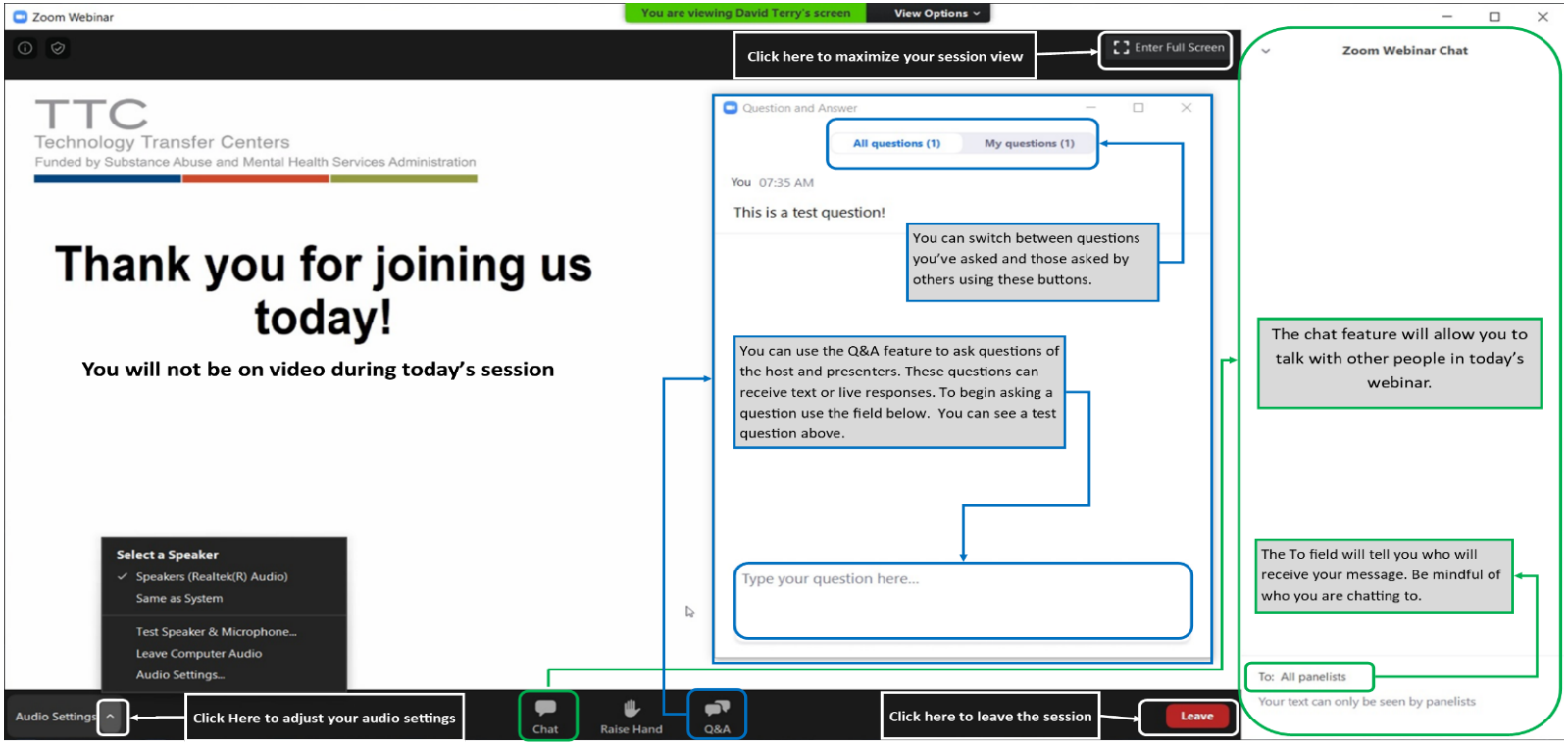
The Zoom Interface



All attendees are muted. Today's session will be recorded.

Telebehavioral Health Services: Planning and Investing for the Future of Your Services

Session 1: The Future of Telebehavioral Health and Digital Mental Health Services

Jay Ostrowski

Behavioral Health Innovation

7/14/2021

Northeast and Caribbean (HHS Region 2)

MHTTC Mental Health Technology Transfer Center Network

Funded by Substance Abuse and Mental Health Services Administration

About Us …

The Northeast and Caribbean MHTTC received 5 years (2018 – 2023) of funding to:

- Enhance capacity of behavioral health workforce to deliver evidence-based and promising practices to individuals with mental illnesses.
- Address full continuum of services spanning mental illness prevention, treatment, and recovery supports.
- Train related workforces (police/first responders, primary care providers, vocational services, etc.) to provide effective services to people with mental illnesses.

Supplemental funding to:

- Support school teachers and staff to address student mental health
- Support healthcare providers in wellness and self-care activities

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We Want Your Feedback!

Our funding comes from the Substance Abuse and Mental Health Services Administration (SAMHSA), which requires us to evaluate our services. We appreciate your honest, ANONYMOUS feedback about this event, which will provide information to SAMHSA, AND assist us in planning future meetings and programs.

Feedback about this training will assist us in developing future trainings that are relevant to your professional needs. Therefore, your feedback counts!

Video Recording Information

Please Note:

We will be recording this webinar and posting it to our website along with the presentation slides and any relevant resources.

Disclaimer

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At the time of this presentation, Tom Coderre served as Acting Assistant Secretary for Mental Health and Substance Use at SAMHSA. The opinions expressed herein are the views of the speakers, and do not reflect the official position of the Department of Health and Human Services (DHHS), or SAMHSA. No official support or endorsement of DHHS, SAMHSA, for the opinions described in this presentation is intended or should be inferred.

This work is supported by grant H79SM081783 from the DHHS, SAMHSA.

Your Interactions With Us

Question and Answers

- Q & A will occur at the end of the call.
- Type your questions in the Q & A feature in Zoom located on the task bar (hover over task bar).
- Note: your question is visible to all participants.

Chat and Polls

- Throughout the webinar, we will be asking for your input.
- Use the Chat or Poll features in Zoom located on the task bar.
- You can control who can see your chat comments.

The MHTTC Network uses affirming, respectful and recovery-oriented language in all activities. That language is:

- Strengths-based and hopeful
- Inclusive and accepting of diverse cultures, genders, perspectives, and experiences
- Healing-centered and trauma-responsive
- Inviting to individuals participating in their own journeys
- Person-first and free of labels
- Non-judgmental and avoiding assumptions
- Respectful, clear and understandable
- Consistent with our actions, policies, and products

Adapted from: https://mhcc.org.au/wp-content/uploads/2019/08/Recovery-Oriented-Language-Guide_2019ed_v1_20190809-Web.pdf

Our Presenter

Jay Ostrowski MA, LPC-S, NCC, DCC, ACS, CTCP

Jay Ostrowski

Roles

CEO - Behavioral Health Innovation

CEO - Adaptive Telehealth

Consultant - Mid-Atlantic Telehealth Resource Center

Licenses and Certifications:

Licensed Professional Counselor Supervisor

Licensed Professional Counselor (MI, SC)

Approved Clinical Supervisor

National Certified Counselor

Board Certified - Telemental Health Provider

Jay Ostrowski's Disclosures

MATRC - Mid-Atlantic Telehealth Resource Center
BHI - Behavioral Health Innovation
ATHN - Appalachian Telemental Health Network
Dialcare Mental Wellness
Interest in Adaptive Telehealth software

Learning Objectives

1. Describe the history of telebehavioral health development
2. Describe the future of telebehavioral health
3. Understand the drivers behind the move to telebehavioral health.
4. List four types of telebehavioral health services and describe their use-cases

Fast Growing Mental Health Problem - Worldwide

Facts:

1. We have a **serious shortage** of mental/behavioral health providers in the US and around the world.

2. There is **growing awareness** of the significance of mental health on overall physical health and healthcare compliance.

3. The **pace of training** new providers is **FAR outpaced by** population growth around the world.

Conclusion 1: We **will never have enough** mental/behavioral health providers to meet the mental health needs of the world.

Conclusion 2 : We **need new paradigms and scalable resources** for detecting and treating mental/behavioral health issues.

