Multidisciplinary Care for Facial Paralysis Patients: Collaboration between Carers

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Abstract

Patient-clinician communication is a significant topic in CSCW and health informatics studies, but little attention has been given to how multidisciplinary facial paralysis teams collaborate with each other to provide care services. Our goal for this study is to understand how clinicians with different roles collaborate with each other to help facial paralysis patients in their recovery processes. We conducted 19 clinical observations and 4 clinician interviews in the Neurosurgery department at Hershey Medical Center. We describe activities and time expenditures during visitations via the construction of a

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workflow model; we also discuss current clinician pain points regarding service provision and potential solutions to some of the pain points.

Author Keywords

Clinical Collaboration; teamwork; workflow; pain points.

ACM Classification Keywords

• Human-centered computing → Human computer interaction (HCI); Empirical studies in HCI • Applied computing → Life and medical sciences; Health informatics

Introduction

Facial Paralysis (e.g., Bell's Palsy, synkinesis, Ramsay Hunt Syndrome, etc. [4, 5]) can be treated by surgeries, Botox injections, and/or physical therapy [4, 5]. Physical therapy is commonly utilized prior to resorting to other treatments, like surgery [4]. Notably, case studies suggest that physical therapy is effective at treating facial paralysis [1], yet literature reviews suggest that controlled experiments do not reproduce case study results [5]. Much research has thus focused on the efficacy of treatment options, but limited research has examined how to facilitate collaboration between specialists on multidisciplinary facial paralysis

Activities	Sub-activities
Preparation	Patient in-home facial exercise Prepare patients' EMR Prepare billing doc.
Informative Collaboration	Read patient EMR History checking Photo & video taken Diagnose/treatment decision
Education & practice	Explain handouts Exercise practice
Treatment	Botox Surgery
Documentation	Visit Summary Update patients' EMR Insurance filling

Table 1: Facial paralysis treatment workflow categories.

teams. This work aims to address that gap by modelling the workflow of one such clinician team (i.e., clinicians here defined as all healthcare professionals within the hospital setting) and discovering pain points which hinder collaboration. We use workflow modelling because of its ability to provide fine insights into pain points in similar CSCW and HCI healthcare research (e.g., [2, 3, 6, 8]). We note the following differences from these closely related works: 1) our team is not loosely formed or highly distributed, as per Lee et al.'s [3] teams; 2) our team does not work in high-risk care departments over short durations, as per both Chen [2] and Zhang et al.'s [6]; and 3) we highlight the role of the patient in their own collaborative healthcare, as the patient's at-home role is crucial for therapy progress [9]. We believe these key differences enable us to contribute to CSCW an unique workflow model of multidisciplinary treatment for facial paralysis, and workflow pain points which account for patients' roles.

Method

We conducted real-world observations during 19 facial paralysis clinical visitations (i.e., 6 new patients, 13 return patients; 9 males, 10 females) and conducted semistructured interviews with 4 clinicians (see table 2) involved in those visitations. This research was approved by the university IRB. Our observations were conducted in the Neurosurgery department at Hershey Medical Center. Each observation lasted from 25 to 90 minutes. The duration varied based on whether a patient was a new or return patient, as well as patients' understandings of educational exercise handouts. Upon clinicians' consent, we collected the facial exercise handouts, as well as copies of typical grading systems clinicians used for assessments. We digitized all of the observation notes. The interviews ranged from 30 to 50

minutes; durations varied based on the conversations between the researcher and the clinician. All interviews were transcribed and coded. Clinicians were not compensated for their interviews and observations. Figure 1 shows our clinician participants' information and how they collaborated to provide services.

Facial Paralysis Treatment Workflow

To develop our facial paralysis treatment workflow, we began with the clinical workflow categories reported by Zhu et al. [8]. We altered their model to better characterize the facial paralysis treatment workflow. Our workflow consisted of the following five higher level activities: Preparation, Informative Collaboration, Education and Practice, Treatment, and Documentation (Table 1 & Figure 1).

1. Preparation begins when the patient performs in-home facial exercises prior to visitations. This stage also includes nurses preparing the patient's EMR and any necessary billing documents.
2. Informative Collaboration includes activities which inform clinicians about a patient and enable medical decision making. A surgeon reads the patient's EMR 5-10 minutes prior to a visit, verbally checks patient history during the visit, records progress and conditions via videos or photos, and makes diagnosis and treatment decisions. This process is collaborative, as patients inform clinicians directly.
3. Education and Practice includes 2 therapists providing patients with instructional exercise handouts, explaining the handout exercises and showing patients how to move muscles; they wear gloves and touch the patients' facial muscles for demonstration.
4. Treatment varies depending upon patient needs and conditions; patients might receive Botox injections or undergo surgery, or their visit may end at step 3 if it

Figure 1: This figure shows a breakdown of the time durations spent and activities undertaken by clinicians and patients during different stages of the workflow; workflow describes typical 3 month visit in which the surgeon and therapists see the patient together.

is a regular follow-up examination. Documentation included the integration of photos/videos and summary reports from the visit to the patient's EMR. 5. Documentation included the integration of photos/videos and summary reports from the visit to the patient's EMR.

