Singapore Healthcare Management 2022

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Acknowledgements: We would like to thank the SMU-X program for supporting this research.

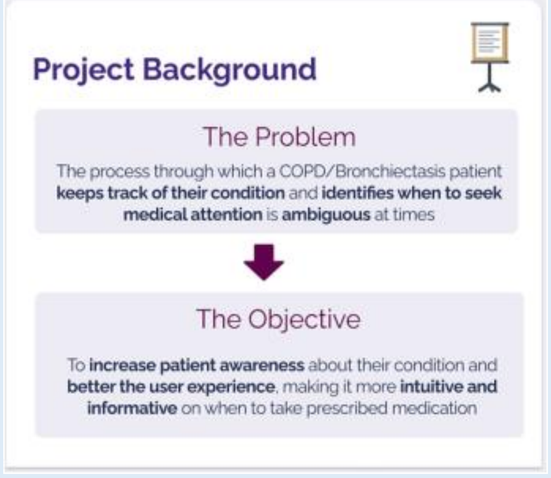
Development of a Bronchiectasis/COPD Action Planner Prototype APP for Patients

INTRODUCTION:

Sputum purulence is associated with bacteria in the lower respiratory tract. Patients with acute infective exacerbations of chronic obstructive pulmonary disease (COPD) and bronchiectasis often have increased sputum purulence. These patients may be prescribed standby antibiotics or other medications to be initiated during exacerbations of their lung conditions.

AIM:

This project aims to develop an App that guides patients in the self-management of their conditions, including the decision on when to begin antibiotics treatment in order to reduce healthcare visits and cost.



Research Methodology

Self-documentation

The team performed secondary research on existing solutions and identified their advantages and limitations:

- WebMD: Too much information clutter; No clear action plan provided to the user
- COMARCH Healthcare: More pre-emptive rather than reactive; Gives patients confidence about condition

User Interview

An in-depth interview was conducted with a bronchiectasis patient to identify their challenges & pain-points:

- Unable to determine when to start taking medication and which medication to take
- Unsure of the stages of her condition
- Needs to visit doctor to decide course of action
- Prefers to go straight to the hospital instead of GP first

Expert Interview

An in-depth interview was conducted with nurses from the airway disease team to identify their challenges and perspectives:

- Patients are not knowledgeable about their own conditions and the treatment methods
- Patients do not know how to use their medication correctly, and refuse to try other methods
- Patients keep their own records for medication & food

The Patient (User)

User Pain Points

1. **Lack of clarity on medication**
   - What medication to take?
   - When to start and stop taking medication?
   - How much medication to take?
2. **Absence of timeliness**
   - Forgetting to take medication
   - Missing key timings to take medication
   - Not sure when medication was last taken
3. **Lack of awareness**
   - No awareness on details of condition
   - No awareness of intricacies or personal aspects of condition

The User Journey

Awareness

User feels uncomfortable, unsure how to categorize symptoms and opens up the RESPIRE app

Check symptoms

User indicates their symptoms for all the relevant categories in the symptoms checklist

Action Plan steps

User has a clear action plan to follow and take their medications, without needing to visit the doctor

Take medication

User can keep track of their medication intake and remain consistent in their daily medication

Wellbeing overview

User can monitor their overall health over a longer period and update their doctors on any discrepancies

The Solution

Based on our findings, the team determined that a native mobile application would best solve the users' needs

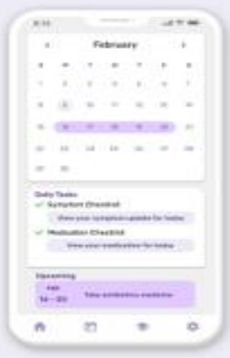
Key Features

1 Patient Onboarding

- For user to perform initial setup of the application
- Allows system to **understand patient's conditions and baseline symptoms**
- Patient can capture or upload photo of baseline sputum which will be the **basis for monitoring exacerbations** in their condition

2 Calendar

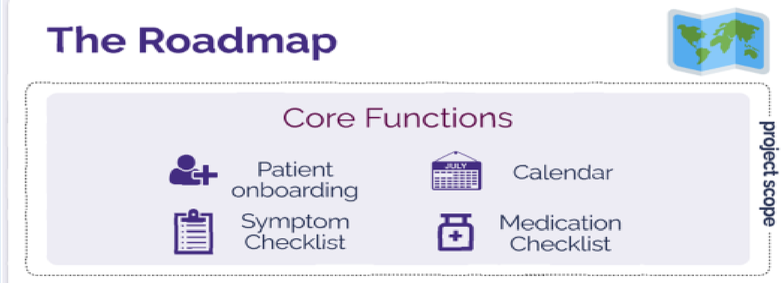
- Provides an **overview of events** for the month
- Highlights **medication** periods
- Displays whether the **daily tasks** (Symptom Checklist & Medication Checklist) have been completed
- Provides **reminders** for upcoming events



3 Symptom Checklist

- **1-minute checklist** about patient's symptoms for the day
- **Sputum monitoring/tracking** using camera to take a photo of current sputum color to be compared against baseline or previous day
- Upon completion, it displays results that **classify the patient's condition** under red, yellow, or green zone and **lists further actions** to take

The Roadmap



Tools & Techniques

The Limitations

1. **Poor design & accessibility**
   Filling in the wrong information can lead to confusing call to actions
2. **Cyber-attacks & security breaches**
   Failure to protect systems can cause users to not want to use the app
3. **Integration across devices & channels**
   Scale and integrate across all platforms so users can interact with the app in various mediums

CONCLUSION:

A prototype web application has been developed to increase patient awareness about their condition. User experience has been enhanced through a design and agile design and development approach to foster the self-management of COPD and Bronchiectasis patients.

RESPIRE
The COPD & Bronchiectasis Monitoring App