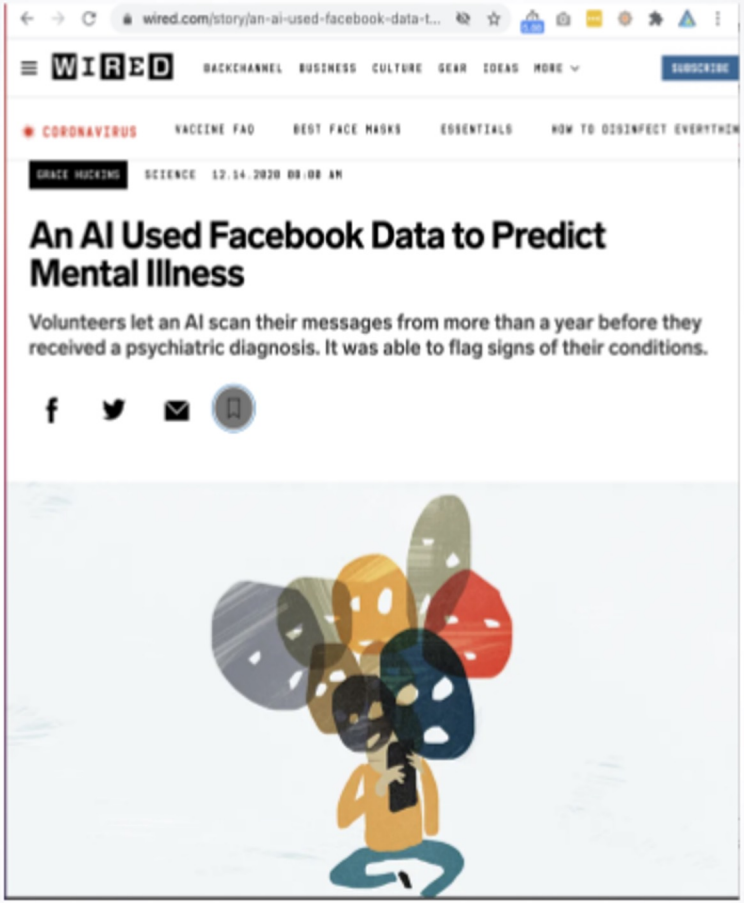
Mental and Behavioral Healthcare services is undergoing a major change.

Early Identification

What If…?

What if…

We could predict that someone would develop psychotic symptoms 1-1.5 years ahead of a clinical diagnoses?



Wired Magazine
Grace Huckins,
12.14.2020 08:00 AM

https://www.wired.com/story/an-ai-used-facebook-data-to-predict-mental-illness/

Minority Report (movie) for behavioral health or preventative medicine?

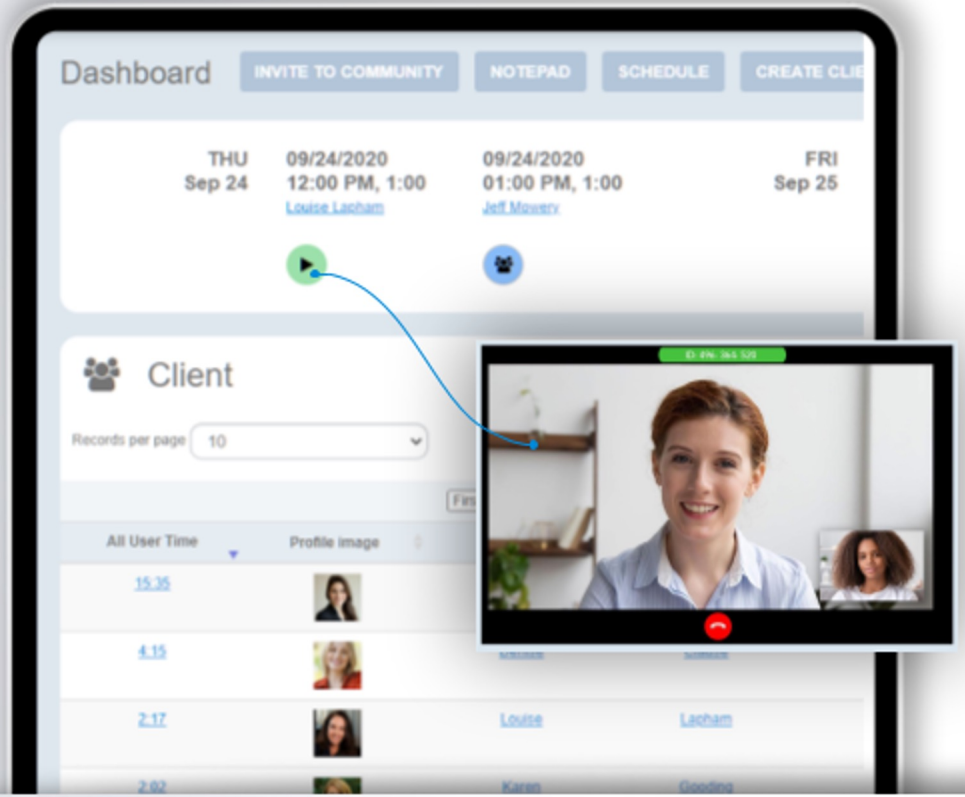
Technology-based solutions are the only viable pathway to meet the needs.

Today's Agenda

- Video
- Apps
- Chatbots
- Virtual Reality
- Artificial Intelligence

What is Possible?

Automate Workflows



Simple, Automated, Video

- HIPAA-Compliant encrypted video meetings
- Schedule video appointments from calendar
- Instant meeting option available
- Appointments automatically generate video links for all invited to the meeting
- Link to the meeting is on calendars and dashboards
- Calendar sync
- SMS meeting reminders
- Screen sharing and many additional user controls
- Staff users can add or remove participants at any time without disrupting video links
- Prompts to self-test microphone and video prior to meeting

Video Use-Cases

Use-Case Examples

1. Screening-Monitoring
2. Video Assessments - Evals
3. Individual Treatment
4. Case Management
5. Clinical Supervision
6. Group Therapy
7. Psychoeducational Classes
8. Medication Management
9. Medication Assisted Treatment
10. Suicidal/Homicidal Eval
11. Scalable individualized treatment programs

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Apps for Mental Health

An App won't be sufficient to replace therapists and psychiatrists.

All Apps are different and made for different purposes.

Using the wrong software for the job?

Types of Uses In Mental & Behavioral Health

Patient-Client Monitoring & Intervention

- Prediction
- Prevention
- Detection
- Response-Treatment
- Maintenance
- Relapse-Prevention

Users

Patients - Providers - Researchers

Provider Training and Support

- Epidemiology Studies
- Monitoring and Alert Systems
- Evidence-based Treatment Plans
- Intervention Recommendations
- Training Tools - Simulations, Provider Feedback
- Provider Resiliency Monitoring & Support

We can use technology in mental and behavioral health to:

Treatment

- Individual video medication management or therapy
- Group video or text therapy (chats, forums)
- Measurements - assessments, surveys track status and progress
- Self-led clinical workbooks, cognitive behavioral computerised treatment, other apps
- Chronic Care Management

Novelty, gamification, and convenience keep clients engaged long enough to get well.

Telebehavioral Health Modalities

Four Types of User Experiences in Telebehavioral Health

Video

Text-Based

Self-Help Content Driven Apps

Avatar or Virtual Reality, Augmented Reality

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Added Benefits Reduce Costs and Increase Revenue

Operational Efficiencies:

- Automate everything that can be automated, reducing the need for some staff costs
- Saves staff **time**, reduces **errors**
- Saving time increase **capacity**
- More **convenient**, more likely to complete.
- Reducing provider **fatigue** and **burnout**
- Reduces staff **turnover**

Treatment logistics:

- Identification, monitoring, automating reminders
- Reminders, easy online scheduling fill the schedule and reduce no-show rate
- Online payment
- Goal/change trackers

Telebehavioral Health Modalities

Four Types of User Experiences in Telebehavioral Health

Video

Text-Based

Self-Help Content Driven Apps

Avatar or Virtual Reality, Augmented Reality

Artificial Intelligence may be in use.

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Apps for Telebehavioral Health

Retain patients at the appropriate level of treatment.

Disinhibition Effect

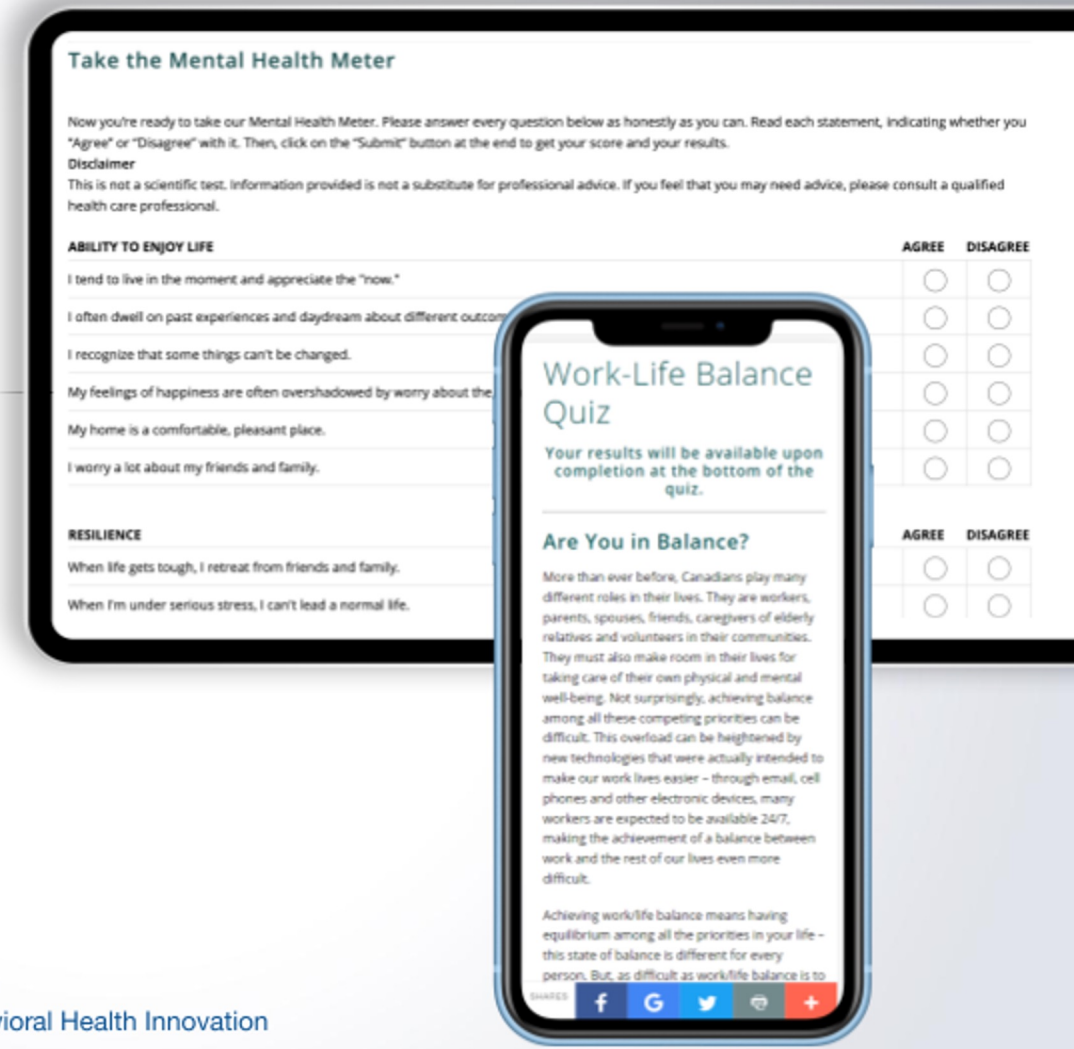
What makes chatbots and virtual therapists able to perform so well?

