Project Title

PERMELIS – A PERsonalized Medication List for our patients

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Organisation(s) Involved

SingHealth Polyclinics, SingHealth Health Services Research Centre, Singapore University of Technology and Design

Healthcare Family Group(s) Involved in this Project

Pharmacy

Applicable Specialty or Discipline

Pharmacology

Aim(s)

- To develop an application to easily and efficiently generate personalized medication lists (PMLs) as well as to determine polyclinic patients' receptiveness to use PMLs generated from the application

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Additional Information

Singapore Healthcare Management Congress 2022 – Merit Award (Patient Experience category)

Project Category

Care Continuum, Preventive Care, Patient Education

Care & Process Redesign, Value-based Care, Patient Satisfaction

Technology, Digitalisation, Systems/Platforms

Keywords

Personalised Medication, Medication Counselling, Patient Education, Medication Understanding, Medication Adherence, Safe Use of Medication

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permelis

A PERsonalized Medication List for our patients

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Singapore Healthcare Management 2022

Polyclinics SingHealth

Aim

To develop an application to easily and efficiently generate personalized medication lists (PMLs), as well as to determine polyclinic patients' receptiveness to use PMLs generated from the application.

Links

Scan the QR code to access **PERMELIS**

Scan the QR code to access the video demonstration

Motivation

- Patients' understanding of their medications is key to continued adherence and safety. [1]
- In Singapore, medication understanding is sub-optimal, especially among patients with multiple medications prescribed. [2]
- Use of PMLs has been shown to improve patients' understanding of their medications. [3]

