Involving Speech-Language Pathologists in the Development of a Mobile Health Device for Dysphagia Treatment

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What is Mobili-T®?

- Mobili-T® is a portable mobile health device for swallowing therapy, developed at the University of Alberta.

- The patient user interface of the application (app) and the accompanying mobile device have been created.

- The software that clinicians (speech-language pathologists) will use for remote monitoring remains to be developed.

Figure 1. Mobili-T® hardware.

Our Project

- Perceived ease of use has been shown to increase adoption of mobile health applications among healthcare professionals[1].

- It is important to involve clinicians in the development of Mobili-T® to create an app that meets clinicians' needs.

- The current workable prototype has been built around previous interviews with clinicians.

- To test the app's usability we had clinicians use the workable prototypes and collected their feedback.
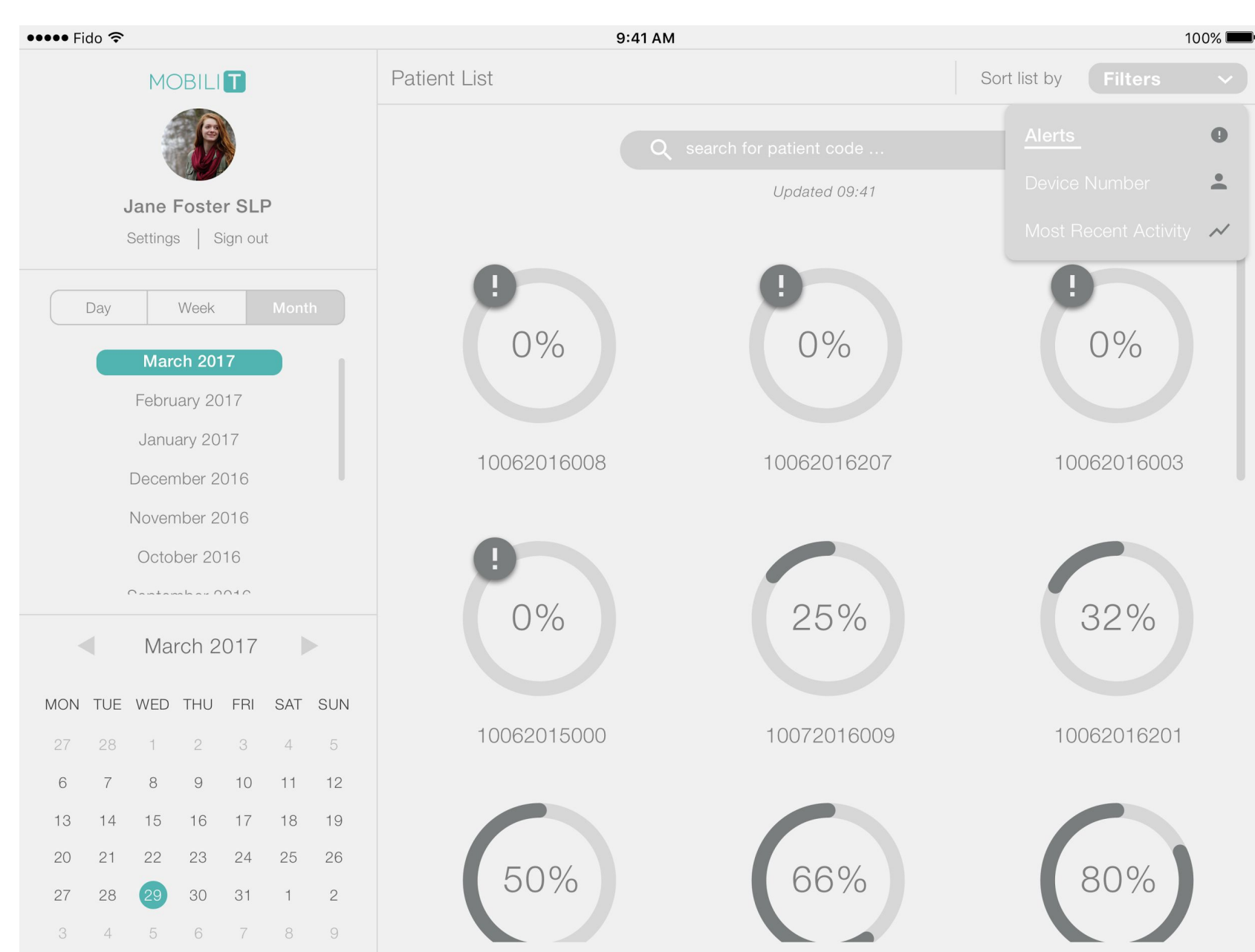

