

Appendix

Appendix A

This is Appendix A: Interviews with healthcare providers (Study #1).

Code	Description
1 Mediums to communicate health progress to patients	Codes in this category relate to ways in which healthcare providers (HPs) communicate rehabilitation results and progress to patients.
1.1 Communication board	Communication boards in every room display patient names, discharge dates, mobility, and transfer abilities.
1.2 Verbal communication (synchronous)	HPs use verbal communication to discuss rehabilitation progress with patients.
1.3 Written notes (asynchronous)	HPs share handwritten notes with patients to show their progress.
2 Types of content communicated to patients	Codes in this category relate to types of content that HPs communicate to patients recovering from a stroke.
2.1 Baseline test results	HPs communicate baseline test results with patients.
2.2 Goals of rehabilitation	HPs discuss the goals of rehabilitation services with patients.
2.3 Health scores	HPs use objective data like health scores to remind patients of their rehabilitation status.
2.4 Discharge summaries	HPs provide patients with written updates of discharge summaries.
2.5 Comparisons between initial health assessment and final assessment	HPs provide patients with a written document that compares the initial health assessment to the final assessment to show progress.
2.6 Weekly rounds report	HPs discuss weekly rounds with patients.
3 Weekly progress report information	Codes in this category are related to information in a weekly progress report that HPs complete together.
3.1 Weekly goal setting	HPs discuss rehabilitation goal setting for patients.
3.2 Discuss the patients' level of function at admission and changes in function over time	Healthcare providers discuss the level of function in a patient at admission and progress in the level of function over time.
3.3 Categories in weekly progress report based on the Functional Independence Measure (FIM) categories	Healthcare providers discuss categories of patients' health similar to categories found in the FIM test.

3.3 Physiotherapist (PT) discusses patients' physical function	PT fills out sections in weekly report related to physical function like mobility, lower limb function, upper limb function transfer, walking ability, if the patient can do stairs, bed mobility, balance
3.4 Speech-Language Pathologist (SLP) discusses patient's communication, language, and swallowing abilities	SLP fills out sections in weekly rounds report related to patient's communication language, and swallowing abilities.
3.5 Occupational Therapists (OT) discusses patient's activities of daily living (ADL), instrumental activities of daily living (IADL), cognition-perceptual functions and visual-spatial functions	OT fills out sections in weekly rounds related to patient's ADL, IADL, cognition-perceptual and visual-spatial functions.
4 Attempts to increase patient engagement in rehabilitation	Codes in this category relate to ways in which HPs attempt to increase patient engagement in rehabilitation process.
4.1 Giving patients handwritten summary notes	HPs give patients handwritten summary notes, to keep patients engaged.
4.2 Communicating test scores to patients	Providing patients with test scores is fundamental for engagement.
4.3 Positive reinforcement	HPs use positive reinforcement to motivate patients in their recovery process.
4.4 Scoring health status in front of patients	HPs will score and explain patient's assessment results right in front of the patient so that the patient better understands their results.
4.5 Educating patients about stroke	Healthcare providers focus on increasing education and awareness about stroke to increase patient understanding and engagement.
4.6 Using simple language to describe progress to patients	Healthcare providers use simple language to communicate scores to patients to increase patient understanding.
4.7 Virtual Reality (VR) for engagement in physical rehabilitation	PT uses VR games to promote engagement in rehabilitation exercise.
4.8 Patients can see physician reports through Electronic Medical Records (EMR)	Patients can stay informed on reports from physicians by seeing them through an online portal.
5 Issues with technology to store/access patient health data	Codes in this category relate to challenges that HPs face regarding issues with technology storage and accessing patient health data.
5.1 Difficulty accessing patient information from other healthcare providers	Accessing EMR between OT, PT, SLP can sometimes be difficult if they have not uploaded documents or if they are uploaded in unfamiliar places.
5.2 EMR system is not organized cohesively making it difficult to find patient information	EMR are stored in different places and are sometimes fragmented.
5.3 No overview of patient data	There is no overview of patient health data in EMR.