Methodology

1. **Conceptualization**
   Operational concept sketch (right) mapped out application requirements, architecture and layout.
2. **Design Thinking**
   Design concept was conceived based on user personas of pharmacists, doctors, nurses and patients.
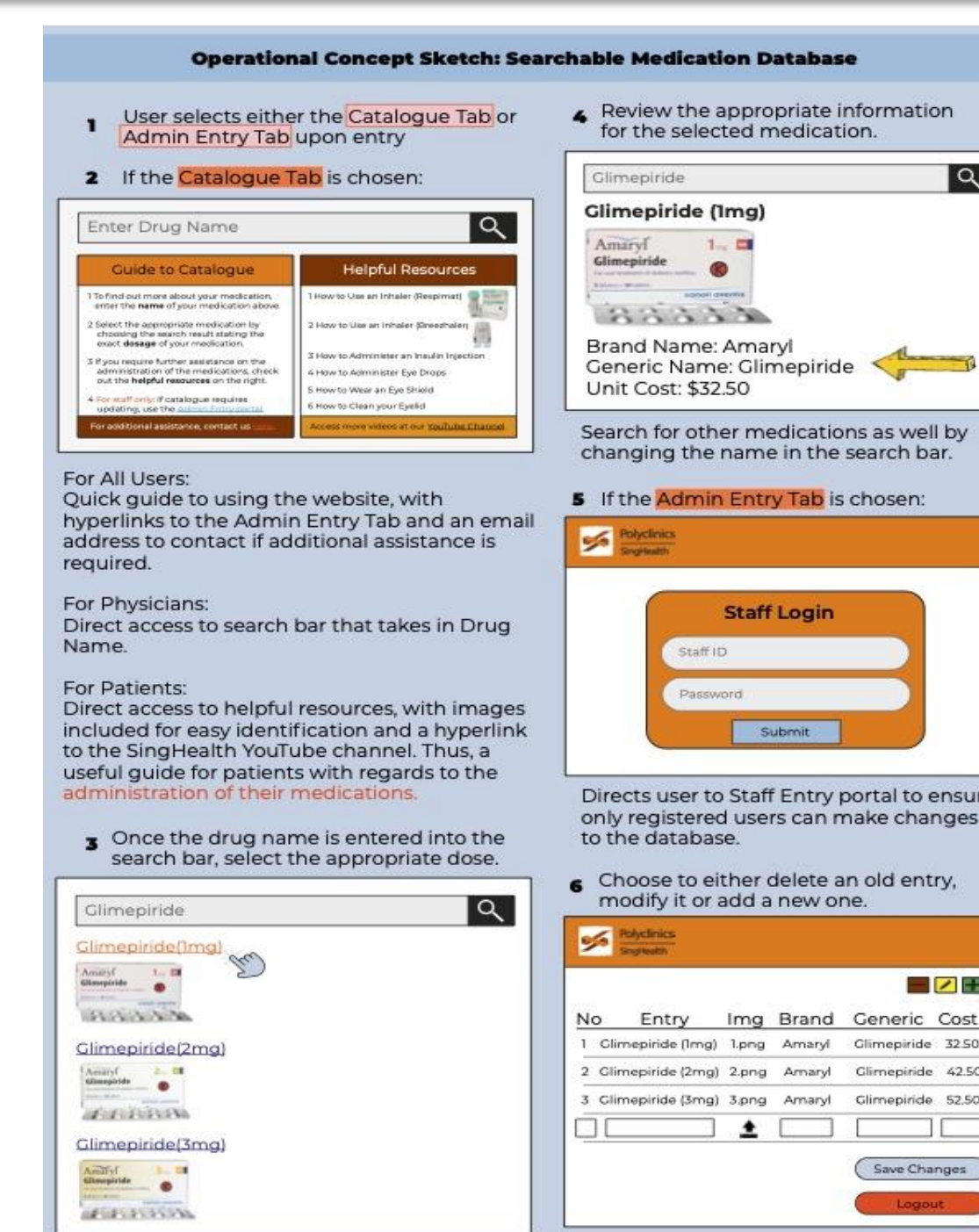3. **Agile Development**
