MINNESOTA BOARD OF PSYCHOLOGY
December 19, 2025
Board Meeting

Order of Business

PUBLIC SESSION:

1. **Call to Order**
    - A. **Link to the Board Meeting**
2. **Adoption of Tentative Agenda**
3. **Announcements**
4. **Approval of the Board Minutes**
    - A. **Approval of Board Meeting Minutes**
5. **Consent Agenda**
    - A. **Staff Delegated Authority Report**
6. **New Business**
    - A. **Minnesota Psychological Association - Legislation update**
    - B. **AI in Psychology Practice**
    - C. **Master's Level Licensure**
    - D. **Executive Director's Report**
    - E. **Officer Election**
    - F. **Board Administrative Terminations**
7. **Committee Reports**
8. **Adjournment**

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY:

TITLE: Link to the Board Meeting

INTRODUCTION TO THE TOPIC:

Please contact the Board for a link to the Board meeting. Email: psychology.board@state.mn.us

BOARD ACTION REQUESTED:

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: Assistant Executive Director

TITLE: Approval of Board Meeting Minutes

INTRODUCTION TO THE TOPIC:

The Board Meeting Minutes for November 2025 are respectfully submitted.

BOARD ACTION REQUESTED:

ATTACHMENTS:

Description	Upload Date	Type
November 2025 Board Meeting Minutes	12/15/2025	Cover Memo

MINNESOTA BOARD OF PSYCHOLOGY

MINNESOTA BOARD OF PSYCHOLOGY
Minutes of the November 21, 2025, Board Meeting

Board Members and Staff in Attendance: Sonal Markanda, Sebastian Rilen, Pamela Freske, Daniel Hurley, Salina Renninger, Michael Thompson, Michelle Zhao, Nancy Cameron, Jill Idrizow, Joel Bakken, Sam Sands and Trisha Hoffman.

Guests: Nick Lienesch, Tracey Sigstad.

PUBLIC SESSION

1. Call to Order

Sonal Markanda called the meeting to order at 9:32 AM. The meeting was held in a hybrid format with some individuals in attendance in person and others online. Voting was held by roll call.

A. Webex MeetingLink

2. Adoption of Tentative Agenda

Daniel Hurley moved, seconded by Pamela Freske Motion: to adopt the tentative agenda. There being 9 "ayes" and 0 "nays" the motion Passed.

3. Announcements

4. Approval of the Board Minutes

Salina Renninger moved, seconded by Michael Thompson Motion: to adopt the September 19, 2025, Board Meeting Minutes. There being 7 "ayes" and 0 "nays" the motion Passed

5. Consent Agenda

A. Staff Delegated Authority Report

6. New Business

A. SmART – Board Financial Report FY25

Tracey Sigstad of the Small Agency Resource Team (SmART) at the Department of Administration gave a presentation on SmART's role in assisting state agencies, the state budgeting cycle, and the Board's financial performance.

B. AI in Psychology Practice

The Board discussed several articles relating to use of AI technology in psychology practice and the anticipated emergence of new regulatory issues.

C. Master's Level Licensure

Sam Sands reported that many states are considering Master's level licensure. The ASPPB Model Act and Rules Committee continues to await APA recommendations in this area.

D. Executive Director's Report

Trisha Hoffman reported that the Licensure Unit remains busy. The Board has issued 866 Behavior Analyst licenses to date and receives about ten to twelve Behavior Analyst applications per week. The Licensure Unit has also continued to engage with individuals whose Psychologist license applications have not moved forward in more than a year, resulting in issuance of a handful of licenses.

Sam Sands reported on the Board's revenue, updates to the Board's website, recent educational presentations, the CEO of ASPPB's request to attend a Board meeting, and the ASPPB Annual Meeting which focused on supervision. He also stated that the Application Review Committee is pitching a presentation to the Minnesota Psychological Association Annual Conference about post-doctoral supervised experience, and that he is exploring a possible continuing education conference on offering the Board's individualized boundaries and ethics course, being an expert for the Board, and the Board's expectations for disciplinary consultants and supervisors. Finally, he noted that the Texas State Board of Examiners of Psychologists is moving forward with development of a licensing exam

E. PSYPACT Commission Meeting Update

Daniel Hurley gave an update on the PSYPACT Commission's recent meeting, including discussions about the potential for PSYPACT to become financially self-sustaining, disciplinary issues that may arise, and residency rules.

F. Board Administrative Terminations

Seb Rilen moved, seconded by Nancy Cameron Motion: to approve the Board Administrative Terminations. There being 7 "ayes" and 0 "nays" the motion Passed.

7. Committee Reports

8. Adjournment

Adjourned at 11:44 AM.

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: Assistant Executive Director

TITLE: Staff Delegated Authority Report

INTRODUCTION TO THE TOPIC:

The Board utilizes a consent agenda for routine financial, legal, or administrative matters that require Board action or inform the Board of action taken under authority delegated by the Board.

BOARD ACTION REQUESTED:

The Board utilizes a consent agenda for routine financial, legal, or administrative matters that require Board action or inform the Board of action taken under authority delegated by the Board.

The items on the consent agenda are expected to be non-controversial and not requiring of a discussion.

The consent agenda is voted on in a single majority vote, but made be divided into several, separate items if necessary.

The items on the consent agenda will be considered early in the meeting. The Board chair will ask if any member wishes to remove an item from the consent agenda for separate consideration, and if so, the Chair will schedule it for later in the meeting.

ATTACHMENTS:

Description	Upload Date	Type
Behavior Analyst Consent Agenda	12/17/2025	Cover Memo
Compliance Consent Agenda	12/17/2025	Cover Memo
Psychologist Consent Agenda	12/17/2025	Cover Memo

MINNESOTA
BOARD OF PSYCHOLOGY

CONSENT AGENDA ITEMS: Staff Delegated Authority Report

Licensed Behavior Analyst (LBA)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Behavior Analyst (LBA) licensure pursuant to MN Statute 148.9983.

