ILLUMINATE.HEALTH

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Findings From a Digital Health Intervention
Pilot Addressing Behavioral Health

ILLUMINATING A DIGITAL PATH TO SUBSTANCE USE DISORDER RECOVERY

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Executive Summary:

20M Americans suffer from Substance Use Disorder involving Alcohol, Opioids, or illicit drugs like Heroin. More than 130 people die daily in the United States after overdosing on opioids. The Midwestern states had the largest increase in opioid overdoses from July 2016 through September 2017viii. Illicit drug addiction costs the US economy $193B in healthcare, lost productivity and crime. Similarly, Alcohol addiction costs $249B and prescription opioids addiction costs $78.5Bvii.

Better access to care options is needed, especially given the stigma around addiction. Digital mobile tools can be not just a good starting point but an integral part of an overall recovery program to provide the continuity in care and prevent relapse. Illuminate Health has developed a mindfulness-based recovery app which not only helps patients with an evidence-based daily routine of activities but also enables medication management especially for patients on MAT (Medication Assisted Therapies) for opioid addiction.

A pilot program with a Midwest Magnet Hospital as part of their program for addiction recovery yielded very positive results. The patients and staff installed the Illuminate Health Recovery Coach app which gave the patients a way to report on their daily mood and other symptoms, get suggestions on activities proven to aid recovery such as perform motivational reading, attend a meeting and manage medications. The engagement and utility was very positive:

* Over 50% of total patients were active app users any given week.
* Each app user recorded at least 13 events each week (whether viewing daily routine, checking in symptoms, searching for a meeting, taking a medication, reading daily spiritual guidance and so on).
* User retention rates averaged 44% over a 45-day time period, relative to a baseline of 11% for other healthcare apps on the market.
* 80% of patients said they would recommend the app to a friend or family member.
* 86% of patients said the app addressed their recovery needs.

Planning has begun for the Illuminate Health tools to be rolled out to other locations of the health system. Apart from being utilized by patients in the recovery program, patients who are discharged continue to engage with the app. Patients who are not ready to begin a formal recovery program are being explored as good candidates to start with the app and be eased into the clinical program as appropriate.
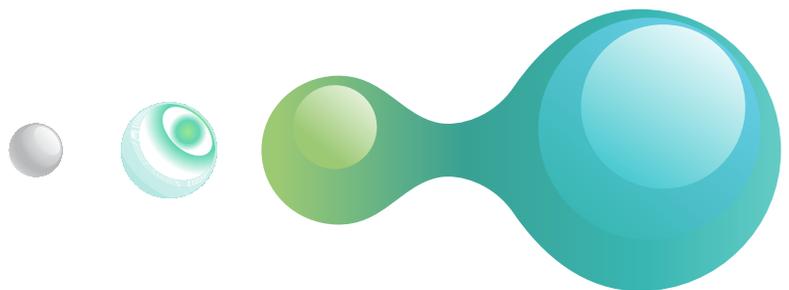
Introduction:

One of the newest and most promising applications of digital healthcare is in the behavioral health space. The multidimensional nature of behavioral health treatment – often taking the form of medication therapy, behavioral therapy, counseling and more –and the heavy titration associated with the weaning of Substance Use Disorder (SUD) related medications creates a scenario in which patient communication and information feedback loops (e.g., how is the patient feeling the day after discharge?) is vital for a safe and sustained recovery. Mental health is a setting wherein the seemingly smallest of triggers can send the patient into relapse or worse, at risk of overdose.

Digital applications outside of healthcare have proven highly effective at engaging consumers, fostering social interactions, and capturing data feedback loops. Digital healthcare applications have the potential to inform, empower, and help patients communicate, and may therefore be a powerful, effective, and low-cost therapeutic tool for behavioral health practitioners.

Despite the promise, however, digital applications in healthcare are largely unproven. Early market data that have emerged paint a discouraging picture: 83% of mobile health apps report less than 10,000 actively monthly users, & 46% of health apps report less than 500 monthly active users. Furthermore, health apps tend to lose roughly 80% of the daily active users within the first 7 days of download, and while this is not unique to health apps, it's a worrying sign of current app offerings.