5.4 No standard template for summarizing patient health progress	HPs do not have an automated template for patient results.
5.5 Patient information is not readily accessible	HPs think it would be beneficial to have a screen in every room to have information readily accessible.
5.6 Tracking exercise and cardiovascular health is limited without fitness tracker	PT think that every patient should have a Fitbit to track their cardiovascular health and exercise.
6 Inpatient treatment protocol and therapy	Codes in this category relate to inpatient treatment protocol and types of therapy that patients receive.
6.1 General protocol: Assess patient status and determine goals	First assessment starts with assessing the patient's status, then goals are created based on their rehabilitation status, health, mobility, ability to transfer, and ability to provide care for themselves.
6.2 Treatment amount depends on the severity of problem	The number of therapy sessions depends on the severity of the patients' problem.
6.3 Physiatrist's protocol	Physiatrist's treatment protocol for caring for patients after a stroke.
6.3.1 Assessment of patient's health status	Physiatrists assess patients' individual medical situations that could interfere with rehabilitation like a painful shoulder, a painful neck, or a painful back swelling.
6.3.2 Assessment of the comorbidities of patients	Physiatrists assess comorbidities like blood pressure, diabetes and lipids, fever, swelling, and complex regional pain syndrome.
6.3.3 Using SOAP (Subjective, Objective, Assessment, and Plan) method to document a medical situation	Physiatrists use the SOAP method as a standardized worldwide method for documenting a medical situation.
6.3.4 Monitoring patients daily	Physiatrists see patients daily to assess their health status.
6.4 PT protocol	PT treatment protocol for caring for patients after a stroke.
6.4.1 Assessment of patient's ability to transfer, stand and walk	PT assesses patients' ability to transfer in and out of bed, patients' ability to stand and walk.
6.4.2 Timeline of patient assessment after admission	Within the first 3 days of admission, PTs assess the patients' social and home environment, their mobility, occupation, what activities they enjoy, and muscular strength.
6.4.3 Using Virtual Reality (VR) to promote physical rehabilitation	PT leads a program in the VR therapy unit for patients recovering from stroke to promote exercise and engagement.
6.4.4 giving patients exercise programs	PT gives patients exercise programs to increase cardiovascular health.
6.4.5 assessments of patient's muscular strength	PT assesses a patient's muscular strength.

6.4.6 Asking patients to use fitness equipment	PT asks patients to use fitness equipment like a bike and treadmill for exercise.
6.4.7 Duration of treatment	Patients receive 5 therapy sessions a week with a PT.
6.5 SLP protocol	SLP treatment protocol for caring for patients after a stroke.
6.5.1 Assessing of difficulty with speech, language, and swallowing	Patients get access to a SLP if they have problems with language, speech or swallowing.
6.5.2 Duration of treatment	Patients receive 2-5 therapy sessions a week with a SLP.
6.6 OT Protocol	Occupational therapy treatment protocol for caring for patients after a stroke.
6.6.1. Assessing patient's capacity to perform everyday tasks	OT assesses patients' capacity to perform tasks (ADL and IADL) and compare it with their pre-stroke self-reported abilities.
6.6.2. Improving patient's functional capacity, ADL and IADL	OT focuses on improving patient's functional capacity in their ADL (personal hygiene or grooming, dressing, toileting, transferring, eating) and IADL (managing finances, medications, food preparation, house-keeping, and laundry).
6.6.3 Assessing cognitive functioning	OT assesses a patient's cognitive-perceptual functioning.
6.6.4 Helping patients learn strategies to manage cognitive, perceptual, and behavioural changes after a stroke	OT helps patients learn strategies to manage behavioural, cognitive, and perceptual changes associated with stroke.
6.6.5 Preparing the home and work environment for patient's return	OT prepares the home and work environment for patient's return after a stroke.
6.6.6 Improving patient's motor control and hand function	OT focuses on improving the patient's motor control and hand function in the stroke-affected upper limb.
6.6.7 Duration of treatment	Patients receive 3-5 therapy sessions a week with an OT.
6.7 Nurse's protocol	Nurse's treatment protocol caring for patients after a stroke.
6.7.1 Helping pain management, assistance with mobilization, assistance with medication administration, and ADL	Nurses help with a range of rehabilitation services including pain management, assistance with mobilization, assistance with medication administration, and ADL.
6.7.2 Role of Nurse	Nursing is a fundamental component. Inpatients get cared for by nurses every day.

