

PAPER NO. 780

Orthopedic eRehab - A Multiple Case Study Analysis

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INTRODUCTION: The home exercise program (HEP) is a commonly used treatment for patients with orthopedic-related injuries. We propose the use of the Internet to deliver and monitor these programs to improve orthopedic patient outcomes and reduce health care costs.

METHODS: We have developed an eRehab patient education web portal that utilizes 3-D animation and video instruction to motivate and inform patients in self-care of their orthopedic condition focusing on the importance of a HEP. The following data is from an ongoing prospective, randomized, controlled, multicenter, non-inferiority trial to assess the efficacy of internet-delivered knee and shoulder home exercise programs on orthopedic patient outcomes. Patients seen in an orthopedic office who were candidates for outpatient non-operative physical therapy (PT) referral were approached about study participation. Inclusion criteria included not having had PT for the current diagnosis, English speaking, non-worker's compensation injuries/conditions and access to the Internet and email. Following informed consent patients were randomized to a six-week trial of eRehab alone (eRehab) with progressive exercises emailed to the patient every two weeks versus standard outpatient physical therapy (PT). KOOS and DASH as well as visual pain scores were obtained pre-treatment and at a six-week follow-up visit. To date we have 20 patients who have completed the study. To evaluate eRehab patient utilization we choose the first 10 consecutive cases randomized to the eRehab group and evaluated the number of home video views, compliance with a HEP as documented by filling out a weekly log and patient subjective outcomes. Paired Student's T-test was performed on the data comparing the patient's baseline pain and DASH/KOOS score with the score at a six-week follow-up evaluation.

RESULTS: Our prospective data indicate that patients with an initial pain score less than six who were candidates for an outpatient PT referral who instead were treated with an eRehab treatment plan had a significant reduction ($p < .02$) in pain scores at a six-week follow-up evaluation. Two patients (C,G) with an initial pain score of six or greater worsened during the study period. Two patients (neither of whom viewed the eRehab videos at any time) discontinued the study. Individual patient data is seen in Table 1.

DISCUSSION AND CONCLUSION: Only cases randomized to the eRehab intervention were included, as the purpose of the study at this time was to evaluate patient interaction with an eRehab application rather than to make comparisons with clinical physical therapy. Larger studies, such as the randomized controlled trial from which this data was extracted, will be necessary to support these results. With the advent of the new technological era, it can only be expected that Internet applications will continue to integrate into care delivery for the health care industry as a whole. It is at this time that all disciplines should evaluate what aspects of their treatment plans can be further augmented with the use of Internet-based programs. In terms of orthopedic care and physical therapy, the existing use of home exercise programs may be a sound bridge toward implementing this type of care structure, but patient

satisfaction and outcomes should not be compromised. The results of this study cannot be generalized across populations or musculoskeletal

Table 1

Patient	Age	Diagnosis	Patient viewed videos in office	# of Home eRehab Logons	# of Days performing HEP	KOOS/DASH Pre Rx	KOOS/DASH 6 week F/U	NRS Pre Rx	NRS 6 wk F/U
A	46	Patellofemoral Malalignment	yes	3	21	K 65.5	K 99.4	4	0
B	39	Medial OA/failed arthroscopy	no	3	16	NR	K 84.5	2	1
C	19	Patellofemoral Malalignment	yes	0	9	K 56.4	K 31.7	6	8
D	66	Rotator Cuff Disease	no	9	NR	D 13.3	D 5.8	5	NR
E	57	Sjogren's, RC Disease	yes	0	36	D 20.8	D 3.3	2	1
F	22	ITB Syndrome	yes	0	"regularly"	K 78	K 90.5	3.5	1.5
G	58	RC Disease	yes	0	NR	D 52.5	D 66.1	8	9
H	37	Patellofemoral Malalignment	yes	11	17	K 76.8	K 75.6	3	1
I	67	OA/MMT	no	0	NR	NR	NR	3	NA
J	50	MMT/LMT	no	0	NR	NR	NR	3	NA

conditions.