HealthBeacon's ICMS: 19% More Patients on Therapy at Month 12

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INTRODUCTION

Considerable declines in treatment persistence occur within 12 months following initiation, and persistence rates to rheumatological, dermatological and gastroenterological treatments may be as low as 59.5% [1]. HealthBeacon's Injection Care Management System (ICMS) aims to improve persistence with their Smart Sharps Bin and patient support platform (Figure 1, Figure 2).
To determine the system's impact on persistence, we followed patients on injectable treatments in each of these therapeutic areas (TAs) for 12 months. Persistence rates were compared with those reported in the literature to test for relative improvements provided by HealthBeacon's ICMS.

Figure 1: HealthBeacon Injection Care Management System (ICMS)

Figure 2: HealthBeacon Smart Sharps Bin

1. Personalized smart reminders alert patients when their medication is due
2. Patients' medication schedules automatically update when a drop is made
3. A real-time record of adherence is created for physicians to review remotely
4. HealthBeacon Support monitors adherence and provide intervention calls, as needed
5. Hazardous sharps waste is safely stored within the internal sharps bin
6. Discreet yet user-friendly design allows for ease of use and incorporation into the home environment

METHODS

Participants

This study included 7,489 patients (53.7% female) on injectable rheumatological (n= 3,242, 43.3%), dermatological (n= 1,003, 13.4%), or gastroenterological (n= 3,244, 43.3%) treatment. Participants were grouped by age: 18-29 (14.5%), 30-44 (30.1%), 45-59 (32.4%), 60-80 (22.1%), or 81-95 (0.8%). Injections were monitored for 12 months or until discontinuation on the ICMS.

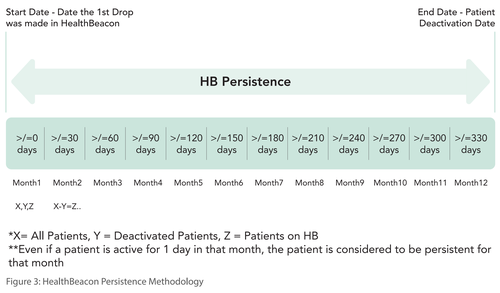
Evaluating Persistence

In this study, persistence was defined as the time from a patient's first use of the HealthBeacon system until deactivation, as a proxy for persistence to therapy (Figure 3). This was compared with a study of therapy discontinuation over 12 months in these same TAs [1], in which discontinuation was defined as ≥90 days without therapy. It was of central interest whether the HealthBeacon ICMS resulted in a reduced risk of discontinuation both overall and within each area. Notably, while these definitions of discontinuation differ somewhat, they are largely comparable.

Statistical Analysis

Cox proportional hazard modelling was used to first assess persistence over 12 months and second test whether differences in persistence were significantly associated with TA, sex, or age groups. All three predictor variables were captured categorically. Kaplan-Meier curves were estimated overall and on each dimension.

Hazard ratios were calculated for each group relative to a reference group. A hazard ratio of 1.0 indicated no relative difference between groups in risk of discontinuation, while a hazard ratio higher or lower than 1.0 indicated a higher or lower relative risk, respectively.



*X= All Patients, Y = Deactivated Patients, Z = Patients on HB
**Even if a patient is active for 1 day in that month, the patient is considered to be persistent for that month

Figure 3: HealthBeacon Persistence Methodology

RESULTS

Persistence

70.6% of HealthBeacon patients remained engaged in treatment at month 12, representing an 18.7% relative increase over previously reported persistence rates during the same time frame [1]. Regarding TA, at month 12, persistence was 67.4% for those on rheumatological treatments (+21.2% relative to previous reports), 73.9% for dermatological (+28.0%), and 72.3% for gastroenterological treatments (+13.1%). At month 12, the persistence rate in males was 74.4%, relative to females at 67.5%. Regarding age, persistence at month 12 steadily declined as age increased, from 18-29 (75.9%), 30-44 (72.4%), 45-59 (69.7%), 60-80 (66.7%), to 81-95 (63.5%). See Figure 4.

Predictors of Persistence

There was a significant effect of TA in predicting persistence ($\chi2$= 15.68, DF= 2, p<0.001), with higher risk of discontinuation for rheumatological treatments relative to both dermatological (Z= 3.09, p= 0.002) and gastroenterological (Z= -3.33, p= 0.001).

Hazard ratios for these effects are outlined in Table 1. Persistence in dermatological and gastroenterological treatments did not significantly differ (Z= 0.81, p= 0.417).

Age was associated with a significantly reduced persistence ($\chi2$= 35.81, DF= 4, p<0.001). The hazard ratio of each age group was incrementally higher than the last, beginning with 18-29 years. This reduction in persistence relative to the youngest age group was significant in 45-59 and 60-80. Lastly, females showed significantly lower persistence ($\chi2$= 43.28, DF= 1, p<0.001).

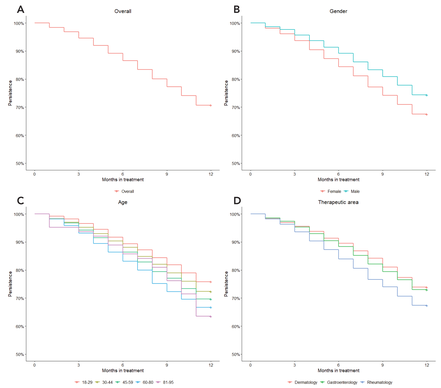


Figure 4: Comparison of 12 month HB persistence rates across demographics and therapeutic areas
(A) All Cohorts (B) Gender Comparison (C) Age Group Comparison (D) Therapeutic Area Comparison

RESULTS

Table 1: Results of Cox proportional hazard modelling to estimate hazard ratios for the association between persistence and covariates

	Group	Reference	HR	95%	CI	Z	p
Age	30-44	18-29	1.15	1.00	1.33	1.90	0.057
	45-59	18-29	1.25	1.09	1.45	3.10	0.002
	60-80	18-29	1.38	1.19	1.61	4.23	0.000
	81-95	18-29	1.39	0.91	2.14	1.51	0.131
Sex	Female	Male	1.31	1.20	1.43	6.20	<0.001
TA	Gastroenterology	Dermatology	1.06	0.92	1.22	0.81	0.417
	Rheumatology	Dermatology	1.24	1.08	1.42	3.09	0.002
	Gastroenterology	Rheumatology	0.85	0.78	0.94	-3.33	0.001

CONCLUSION AND DISCUSSION

Our findings suggest HealthBeacon's ICMS provided a considerable improvement in persistence when compared with previous reports. Interestingly, improvements were strongest in rheumatological treatments, suggesting other factors may impact persistence.

Counterintuitively, while previous reports, and other HealthBeacon data, suggests overall adherence is higher in older age groups, the risk of discontinuation is significantly higher as age increases. These findings highlight that adherence cannot be adequately measured in a single metric, and that the cross-section of adherence at a given time and the risk of discontinuation over time, can negate one another. Rather, both should be considered targets for improvement to maximize therapeutic gains.

It should also be noted, HealthBeacon's ICMS holds a stricter definition of persistence than the study referenced, meaning the actual improvement in persistence with the ICMS may be higher than reported.

In conclusion, the findings suggest that HealthBeacon's ICMS provided a decreased risk of discontinuation overall and within each TA, relative to previous reports. Hence, HealthBeacon's ICMS represents a considerable step in improving treatment persistence across numerous conditions.

REFERENCES

[1] Marshall et al. (2018). Impact of the adalimumab patient support program's care coach calls on persistence and adherence in Canada: An observational retrospective cohort study. Clinical Therapeutics, 40(3), 415-429.