License Number	Licensee
LBA0867	Dana Gresock
LBA0868	Helena Vinciguerra
LBA0869	Nasiah Cirincione-Ulezi
LBA0870	Anna Webber
LBA0871	Meggan Dubin
LBA0872	Christopher Fast
LBA0873	Dayna Sedlacek
LBA0874	Daniel Guglielmo
LBA0875	Jennifer Lords
LBA0876	Mariah Nosich
LBA0877	Holly Brunton
LBA0878	Amanda Scott
LBA0879	Kimie Klawer
LBA0880	Nathaniel Runck
LBA0881	Benjamen Shrewsberry
LBA0882	Laura Jacobson
LBA0883	Nadine Ayudiani
LBA0884	Cortney Magyarics
LBA0885	Annika Frey
LBA0886	Victoria Catrett
LBA0887	Alyssa Timmerman
LBA0888	Jayme Kirkland
LBA0889	Noelle Balsamo
LBA0890	Talia Van Siclen
LBA0891	Natasha Patel
LBA0892	Taylor Payne
LBA0893	Kayla Rosado
LBA0894	Leah Verkuylen
LBA0895	Aubrey Taylor
LBA0896	Jake Crifasi Jr.

MINNESOTA
BOARD OF PSYCHOLOGY

Licensure Progression Statistics

The following data is a summary of the length of time it takes for an applicant to obtain licensure as a Behavior Analyst with the Minnesota Board of Psychology.

Total Number of LBA Applications Filed Since Last Council Meeting: 23 (Plus 15 Awaiting Payment and Pending)

Of applications filed, number of LBA applications that have satisfied all license fees: 23

Of these applications, number submitted to CBC program (anticipated timeline to process CBC is 30 days): 23

Of all applications filed (and paid fees), number in compliance review: 7

Average days for license to be granted (time counted from staff review to license application approved): 1 to 2 Days

Of applications filed, number of Behavior Analyst License applications still in review: 11

Reasons for continued review: Applications are either Staff Review or In Progress.

MINNESOTA
BOARD OF PSYCHOLOGY

Minnesota Board of Psychology
Consent Agenda Items:
Staff Delegated Compliance Report
Data from 11/21/25 – 12/19/25

Complaint Data – Open/NJ/FWD
Data on complaints that have been received since the November Board meeting.

Total complaints received, and those that either were opened for investigative review or were non-jurisdictional or forwarded to another Health-Related Licensing Board (HLB). Forwarded and non-jurisdictional may overlap as a complaint may be non-jurisdictional because the respondent is licensed with another HLB.

Licensed Psychologists:

Total Complaints	Opened	Non-Jurisdictional	Forwarded
11	9	2	1

Behavior Analysts:

Total Complaints	Opened	Non-Jurisdictional	Forwarded
2	2	0	0

Complaint Data – Reviews
Compliance data that has been reviewed since the November Board meeting.

Licensed Psychologists:

Triage Cases	Dismissed Cases	Disciplinary Conferences	SCOs Offered	NOC Assigned	Disciplinary/ Corrective Action Assigned
10	6	0	1 SCO	3	0

Behavior Analysts:

Triage Cases	Dismissed Cases	Disciplinary Conferences	SCOs Offered	NOC Assigned	Disciplinary/ Corrective Action Assigned
2	0	0	0	2	0

Complaint Data
Amount of complaints currently under investigative review and the average (median) amount of days taken to open a complaint, meaning send to investigative review, and all complaints that were closed from 9/26/25 – 11/21/25

Licensed Psychologists:

Currently Open Complaints (under review)	**Days Taken** (average amt of days since 9/26/25)	**Closed Complaints**
Investigative review: 64	<1	6
Committee review: 31		

Behavior Analysts:

Currently Open Complaints (under review)	**Days Taken** (average amt of days since 9/26/25)	**Closed Complaints**
Investigative review: 5	<1	0
Committee review: 2		

MINNESOTA
BOARD OF PSYCHOLOGY

CONSENT AGENDA ITEMS: Staff Delegated Authority Report

Admission to Examination for Professional Practice in Psychology (EPPP)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Admission to the Examination for Professional Practice in Psychology (EPPP) pursuant to Minnesota Rules 7200.0550.

Applicant(s) Granted Admission to the (EPPP) Exam
Richard Nelson, Ph.D
Richard Warmke, Ph.D.
Bridgette Eastman, Ph.D.
Danielle Petruska, Psy.D.
Dante Williams, Psy.D.
Bharathi Venkat, Psy.D.
Tamara Nevergall, Psy.D
Holly Brannan, Psy.D.
Victoria Richter, Psy.D.
Rebekah Charles, Ph.D
Michael Stensland, Ph.D.

Admission to Professional Responsibility Examination (PRE)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Admission to the Professional Responsibility Examination (PRE) pursuant to Minnesota Rules 7200.0550.

Applicant(s) Granted Admission to the (PRE)
Shannon Drabek, Psy.D
Bridgette Eastman, Ph.D.
Richard Warmke, Ph.D.
Kelsey Maleski, Psy.D.
Melissa Huy, Ph.D.
Bradley Nevins, Ph.D
Amy Collins, Ph.D.
Tohar Scheininger, Ph.D
Amy Donovan, Ph.D
Christopher Hagan, Ph.D.
Mark Schade, Ph.D.
Myra Thompson, Psy.D
Susan Alexander, Ph.D.
Cody Flynn, Psy.D.
Deborah Day, Psy.D.
Danielle Petruska, Psy.D.

MINNESOTA
BOARD OF PSYCHOLOGY

Licensed Psychologist (LP)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Licensed Psychologist (LP) licensure pursuant to Minnesota Statutes, section 148.907 and the administrative rules of the Psychology Practice Act.

License Number	Licensee
LP7294	Zoe Green, Psy.D.
LP7295	Amber Hays, Ph.D.
LP7296	Mychele Benoit, Psy.D.
LP7297	Emily Hilton, Ph.D.
LP7298	Shannon Drabek, Psy.D.
LP7299	Christopher Hagan, Ph.D.
LP7300	Stephen Costello, Psy.D.
LP7301	Abigail Hoxsey, Ph.D.

