As the coronavirus pandemic progressed toward a critical surge in Massachusetts, leaders of the department of Psychiatry at Cambridge Health Alliance recognized the urgency of continuing to care for patients remotely. Deploying Lean methodology, the department rapidly transformed all outpatient non-urgent mental health appointments to telemedicine within a span of five days. The system redesign process incorporated a customer-centric approach and continuous improvement through monitoring of operational data. Outcomes included a reduction of no-shows, stability in volume of visits, and an opportunity to consider strategies that will enhance seamless delivery of equitable and quality care for all. This article provides practical strategies for rapid implementation of telepsychiatry and key takeaways for other health care organizations undertaking similar transformations.

The Covid-19 pandemic has challenged health care delivery systems in unprecedented ways. Across the United States, and in many other countries, outpatient services have either dramatically curtailed operating hours or closed indefinitely, while elective procedures have been postponed.1-4 Increasing access to care during public health emergencies requires collaborating closely with state and local health officials while developing new sets of clinical guidelines.4,5 As health care organizations respond to the pandemic, they must prioritize timely, equitable, safe, and appropriate access to quality care for all patients, using appropriate technologies. Swift transformations of health care delivery models often pose immediate accessibility challenges for patients in need, particularly so in vulnerable communities, who are at higher risk of Covid-related morbidity and mortality.6,7

Outpatient mental health care is an essential service to help individuals maintain functioning while avoiding higher levels of care.8,9 Treatment cannot be postponed until after the Covid-19 pandemic
due to risk of decompensation, self-injury, hospitalization, and aggravation caused by pandemic stressors.\(^2\)\(^8\) Telemedicine, the practice of medicine through remote electronic communication between a patient and provider, improves access to care and is especially important in hard-to-reach communities (due to limited broadband, geographical barriers, or confined living spaces like prisons and nursing homes).\(^10\)\(^-\)\(^13\) Outcomes research suggests that synchronous telepsychiatry, or mental health care delivered in real time through video conferencing systems, is comparable to face-to-face services in reliability of clinical assessment, treatment outcomes, patient and provider satisfaction, and cost-effectiveness.\(^14\)\(^,\)\(^15\) During a pandemic, telemedicine provides a practical solution to maintain continuity of care while adhering to physical distancing and self-isolation protocols.\(^16\)\(^,\)\(^17\)

Historically, health care organizations have faced many challenges when operationalizing telepsychiatry.\(^14\)\(^,\)\(^16\)\(^,\)\(^18\) During the Covid-19 pandemic, as staff transitioned to working from home and restrictive telemedicine policies were temporarily relaxed, implementation of telepsychiatry has occurred at a pace never experienced before.\(^17\)\(^,\)\(^19\)\(^,\)\(^20\) In addition to leveraging the external regulatory environment, health care systems have executed transition strategies with evidence-based program design; comprehensive training and communication plans; continuous improvement procedures; staff engagement efforts; and cross-departmental collaboration initiatives.\(^6\)\(^,\)\(^21\)\(^,\)\(^22\) The combination of these factors contributed to rapid virtualization\(^17\) of psychiatric services at this critical juncture. However, the literature is lacking in more detailed operational accounts of these rapid transitions, especially in safety-net institutions serving culturally and linguistically diverse communities.

Cambridge Health Alliance (CHA) is an academic, urban community safety-net health system north of Boston, Massachusetts, serving more than 140,000 patients. More than 40% of CHA’s patients speak a language other than English and approximately 65% are either publicly insured or uninsured. The psychiatry department is the largest ambulatory specialty service at CHA, with 113,152 completed visits in Fiscal Year 2019, followed by Surgical and Medical Specialties (with 71,306 and 44,269 completed visits respectively in the same time period). Psychiatry offers services across the continuum of care including a regional inpatient service with five units, a consult liaison service, a partial hospitalization program, and outpatient services. Outpatient services include seven specialty clinics and multidisciplinary mental health consultation teams serving 15 primary care clinics. Staff supporting outpatient sites include 44 psychiatrists, 55 licensed social workers, 44 psychologists, nine advanced practice nurses, two licensed mental health counselors, 70 trainees, five case managers, 39 schedulers, and five managers. As of June 23, CHA has hospitalized 907 suspected or confirmed Covid-19 patients and tested 27,952 patients and community members.

