

“Can personalised video-based prescriptions engage patients in actively managing their own health outcomes?”

A review of outcomes from the eHealth Service Evaluation

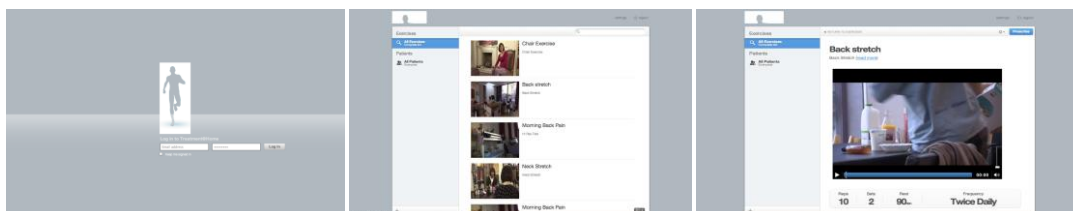
Background: Littlefox Communication’s interest in digital communications designed to improve patient health outcomes stems from our work with both public and private sector clients supporting organisational change. We are talented communication experts, graphic designers, filmmakers and researchers who are constantly looking for fresh approaches to make sure that, as a result of what you see, you will do something differently. Littlefox has recently worked with the Gates Foundation and Development banks in Europe and North America to support the launch of the Global Health Investment Fund (www.ghif.com), is collaborating with HIFA <http://www.hifa2015.org> and iHeed (Global Health Education Innovators) <http://www.iheed.org>, and potentially with DFID and AMREF.

Situation: In April 2013, Littlefox in collaboration with Hampshire Hospitals NHS FT (HHFT) undertook a small-scale service evaluation of a digital platform that we call “eHealth”. The platform allows the clinician to deliver personalised video-based prescriptions to patients and creates a feedback loop to check on compliance between treatment sessions.

The eHealth platform has the capacity to support a wide range of treatments in COPD, cystic fibrosis, diabetes, obesity, bronchiectasis etc and in many different languages and countries. For the purposes of this service evaluation, we selected rehabilitation from musculoskeletal injury at the HHFT Physiotherapy Department as our evaluation platform.

The service evaluation’s primary aim was to see if, by engaging with patients outside of the clinical setting, there would be a measurable impact on their health outcomes. We sent patients short, engaging video-based prescriptions, to test whether they might “get better faster”.

It must be stressed that because of the nature of a service evaluation that is not conducted under trial conditions and the small sample size, it is clearly not possible to attribute the findings in this paper solely to the introduction of the eHealth platform. However, we suggest that an unusual effect has been detected in an otherwise stable environment.



Service Evaluation Parameters:

The aim of the service evaluation was to understand its effectiveness in improving:

1. the range of recovery as measured on a patient specific functional scale - a 10 point measurement of function. A measure of function is recorded at the start of treatment and then again at the point of discharge, typically 3 months later. An improvement of 2-3 points is registered as a “significant improvement” on the HHFT MSK Department monthly performance data,
2. the speed of recovery as measured by the improvement in function against the number of treatment sessions.

Service Evaluation set-up:

1. Review of historical data to set bench mark: February-May 2013 monthly department-wide population outcomes; monthly monitoring of whole population statistics June-September 2013 during the period of the evaluation
2. 50 patients were recruited to the evaluation over a three month period from April to June producing the first cohort of Service Users (SUs) discharge data in June
3. Service-users were clustered around the core treatment areas of Upper and Lower Back, Neck, Knees, Wrists and Ankles
4. 50 non-service users (NSU) were selected to correspond to similar injury/treatment areas to provide a closer benchmark than possible from the population-wide Department Monthly statistics.

Headline Outcomes:

1. impact on whole population figures:
 - the overall percentage of patients in the MSK Department achieving “significant improvement” increased from an average of 62% in the 4 months preceding the service evaluation to an average of 70% during the evaluation June-September.
 - as our first cohort of service users start to exit treatment in June, we see the overall percentage of those achieving significant improvement jump to 77%, and gradually begin to drop back towards pre-evaluation levels (July:68%; Aug:71%; Sept: 65%)
 - during the period of the service evaluation we also noted a very interesting fall in the percentage of patients who did not attend their follow-up appointments from an average of 7.67% of patients in months prior to the evaluation (Feb-May) dropping sharply to an average of 2.15% in June-September.