Guest Licensure (GL)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Guest Licensure (GL) pursuant to Minnesota Statutes, section 148.916 and the administrative rules of the Psychology Practice Act.

License Number	Licensee
GL0144	Melissa Huy

Licensure for Voluntary Practice (L-VP)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Licensure for Volunteer Practice (LPV) pursuant to Minnesota Statutes 148.909 and the administrative rules of the Psychology Practice Act.

License Number	Licensee

Emeritus Registration (Em.)

Under delegated authority from the Board, Board staff approved the following applicant(s) for Emeritus Registration pursuant to Minnesota Statutes, section 148.9105.

License Number	Licensee
ER00211	Gary Goldetsky

MINNESOTA
BOARD OF PSYCHOLOGY

Voluntary Terminations (VT)

Under delegated authority from the Board, Board staff terminated the following License's pursuant to Minnesota Rules 7200.3700.

License Number	Licensee
LP2516	Marya Hage
LP0508	Gary Goldetsky
LP0363	Dennis Keierleber
LP0251	Timothy Tinius
LP5955	Kimberly Sommers
LP0331	Gerald August
LP3453	Sarah Truesdell

Continuing Education Variance Requests

Under delegated authority from the Board, Board staff approved the following licensee(s)' requests for a six (6) month continuing education variance pursuant to Minnesota Rules 7200.3860, D.

License Number	Licensee
LP5929	Casandra Clark
LP4488	Katherine Thomas
LP5395	Thomas Campion
LP0368	Ruth Markowitz
LP3383	Kerri Jaeger
LP0245	Tamara Nelson
LP0641	Brockman Schumacher

Licensure Progression Statistics

The following data is a summary of the length of time it takes for an applicant to obtain licensure with the Minnesota Board of Psychology. The starting point is staff review; when the applicant has submitted all required documents for the specific type of license application.

Number of Initial, Reciprocity and Mobility LP applications filed since last Board meeting: 9

Of applications filed, number of LP applications still in review: 1

Reasons for continued review: additional information needed.

Initial, Reciprocity, and Mobility applications days to license: 20

Number of Guest License applications filed since last Board meeting: 1

Of applications filed, number of Guest License applications still in review: 0

MINNESOTA
BOARD OF PSYCHOLOGY

Reasons for continued review: N/A

Guest License applications days to license: 6

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY:

TITLE: Minnesota Psychological Association - Legislation update

INTRODUCTION TO THE TOPIC:

The Minnesota Psychological Association is moving forward with two legislative proposals this year. Steve Girardeau will present both topics to the Board.

1. **Medical Debt law**
   - Still awaiting bill numbers as of 1/1/26
   - A recently passed law forces healthcare providers to continue seeing clients/patients even if the client is not making payments on their account.
   - MPA is advocating for an amendment that will remove psychotherapy services from this statute.
   - Importantly, providers may experience an ethical dilemma if they are forced to continue seeing clients who are not making payments – resentments on the part of the psychologist may impede their ability to be objective and non-judgmental with clients.
   - Since financial margins are incredibly slim in behavioral health, it is existentially threatening for small practices (and even some larger organizations) if providers are required to continue seeing clients who are not paying for services.

"Sec. #. Minnesota Statutes 2024, section 62J.807, is amended to read:
(c) This section does not apply to a health care provider licensed under section 148.907."

2. **Regulation of Algorithm-based Systems in Behavioral Health**
   - Still awaiting bill numbers as of 1/1/26
   - This bill follows a recently passed Illinois law that explicitly forbids the provision of psychology and behavioral health services by any entity that is not licensed by a Minnesota Board
     - This includes prohibiting algorithm-based or machine learning systems (AKA "AI") from providing psychology services
     - It lays out penalties for any entities misusing AI to provide psychology services
     - Allows for the use of algorithm-based systems in administrative and support processes/operations
     - Working on adding an amendment that would require companies operating these algorithm-based systems to include a disclaimer that they do not provide therapeutic services

BOARD ACTION REQUESTED:

ATTACHMENTS:

Description	Upload Date	Type
Illinois Law - For reference	12/18/2025	Cover Memo
Medical Debt Law	12/18/2025	Cover Memo

AN ACT concerning regulation.

Be it enacted by the People of the State of Illinois, represented in the General Assembly:

Section 1. Short title. This Act may be cited as the Wellness and Oversight for Psychological Resources Act.

Section 5. Purpose. The purpose of this Act is to safeguard individuals seeking therapy or psychotherapy services by ensuring these services are delivered by qualified, licensed, or certified professionals. This Act is intended to protect consumers from unlicensed or unqualified providers, including unregulated artificial intelligence systems, while respecting individual choice and access to community-based and faith-based mental health support.

Section 10. Definitions. In this Act:

"Administrative support" means tasks performed to assist a licensed professional in the delivery of therapy or psychotherapy services that do not involve communication. "Administrative support" includes, but is not limited to, the following:

(1) managing appointment scheduling and reminders;

(2) processing billing and insurance claims; and

(3) drafting general communications related to therapy

logistics that do not include therapeutic advice.

"Artificial intelligence" has the meaning given to that term in Section 2-101 of the Illinois Human Rights Act.

"Consent" means a clear, explicit affirmative act by an individual that: (i) unambiguously communicates the individual's express, freely given, informed, voluntary, specific, and unambiguous written agreement, including a written agreement provided by electronic means, and (ii) is revocable by the individual. "Consent" does not include an agreement that is obtained by the following:

(1) the acceptance of a general or broad terms of use agreement or a similar document that contains descriptions of artificial intelligence along with other unrelated information;

(2) an individual hovering over, muting, pausing, or closing a given piece of digital content; or

(3) an agreement obtained through the use of deceptive actions.

"Department" means the Department of Financial and Professional Regulation.