The aim of this article is to provide practical strategies for rapid implementation of telepsychiatry and key takeaways for other health care organizations undertaking similar transformations.

**Establishing a Team Approach Using Lean Methods**

Striving toward providing value-based care, CHA leadership had faced significant institutional and regulatory challenges in the development of a telepsychiatry program even prior to the pandemic. Because CHA’s clinics and hospitals are conveniently located in our relatively small
geographical catchment area, patients can be seen by a psychiatry provider in any primary care or specialty location. Without guaranteed reimbursement, CHA had few incentives to prioritize this program above other regulatory and contractual obligations requiring organizational resources. Furthermore, cultural resistance to change, concerns about the role of added technological burdens in provider burnout, and skepticism about the added-value of new technologies hindered the acceptance and buy-in of similar initiatives in the organization. Without previous telemedicine experience, psychiatry leadership could not prove to providers, staff, patients, or executive leadership the benefits of this modality for treatment goals and quality care. By March 27, while Covid-19 was rapidly spreading, Massachusetts already had 3,240 confirmed cases.23 The immediate need for telepsychiatry capacity was made clear by the mandate to minimize in-person care and an anticipated surge in mental distress.8,24

"The immediate need for telepsychiatry capacity was made clear by the mandate to minimize in-person care and an anticipated surge in mental distress."

CHA’s Covid-19 Incident Command Center, which included hospital executive leadership, tasked us (the authors) with designing and implementing a streamlined, safe, and cost-neutral process to transition all non-urgent outpatient mental health appointments to telemedicine. Using Lean methods and leveraging only existing resources,25-27 we collaborated with psychiatry managers, staff, and providers, as well as representatives from marketing, interpreter services, and information technology departments (Figure 1), to swiftly design and initiate a new workflow by March 31, within a span of five days (Figure 2).
**FIGURE 1**

**Telepsychiatry Implementation Team during the 5-Day Period**

This table displays Cambridge Health Alliance's (CHA) staff involvement and the number of hours worked during the initial design and implementation of the Telepsychiatry program (03/27/20–03/31/20).

| Group               | Department                      | Title                                      | # of Staff | Hours/ Day/ Person | Days worked | Total Hours |
|---------------------|--------------------------------|--------------------------------------------|------------|--------------------|-------------|-------------|
| Core Team           | Performance Improvement         | Sr Advisor & Advisor                      | 2          | 8                  | 5           | 80          |
|                     |                                 | Director                                  | 1          | 1                  | 3           | 3           |
|                     | Psychiatry                      | Medical Director, Outpatient Services      | 1          | 3                  | 5           | 15          |
|                     |                                 | Child & Adolescent Services               |            |                    |             |             |
|                     |                                 | Vice Chief of Operations                  | 1          | 2                  | 3           | 6           |
| Subject Matter Experts | Interpreting Services         | Director                                  | 1          | 0.5                | 2           | 1           |
|                     |                                 | Translator                                | 3          | 0.5                | 1           | 1.5         |
|                     | Marketing                      | Director                                  | 1          | 0.5                | 5           | 2.5         |
|                     |                                 | Staff                                     | 1          | 1                  | 5           | 5           |
|                     | Information Technology         | Director or Manager                        | 4          | 0.5                | 2           | 4           |
|                     |                                 | Analyst                                   | 6          | 0.5                | 5           | 15          |
|                     | Performance Improvement        | Advisor (Training)                         | 1          | 0.5                | 4           | 2           |
| End Users           | Psychiatry                      | Manager                                   | 5          | 2                  | 3           | 30          |
|                     |                                 | Provider or Trainee                        | 224        | 1                  | 2           | 448         |
|                     |                                 | Scheduling Staff                          | 39         | 1                  | 1           | 39          |
| Total               | N/A                             | N/A                                        | 290        | 22                 | N/A         | 652         |

Source: The Authors

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The process described in this paper did not require any additional funding, technology, personnel, or devices. The device integration did not cost any money because CHA was the pilot site for the integration between Google and Epic. Google coordinated and paid for the vendor to integrate the systems.