Some studies show that we react to avatars as if they were real humans. Mel Slater of University College London, UK, and his colleagues observed this behavior when they conducted experiments where people were aware that they were interacting with robots, yet they related to them as if they were real.[5]

Some psychologists also argue that we find it easier to share potentially embarrassing information with a virtual therapist. In human-to-human interaction, there is often a degree of self-restraint. Shame can prevent people from sharing openly with another person. However, when sitting with a virtual therapist, subjects were found to be more willing to express themselves, which could have an important therapeutic advantage. When patients talk to a psychotherapy bot, they report not feeling judged. This tendency to disclose more online than in-person is called the Disinhibition Effect.

Self check-ins don’t require a mental health provider.

AI can use this data for early identification mental health problems, symptom escalation. patient triage and more.



Eliza

The first mental health Chatbot

Some of the early chatbots were designed in the 1960s at the MIT Artificial Intelligence Laboratory. Their program **ELIZA** was able to simulate a short conversation between a therapist and a patient and is considered the grandparent of systems being used today.

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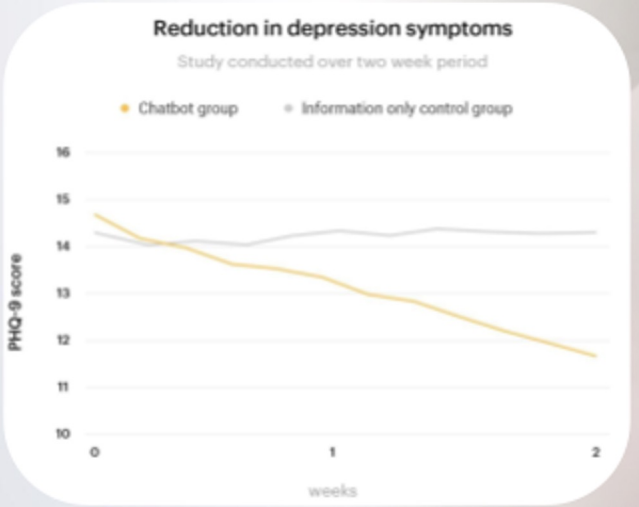
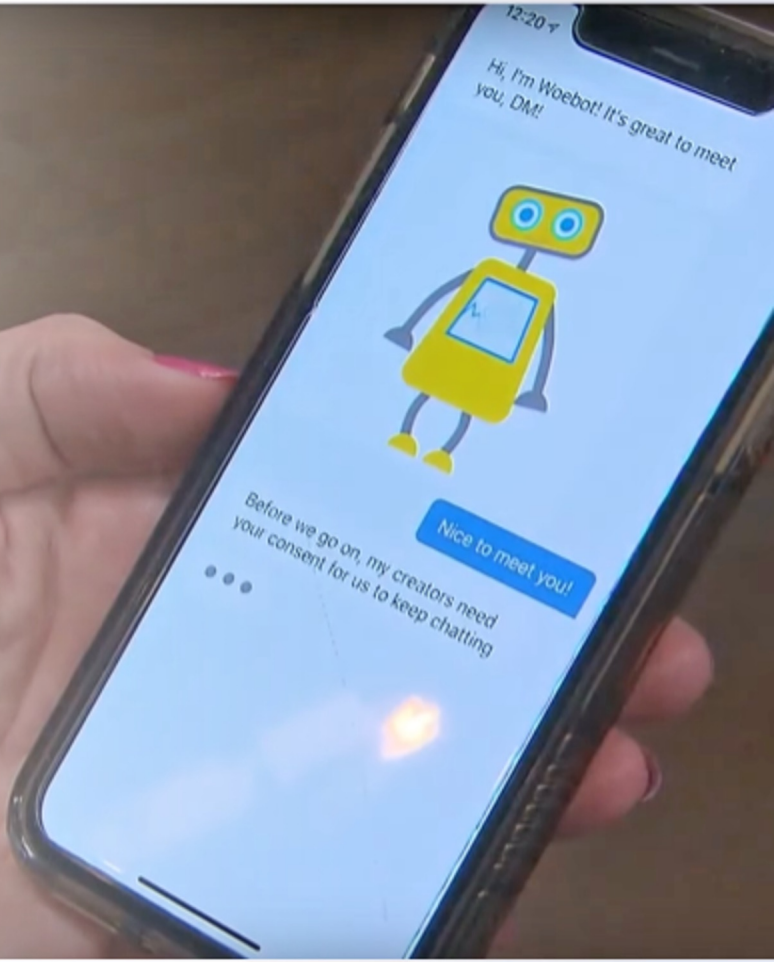
Chatbots

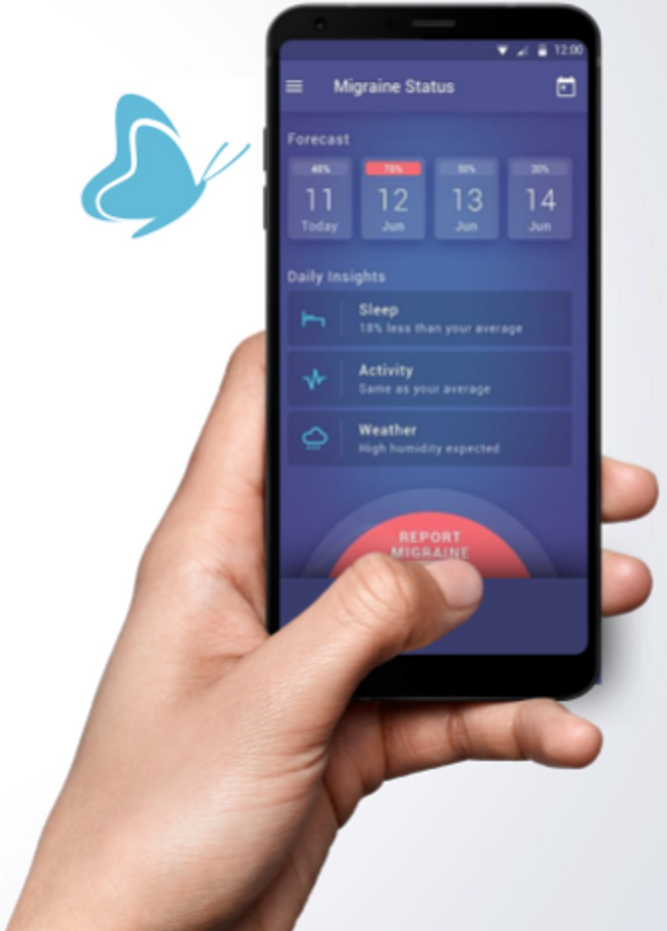
In a study of university students suffering from depression, **those using the chatbot experienced close to a 20% improvement in two weeks**, based on PHQ-9 scores.





Passive Continuous Monitoring

- Smart-phone sensors track patients' sleep, motion, and vocal attributes.
- Abnormalities detected in the patient's day-to-day behavior, which could be identified by a change in the pitch of a patient's voice or the patient's travel patterns
- Machine-learning algorithms detect real-time changes in a patient's clinical behavior two to four weeks prior to the occurrence of a mental health episode.
- Alert log is displayed through a dashboard, delivering information and warning signs.
- ML algorithms adapt to the patient and send necessary alerts to the doctor when a patient exhibits out of the ordinary behavior.