"Licensed professional" means an individual who holds a valid license issued by this State to provide therapy or psychotherapy services, including:

(1) a licensed clinical psychologist;

(2) a licensed clinical social worker;

(3) a licensed social worker;

(4) a licensed professional counselor;

(5) a licensed clinical professional counselor;

(6) a licensed marriage and family therapist;

(7) a certified alcohol and other drug counselor authorized to provide therapy or psychotherapy services;

(8) a licensed professional music therapist;

(9) a licensed advanced practice psychiatric nurse as defined in Section 1-101.3 of the Mental Health and Developmental Disabilities Code; and

(10) any other professional authorized by this State to provide therapy or psychotherapy services, except for a physician.

"Peer support" means services provided by individuals with lived experience of mental health conditions or recovery from substance use that are intended to offer encouragement, understanding, and guidance without clinical intervention.

"Religious counseling" means counseling provided by clergy members, pastoral counselors, or other religious leaders acting within the scope of their religious duties if the services are explicitly faith-based and are not represented as clinical mental health services or therapy or psychotherapy services.

"Supplementary support" means tasks performed to assist a licensed professional in the delivery of therapy or psychotherapy services that do not involve therapeutic communication and that are not administrative support.

"Supplementary support" includes, but is not limited to, the following:

(1) preparing and maintaining client records, including therapy notes;

(2) analyzing anonymized data to track client progress or identify trends, subject to review by a licensed professional; and

(3) identifying and organizing external resources or referrals for client use.

"Therapeutic communication" means any verbal, non-verbal, or written interaction conducted in a clinical or professional setting that is intended to diagnose, treat, or address an individual's mental, emotional, or behavioral health concerns. "Therapeutic communication" includes, but is not limited to:

(1) direct interactions with clients for the purpose of understanding or reflecting their thoughts, emotions, or experiences;

(2) providing guidance, therapeutic strategies, or interventions designed to achieve mental health outcomes;

(3) offering emotional support, reassurance, or empathy in response to psychological or emotional distress;

(4) collaborating with clients to develop or modify therapeutic goals or treatment plans; and

(5) offering behavioral feedback intended to promote psychological growth or address mental health conditions.

"Therapy or psychotherapy services" means services provided to diagnose, treat, or improve an individual's mental health or behavioral health. "Therapy or psychotherapy services" does not include religious counseling or peer support.

Section 15. Permitted use of artificial intelligence.

(a) As used in this Section, "permitted use of artificial intelligence" means the use of artificial intelligence tools or systems by a licensed professional to assist in providing administrative support or supplementary support in therapy or psychotherapy services where the licensed professional maintains full responsibility for all interactions, outputs, and data use associated with the system and satisfies the requirements of subsection (b).

(b) No licensed professional shall be permitted to use artificial intelligence to assist in providing supplementary support in therapy or psychotherapy where the client's therapeutic session is recorded or transcribed unless:

(1) the patient or the patient's legally authorized representative is informed in writing of the following:

(A) that artificial intelligence will be used; and

(B) the specific purpose of the artificial intelligence tool or system that will be used; and

(2) the patient or the patient's legally authorized representative provides consent to the use of artificial

intelligence.

Section 20. Prohibition on unauthorized therapy services.

(a) An individual, corporation, or entity may not provide, advertise, or otherwise offer therapy or psychotherapy services, including through the use of Internet-based artificial intelligence, to the public in this State unless the therapy or psychotherapy services are conducted by an individual who is a licensed professional.

(b) A licensed professional may use artificial intelligence only to the extent the use meets the requirements of Section 15. A licensed professional may not allow artificial intelligence to do any of the following:

(1) make independent therapeutic decisions;

(2) directly interact with clients in any form of therapeutic communication;

(3) generate therapeutic recommendations or treatment plans without review and approval by the licensed professional; or

(4) detect emotions or mental states.

Section 25. Disclosure of records and communications. All records kept by a licensed professional and all communications between an individual seeking therapy or psychotherapy services and a licensed professional shall be confidential and shall not be disclosed except as required under the Mental

Health and Developmental Disabilities Confidentiality Act.

Section 30. Enforcement and penalties.

(a) Any individual, corporation, or entity found in violation of this Act shall pay a civil penalty to the Department in an amount not to exceed $10,000 per violation, as determined by the Department, with penalties assessed based on the degree of harm and the circumstances of the violation. The civil penalty shall be assessed by the Department after a hearing is held in accordance with Section 2105-100 of the Department of Professional Regulation Law of the Civil Administrative Code of Illinois. An individual, corporation, or entity found in violation of this Act shall pay the civil penalty within 60 days after the date of an order by the Department imposing the civil penalty. The order shall constitute a judgment and may be filed and executed in the same manner as any judgment from a court of record.

(b) The Department shall have authority to investigate any actual, alleged, or suspected violation of this Act.

Section 35. Exceptions. This Act does not apply to the following:

(1) religious counseling;

(2) peer support; and

(3) self-help materials and educational resources that are available to the public and do not purport to offer

therapy or psychotherapy services.

Section 99. Effective date. This Act takes effect upon becoming law.

62J.807 DENIAL OF HEALTH TREATMENT OR SERVICES DUE TO OUTSTANDING MEDICAL DEBT.

(a) A health care provider must not deny medically necessary health treatment or services to a patient or any member of the patient's family or household because of current or previous outstanding medical debt owed by the patient or any member of the patient's family or household to the health care provider, regardless of whether the health treatment or service may be available from another health care provider.

(b) As a condition of providing medically necessary health treatment or services in the circumstances described in paragraph (a), a health care provider may require the patient to enroll in a payment plan for the outstanding medical debt owed to the health care provider. The payment plan must be reasonable and must take into account any information disclosed by the patient regarding the patient's ability to pay. Before entering into the payment plan, a health care provider must notify the patient that if the patient is unable to make all or part of the agreed-upon installment payments, the patient must communicate the patient's situation to the health care provider and must pay an amount the patient can afford.