Illuminate Health set out to offer a meaningful, effective and "sticky" solution for SUD patients and healthcare professionals that would accomplish three key objectives:

1. To provide users with effective informational resources to help maintain sobriety.
2. To inspire patients to discover new ways to form healthy habits.
3. To function as a virtual Intensive Out-Patient Program (IOP) and daily companion for patients who do not have access to traditional clinical services.

The Illuminate Health Recovery Coach is a digital care platform clinically designed to assist SUD patients in managing their recovery and help create habits for a sustainable sober lifestyle. Illuminate Health leveraged "Mindfulness Based Relapse Prevention" (MBRP) research to develop robust recovery tools in the form of recovery routine activities, symptom tracking, community support, socializing tools and more to provide users a foundation of habit forming coping mechanisms that have proven to reduce the likelihood of relapse, alter behavior and improve patient well-being.

In addition, Illuminate Health's robust medication management feature offers patients and their care providers the ability to ensure safe and accurate medication administration through clinical safety checks and optimized medication scheduling resulting in reduced medication side-effects and prolonged medication effectiveness. It is the hope of Illuminate Health that the confluence of these features in concert with appropriate involvement/interventions from healthcare professionals that patients will feel more secure and confident in navigating their recovery, especially in non-clinical settings.

Illuminate Health, in conjunction with a leading Midwest Magnet Hospital (hereafter referred to as "the hospital"), agreed to collaborate on a pilot program to test patient and clinical staff acceptance, application utility, and effectiveness of the Illuminate Health Recovery Coach platform amongst its addiction patient population. Beyond this, the pilot served as an opportunity for the hospital's program to see if the Illuminate Health Recovery Coach could serve as a digital extension of their recovery program.

This report outlines the results of the program to date and lessons from an early-stage behavioral health pilot of a digital health tool.
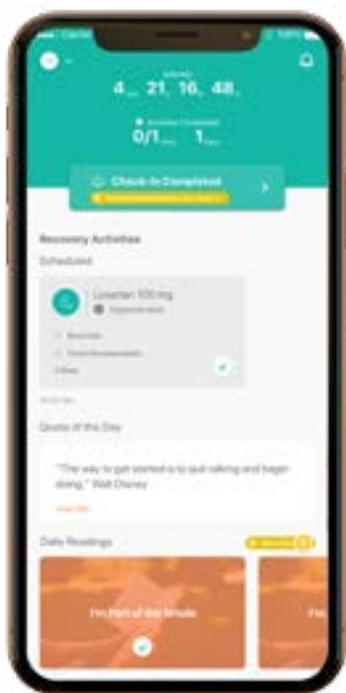
Methodology

○ *Hospital Role and Process*

The hospital was a tremendous partner wherein the staff saw value in the Illuminate Health product and became an advocate and promoter of the app to the patients. The staff members would encourage new patients to download and install the recovery app. The staff including recovery coaches, nurses and even the program director would send feedback and ideas to the Illuminate Health team.

○ *Illuminate Health Role and Process*

The Illuminate Health team closely worked with clinic staff on an ongoing basis, returning to the hospital facility as needed, whether to enroll new patients, answer existing patient questions, and record feedback from patients and staff on areas of improvement for the app. A total of 39 users, which include patients and several hospital staff members, were ultimately enrolled to the Illuminate Health Recovery Coach. To date all engagement, feedback and onboarding has been recorded and monitored by the Illuminate Health staff.

Illuminate Health has collected 13 weeks of user engagement analytics and qualitative feedback from patients and staff in an effort to assess the usage of the app in the hands of hospital patients/staff. The goal of this data collection was three-fold. First, for the hospital to understand their patient population's utilization and engagement with the app. Second, for the hospital to understand what product features their patients found most useful for their recovery. Finally, Illuminate Health used data collected during this period to make app improvements through design changes, content creation and the expansion of informational clinical resources.

○ *Subject Population*

The patient user base over time included thirty-five (35) subjects diagnosed with some form of substance use disorder. Four (4) additional users represented clinical counselors, recovery coaches, and nurse practitioners.