Responsive Surveys & Outcomes

Outcome of PHQ-9

- **If PHQ Score is less than 6**

Your score indicates you are doing ok, to stay that way try one of the programs here.

CANCEL OK

- **If PHQ Score is less than 10**

Your score indicates you could do with some self help. We recommend you try one of the programs here (click here) or chat with our presonal assistant.

CANCEL IM CHAT

- **If PHQ Score = 10 or More**

Your score indicates you could need some self help. Our personal assistant would like to help you on IM chat.

CANCEL IM CHAT

What is Possible?

Data Screening Questions

Drug Screening Questionnaire (DAST)

Using drugs can affect your health and some medications you may take. Please help us provide you with the best medical care by answering the questions below.

Patient name: _____

Date of birth: _____

Which recreational drugs have you used in the past year? (Check all that apply)

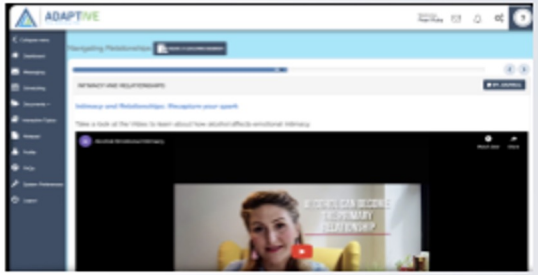
- ☐ methamphetamines (speed, crystal)
- ☐ cocaine
- ☐ cannabis (marijuana, pot)
- ☐ narcotics (heroin, oxycodone, methadone, etc.)
- ☐ inhalants (paint thinner, aerosol, glue)
- ☐ hallucinogens (LSD, mushrooms)
- ☐ tranquilizers (valium)
- ☐ other _____

How often have you used these drugs? ☐ Monthly or less ☐ Weekly ☐ Daily or almost daily

1. Have you used drugs other than those required for medical reasons?	No	Yes
2. Do you abuse (use) more than one drug at a time?	No	Yes
3. Are you unable to stop using drugs when you want to?	No	Yes
4. Have you ever had blackouts or flashbacks as a result of drug use?	No	Yes
5. Do you ever feel bad or guilty about your drug use?	No	Yes
6. Does your spouse (or parents) ever complain about your involvement with drugs?	No	Yes
7. Have you neglected your family because of your use of drugs?	No	Yes
8. Have you engaged in illegal activities in order to obtain drugs?	No	Yes

Automated workflow for each response.

- **Library**



- **Chat or workbook**

- **Video Meeting**

Clinical Workbook Example

Coaching Program

Client successfully registers to the portal and gets to see the welcome message with user guides. They can then fill out the assessments for drinking problems which they will also have an option to schedule appointment with providers via online video if preferred.

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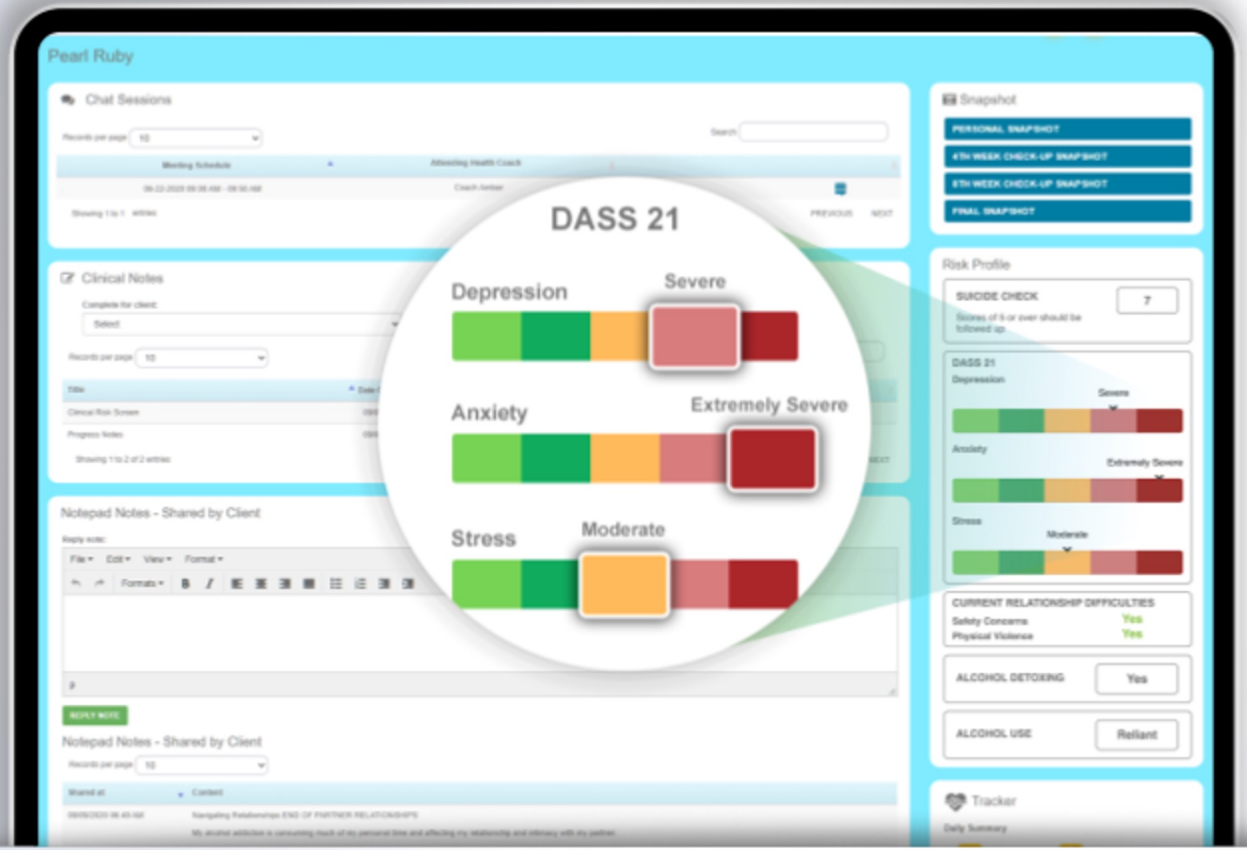
HIPAA COMPLIANT
Health Insurance Portability and Accountability Act



