

Home to stay: interim results of a randomized controlled trial (RCT) of a physician assistant (PA) led integrated monitoring system to support patients after discharge following colorectal surgery

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Introduction

- Colorectal surgery patients are particularly vulnerable during their transition from hospital to home due to changes in bowel function/diet and complex wound, stoma and drain care^{1,2}
- Up to 20% of readmissions are for dehydration, stoma related complications and surgical site infections (SSI) which may be preventable³
- In a previous pilot study, PAs monitored colorectal surgery patients following hospital discharge using a mobile app. This showed a decrease in 30-day ED visits and hospital readmissions and increase in patient satisfaction in self-management at home

Objective

A RCT to evaluate a PA led integrated monitoring system called “Home to stay”, a mobile app, to reduce 30-day ED visits and readmissions following hospital discharge

Methods

- All elective colorectal surgery patients at a tertiary care, academic hospital, meeting the inclusion criteria were randomly assigned to the “Home to stay” group (app arm) or standard care group (control arm).
- Inclusion criteria: (i) patients >18 years, (ii) understood English, (iii) had a smartphone/tablet/desktop computer

Control arm

- These patients received standard discharge and follow up instructions

Mobile app arm

- General surgery PAs invited these patients to download the “Home-to-stay” mobile app in hospital
- Following discharge, these patients were sent daily reminders from day #1 to #14 to complete a “daily health check” survey
- These responses were monitored by the PAs prompting follow-up phone calls for problems

Sample Size

A sample size of 258 patients was estimated to detect an absolute difference of 10% in 30-day readmissions (17% versus 7%), assuming an alpha of 0.05 and beta of 0.80.

Figure 1. Mobile app features

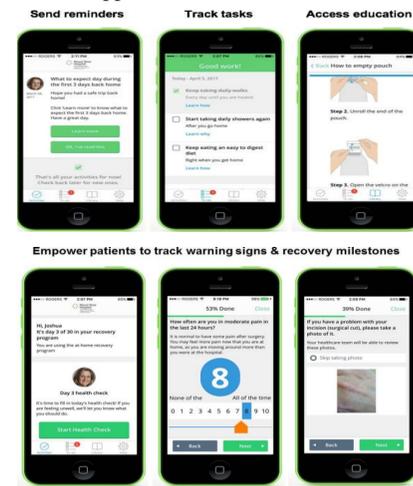
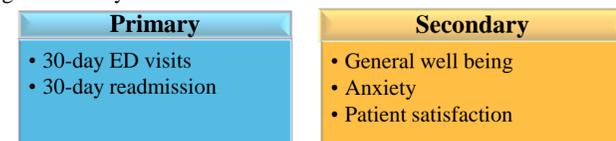


Figure 2: Study outcomes



To collect these outcomes, the PAs performed charts review and conducted 30-day follow up phone surveys for patients in both control and app groups

Results

The interim results are presented for 107 patients (55 control, 52 app)

Table 1: Demographics

Variable	App n (%)	Control n (%)	P-value
Sex	52 (49%)	55 (51%)	<i>P=0.68</i>
Male	26 (50%)	25 (45%)	
Female	26 (50%)	30 (55%)	
Age- Median (range)	42 (19-73)	50 (21-86)	<i>P=0.0099</i>
DX			<i>P=0.99</i>
Colon Malignancy	10 (19%)	15 (27%)	
IBD	31 (60%)	34 (62%)	
Other	11 (21%)	6 (12%)	
Immunosuppression			<i>P=0.99</i>
Yes	12 (23%)	12 (22%)	
No	39 (75%)	42 (76%)	
BMI- Median (range)	25 (17-36)	25 (17-46)	<i>P=0.36</i>

* See separate full list of baseline characteristics

Patient in both groups were similar in all characteristics except for age (*p*<0.05)

- The uptake in the app arm was 79% (41/52)
- An intention-to-to analysis was performed

Table 2: Primary outcomes and LOS

	App (n=52)	Control (n=55)	p-value
30-day ED visits, n(%)	11 (21%)	20 (36%)	0.08
30-day Re-admissions, n(%)	8 (15%)	10 (18%)	0.69
LOS, mean, SD	8.69 ± 5.29	11.3 ± 10.11	0.095