History: *2024 c 114 art 3 s 27*

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: Executive Director

TITLE: AI in Psychology Practice

INTRODUCTION TO THE TOPIC:

Articles of note for the Board to consider around AI use in practice and regulation.

BOARD ACTION REQUESTED:

ATTACHMENTS:

Description	Upload Date	Type
The New Regulatory Reality for AI in Healthcare: How Certain States Are Reshaping Compliance By:	12/17/2025	Cover Memo
AI Integration and Regulatory Compliance in Healthcare -Vanderbilt Law School _ Vanderbilt University	12/17/2025	Cover Memo
Among psychologists, AI use is up, but so are concerns	12/17/2025	Cover Memo
First Therapy Chatbot Trial Yields Mental Health Benefits _ Dartmouth	12/17/2025	Cover Memo
Your Robot Therapist Will See You Now - Ethical Implications of Embodied Artificial Intelligence in Psychiatry, Psychology and Psychotherapy	12/17/2025	Cover Memo

September 29, 2025

The New Regulatory Reality for AI in Healthcare: How Certain States Are Reshaping Compliance

By: Jennifer Yoo , Ana Razmazma , Sari Heller Ratican , Zach Harned , Natalie Kim

What You Need To Know

- California, Nevada, Texas, and Illinois are bringing artificial intelligence-related healthcare regulations into sharper focus by limiting how AI is portrayed and what kind of care can be provided with the help of AI.
- California laws prohibit AI systems from implying the presence of licensed medical oversight where none exists and create new compliance considerations by giving the state professional

Related Professionals

Jennifer Yoo
Partner · Hea

Ana Razmazn
Partner · Priva

Sari Heller Ra

licensing boards direct authority to investigate violations.

- Illinois' law prohibits the use of AI in providing mental health and therapeutic decision making, unless an individual, corporation, or entity falls under an exemption.
- Nevada's law prohibits AI providers from utilizing AI systems to provide or claim to provide professional mental or behavioral healthcare.
- Texas laws require providers to disclose AI use in clinical care and maintain oversight of AI-generated medical records.

The landscape for AI in healthcare is shifting dramatically as state legislators move beyond general guidelines to establish concrete enforcement mechanisms. Healthtech companies' success using AI may be aided by integrating regulatory readiness into core business strategy rather than treating compliance as an afterthought. Below we provide an overview of these laws, as well as questions companies can use to guide their analysis on how such laws may apply to their AI use.

California Targets Misleading Systems and Design

California had already targeted the regulation of generative AI use in the healthcare setting with AB 3030, which took effect on January 1, 2025. It imposes disclosure requirements on healthcare providers, including clinics, hospitals, and

Counsel · Priv
Cybersecurity

Related Practices

- Healthcare Regulatory
- Privacy & Cybersecurity
- Intellectual Property

Related Industries

- AI & Machine Learning
- Healthtech

Share

Subscribe

physician offices, that use generative AI to produce written or verbal communications containing clinical information. Under AB 3030, such communications must include (1) a disclaimer indicating that the content was produced by generative AI and (2) clear instructions for patients on how to contact a licensed human healthcare provider. These requirements were designed to ensure transparency and preserve patient trust in clinical communications.

California's AB 489 represents a critical evolution in healthcare AI regulation by targeting systems (rather than healthcare practitioners) that could mislead patients about the presence of licensed medical oversight. Signed into law on September 2, 2025, and effective October 1, 2025, AB 489 prohibits AI systems from using professional terminology, interface elements, and post-nominal letters (like M.D., D.O., or R.N.) suggesting users are receiving care from licensed human healthcare professionals when no such oversight exists. This extends beyond obvious misrepresentations and is meant to capture subtle design choices that could convey professional authority. Thus, healthtech companies should consider avoiding any language, design, or branding that could be interpreted as implying medical authority or licensed professional involvement, such as "Virtual Physician," "AI Doctor," or "Nursebot." Additionally, healthtech companies should not (1) use clinical terminology implying that the care or advice being offered is provided by a person in possession of a professional license or (2) market products by using

terms implying a medical professional may be involved.

AB 489's enforcement mechanism begins October 1, 2025, when state professional licensing boards will have direct authority to investigate violations with each prohibited term, letter, or phrase constituting a separate offense. This creates a new compliance consideration alongside existing privacy, security, and consumer protection requirements companies must navigate.

Companies developing diagnostic AI tools or virtual health assistants should consider conducting a comprehensive review of all product features, user interfaces, and marketing materials to assess whether their systems use any language, design, or branding that could be interpreted as implying medical authority.

Illinois Takes a Comprehensive Approach to AI in Mental Health

Illinois has enacted even more sweeping restrictions through the Wellness and Oversight for Psychological Resources Act (HB 1806) (WOPRA). Effective August 4, 2025, WOPRA prohibits the use of AI to (1) make independent therapeutic decisions, (2) directly interact with clients in any form of therapeutic communication, or (3) generate therapeutic recommendations or treatment plans without review and approval by the licensed professional.

WOPRA permits the use of AI systems for "administrative or supplementary support," defined as tasks performed to assist a licensed professional in the delivery of therapy or psychotherapy services not

involving therapeutic communication. Such tasks include:

- Appointment scheduling
- Processing billing and insurance claims
- Preparing and maintaining client records (including therapy notes)
- Analyzing anonymized data to track client progress or identify trends, subject to review by a licensed professional
- Identifying and organizing external resources or referrals for client use
- Drafting general communications related to therapy logistics that do not include therapeutic advice or recommendations

Section 25 of WOPRA provides that WOPRA does not apply to religious counseling, peer support, or publicly available self-help materials and educational resources not offering therapy or psychotherapy services. As a result, services delivered for these purposes (including mental health coaching) may fall outside the scope of WOPRA. However, organizations should conduct careful legal analysis to determine whether a particular service qualifies for an exemption.