Evaluating the Current State

We began by understanding the organization’s strategy for telemedicine and leadership’s vision for the future state of telepsychiatry. After collecting information through Gemba walks (a Lean process where leaders step back and observe the actual work process and engage with the workers to discover improvement opportunities), we synthesized our findings in a cause-and-effect (Ishikawa) diagram that mapped out inefficiencies (Mudas) in the following areas: people, process, technology, monitoring, environment, and equity (Figure 3).
Cause-and-Effect (Ishikawa) Diagram for Transition to Telepsychiatry

This diagram was used to identify inefficiencies, knowledge gaps, and other internal and external factors. This helped remove obstacles, resulting in a rapid transformation to Telepsychiatry at Cambridge Health Alliance.

Developing the Future State

We conducted an Impact/Effort analysis (Figure 4) to identify and prioritize value-adding processes.
Impact-Effort Matrix for Telepsychiatry Program Design

This matrix displays change ideas and their potential impacts and anticipated efforts. This assisted us in prioritizing interventions while optimizing resources and ensuring strategic alignment.

We used Value Stream Mapping and Kaizen Plan-Do-Study-Act (PDSA) improvement cycles to develop a workflow (Figure 5) that mitigated human error (Poka Yoke) and optimized patient experience.
Leveraging Available Technology

Because CHA’s video platform (Google’s G Suite) and electronic health record (EHR) had not been integrated as of March of 2020, we first mapped out training, safety, and confidentiality considerations. To minimize confusion in schedules and enhance data structures, we built telemedicine *appointment types* (Figure 6) for each treatment modality and length of visit.
We used EHR reports to track visit volumes, visit modality (video versus phone), and no-shows by provider and clinic. Patient enrollment in the EHR portal was not a prerequisite for video visits.6

**Effective Patient Communication**

We followed agile principles to effectively share the right information, in the right format, at the right time with patients.28 This included instructions on CHA’s website, emails to patients with upcoming appointments, guidelines to the EHR patient portal sign up, and timely appointment reminders sent through our EHR patient portal (Figure 7). These reminders replaced our usual system, which was suspended in early March. All of the above communications were translated into CHA’s four main languages: English, Portuguese, Spanish, and Haitian Creole.
Patient Communication for Transition to Telepsychiatry

The email and EHR patient message below display examples of the messages sent out to patients to share information and instructions about the upcoming changes to visits. Both messages included links to the Cambridge Health Alliance (CHA) website, where patients and families could access and review additional information on how to download the video conference application and join the video visit with providers and interpreters.

Frontline Engagement

We held mandatory interactive training sessions with live video visit demonstrations: one for 224 providers, including trainees (with two separate times from which to choose), and one for 44 staff members and managers. The training for providers included instructions for initiating a video visit, troubleshooting common technical issues, and adding interpreters or supervisors to the visit. The training for staff included instructions for correctly updating patient contact information, capturing telemedicine preferences, and supporting patients with the video technology application. We shared training materials, recordings, and Frequently Asked Questions (FAQs) through CHA’s intranet and department-wide emails. (Appendix).
Lessons Learned

There are three important lessons we share based on this experience:

*Lean and Systems Thinking provide a pragmatic approach to achieve continuity of care and rapid diffusion of innovation in low-resource settings.*

Lean principles and tools accelerated this transformation and helped the new workflow stick. We observed a quick peak (Figure 8) and shortened stages in the adoption curve during the diffusion of innovation. We think key variables contributing to this phenomenon were a shared vision, agile coordination through daily huddles during the first three weeks after roll-out, and alignment of incentives for patients, providers, government, payers, and health care organizations.
In the first 11 weeks (March 29–June 12) of the telepsychiatry program, providers completed 19,818 total phone visits, 6,302 video visits, 2,234 visits with imprecise documentation about whether providers used video or phone, and 172 in-person visits. During the workflow period described in this article, psychiatry providers have seen a total of 6,410 unique patients through phone visits and 1,804 unique patients through video visits during the Covid-19 pandemic. Even though some providers were redeployed to other clinical areas, lower no-shows and cancellations preserved a comparable volume of completed visits before and after the telepsychiatry implementation. Because each service line at CHA defined their own telemedicine workflow, overall volumes and video adoption trends are not comparable. Initially, the EHR fields required to document telemedicine details were not defaulted into the provider note templates. To address this problem, the information technology department created EHR note types for telemedicine,
which automatically included these fields, along with hard-stops for providers to complete their
documentation correctly before closing their notes.