   Functionality and design were refined continuously based on iterative feedback from pharmacists, doctors, nurses and patients till the final version.
4. **Deployment**
   Application was deployed on Amazon Web Services (AWS) to make access ubiquitous via the Internet.
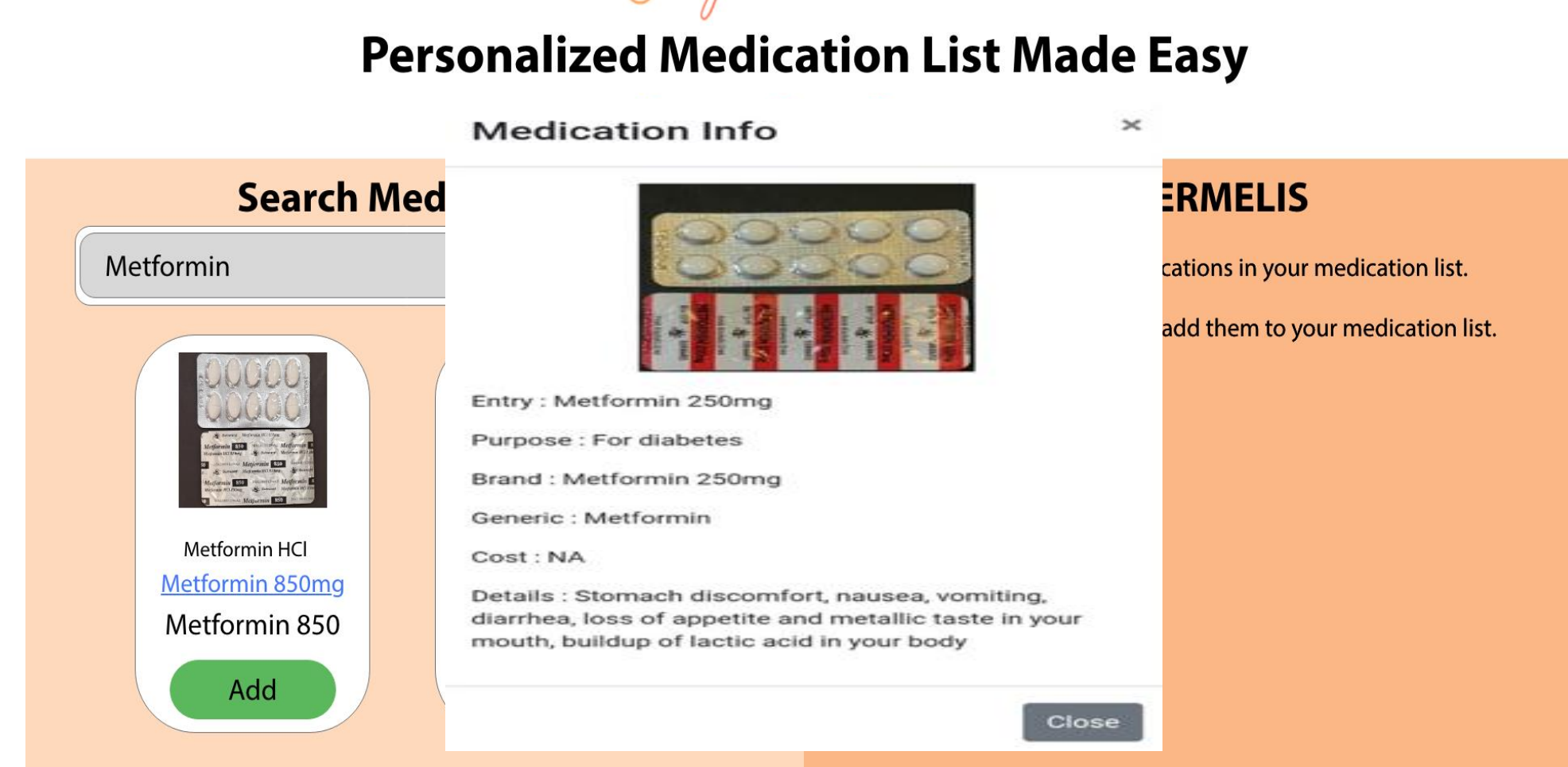5. **Survey**
   Pilot ran in SHP-Bedok for 1 month with 30 patients surveyed.
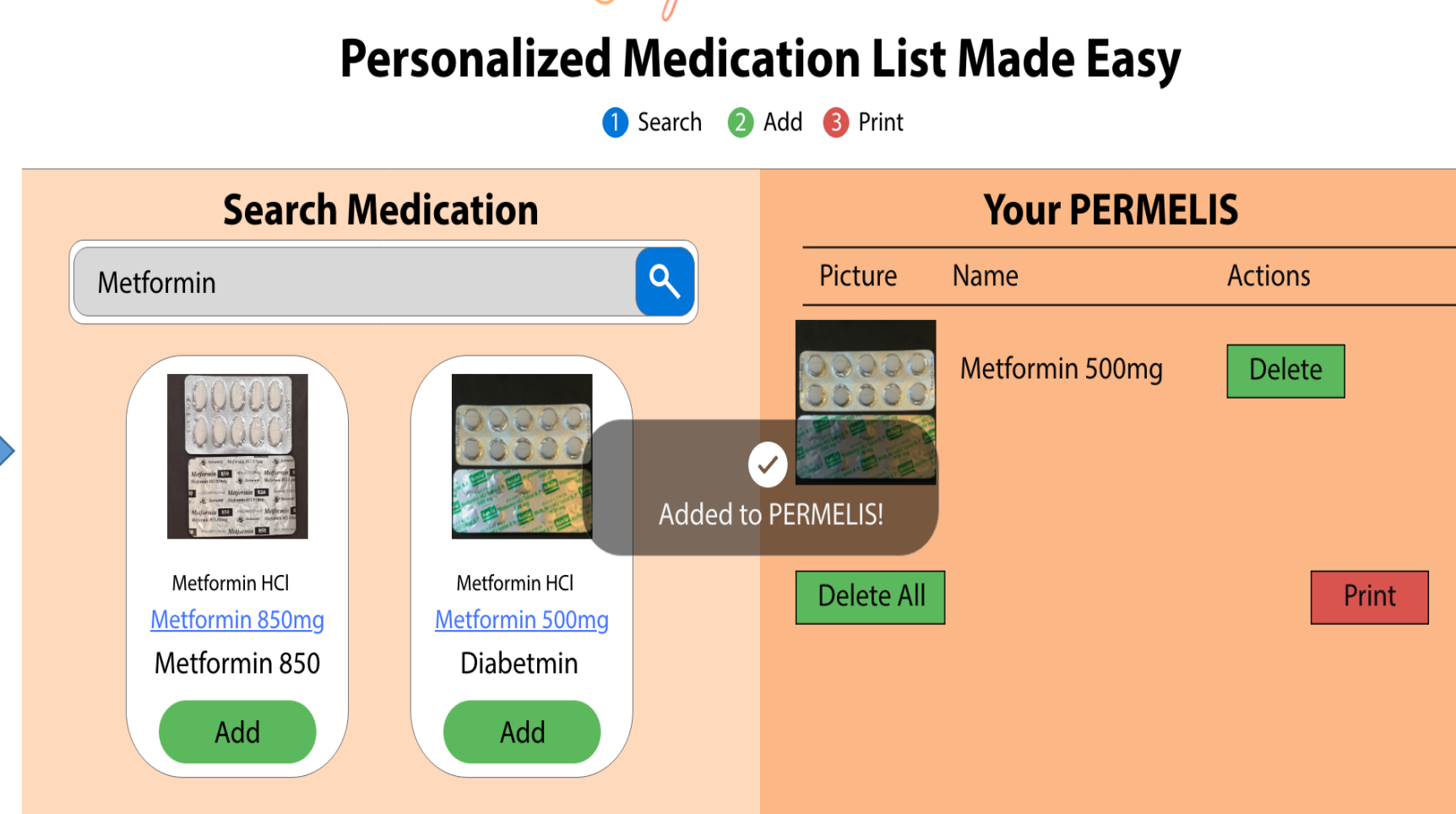
Results