The law, enforced by the Illinois Department of Financial and Professional Regulation with penalties up to $10,000 per violation, establishes the nation's first statutory restriction on AI therapy while imposing strict conditions on how licensed professionals may incorporate AI into care delivery. Such financial penalties add to the existing risks of eroding client trust and privacy that may result from misuse of AI in therapeutic contexts.

For healthtech companies and AI providers, these restrictions require a clear separation between administrative and therapeutic functions, robust oversight by licensed professionals, and careful review of product features to enhance compliance. The law may limit the scope of AI-driven mental health solutions in Illinois, necessitating product redesign, enhanced compliance protocols, and ongoing legal review for businesses operating in this space.

Nevada Targets AI Providers Offering Mental Health Services

Nevada's AB 406, signed into law on June 5, 2025, and effective on July 1, 2025, prohibits AI providers from offering and programming AI systems that provide services constituting the practice of mental or behavioral healthcare. AB 406 defines "professional mental or behavioral health care" as mental or behavioral healthcare or services relating to the diagnosis, treatment, or prevention of mental illness or emotional or behavioral disorders which are typically provided by a provider of mental or behavioral healthcare within their authorized scope of practice.

Under Nevada's AB 406, AI providers face clear prohibitions designed to safeguard the delivery of mental and behavioral health care:

- **Prohibition on Misleading Titles or Claims**: AI providers may not represent or make statements that (1) AI systems are capable of providing professional mental or behavioral health care; (2) allow users to interact with conversational features that simulate human conversation for the purpose of

obtaining professional mental or behavioral healthcare; or (3) use features, avatars, or titles such as therapist, clinical therapist, counselor, psychiatrist, doctor, or any similar term that implies the system is a licensed provider of professional mental health or behavioral care.

- **Ban on Direct Care Delivery**: AI systems cannot be made available to individuals in Nevada if (1) they are programmed to provide any service or experience constituting the practice of professional mental or behavioral healthcare as if performed by a human provider or (2) the provider makes a representation or statement explicitly or implicitly indicating that such AI system is capable of providing professional mental or behavioral healthcare.
- **Restrictions in Telehealth and Schools**: The law extends to telehealth platforms and prohibits public schools from using AI systems to perform the functions of school counselors, psychologists, or social workers related to student mental health. Using AI systems in connection with providing professional mental and behavioral health care directly to a patient is also prohibited.

Like Illinois' WOPRA, AB 406 permits the use of AI systems designed for use by mental and behavioral health providers to perform administrative support tasks, such as scheduling, managing records, analyzing operational data, and organizing, tracking, and managing files and notes pertaining to students. Additionally, AB 406 does not prohibit any advertisement,

statement, or representation for or relating to materials, literature, and other products meant to provide advice and guidance for self-help relating to mental or behavioral health, if the material, literature, or product does not purport to offer or provide professional mental or behavioral healthcare. Thus, like WORPA, services delivered for either administrative purposes or for purposes such as self-help may fall outside the scope of AB 406. However, a careful analysis should be conducted to see if a company qualifies for an exemption.

Violations of the Nevada law may result in civil penalties up to $15,000 per instance and disciplinary action for licensed providers.

For healthtech companies and AI providers, Nevada's AB 406 calls for a clear separation between administrative support functions and any features that could be construed as clinical care, along with careful review of product language and marketing to avoid any implication of professional mental or behavioral health services. The law may restrict the deployment of AI-driven mental health solutions in Nevada, compelling businesses to redesign products, enhance compliance oversight, and regularly consult legal counsel to mitigate the risk of substantial penalties and regulatory action.

Texas' Approach to AI Disclosure, Oversight, and Utilization by Health Care Providers

Under the Texas Responsible Artificial Intelligence Governance Act (HB 149, TRAIGA), signed into law on June 22,

2025, and effective January 1, 2026, health care providers must disclose to patients or their personal representatives when AI systems are used in diagnosis or treatment. This disclosure must be made before or at the time of interaction in clinical settings, except in emergencies, when it must be provided as soon as reasonably possible. The law is designed to ensure patients are fully informed about the involvement of AI in their care and allow them to make decisions accordingly. TRAIGA also includes a cure period, in which the company has 60 days after the receipt of a written notice of violation from the state attorney general to cure the alleged violation, provide supporting documentation to show the manner in which the violation was cured, and make any necessary changes to internal policies to prevent further such violations. However, it is unclear whether the failure to timely disclose AI use in diagnosis or treatment will be deemed curable under this mechanism.

Additionally, SB 1188, effective September 1, 2025, imposes further requirements on providers using AI in diagnostic contexts. Licensed practitioners may use AI to support diagnosis and treatment planning only if all AI-generated records are reviewed to ensure the data is accurate and properly managed. Providers must review any AI-generated recommendations and retain ultimate responsibility for clinical decisions.

Healthtech companies and AI providers should ensure their systems enable clear patient disclosures for diagnosis or treatment, support practitioner oversight,

and comply with all licensure and record review requirements under Texas Medical Board standards. These laws may require product modifications, enhanced transparency features, and ongoing collaboration with legal and compliance teams. On August 18, 2025, Texas Attorney General Ken Paxton opened an investigation into AI chatbot platforms for potentially engaging in deceptive trade practices and misleadingly marketing themselves as mental health tools, signaling heightened enforcement risk for companies operating in this space.

Compliance Decision Models

The evolving patchwork of state laws creates a complex compliance landscape for AI deployment in mental health and healthcare. Each statute draws clear boundaries between what is permitted, restricted, or prohibited, often hinging on the AI system's function and the degree of human oversight. The following decision models may help organizations evaluate the applicability of these laws to their products and practices.

California

Key Question	If Yes, How It Affects Compliance
Does your AI system use professional titles or post-nominal letters (e.g., M.D., D.O., R.N.)?	Likely prohibited unless licensed oversight is present; may trigger investigation.
Does the AI interface imply professional authority (e.g., icons, tone, terminology)?	Prohibited unless there is a licensed professional; each

Key Question	If Yes, How It Affects Compliance
	instance could be a separate offense.
Is the AI marketed as providing care from licensed professionals?	Misrepresentation is prohibited; marketing language must be carefully vetted.
Is there licensed medical oversight for the AI system?	Oversight may allow AI use but must be clearly disclosed.
Is the AI used only for administrative support (e.g., scheduling)?	Permitted, but must avoid misleading design or terminology.