○ *Application Features*

The Recovery Routine- is a feature that allows the app user the opportunity to schedule, track and consume content of activities that experts and the hospital outlined as essential for recovery. These activities include: Daily Reflective Readings, Mindfulness Mediations, Acts of Gratitude, Contact A Sponsor, Attend an AA (Alcoholics Anonymous) Meeting, Connect with Someone and Exercise.

Meeting Search- is a module that allows users to search for Recovery Meetings and filter based on a series of criteria that includes: Meeting Type, Day, Time and Location. This has proven to be a useful resource for patients, so much so that they have requested Illuminate Health add more meeting types for them to search. Meetings initially started with Alcoholics anonymous, and later included Narcotics anonymous and more. *Daily Check-In/ Symptom Tracking*- is a feature where users self-report their real-time mood and associated symptoms they are experiencing throughout the day. These data points are invaluable digital biomarkers shedding light on mental state of patients.

Medication Module- Illuminate Health offers a robust medication management platform. Here users can add a medication and the platform will automatically schedule the medication for the user based on the medication properties and a user's daily schedule. Additionally, Illuminate Health performs safety checks and educates users on how to safely and accurately administer their medication. The patients had the option to manage regular medications as well as Medication Assisted Therapies (MAT).

Results

Qualitative data in the form of feedback regarding overall engagement and experience for hospital staff and patients was highly positive. For instance, the hospital has committed to continuing to promote and utilize the Illuminate Health product as part of their care management. Furthermore, deployment across other locations within the health system, including expanding scope to all of behavioral health, is now being explored.

Given that digital health applications can only add value if used consistently by patients, Illuminate Health closely tracked utilization data. Utilization data from the application showed over 50% of total patients were active app users any given week. Each app user recorded at least 13 events each week (whether viewing daily routine, checking in symptoms, searching for a meeting, taking a medication, reading daily spiritual guidance and so on)

Patient reported symptoms as Digital Biomarkers for Mental Wellbeing:
These were the symptoms defined for patients to report daily, some patients reported more than once a day.

The scale was a Likert scale to understand severity of these psychological measures.

Here is an example of the types of patient reported symptoms as an aggregated de-identified view of the data.

Symptom Name	Very Low	Low	Med	High	Very High	Total
Mood	Great-45	Good-81	Okay -65	Bad -18	Awful -6	Total -215
Angry	84	49	12	3	7	155
Anxiety	45	61	29	11	9	155
Depression	60	62	14	10	10	156
Hungry	62	52	24	12	5	155
Lonely	57	38	22	7	12	136
Tired	32	34	33	19	16	134
Total	340	296	134	62	59	891

Percent of people with following severity level of symptons

| 38.2%	32.2%	15%	7%	6.6%
Very Low	Low	Meduim	High	Very High

◯ *User retention with the Illuminate Health mobile app*

Health apps tend to lose roughly 80% of their daily active users within the first 7 days of download. In an encouraging sign, data suggests that users in the pilot were substantially more likely to continue using the application following the point of enrollment when compared with industry averages. Users of Illuminate Health's SUD Recovery App were 3.9X more likely to continue using the app after 30 days than users of other digital health applications.

Percent of Active Users Following Enrollment Date
Graph depicts a comparasion of the percent of toatal users, over severaltime periodss, who loginto and use a digital health application following their original enrollment period forIlluminate Health's application.