We used the PDSA model\textsuperscript{30} (Figure 9) to gather timely feedback and monitor EHR data for
troubleshooting challenges with technology, documentation, and barriers to care. This propelled
agile improvement toward greater equity, quality, and safety.\textsuperscript{28}

\textbf{FIGURE 9}

\textbf{PDSA Rapid Improvement Cycles during Telepsychiatry Implementation}

This diagram conveys use of the Plan-Do-Study-Act (PDSA) model to incorporate feedback and
operational data into workflow changes throughout the first 13 weeks of the new Telepsychiatry
program at Cambridge Health Alliance (CHA).

\begin{center}
\includegraphics[width=\textwidth]{pdsa-diagram.png}
\end{center}

\textit{*PDSA 6 Includes a 5-week time range}

Source: The Authors
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For a nimble transformation toward operational excellence we recommend: 1) following Lean
methods and PDSA cycles to remove institutional barriers and accelerate the diffusion of
innovation; 2) aligning vision and goals, enhancing teamwork; 3) fostering strategic collaboration
and transparency; and 4) optimizing available technology to ensure efficiency and actionable
reporting for sustainability.\textsuperscript{31,32}
Telepsychiatry increases patient engagement and offers opportunities to both redesign mental health services and improve health outcomes.

The Covid-19 pandemic has highlighted how telemedicine can, at least in the short-term, virtually replace in-person outpatient mental health services while protecting the public’s health and ensuring reliable, quality, and cost-effective psychiatric care.17 One provider’s comment reflects the added clinical value from video visits, “I met the father for the first time. I observed them in their home setting. I coached the parents in the moment on how to behaviorally manage the patient and siblings fighting as it was occurring ... I explained Autism Spectrum Disorder to the child himself and shared resources. This worked better than any of my hospital visits.”

Additionally, EHR data demonstrates increased patient engagement with telemedicine (Figure 10). When we compare a 5-week period before (February 9–March 14) to a 9-week period after (April 12–June 12) the transition, no-show rates decreased from a weekly average of 23% (SD 0.03) for in-person visits to a weekly average of 12% (SD 0.01) with telemedicine, including phone and video visits.
Telepsychiatry will continue to play a key role in addressing the expected surge in mental health needs. Serious considerations of clinical, operational, and financial implications for incorporating telemedicine into mental health care delivery are essential. To this end, we propose: 1) instituting evidence-based guidelines around implementation and delivery of telepsychiatry; 2) developing training tools and access to necessary technology to improve clinician webside manner and patient experience; 3) conducting measurement of clinical outcomes, patient and provider experience, cost-effectiveness, and ramifications of digital innovations on value-based models; and 4) exploring factors associated with patient engagement (e.g., privacy, perceptions of treatment, and economic distress), particularly during emergencies.
An equity-based approach is fundamental to mitigate risks of worsening health disparities through telemedicine.

In a virtualized health care system, equitable access to care relies on adequate technological resources and digital literacy. Disparities in access represent fundamental challenges to CHA’s mission to provide excellent care for all during the pandemic. CHA psychiatry providers initially anticipated that inadequate access to the Internet, difficulty navigating the video application, privacy concerns, and low literacy would pose significant issues for patients. This was evident in the video adoption rates seen in various types of subspecialty clinics (Figure 11), demonstrating that certain patient groups may be disproportionately challenged in adopting the new approach.

FIGURE 11

Adoption of Telepsychiatry Workflow by Department during Covid-19

This table displays weekly data from the top 10 departments—accounting for 89% of all outpatient psychiatry visit volumes since the transition to telepsychiatry. Departments are ranked by overall use of video visits beginning when the new workflow was implemented (3/30/20).