- PERMELIS is a lightweight web application that contains information and images of over 450 medications from the polyclinic formulary.
- It enables pharmacists and clinicians to efficiently generate PMLs featuring pictograms using a "Search-Add-Print" flow.
- An administrator's panel allows for easy updating of medication information, such as the addition of new medications or changes in brands and images.
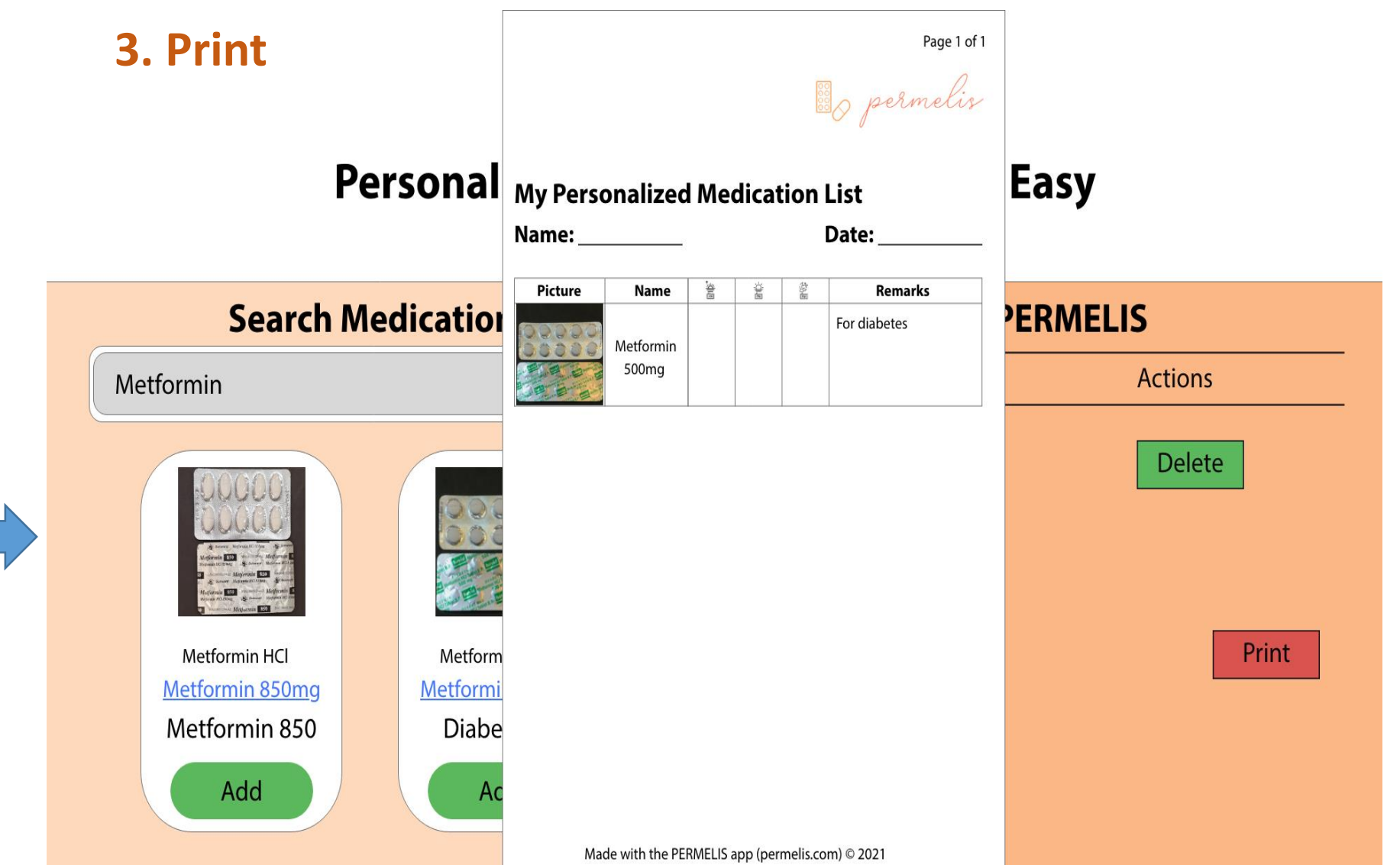
1. Search