Appendix B

This is Appendix B: Interviews with healthcare providers (Study #2).

Code	Description
1 Categorize and label health assessments	Codes in this category pertain to the feedback regarding the categorization and labelling of health assessments in the visualization designs.
1.1 Display health sub-domains that are relevant to the patient's rehabilitation	The results should demonstrate sub-domains relevant to the patient rehabilitation so that results are more informative and meaningful to them.
1.2 Categorize health assessments into their corresponding health domains	Health assessments should be placed in their corresponding health domains.
1.3 Add signposts to categories of health assessment in the overview	Health assessments should be signposted to their related categories.
2 Display informative scales	Codes in these categories relate to feedback on the display of informative scales in the visualization designs.
2.1 Display severity levels of scales	When applicable, tests should demonstrate severity levels in the scales to inform patients about the meaning of their results.
3 Provide comprehensive results explanations	Codes in these categories relate to the provision of a comprehensive explanation of results.
3.1 Display meaningful context of patients results	The progress findings from each health assessment tool should give meaningful context about the areas of rehabilitation that have improved or worsened.
4 Include a designated place to add notes in assessment visualizations	Codes in these categories relate to the inclusion of a designated place for adding notes in assessment visualization
4.1 Record and display additional text for results of tests as applicable	To support patients with diet planning, additional information about diet should be included in a comment box.
5 Provide customization options	Codes in this category pertain to the feedback regarding the provision of customization options for both patients and providers
5.1 Display functional independence goals	Visualization of goals should demonstrate all levels of functional independence to patients to support them in reaching specific goals.
5.2 Enable patients to personalize their data view	Allow patients to select which elements display in the visualization to reduce cognitive burden.
5.3 Visualization should demonstrate the most common tests that are used by healthcare providers	Visualization should take out tests that are not used by the healthcare providers at the hospital and add tests that are most used.

Appendix C

This is Appendix C: Interviews with patients (Study #3).

Codes	Description
1 Challenges with information retention:	Codes in this category describe the patient's experience during recovery
1.1 Patient expresses difficulty remembering all the tests they completed	Patients discuss that they participated in many tests and could not remember exactly which ones they did
1.2 Patient gauges their recovery progress based on the increasing ease of performing a test over time	Patients perceive their recovery progress by measuring the relative ease with which they can complete tests as time progresses.
1.3 Patient expresses feeling encouraged by healthcare providers	Patients report feeling motivated and supported by their healthcare providers throughout the stroke recovery process.
2 Limited access to recovery progress:	Codes in this category describe ways in which patients receive information regarding their progress and results in stroke recovery and in which ways patients receive health instructions
2.1 Verbal communication from healthcare providers	Patients receive verbal communication from healthcare providers on their stroke recovery progress and test results
2.2 Handwritten results from admission and discharge test scores	Patients receive handwritten health results from admission and discharge test scores
2.3 Patient portal and email notification	Patients receive their medical results through a patient portal called Meditech. A medical update is sent to patients daily via e-mail notification
2.4 Recovery instructions on printouts	Patients receive recovery instructions, such as exercises on printed materials
2.5 Recovery instructions on iPad	Patients receive recovery instructions, such as speech therapy exercises through a speech-language therapy application on an iPad
3 Feedback on the visualization designs	Codes in this category describe patient's feedback on the data visualization designs
3.1 Clearly defined goals could help direct patients in their recovery	Patients believe that showing clearly defined goals could help direct patients in their recovery
3.2 Clearly labeled legends are valuable for understanding results	Patients believe that showing clearly defined labels help them understand more complex visualizations
3.3 Accommodate for a mobile layout	It is recommended to design a mobile-friendly layout since most patients will have access to the data visualizations on their phones.
3.4 Preference for numerical results over complex visualization designs	Patients indicated a preference for numerical results that are displayed in a visually apparent and prominent matter when complemented with complex data visualizations.
3.5 Grayscale was not intuitive or easy to understand	Patients did not understand the use of grayscale within the swallowing test and recommended removing it.