“Interestingly we are seeing significantly lower DNA rates suggesting that people are engaging in their treatment” Head of MSK Services

2. Service-user verses non-service user outcomes:
 - a more detailed examination of service-user improvement in function at point of discharge shows an average improvement of +4.48 points on the patient specific functional scale against a +3.32 points improvement in the non-service user control group. (35%)

- when we examine the number of treatment sessions required to achieve this improvement in function we find that on average service users required 5.26 sessions as against 6.32 sessions for non-service users, suggesting that service users achieved their greater functional improvement with marginally fewer treatment.
- in addition, when the average range of functional improvement achieved within each session is compared, it appears that the service user group achieved +1.30 points of functional improvement vs +0.75 points of improvement per treatment session in the non-service user control group.

Service Evaluation Outcome: 1. HHFT MSK Department: Whole Population study

Figures were analysed from overall population figures provided by in-house HHFT BI team in Word report format. These figures were re-captured as tables and totals re-calculated. These figures contain 2 groups: those patients that were referred but were not treated and those patients that were treated by the department.

The table below shows the whole population figures for the 4 months preceding the evaluation and the 4 months of the evaluation. The Blue figures show those patients that were referred and underwent treatment and the pink figures show patients that were referred but did not undergo treatment within the department.

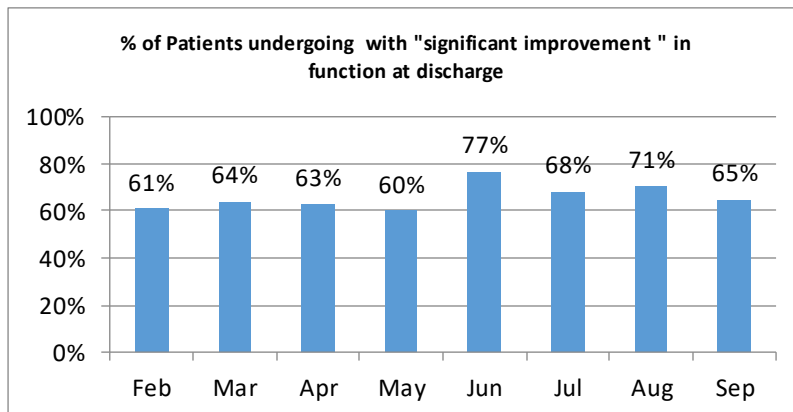
Summary of Discharge Reports February- September 2013

Discharge Reports	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
No. patients referred and treated								
Significant improvement	142	167	127	141	269	226	218	197
Some improvement	45	50	33	31	42	51	36	35
No improvement	18	19	14	24	19	27	19	25
No improvement but maint achieved	3	10	6	6	3	6	9	11
Outcome unknown	18	11	15	25	15	10	22	29
Deterioration due to physio	2	1	1	0	0	2	0	0
Deterioration NOT due to physio	5	3	6	8	2	9	5	7
No. patients referred not treated:								
Assessment and advice	97	73	21	29	26	30	105	143
Failed to rebook	54	53	31	48	36	44	40	54
DNA	39	68	62	88	78	70	72	67
Transferred	2	6	3	9	6	6	2	12
Treatment no longer required	3	9	6	7	8	7	7	6
Totals	428	470	325	416	504	488	535	586

When we analyse the Discharge Reports for those patients that received treatment, as you would expect, we see the largest proportion of patients show “significant improvement” achieving a minimum of a 2-3 point improvement in function over the course of their treatment.

It should be noted that is not possible to break down these figures further (i.e. number of points improved, improvement by injury type etc) due to the grouped/aggregate nature of the input data provided.