Figure 2. Mobili-T® clinician user interface in dashboard view.
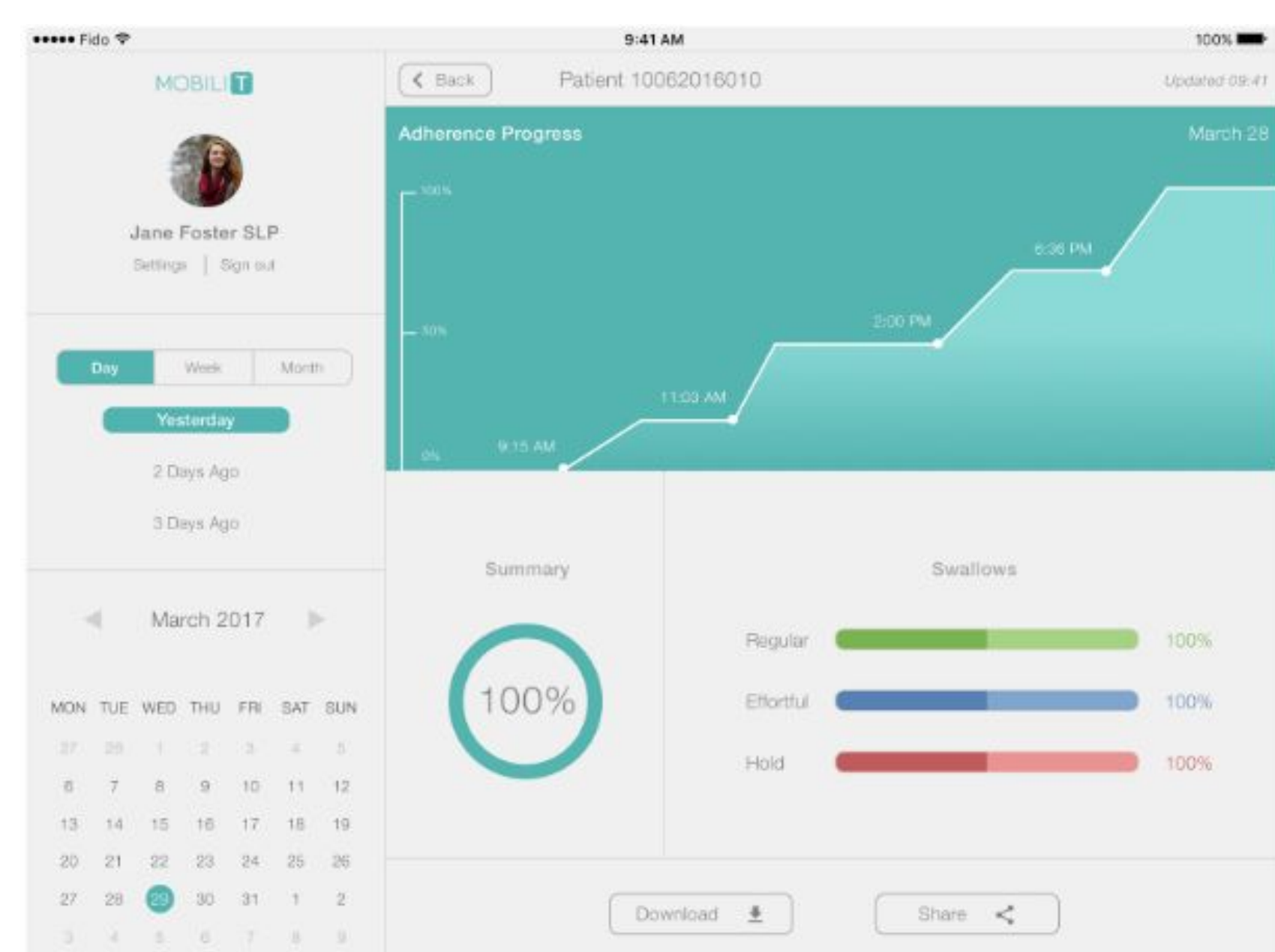

Figure 3. Mobili-T® clinician user interface in patient profile view.

Procedure

- Six speech-language pathologists specializing in swallowing impairments were recruited to participate in a discussion group using a consensus method called the Nominal Group Technique (NGT).

- The clinicians were provided with a clickable prototype of the app and were asked to consider the overall app design, navigation, and content.

- Then, the NGT was employed in four consecutive steps:

1. Clinicians silently and independently recorded their initial reactions to the app.

Figure 4. Clinicians independently writing down their ideas.