Illinois

Key Question	If Yes, How It Affects Compliance
Does your product diagnose, treat, or support mental health conditions?	Product is likely considered therapy and must comply with WOPRA.
Does the AI interact with users in an emotional or therapeutic context (e.g., conversations)?	Likely prohibited unless a licensed provider is directly involved and specific consent is obtained.
Is the AI used only for administrative or back-end support with oversight from a licensed professional?	Permitted, but requires informed consent and confidentiality protections.

Key Question	If Yes, How It Affects Compliance
Is the service framed as “wellness” or “health coaching” with no clinical language or claims?	Possibly outside WOPRA’s scope, but marketing language must be carefully vetted.
Are licensed professionals directly supervising the AI’s therapeutic output?	Permitted, but professional review, documented consent, and confidentiality compliance are critical during use.

Nevada

Key Question	If Yes, How It Affects Compliance
Does your AI system provide or claim to provide mental/behavioral health care?	Prohibited; violations may result in penalties up to $15,000 per instance.
Is the AI used for administrative support (e.g., scheduling, billing)?	Permitted, but outputs must be independently reviewed for compliance.
Is the AI used in technical platforms or public schools for counseling?	Prohibited; schools may only use AI for administrative tasks.
Does the AI use titles like “therapist,” “psychiatrist,” or similar?	Prohibited; misleading titles or claims are not allowed.
Are clinical decisions made by AI without human review?	Prohibited; all decisions must be made by licensed practitioners.

Texas

Key Question	If Yes, How It Affects Compliance
Was AI used in diagnosis or treatment of a patient?	Permitted, so long as disclosure to the patient or their representative is made before or during interaction, unless in emergencies.
Was the disclosure made clearly and timely?	Required; failure to disclose may violate TRAIGA and trigger enforcement actions.
Are AI-generated records reviewed by the provider?	Required; the provider must review all AI outputs per Texas Medical Board standards.
Is the AI marketed as a mental health tool without oversight?	Prohibited; may trigger investigation for deceptive trade practices.

Strategic Considerations for Product Development and What's Next for Healthcare AI Regulation

Given these regulatory developments, healthtech companies and AI providers should consider embedding compliance considerations into early-stage product design, rather than treating them as post-launch modifications. Companies should consider conducting comprehensive audits to classify all AI tools as administrative, supplementary, or potentially therapeutic, and implement geofencing controls to disable prohibited features for users in regulated states.

The emphasis on clear disclosure and transparency creates opportunities for companies to build competitive advantages through proactive compliance. Healthtech companies and products that clearly communicate AI capabilities and limitations, implement explainable decision pathways, and engage licensed practitioners in development processes may find stronger market acceptance as regulatory scrutiny intensifies.

The future belongs not to the fastest AI innovators, but to those who earn and maintain public trust through responsible development and deployment practices.

Related Insights

Publications

California AG Secures Record $1.55M CCPA Settlement Against Healthline Over Targeted Ads and Health Data Sharing

July 15, 2025

Publications

Supreme Court's McLaughlin Dec Creates New Uncertainty for Hea Text Message Compliance

July 15, 2025

View more related insights

AI Integration and Regulatory Compliance in Healthcare

Oct 6, 2025, 2:01 PM

Share

By Isaac Stovall

The emergence of Artificial Intelligence and Machine Learning ("AI/ML") in recent years has drastically reshaped a wide range of industries, with the healthcare field being no exception. Healthcare systems have been implementing AI/ML technologies for assistance with clinical decision-making, improvement of the efficiency of administrative tasks, and as a tool for diagnostic and medical testing. [1]

developers and vendors, HIPAA requirements of patient data protection and limits on disclosure without patient authorization apply to "business associates," which are entities that a covered entity may contract with to carry out certain functions, which could include many of the tasks that AI/ML models are already being used for today. Experts have highlighted a few compliance issues that could arise when integrating AI/ML models into healthcare systems, including that healthcare AI/ML models are trained on patient datasets, and the collection by a third-party vendor may make such data vulnerable to being intercepted by malicious actors. [3] Additionally, although such patient data is de-identified, scholars have discussed the issue of this data being re-identified when large tech companies gain access to it when they themselves integrate AI/ML models into their own technologies.[4]

Other various laws could potentially implicate the use of AI/ML technologies in healthcare systems, including the Federal Food, Drug, and Cosmetic Act (FDCA). [5] These technologies will often be used in a manner that classifies them as a "medical device" for the purposes of the FDCA, which, in pertinent part, defines medical devices as technologies that can be used in the diagnosis or treatment of disease or other conditions.[6] Therefore, AI developers will need to make submissions for approval by the Food and Drug Administration ("FDA"). The FDA has issued various documents to guide AI vendors as they develop and market their devices, and the agency has already approved the use of over 1,000 AI technologies as medical devices. [7]

AI/ML technologies hold great promise in revolutionizing healthcare delivery. Remaining cognizant of HIPAA, FDCA, and other laws and regulations that govern health systems will be essential in maximizing the potential of these models in this

[2] 45 C.F.R. § 160.103 (2024).

[3] See DOUGLAS MCNAIR & W. NICHOLSON PRICE II, HEALTH CARE ARTIFICIAL INTELLIGENCE: LAW, REGULATION, AND POLICY, IN ARTIFICIAL INTELLIGENCE IN HEALTH CARE: THE HOPE, THE HYPE 1, 222 (Michael Matheny, Sonoo Thadaney Israni, Mahnoor Ahmed & Danielle Whicher eds., 1990).

[4] See Delaram Rezaeikhonakdar, *AI Chatbots and Challenges of HIPAA Compliance for AI Developers and Vendors*, 51 J. L. MED. ETHICS, March 2024, at 988, 991.