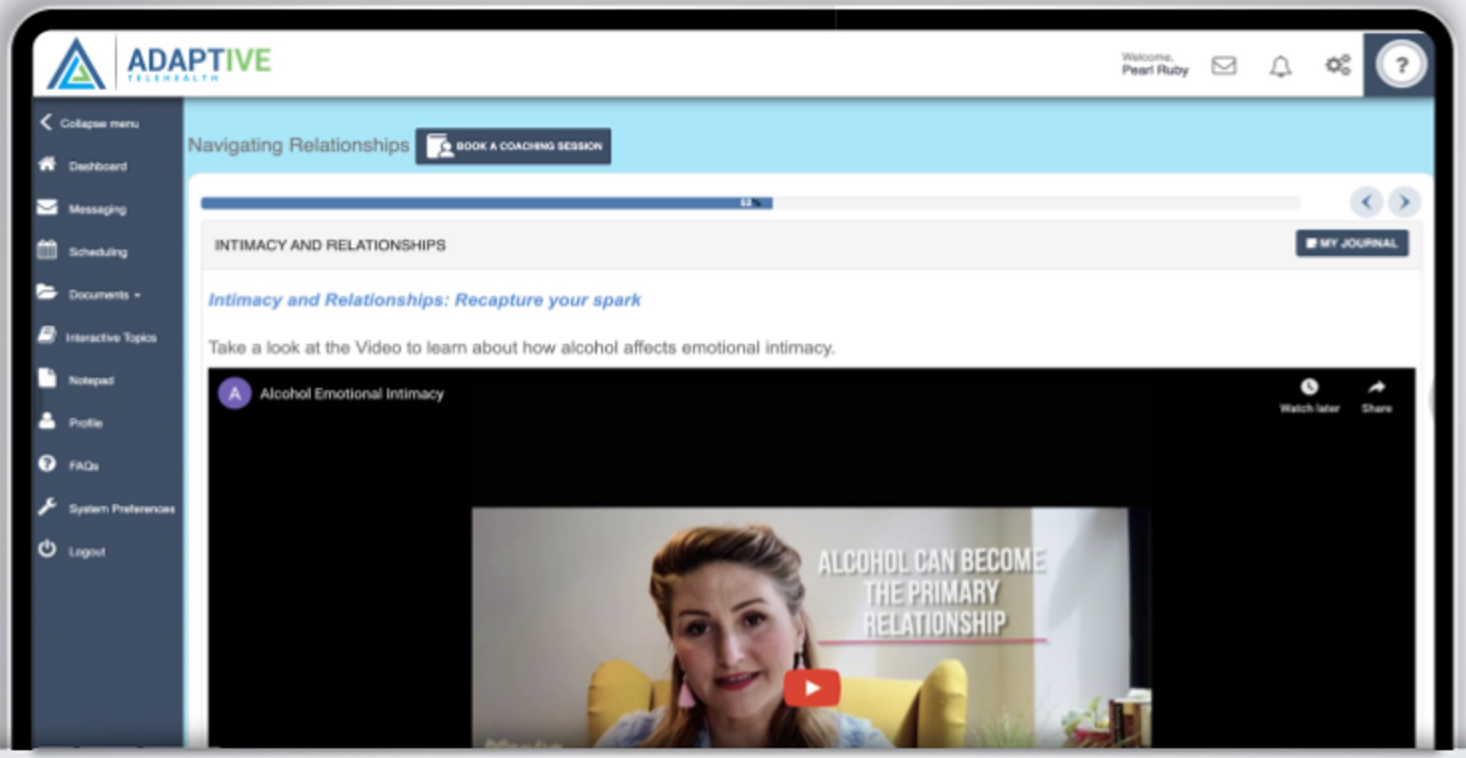
Monitor Client Self-Report

HIPAA COMPLIANT
Health Insurance Portability and Accountability Act

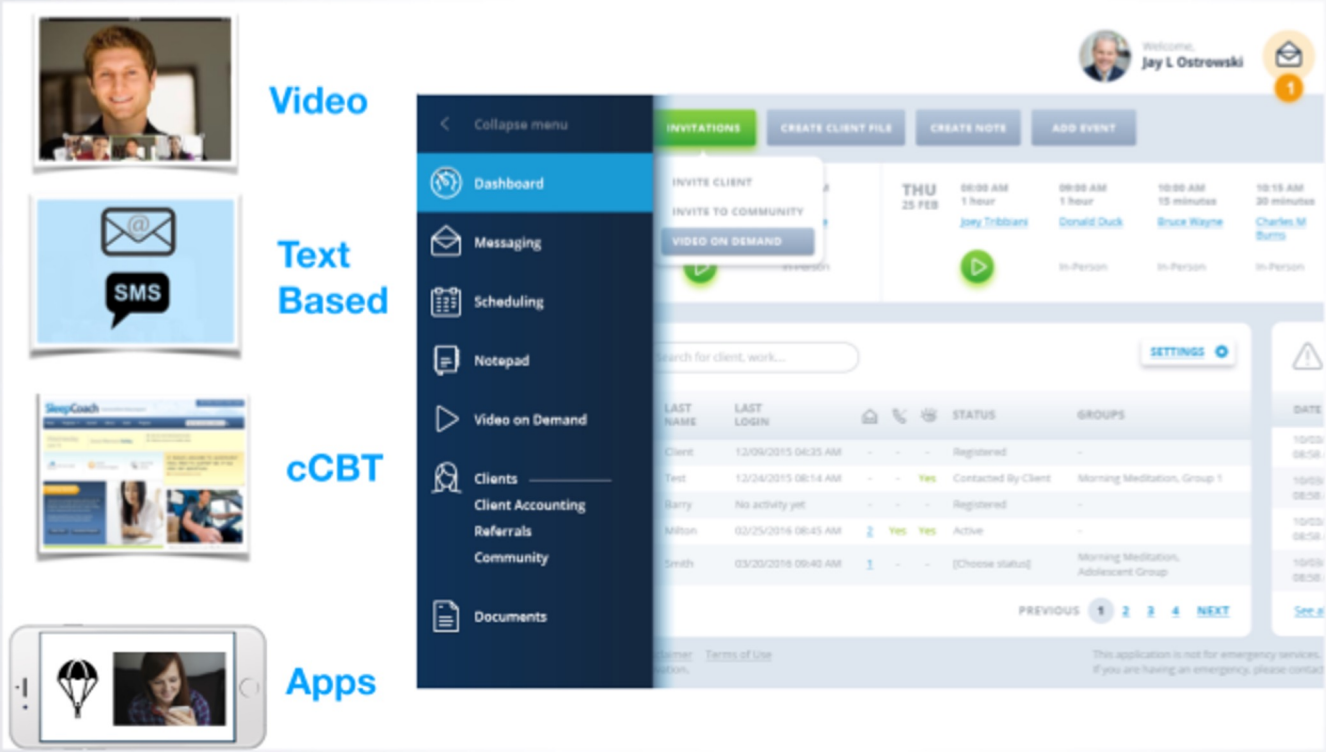
Trackers for Client's Behaviors

Clinical Workbooks

Interactive workbooks that are either self-selected or assigned by a provider. They include private patient worksheets that can be shared with the provider. The customer's content can be made into workbooks.



Choosing Telehealth Tools



Service Combinations

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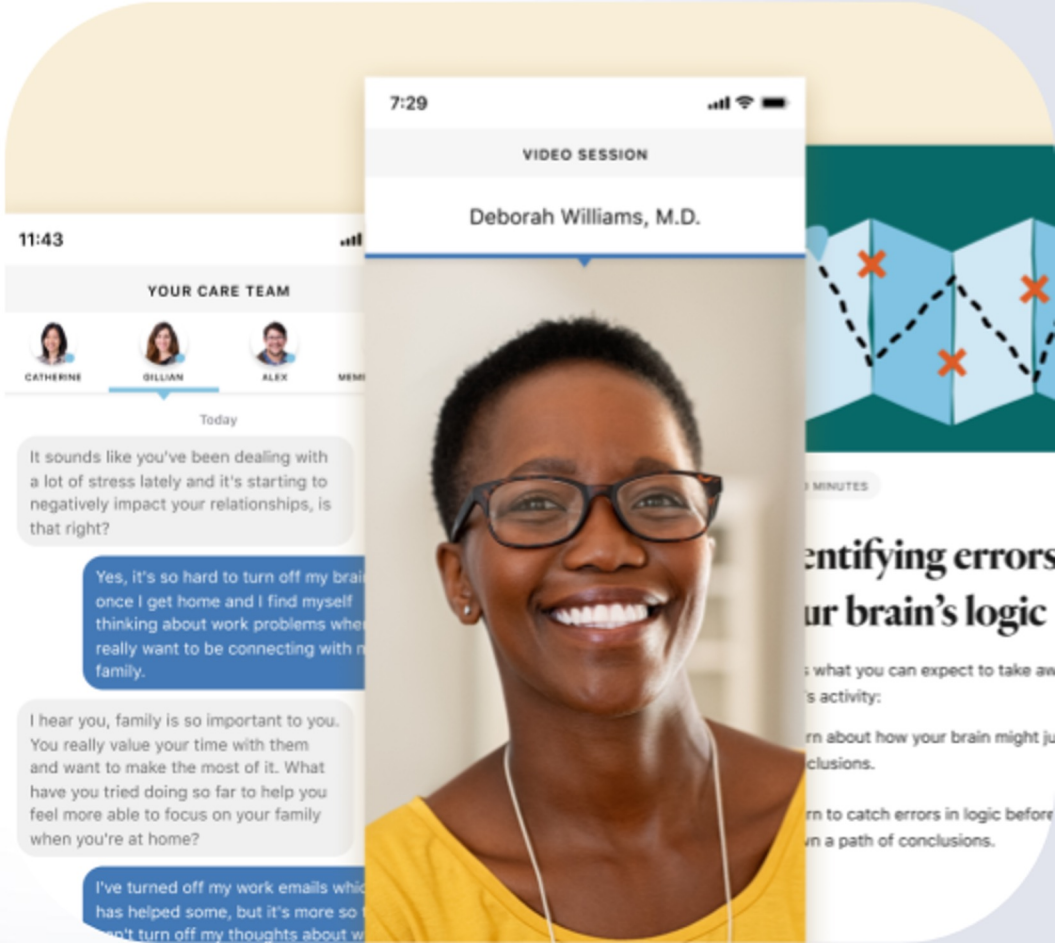
AI + Clinician

- AI individualized emotional support.
- Combination of machine learning and clinical network
- 24/7 online CBT, mindfulness and resilience training.
- Interactions with coaches and therapists can range from unlimited live chats to video sessions.



Avatars

Ellie was designed to treat veterans experiencing depression and post-traumatic stress syndrome.

What is so special about the technology is that Ellie can detect not only words but also nonverbal cues (e.g., facial expression, gestures, posture). Nonverbal signs are very important in therapy, yet can be subtle and difficult to pick up.

Ellie can gather and analyze multisensory information and help assess a user.

Ellie's creators argue that this virtual human can advance mental health and improve diagnostic precision.

Other Avatars - Can be used to as treatment tools or to provide a novel treatment environment.