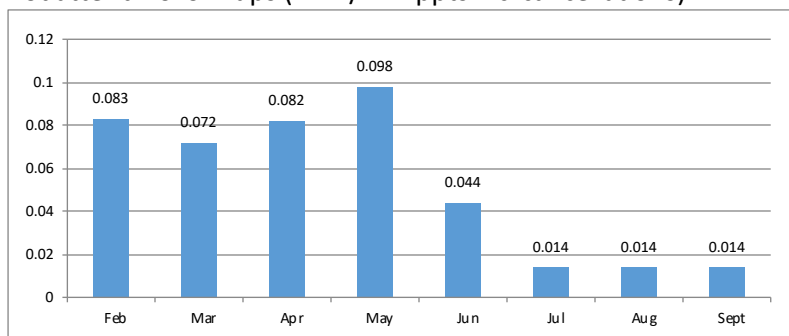
Zooming in on percentage of patients who have significantly improvement we can see that the consistent narrow band of performance Feb-May of 60-63% (mean 61.7%) has moved sharply up following the start of the evaluation reaching 77% in June, 68% in July and 71% in August.



In September, we see the percent of significant improvers beginning to fall back towards pre-evaluation levels at 65%, although still above the 62% mean achieved in the preceding months. This corresponds to the gradual discharge of the cohort of Service Users exiting the service evaluation and thus no longer contributing positively to the overall population figures.

When we analyse the departmental report on the number of patients undergoing treatment who cancelled or did not attend follow up appointments as a percentage of the number of patients in treatment we see that in the 4 months prior to the commencement of the evaluation the average "DNA (Follow-ups) (DNA/All Appts incl cancellations)" was 8.38%. However this percentage of DNA dropped to an average of 2.15% over the months of June to September

Did not attend Follow-ups (DNA/All Appts incl cancellations)"



Service Evaluation Outcome 2:

Assessment of 50 Service Users vs Sample of 50 Non-Service Users:

The selection of 50 Service Users (SUs) and a control group of 50 Non service user (NSUs) was made by physiotherapists in HHFT MSK Department as follows:

- a patient presenting with an injury within the range of treatments offered on the Platform
- a patient prepared to share email details in order for their clinician to register them on to the Platform

In order to ensure that the selection of treatment/injury types addressed by the evaluation of service users were well matched to the non-service users a sample was selected by the team based on:

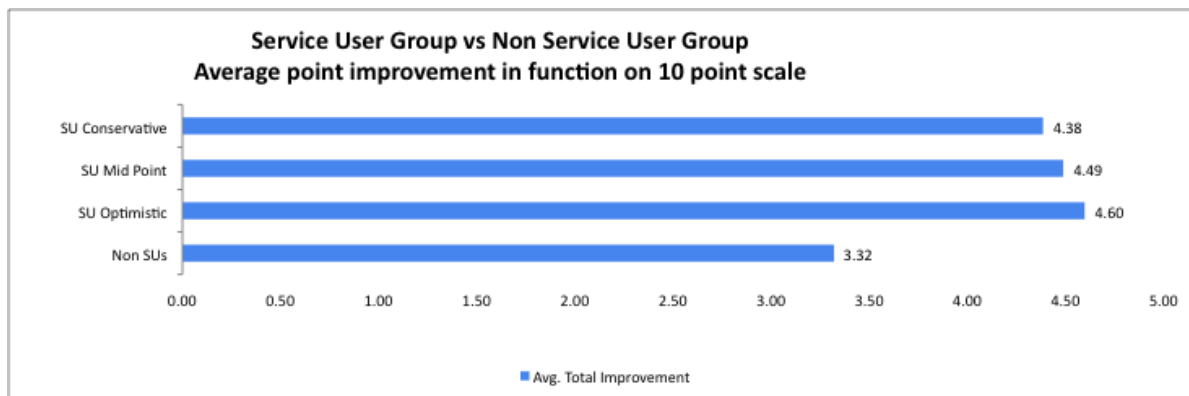
- availability of comprehensive data for the non-service user patient
- similarity of injury and treatment type

At the point of writing this review 49 of the 50 Service Users have been discharged. Of the 49, 7 patients did not return for their final appointment so did not receive a final assessment of their improvement in function, and 1 is undergoing long-term treatment and therefore has been removed from the evaluation

To ensure that we do not over or understate the outcome figures we have presented below 3 options to calculate the final improvement in function score for these DNA patients:

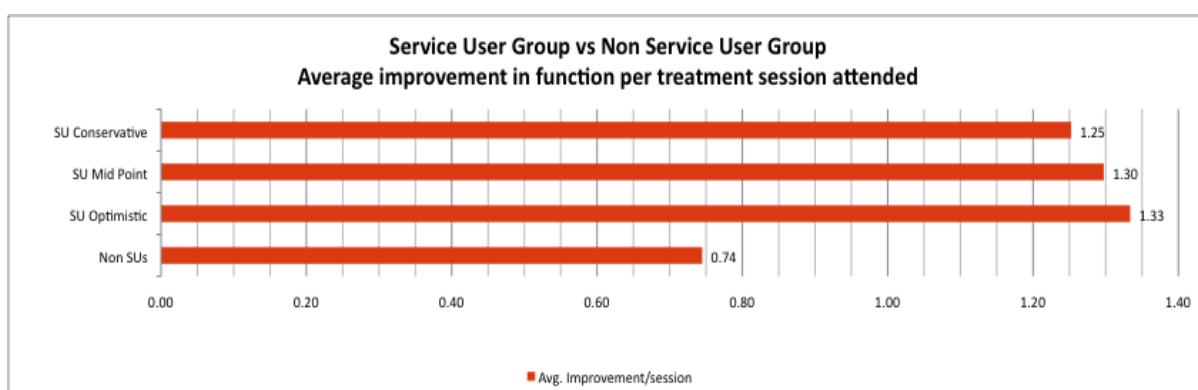
1. Optimistic: this assumes that the DNA patients felt so much better that they achieved a full improvement in function (10)
2. Mid point: this assumes that the DNA group achieved the same change in function score as the average achieved by the service user group (+4.49)
3. Conservative: this assumes that the DNA group achieved the average of the non-service user group (+3.32)

The Chart below shows the improvement in function from first appointment to discharge for Non-service users versus Service users based on the above scenarios for the DNA patients



Non-service users averaged +3.32 point improvement in their function at the point of discharge, whilst Services Users averaged between +4.38 and +4.6 point improvement in function. For the purposes of this study we have assumed the mid-point improvement of +4.49 points giving a 35% increase in function over the non-service user group.

Functional Improvement per treatment session:



When we look at the improvement in function scores versus the number of appointments required to achieve that improvement in function we see that non-service users achieved a +0.74 point improvement in their function per treatment session against a range of +1.25 and +1.33 point improvement in function per treatment session for the service users. For the purposes of this review we have assumed the mid-point average of +1.30 point change in function per session. This suggests that each session is 57% more efficient for the service user group than for non-service user group.

Finally when we examine the number of treatment sessions required to achieve this improvement in function we find that on average service users required 5.26 sessions as against 6.32 sessions for non-service users, suggesting that service users achieved their greater functional improvement with 1 less treatment.

Summary:

Because of the nature of a service evaluation, not conducted under trial conditions, and the relatively small sample size, it may not be possible to attribute these positive improvements in function solely to the introduction of the eHealth platform.

However, the figures do suggest that an unusual effect has been detected in the usually stable “significant improvement” percentages for the population under treatment and that those who were prescribed treatments from the platform appear to have achieved both greater functional rehabilitation than those in the control group and with marginally fewer treatments.

It is, of course well known anecdotally that the smallest amount of exercise done away from the clinical setting will have an exponential impact on the health outcome of the patient. Digital communications can provide to patients:

1. a sense of **autonomy** - by giving the patient his or her own personalised set of exercises to be conducted within the pattern of a regular day. His or her recovery is in his /her hands.
2. a sense of **competence** by demonstrating exercises via video in recognisable contexts (such as in the home), it encourages the patient to believe that whatever exercise they do, they will get better more quickly.
3. a sense of **relatedness** or belonging – the patients are not in it alone. The automated, regular reminders from the clinician and feedback from the patient places the patient at the centre their treatment whilst allowing clinicians to monitor patient compliance.

We would be delighted to explore further the implications of our work and how it may be applied into the wider context of patient engagement in health.

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