Patients visit the surgeon every 3 or 4 months; however, they visit the therapists more frequently (e.g. once per month). Patients usually schedule a 1-hour physical therapy visitation with a therapist and without a surgeon. Our work is distinguished from prior workflow models by the complex nature of interaction and collaboration that it describes.

Pain Points for Clinicians

We discovered the following 3 types of data challenges that clinicians face: Data Collection, Data Storage and Organization, and Data Sharing.

1. Data collection faced challenges regarding missing or incomplete data (i.e., patients failed to complete

patient journals during patient at-home Preparation, which hindered clinicians' progress monitoring during Informative Collaboration) and tool accessibility (i.e., clinicians shared the same hospital camera and iPad, and new data could not be collected during Documentation). Our observations also reinforce findings from prior literature that patients share data on their phones in clinical settings [7]. However, phone data is not always easily utilized by clinicians, especially if it is in a difficult to extract format (i.e., patients used a variety of applications to store and collect data); this limited patients' abilities to perform Informative Collaboration, as well as clinicians' options for Documentation. Clinicians were also wary of collecting data in potentially insecure ways, like emails, because of HIPAA laws.

2. After data was collected, clinicians face storage challenges during Documentation. Challenges of data integration and storage are somewhat reminiscent of those EMR related challenges found by Chen [2]; for example, data collected during Informative Collaboration (e.g., patient photos or videos) need to be uploaded to EMRs for each patient and for every visit. Other data would also need to be converted and synthesized to allow for EMR integration (e.g., sunnybrook facial grading, dictations of visit summaries which had to be sent to a company for transcription). However, we note a unique challenge in patients' Informative Collaboration with clinicians; patient-shared videos/photos cannot be uploaded to their EMRs, as there are no means for patient shared videos/photos to be stored in hospital EMRs. Finally, clinicians found data organization difficult, as there were no easy means to organize or search for collected photos and videos by individual patients from the departmental devices (i.e., camera, iPad).

ID	Specialty
C1	Facial Plastic and Reconstructive Surgeon
C2	Speech Language Pathologist
C3	Neurology Nurse
C4	Physical Therapist

Table 2: Clinician Demographics.

3. Clinicians at our observation site also faced data sharing difficulties. Notably, clinicians were hindered by policies and decisions which limited access to, and thus sharing of, data (e.g., using one storage device for all patient videos hindered Documentation). Such practices, as well as the lack of an organized data storage system, also made it difficult for patients to view their progress, thus hindering Informative Collaboration; clinicians would have to first locate the relevant photos and videos in the disorganized system before sharing them.

Conclusion

Facial paralysis therapy, as demonstrated by our reported workflow, requires collaboration between various clinicians and their patient. The multidisciplinary team for facial paralysis at our observation site suffered from data collection, storage and organization, and sharing challenges. Data storage saw some of the most significant challenges. Organization features should be created to make data retrieval easier and patient-shared data storage possible. To reduce the variability of patient-shared data and ease data collection, a standardized application could be encouraged during initial visits. Finally, we want to suggest the possibility that patients voluntarily initiating the process of sharing their data may ease clinician concerns over potential HIPAA violations. However, HIPAA laws must also be respected, and patient-shared data collection should occur via secure means.

References

- [1] Jennifer S Brach and Jessie M VanSwearingen. 1999. Physical therapy for facial paralysis: a tailored treatment approach. *Physical therapy* 79, 4 (1999), 397–404.
- [2] Yunan Chen. 2010. Documenting transitional information in EMR. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM, 1787–1796.
- [3] Soyoung Lee, Charlotte Tang, Sun Young Park, and Yunan Chen. 2012. Loosely formed patient care teams: communication challenges and technology design. In *Proceedings of the ACM 2012 conference on computer supported cooperative work*. ACM, 867–876.
- [4] TS Shafshak. 2006. The treatment of facial palsy from the point of view of physical and rehabilitation medicine. *Europa medicophysica* 42, 1 (2006), 41.
- [5] LJ Teixeira, JS Valbuza, and GF Prado. 2011. Physical therapy for Bell's palsy (idiopathic facial paralysis). (2011).
- [6] Zhan Zhang, Aleksandra Sarcevic, and Claus Bossen. 2017. Constructing Common Information Spaces across Distributed Emergency Medical Teams. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing*. ACM, 934–947.
- [7] Haining Zhu, Joanna Colgan, Madhu Reddy, and Eun Kyoung Choe. 2016. Sharing Patient-Generated Data in Clinical Practices: An Interview Study. In *AMIA Annual Symposium Proceedings*, Vol. 2016. American
- [8] Haining Zhu, Yuhuan Luo, and Eun Kyoung Choe. 2017. Making Space for the Quality Care: Integrating Technology into Cognitive Behavioral Therapy for Insomnia. In *Proceedings of the SIGCHI conference on Human Factors in computing systems*. ACM.
- [9] Haining Zhu, Zachary Moffa, Xiyang Wang, Saeed Abdullah, Juxihong Julaiti, John Carroll. 2018. Understanding Challenges in Prehabilitation for Patients with Multiple Chronic Conditions. In *Proceedings of the 12th EAI International Conference on Pervasive Computing Technologies for Healthcare*. ACM.