NewScientist

Project Talia: More effective digital mental healthcare with AI

Stratify

Understand patient sub-types which respond best to treatment + interventions

Predict

Understanding client engagement and outcomes

Intervene

Intervene timely to ensure earlier intervention and improved outcomes

Improve

Identify successful patterns in supporter behavior in relation to patient sub-type to improve therapy effectiveness

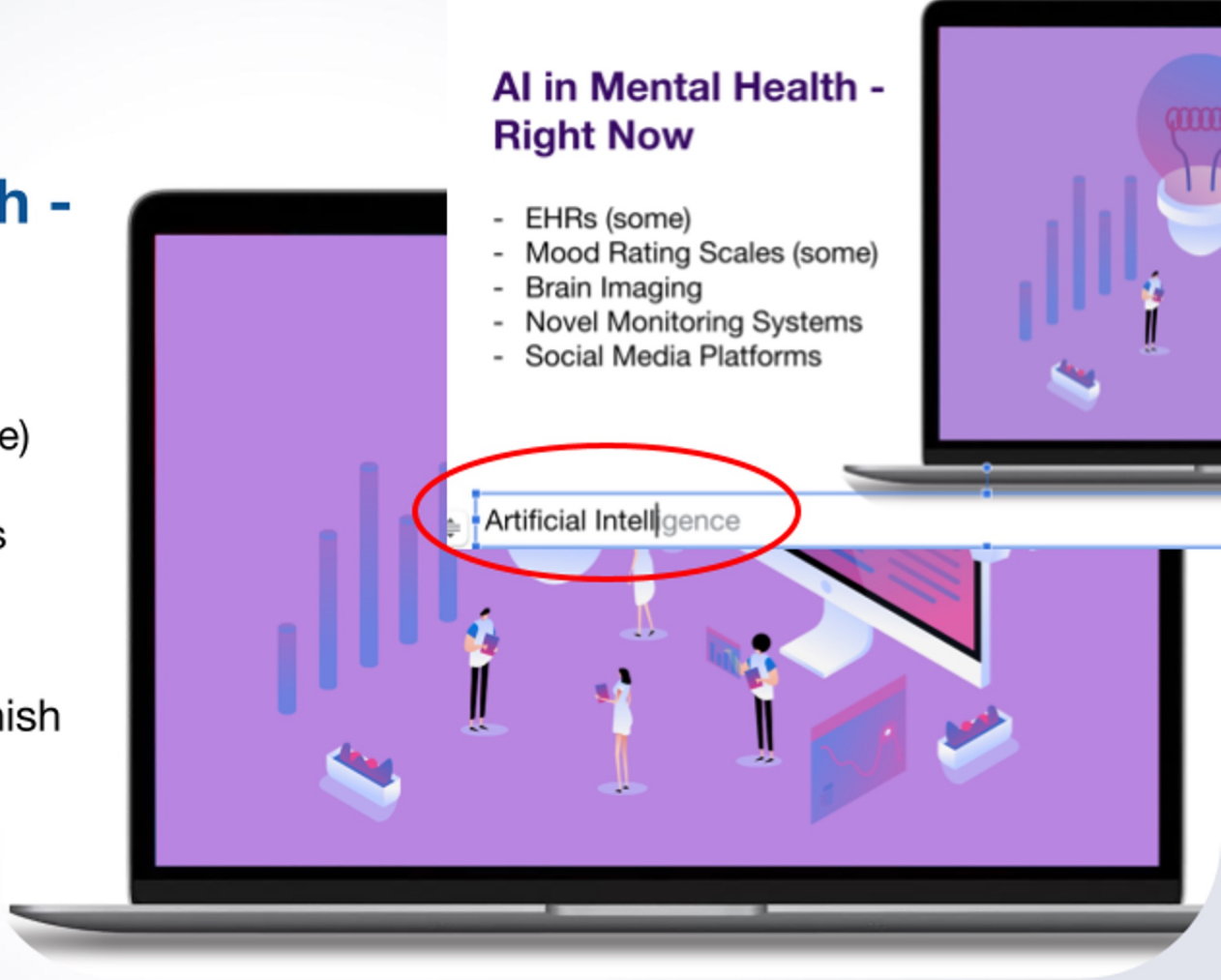
Personalize

Tailor content and delivery to achieve optimal therapy outcomes for individual patients

AI in Mental Health - Right Now

- EHRs (some)
- Mood Rating Scales (some)
- Brain Imaging
- Novel Monitoring Systems
- Social Media Platforms

Artificial Intelligence can finish my sentence.



Artificial Intelligence Uses In Behavioral Health

Patient-Client Monitoring & Intervention

- Prediction
- Prevention
- Detection
- Response-Treatment
- Maintenance
- Relapse-Prevention

Users

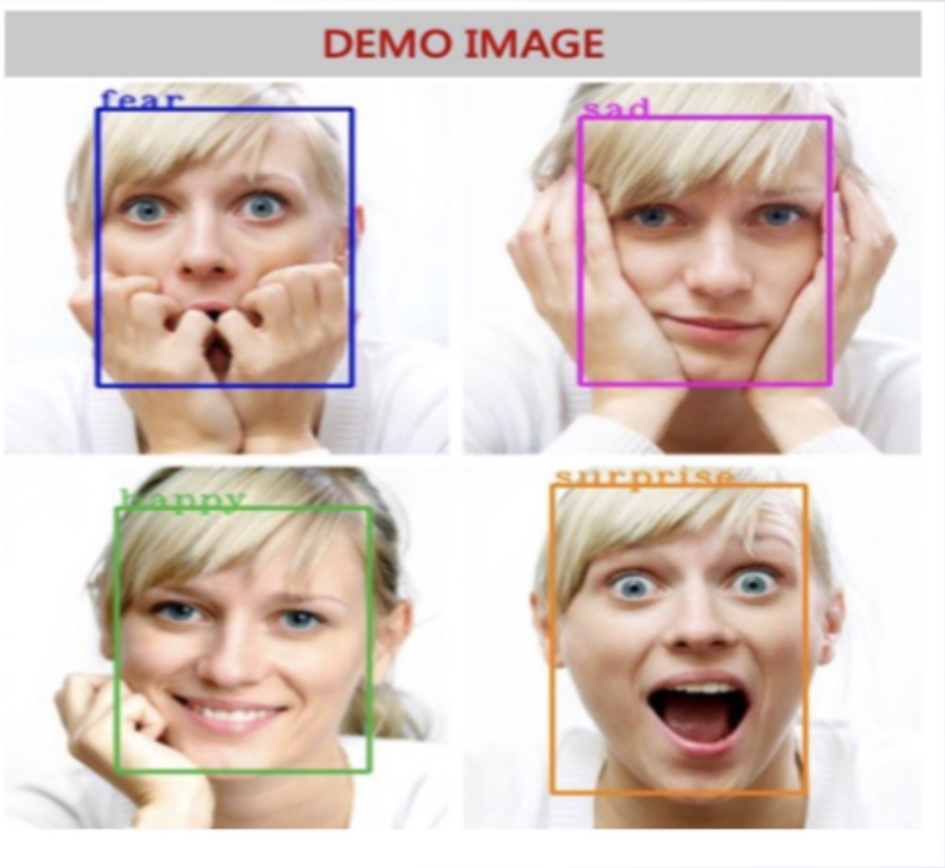
Patients
Providers
Caregivers
Researchers

Provider Training and Support

- Epidemiology Studies
- Monitoring and Alert Systems
- Evidence-based Treatment Plans
- Intervention Recommendations
- Training Tools - Simulations, Provider Feedback
- Provider Resiliency Monitoring & Support

Emotion Detection

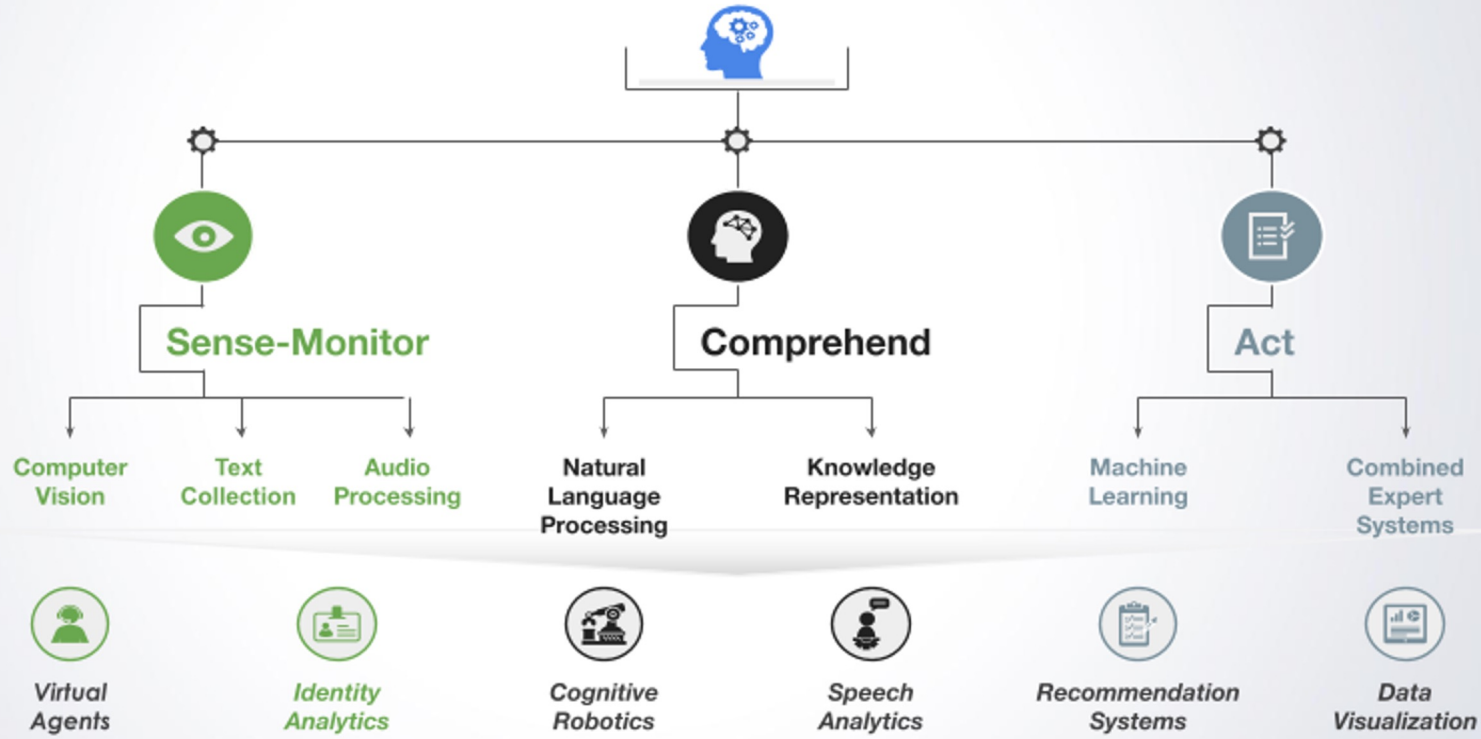
Face Emotion Recognition (FER) from Kaggle and built a CNN to detect emotions. The emotions can be classified into 7 classes — happy, sad, fear, disgust, angry, neutral and surprise.