01
Illuminate Health

02
Industry Average
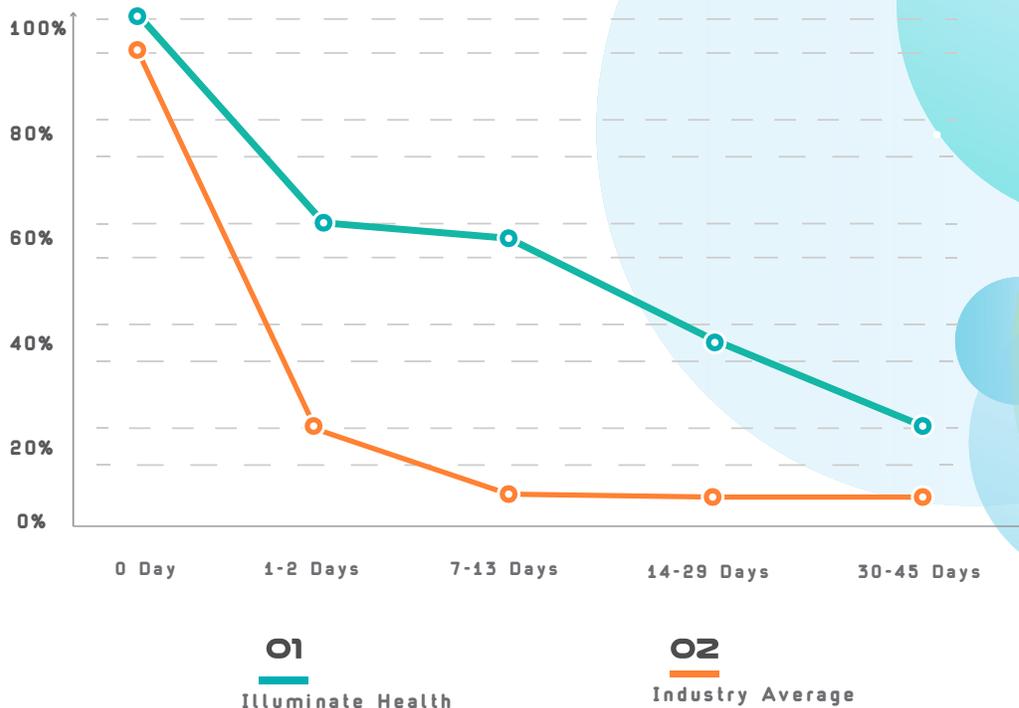
 Discussion

Given promising engagement numbers, Illuminate Health believes that its application was well utilized when functioning as part of care management while patient was enrolled in the recovery program. There would be even greater impact if the mobile app was made to be a digital extension of such a recovery program, either prior to patient enrolling in the clinic as well as continuity of care post discharge. Integrating the platform within the hospital program creates a synergy of purpose that is otherwise absent in the minds of most users. Furthermore, the application becomes a valuable tracking tool for hospital staff once integrated into the recovery program. For example, the Illuminate Health app could function as the attendance record for recovery meetings, or its Daily Symptom Check-In can be used during counseling sessions. It is the interplay of patient generated information and existing clinical resources where the Illuminate Health platform truly shines as a holistic solution for patients and clinical staff.

A post-hoc survey of patient and staff was conducted to understand what aspects and features of the app users felt were the most and least useful as well as understand general satisfaction.

80% of patients responded "yes" when asked if they would recommend the Illuminate Health App to a friend.

When asked whether they would recommend the app to a friend or family member? 80% of patients said yes. Additionally, when asked if the app addressed any of your recovery needs 86% of patients stated yes.

To get an understanding of how clinical professionals view the Illuminate Health Recovery Coach in the context of patient use, we asked staff members at our partnering hospital, what stage of recovery would a patient benefit most from the app? Essentially the response was that the app should be utilized and is valuable at all stages of recovery, even long term.

The Illuminate Health SUD Early Adopter Program was designed to assess the capabilities and effectiveness of our patient-facing digital platform in encouraging SUD patients participate in pre-defined recovery activities and educate patients and staff on the digital resources available in today's market. Through this process Illuminate Health was able to identify key areas of intervention that are important to the addiction population and the hospital staff was able to assess how the Recovery Coach could be implemented into their program. This experience has given Illuminate Health the resources and data needed to iterate and perfect its Recovery Coach app and also validated the utility of a digital resources for SUD patients in and out of formal clinical settings.

About illuminate.health

Illuminate health is on a mission to be the digital care assistant for the family caregiver and end user. We have built a clinically intelligent digital assistant and communication platform to simplify, educate, protect and support patients. Our first digital assistant, the Med Guide app is on the stores for family care management. Our next digital assistant which is an addiction recovery app was utilized in this pilot with the hospital and will be generally available summer 2019.

For more information, [visit www.illuminate.health](www.illuminate.health) or contact vg@illuminate.health

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