2. Clinicians provided their feedback about their concerns orally in a round-robin fashion and facilitators recorded this feedback.

Figure 5. Clinician interacting with workable prototype.
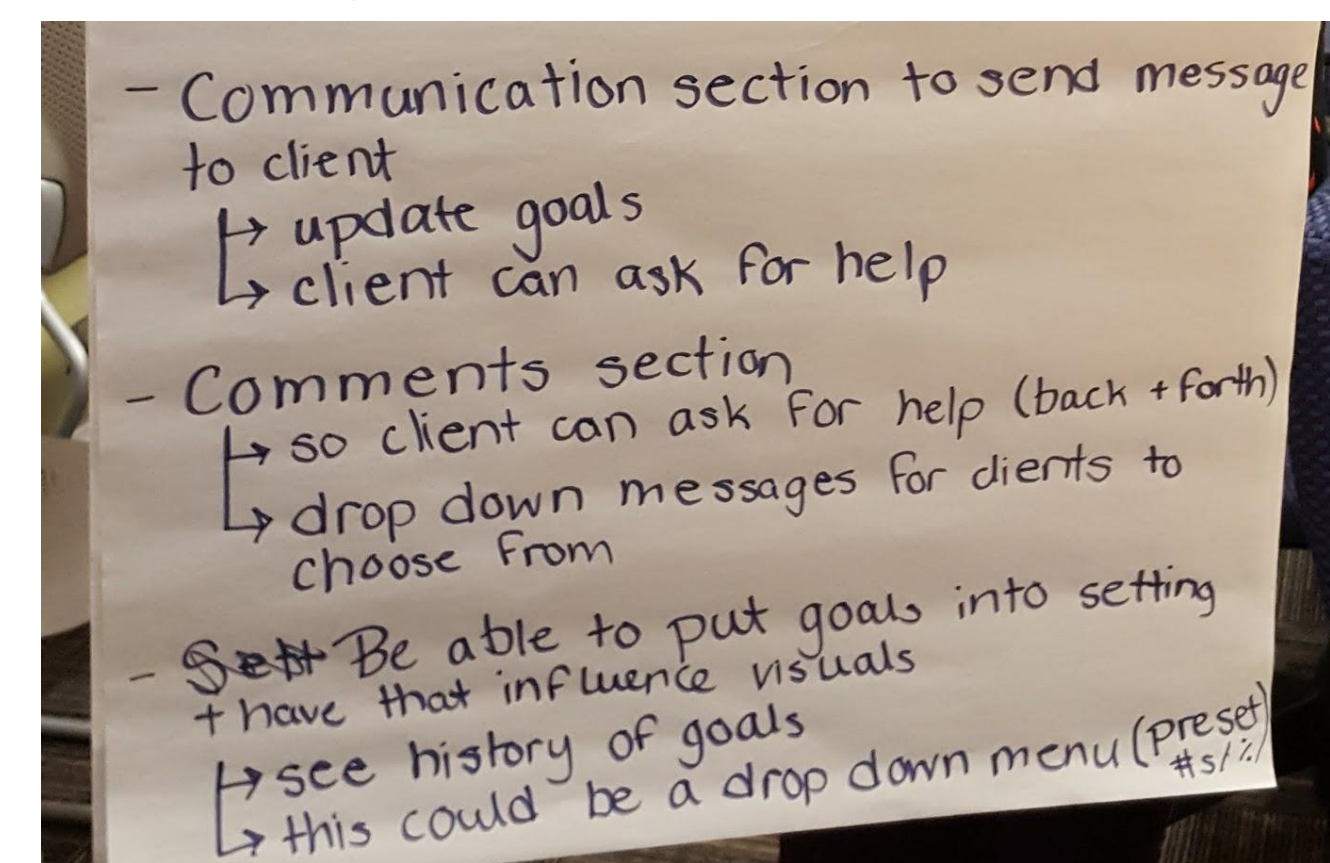
3. Feedback was clarified and grouped into main concerns.

Figure 6. Grouping clinician feedback into themes.