- There is a trend towards statistical significance in reducing 30-day ED visits and LOS for patients discharged with the mobile app

Figure 3: 30-day ED visits

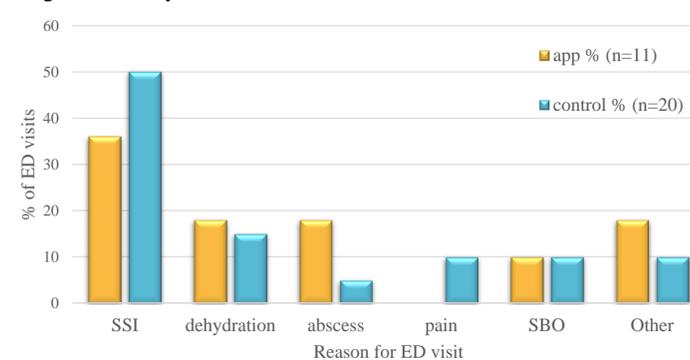
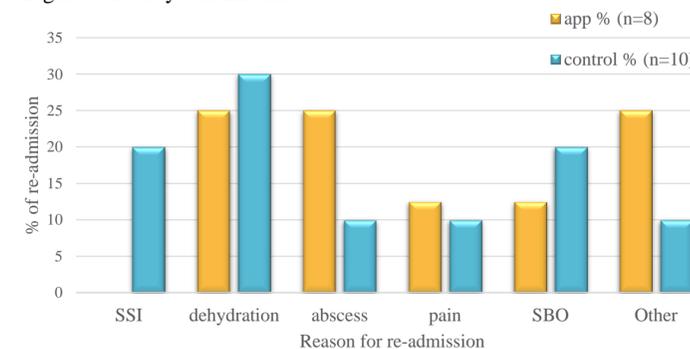


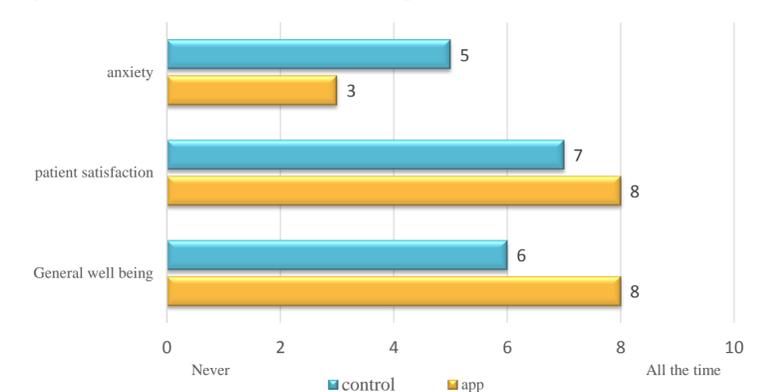
Figure 4: 30-day readmission



- There was 15% decrease in the ED visits due to surgical site infection (SSI) in the app group (50% control vs. 35% app) (figure 3)
- Up to 20% of re-admission in the control group were related to surgical site problems as compared to none in the app group (figure 4)

- 91% of patients (98/107) completed the 30-day follow up telephone surveys post-discharge
- The median scores on all three patient reported outcomes reported lower anxiety and higher patient satisfaction and feeling of general well-being in using the mobile app

Figure 5: Median score on 30-day follow up survey



**p*-value <0.05 for all three outcomes

Discussion

- The “Home-to-stay” group showed a decrease in 30-day ED visits and LOS compared to the control group
- The mobile app is also viewed positively by patients indicated by high participation rate of 79%
- The 30-day follow up surveys indicated a significant decrease in patient anxiety and significant increase in general well being and patient satisfaction in the app group vs. the control
- Younger age of the app patients may explain the favorable outcomes to some degree. A larger sample size would allow for a sub-group analysis to eliminate this bias.

Conclusion

- The interim results of the RCT suggest that the PA-led “Home-to stay” mobile app has strong potential to decrease 30-day ED visits as well as increase patient empowerment and patient satisfaction
- Next steps will be to complete the trial, anticipating similar positive outcomes

References

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