What is AI?

AI refers to Artificial Intelligence, which is the Intelligence demonstrated by the machines,

Artificial Intelligence Overview



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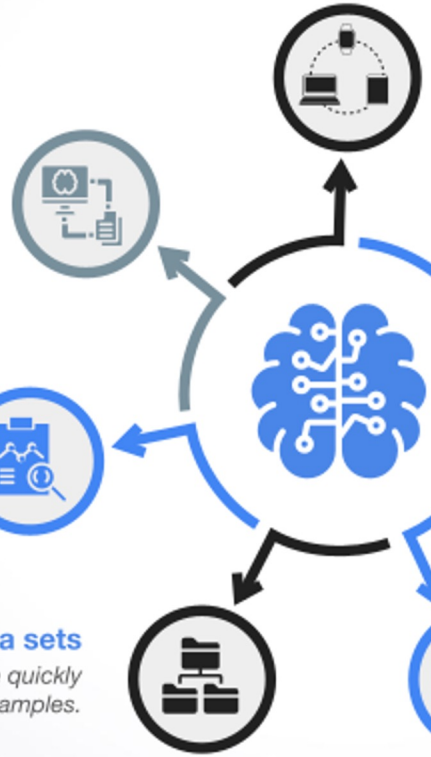
Core Areas of Artificial Intelligence For Mental Health



Sensory AI such as Internet of Things

Gathering biological, environmental and user input data from many sources.

Explainable AI

How the AI came to its conclusions. AI that provide insights into the data, variables and decision points used to make a recommendation.

Triage and Experience Automation

Using data to provide the optimal user experience in mental health treatment and mental health apps.

Research on new algorithms

Gather and analyze AI data and methods to make better AI over time.

Cognitive AI Training

Client coaching, client psychoeducation, and Clinical provider training.

High precision learning from small data sets

Create new insights and methods more quickly with less time and cost using smaller samples.

General AI

Create new monitoring, identification, and treatment tools.

Automate & optimize mental health operations, quality assurance, practice management monitoring and improvement

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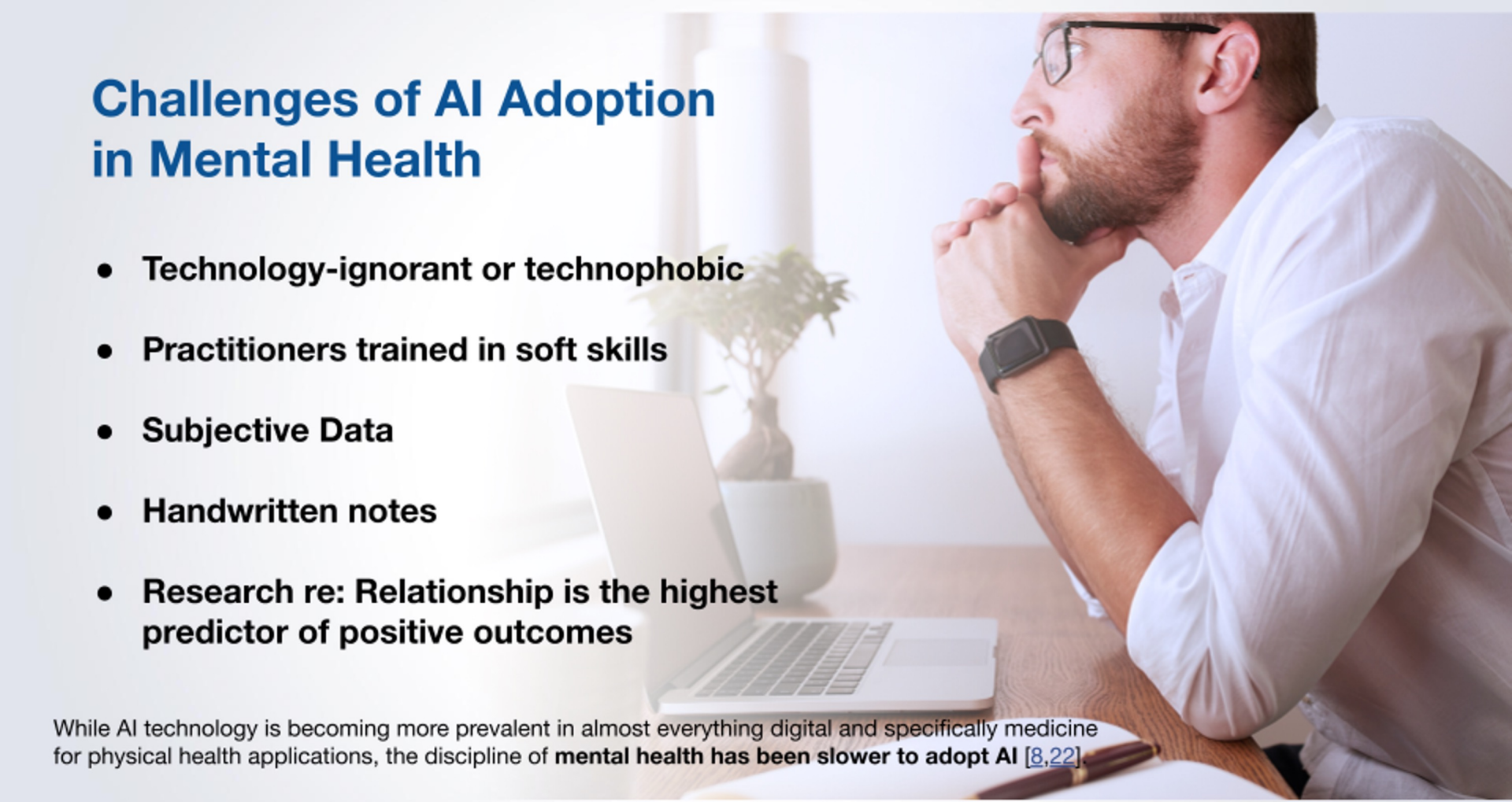
Limitations

- Data - Garbage in, Garbage out
- Clinical Validation
- Clinical Decision-Making - Legal Risks
- Perception & Adoption by Providers
- Perception & Adoption by Clients-Patients