4. Clinicians ranked concerns based on their importance using colour coding labels[2].
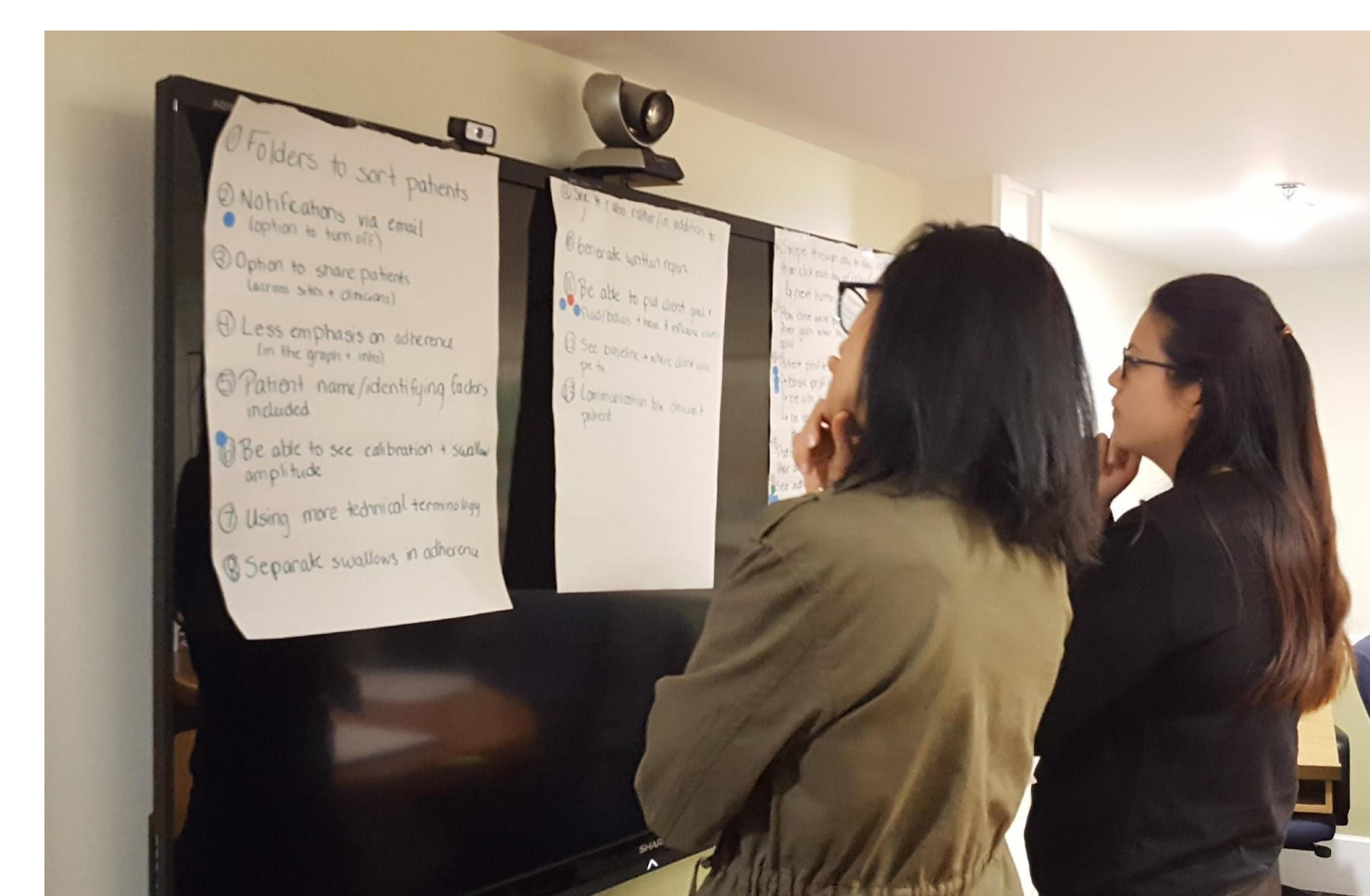