- Users search using medication name, brand or purpose to produce image cards.
- Each image card depicts medication information which can be easily accessed by clicking on either the image or name.

2. Add

- Users generate a PML by adding medication using the "Add" button.
- Added medications can be easily removed using the "Delete" button.
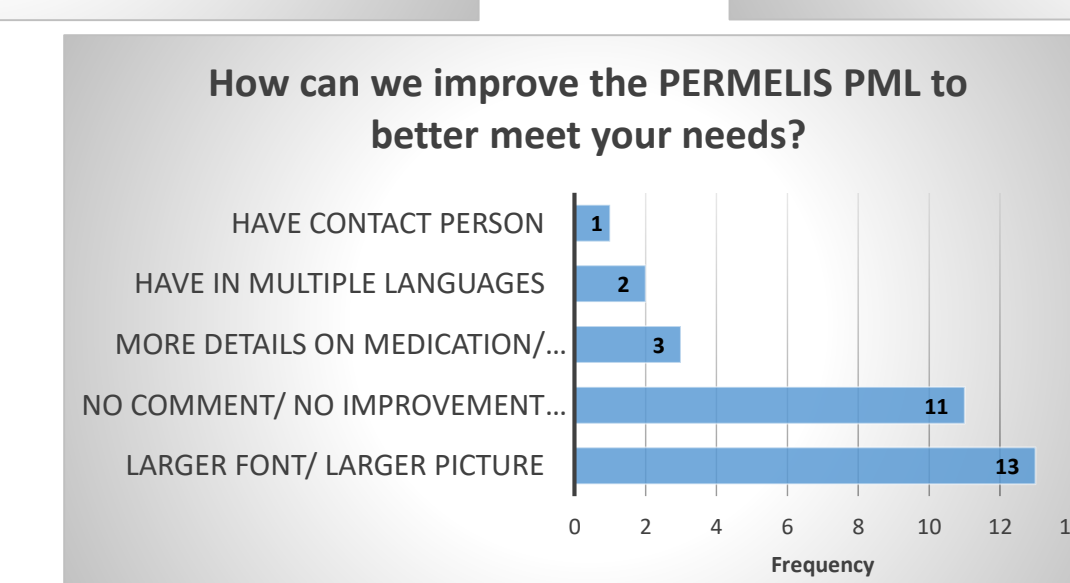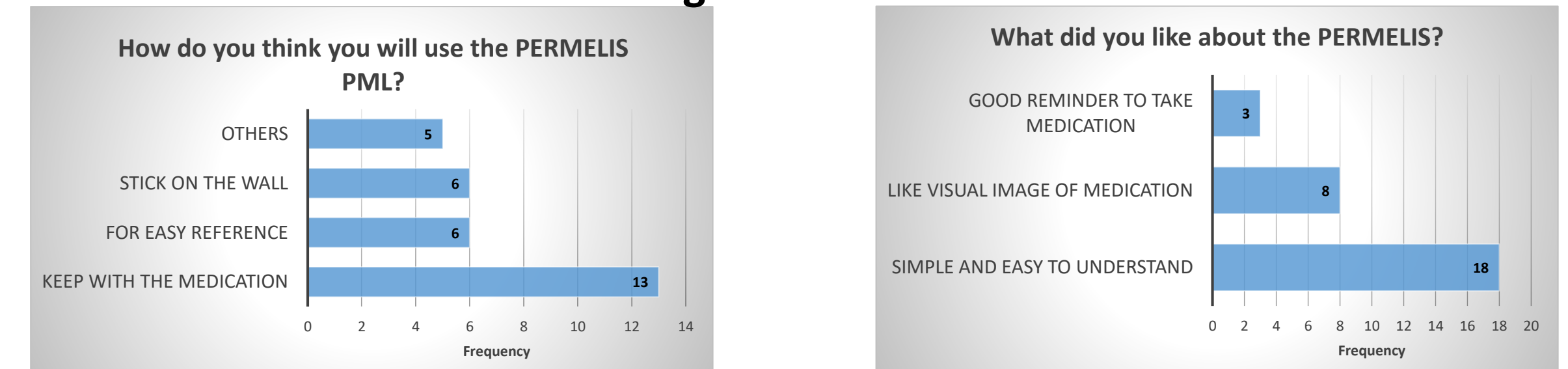- A "Delete All" button clears the entire PML for use on the next patient.