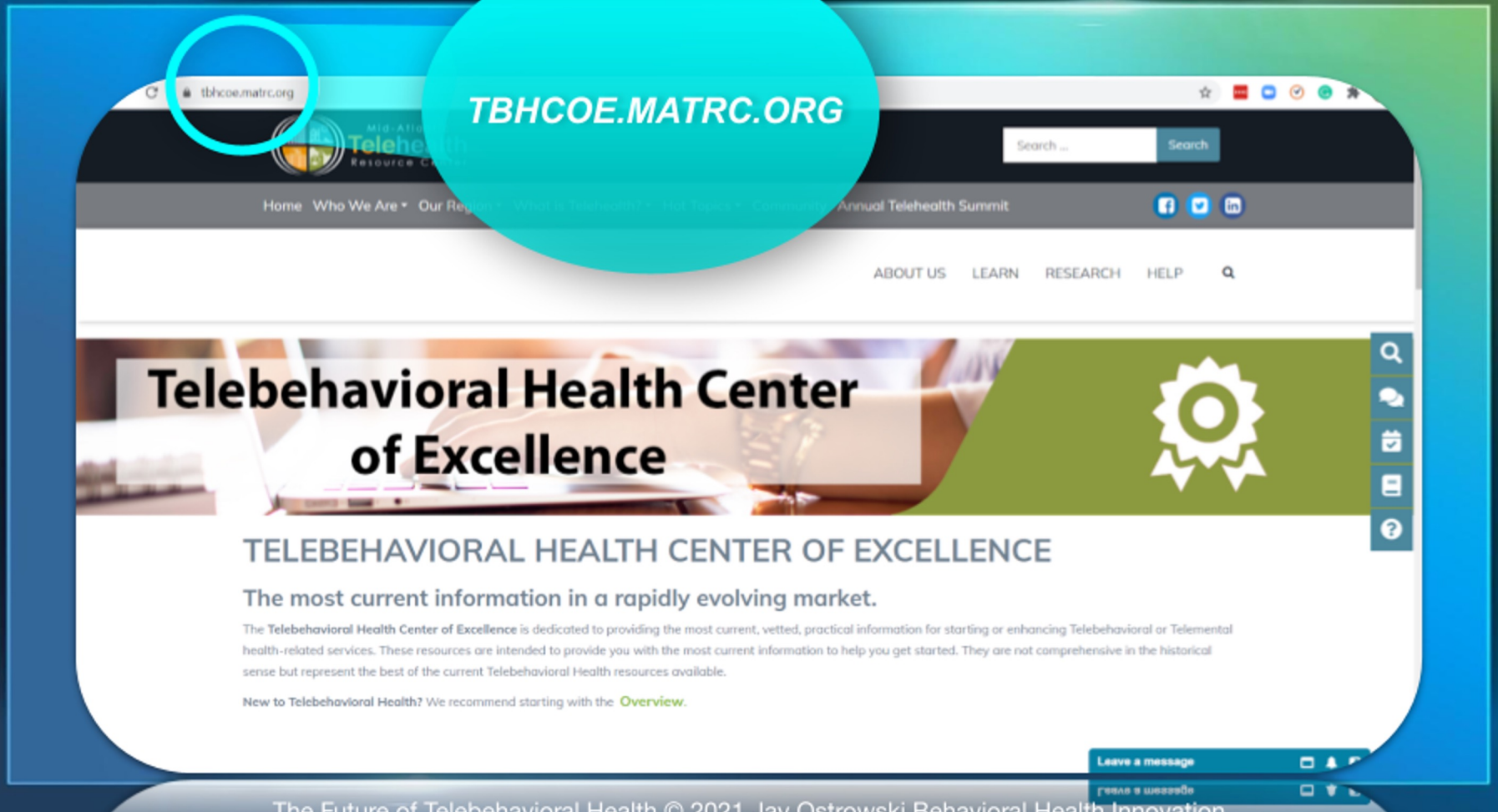
Challenges of AI Adoption in Mental Health



- **Technology-ignorant or technophobic**
- **Practitioners trained in soft skills**
- **Subjective Data**
- **Handwritten notes**
- **Research re: Relationship is the highest predictor of positive outcomes**

While AI technology is becoming more prevalent in almost everything digital and specifically medicine for physical health applications, the discipline of **mental health has been slower to adopt AI** [8,22].

Why is there reluctance to to use Telebehavioral Health and Apps?



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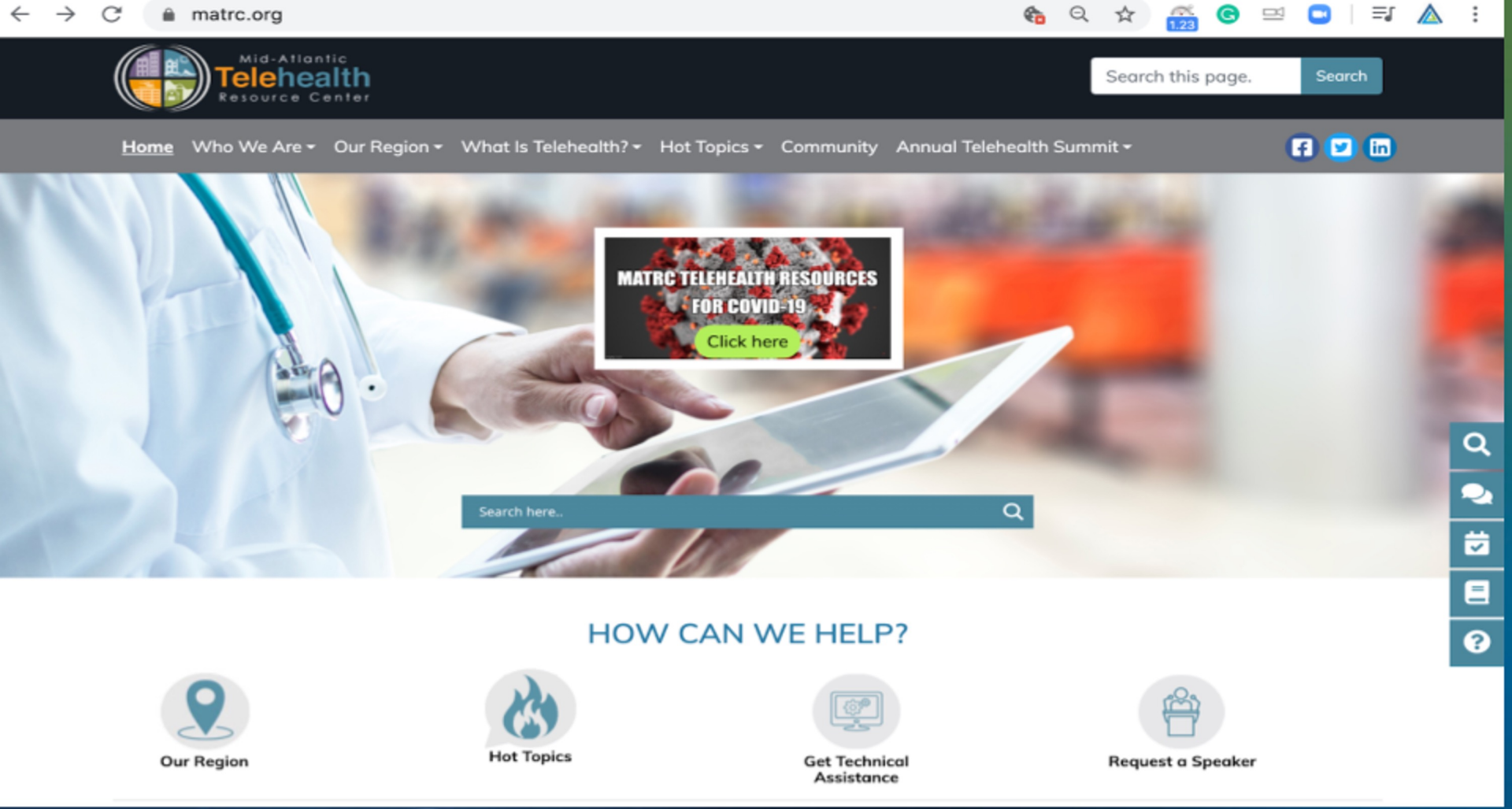
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24 APRIL
Questions about Telehealth Basics or Telemental Health?
Join us for virtual office hours with Jay Ostrowski.
Second and Fourth Friday of each month from 12 PM - 2 PM
Click Here To Join The Live Meeting
VIEW DETAIL
Many Telehealth Funding Opportunities Available
#FUNDING. Here are a list of grant funding opportunities with potential for telehealth
#MATRC Toolkit Has Been Updated to Reflect New Guidance for #FQHCs and #Telehealth
FOR COVID-19

Thank you.

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Machine learning (ML) is an AI approach that involves various methods of enabling an algorithm to learn [27,29,31-35]. ML methods identify patterns of information in data that are useful to predict outcomes at the individual patient level, and do not distinguish samples and populations.

Supervised Machine Learning (SML):

Here data are pre-labeled (e.g., diagnosis of major depressive disorder (MDD) vs. no depression) and the algorithm learns to associate input features derived from a variety of data streams (e.g., sociodemographic, biological and clinical measures, etc.) to best predict the labels [36,42].

Unsupervised Machine Learning (UML):

Here algorithms are not provided with labels; thus, the algorithm recognizes similarities between input features and discovers the underlying structure of the data, but is not able to associate features with a known label [37].

Machine learning for big data analysis

Machine learning (ML) is an AI approach that involves various methods of enabling an algorithm to learn [27,29,31-35].

Natural Language Processing (NLP):

NLP is a subfield of AI that involves using the aforementioned algorithmic methods; however, it specifically refers to how computers process and analyze human language in the form of unstructured text, and involves language translation, semantic understanding, and information extraction [50].

Deep Learning (DL):

DL algorithms learn directly from raw data without human guidance, providing the benefit of discovering latent relationships [45]. DL handles complex, raw data by employing artificial neural networks (ANNs; computer programs that resemble the way a human brain thinks) that process data through multiple "hidden" layers [13,38,46].

*"Machine learning really meets a **specific need** that we have in psychiatry — and that's the **need for personalization**," he says. "For decades, we've been working on group averages and statistics that apply to populations who may have the same diagnosis but don't translate as well to an individual patient. **Machine learning allows us to get at individual predictions in a way we haven't been able to before.**"*

David Benrimoh, MD, CM, a psychiatry resident at McGill University

The Future of Telebehavioral Health © 2021
Jay Ostrowski, Behavioral Health Innovation, Adaptive Telehealth

Question and Answer

Evaluation Information

The MHTTC Network is funded through SAMHSA to provide this training. As part of receiving this funding we are required to submit data related to the quality of this event.

At the end of today's training please take a moment to complete a **brief** survey about today's training.

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