Figure 7. Clinicians ranking importance of concerns.
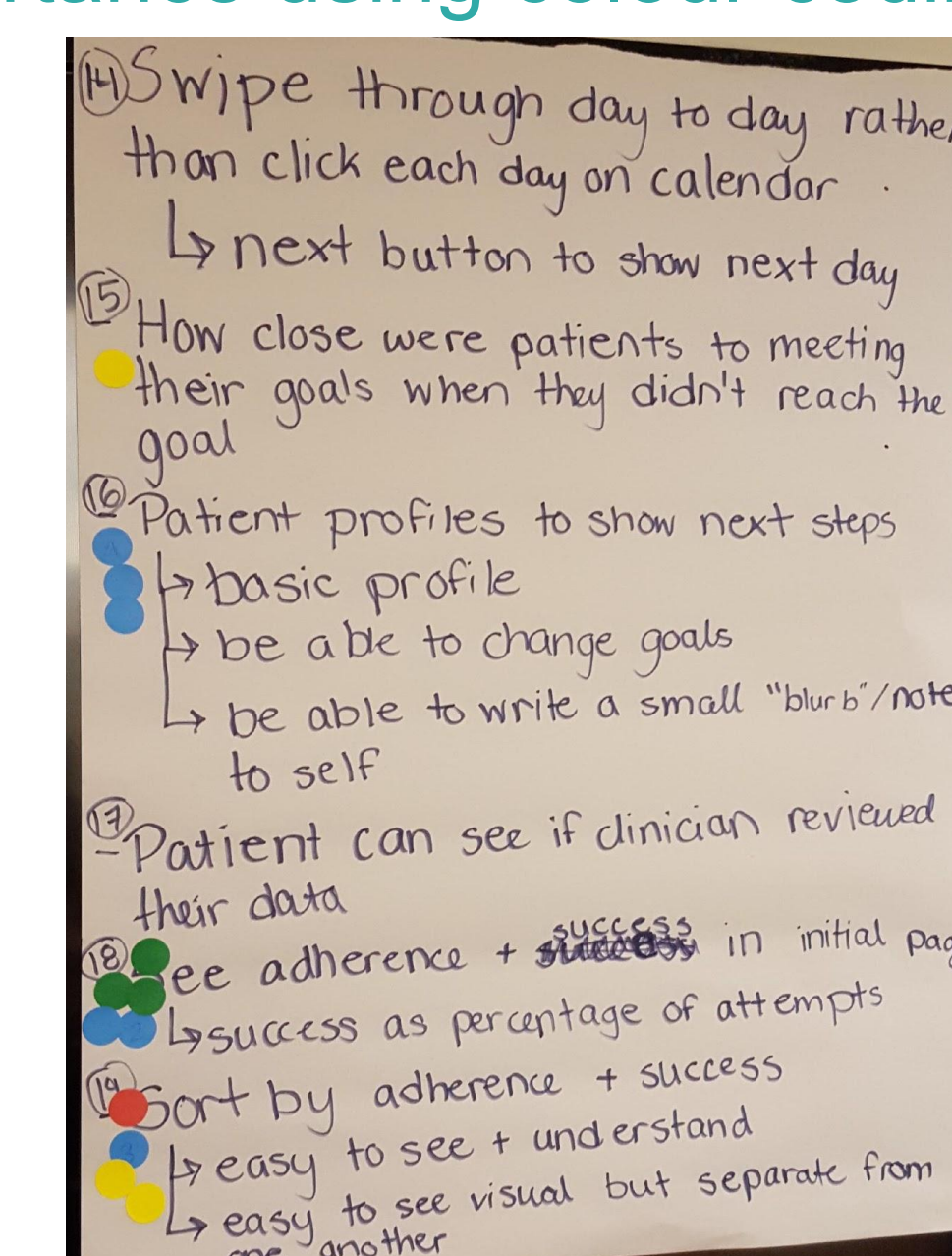

Figure 8. Concerns ranked using colour-coding labels.

Results

The top five changes clinicians wanted to see, along with their relative ranking of importance were:

1) To view client goals and type of bolus (e.g., thin, liquid, solid) on the interface.

2) To see adherence (how often patients attempted exercises) and success (how accurately patients complete exercises) on the interface dashboard.

3) To sort patients by adherence and success.

4) To provide an area on the patient profile where the clinician can change goals, write notes, and indicate the next steps in treatment.

5) To see a ratio of exercises completed overall in addition to percentage (to note total exercises prescribed).

Aspects of the app that clinicians did not want changed were:

- The calendar
- The report of individual patient adherence
- The report of individual patient swallowing exercises
- The esthetics of the interface
- The percentage for each swallow/goal

Future Directions

- Clinicians showed excitement to remotely monitor patients, but voiced concerns about the potential cost to patients and personalization of the user interface.

- This project also identified that the visual language for communicating "adherence" and "success" was not clear and required improvement.

- Overall, clinician feedback may contribute to Mobili-T®'s usability. This is important, as currently, clinical resources do not allow for all patients requiring swallowing therapy to be seen. If clinician consultation can lead to increased usability, this may then result in improved access to swallowing therapy for patients.

References

[1] Gagnon, M. P., Ngangue, P., Payne-Gagnon, J., & Desmartis, M. (2016). m-Health adoption by healthcare professionals: a systematic review. *Journal of the American Medical Informatics Association, 23*(1), 212-220. doi: 10.1093/jamia/ocv052

[2] Boddy, C. (2012). The Nominal Group Technique: an aid to brainstorming ideas in research. *Qualitative Market Research: An International Journal, 15*(1), 6-18, doi: 10.1108/13522751211191964