3. Print

- Pharmacists and clinicians can input dosing information on PMLs.
- PMLs can then be printed out as a physical copy or sent digitally to patients.

Patients provided highly positive reviews regarding their satisfaction with PERMELIS and would like to continue receiving PMLs in their future visits.

Question	Median (IQR)
I am satisfied with using the personalized medication list (PERMELIS).	**5** (4 to 5)
The PERMELIS was easy to understand and use.	**5** (4 to 5)
As a result of using PERMELIS, I feel that I am better able to understand my medications.	**5** (4 to 5)
As a result of using PERMELIS, I feel that I am better able to cope with my medications as prescribed by my doctor/nurse.	**5** (4 to 5)
I would like to continue receiving PMLs in my future visits.	**5** (4 to 5)
Amount I am willing to pay (SGD)	**0.50** (0.125 to 1.00)

Note: The maximum score for each question is 5 ("Strongly Agree": 5, "Strongly Disagree": 1).

How do you think you will use the PERMELIS PML?

What did you like about the PERMELIS?

How can we improve the PERMELIS PML to better meet your needs?

Conclusion

- PERMELIS enables pharmacists and clinicians to easily and efficiently generate patients' PMLs, which can be used to guide patients on the use of their medications and supplement their medication counselling.
- Time saved from the ease of generating PMLs using the application can be used to provide more comprehensive medication counselling for the patients, thereby improving safe use of their medications and medication adherence.
- Patients had positive experiences with the PMLs generated by PERMELIS and they would like to continue receiving PMLs in their future visits.

References

[1] Pasina, L., Brucato, A.L., Falcone, C. et al. Medication Non-Adherence Among Elderly Patients Newly Discharged and Receiving Polypharmacy. Drugs Aging 31, 283–289 (2014). https://doi.org/10.1007/s40266-014-0163-7
[2] Tan YW, Suppiah S, Bautista MAC, Malhotra R. Polypharmacy among community-dwelling elderly in Singapore: Prevalence, risk factors and association with medication non-adherence. Proceedings of Singapore Healthcare 28(4), 224-231 (2019). https://doi.org/10.1177/2010105819868485
[3] Hugtenburg JG, Borgsteede SD, Beckeringh JJ. Medication review and patient counselling at discharge from the hospital by community pharmacists. Pharm World Sci PWS. 2009 Dec;31(6):630–7.

Acknowledgements