| Department                                      | City          | Average visits |
|-------------------------------------------------|---------------|----------------|
| Adult Psychotherapy Training Clinic             | Cambridge     | 200            |
| Child & Adolescent Specialty Psychiatry Clinic  | Cambridge     | 257            |
| Child & Adolescent Specialty Psychiatry Clinic  | Revere        | 81             |
| Malden Family Medicine Psychiatry Clinic (1)    | Malden        | 72             |
| Adult Specialty Psychiatry Clinic               | Revere        | 231            |
| Psychiatry Transition Clinic (2)                | Cambridge     | 91             |
| Adult Specialty Psychiatry Clinic (3)           | Somerville    | 824            |
| Adult Outpatient Addictions Clinic              | Somerville    | 103            |
| Geriatric Psychiatry Clinic                     | Somerville    | 184            |
| Latino, Haitian, and Asian Psychiatry Clinics    | Cambridge     | 215            |

(1) Largest primary care mental health integration clinic at CHA
(2) Clinic for urgent appointments and transitions of care for inpatient and emergency department discharges in need of a follow-up appointment within 7 days
(3) Includes General Psychiatry, Trauma-Informed Program (Victims of Violence), Portuguese Mental Health Clinic, and Program for patients with Serious Mental Illness (Health Integration Program)

Source: The Authors

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Confronting language barriers is crucial to guaranteeing equitable access to quality care. Certain patients continue to face barriers communicating with their care team outside of visits due to the limited language capacity of CHA’s patient portal, currently only available in English and Spanish.

Similarly to other health care systems responding to Covid-19, we faced interoperability challenges between our video technology and interpreter platforms; however, we ultimately succeeded in adding CHA interpreters to video visits in 17 languages through video and in 55 additional languages through audio only.
To address equity in transitions to telemedicine, we propose: 1) incorporating questions about access to technology and digital literacy into existing social needs screenings; 2) creating strategic public-private partnerships to recognize and address limitations to technological access; 3) evaluating quality outcomes of phone and video visits as compared to in-person visits; and 4) prioritizing access to video interpreters and EHR portals in multiple languages.

“Within a two-month period, we applied Lean methods to swiftly launch and scale-up telepsychiatry for outpatient services. Without a preexisting telemedicine program or additional personnel, funding, devices, or platforms, we observed comparable visit volumes and a 48% reduction of no-shows.”

Looking Ahead

Within a two-month period, we applied Lean methods to swiftly launch and scale-up telepsychiatry for outpatient services. Without a preexisting telemedicine program or additional personnel, funding, devices, or platforms, we observed comparable visit volumes and a 48% reduction of no-shows. Customer-focused, value-driven processes supported by operational data allowed us to systematically address challenges, thereby improving patient experience and provider engagement. Psychiatry leadership continues to fine-tune EHR processes and collaborate with other service lines, executive leadership, and the quality and safety department to support clinics in identifying barriers that delay wider adoption of video visits. Early observations suggest that for both patients and providers, barriers include inadequate access to appropriate technology, lack of digital literacy, lack of privacy, and skepticism about the value of telemedicine. As a safety-net system, we continue to learn and enhance quality of care for all, while preparing to incorporate telemedicine as standard practice for all service lines during and after the pandemic. On May 26, with insights from this effort, CHA implemented the pilot workflow where providers initiate a video visit on Google’s G Suite directly from the Epic EHR. We hope that health care systems and clinicians find these operational strategies valuable for developing scalable, malleable, and sustainable solutions during and after the pandemic.

Appendix

Index of Telepsychiatry Frequently Asked Questions (FAQs) for Staff and Providers, March 30, 2020

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Acknowledgements

We thank Mark Albanese, Odette Argant, Maria Carvalho, Lisa Foley, Eloni Feliciano, Charlotte Golden, Hsiang Huang, Luz Morales, Michael Williams, and all providers, trainees, and staff from Psychiatry, whose feedback and dedication were critical for this implementation. We also thank Wendi Joy Brenner, Gretta Buckley, Yige Cao, Vonessa Costa, Abbot Cooper, Vanessa Doleyres-Nazaire, Kevin Forbes, Yomaris Guerrero, Brian Herrick, Alexis Ladd, Zhishao Luo, Jeffrey Nussbaum, Ryan Oullette, Arthur Ream, Julie Regner, Daniel Rezes, Ed Trejo, Michelle Weiss, Daniel Wilkensen, and others in CHA supporting our transition to telemedicine.

Disclosures: Paola Peynetti Velázquez, Gaurav Gupta, Gouri Gupte, Nicholas J. Carson, and Jacob Venter have nothing to disclose.

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