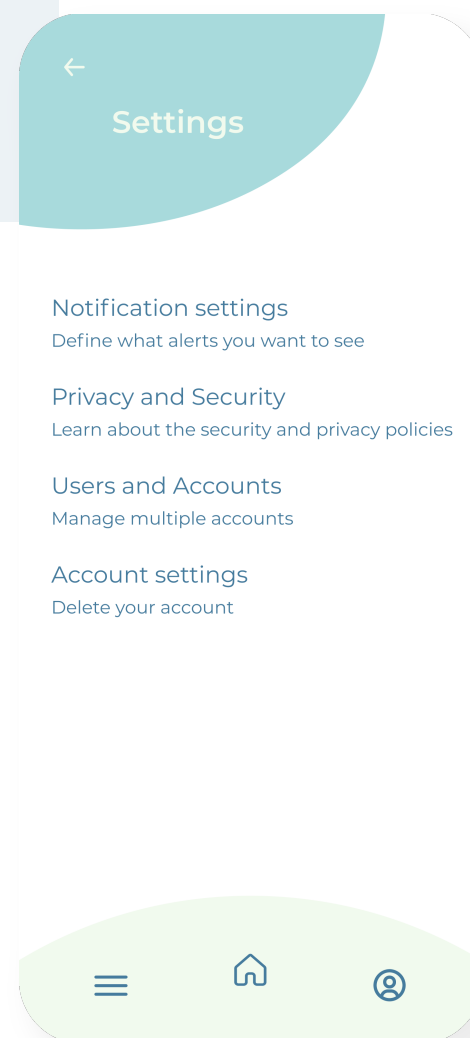
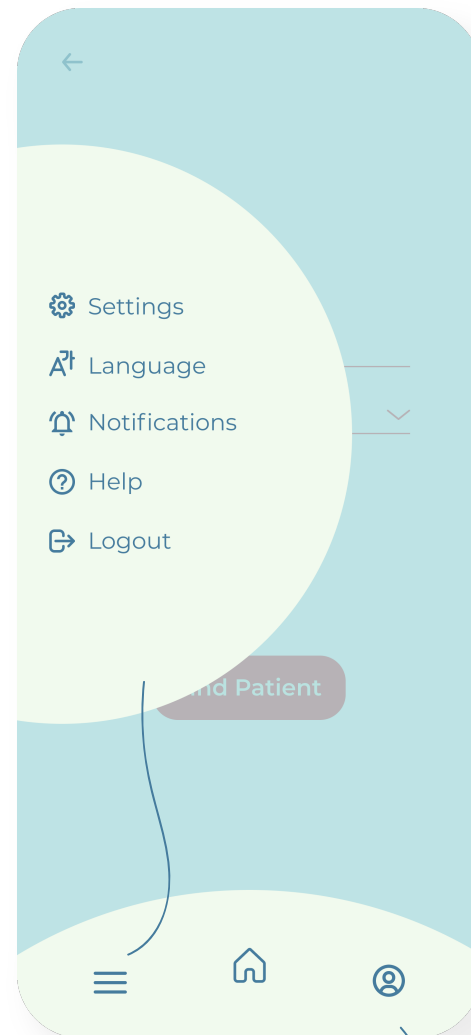
P - Patient
D - Doctor
N - Nurse
Ph - Pharmacy



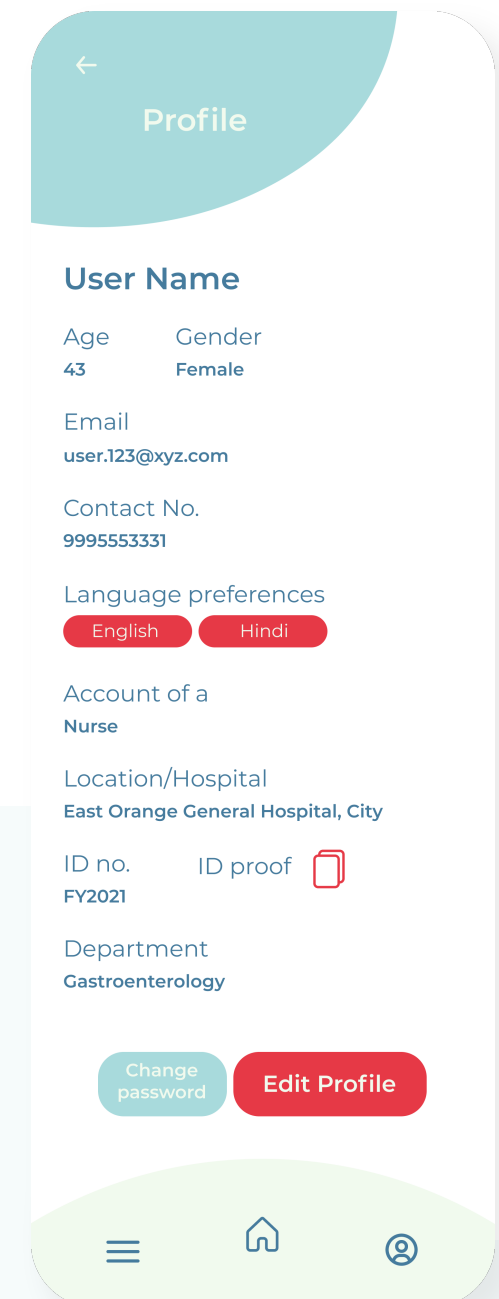
Chats have attachment options for files, referring to recent medications, and images.



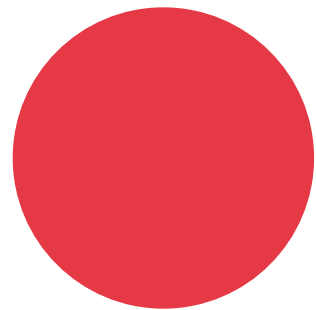
Menu



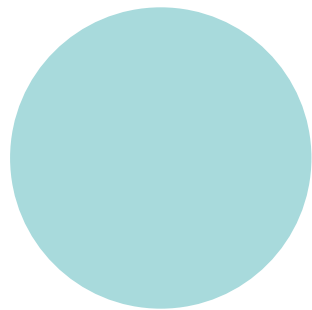
Profile page



Color Palette



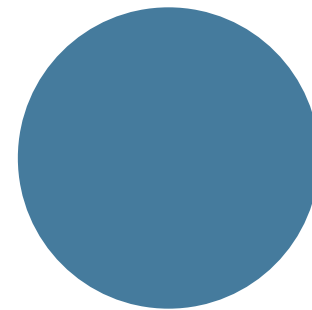
#E63946



#A8DADC



#F1FAEE



#457B9D

Fonts

Montserrat Regular AaBbCcDd

Montserrat Semibold AaBbCcDd

Montserrat Italic AaBbCcDd



References:

1. <https://mocdoc.in/util/hospital-management-system>
2. <http://itdoseinfo.com/hospital-information-management-system.php>
3. <https://suvarna.co.in/products/hims>
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5030876/>
5. <https://www.nursingcenter.com/ncblog/may-2016/medication-safety-go-beyond-the-basics>
6. <https://www.wgu.edu/blog/7-nursing-technologies-transforming-patient-care1903.html#close>
7. <https://www.psqh.com/analysis/making-the-most-of-data-for-patient-safety-how-dose-tracking-software-a-customized-drug-library-and-expert-in-depth-analysis-provide-safer-data-driven-dosing/>
8. <https://healthblog.uofmhealth.org/wellness-prevention/8-easy-ways-to-remember-to-take-your-medication>