[5] See *FDA Issues Comprehensive Draft Guidance for Developers of Artificial Intelligence-Enabled Medical Devices*, UNITED STATES FOOD AND DRUG ADMIN. (Jan. 6, 2025), https://www.fda.gov/news-events/press-announcements/fda-issues-comprehensive-draft-guidance-developers-artificial-intelligence-enabled-medical-devices

[6] 21 U.S.C. § 321(h)(1)

[7] See U.S. FOOD & DRUG ADMINISTRATION, ARTIFICIAL INTELLIGENCE/MACHINE LEARNING (AI/ML)-BASED SOFTWARE AS A MEDICAL DEVICE (SAMD) ACTION PLAN , https://www.fda.gov/media/145022/download?attachment;%20https://www.fda.gov/regulatory-information/search-fda-guidance-documents/artificial-intelligence-enabled-device-software-functions-lifecycle-management-and-marketing (last visited Sep. 24, 2025); U.S. FOOD & DRUG ADMINISTRATION, PROPOSED REGULATORY FRAMEWORK FOR MODIFICATIONS TO ARTIFICIAL INTELLIGENCE/MACHINE LEARNING

Recent News

The History of Trade Secret Law in the U.S.

Dec 9, 2025

Stanton Foundation First Amendment Clinic Authors Amicus Brief in Fifth Circuit Social Media Blocking Case

Dec 8, 2025

Supreme Court to hear major test of presidential power over Trump's firing of FTC commissioner

Dec 8, 2025

VANDERBILT UNIVERSITY

Academic Programs

Clinics

Office of Culture & Community

Alumni

Library

Calendar

Vanderbilt University's Online Privacy Notice

Date created: December 9, 2025

Among psychologists, AI use is up, but so are concerns

Artificial Intelligence (/topics/artificial-intelligence-machine-learning) Practice (/search?osquery=practice)

Two-thirds of psychologists worry artificial intelligence tools may bring data breaches, unanticipated harm to society

WASHINGTON — More than half of psychologists experimented with artificial intelligence tools in their practices in the past year, but almost all cite concerns about how the technology may affect their patients and society, according to the American Psychological Association's 2025 Practitioner Pulse Survey (/pubs/reports/practitioner/2025) .

This annual survey, conducted by APA and its companion organization, APA Services, Inc., was completed by 1,742 psychologists in September 2025. It found that 56% of psychologists reported using AI tools to assist with their work at least once in the past 12 months, up from 29% in 2024. And close to three in 10 psychologists (29%) said they used AI on at least a monthly basis—more than twice as many who said the same in 2024 (11%). These technologies can support psychologists in various ways, from providing administrative support to augmenting clinical care.

However, as psychologists grow more familiar with AI, they are also becoming more attuned to its potential risks. More than nine in 10 psychologists (92%) cited concerns about the use of AI tools in psychology, most commonly potential data breaches (67% vs. 59% in 2024), unanticipated social harms (64% vs. 54%), biases in the input and output (63% vs. 54%), a lack of rigorous testing to mitigate risks (61% vs. 51%) and inaccurate output or "hallucinations" (60% vs. 44%).

"Artificial intelligence can help ease some of the pressures that psychologists are facing—for instance, by increasing efficiency and improving access to care—but human oversight remains essential," said APA CEO Arthur C. Evans Jr., PhD. "Patients need to know they can trust their provider to identify and mitigate risks or biases that arise from using these technologies in their treatment."

While 38% of psychologists worried that AI may make some of their job duties obsolete in the future, few psychologists are relying on AI to help with the complex tasks required to treat their patients. Approximately one in 10 psychologists who used AI (8%) said that they used it to assist with clinical diagnosis, and only 5% said they used chatbot assistance for patients or clients.

Among psychologists who used AI to assist with their work, the most common uses included assistance with writing emails and other materials (52%), generating content (33%), summarizing clinical notes or articles (32%) and note-taking (22%)—routine tasks that often demand time and energy from psychologists that they'd rather spend with patients. Overall, more than three in five psychologists (62%) said that advancements in technology are helping them work more efficiently and accurately.

"Psychologists are drawn to this field because they're passionate about improving people's lives, but they can lose hours each day on paperwork and managing the often byzantine requirements of insurance companies," said Evans. "Leveraging safe and ethical AI tools can increase psychologists' efficiency, allowing them to reach more people and better serve them."

Before using AI tools to assist with clinical care, APA recommendations for psychologists (PDF, 458KB) (/topics/artificial-intelligence-machine-learning/ethical-guidance-professional-practice.pdf) include:

- Obtain informed consent from patients by clearly communicating the use, benefits and risks of AI tools.
- Evaluate AI tools for potential biases that could potentially worsen disparities in mental health outcomes.
- Review AI tools to check for compliance with relevant data privacy and security laws and regulations.
- Understand how patient/client data are used, stored or shared by companies that provide AI tools.

Despite the use of new technology to manage administrative burdens, the survey revealed that psychologists continue to struggle with insurance requirements and demands for treatment. Fewer than two-thirds of psychologists (62%) said that they accept some form of insurance, often because of insufficient reimbursement rates and struggles with pre-authorization requirements, audits and other administrative issues.

And while psychologists' stress levels and work-life balance have improved since the onset of the COVID-19 pandemic, nearly half of all psychologists said that they do not have openings for new patients (46%) and that their patients' symptoms are increasing in severity (45%), indicating that the mental health crisis is not resolved yet.

Methodology

The APA Practitioner Pulse Survey series has been conducted annually since 2020. The survey was conducted online and distributed via email using a probability-based random sample. Invitations were sent to a sample of 30,000 on September 3, 2025, and several reminder emails were sent to encourage survey completion. The survey closed on September 29, with a completion rate of 6.6%. A full methodology is available (PDF, 250KB) (/pubs/reports/practitioner/2025/methodology.pdf) .

Contact

Sophie Bethune
(202) 336-6134

750 First St. NE, Washington, DC 20002-4242

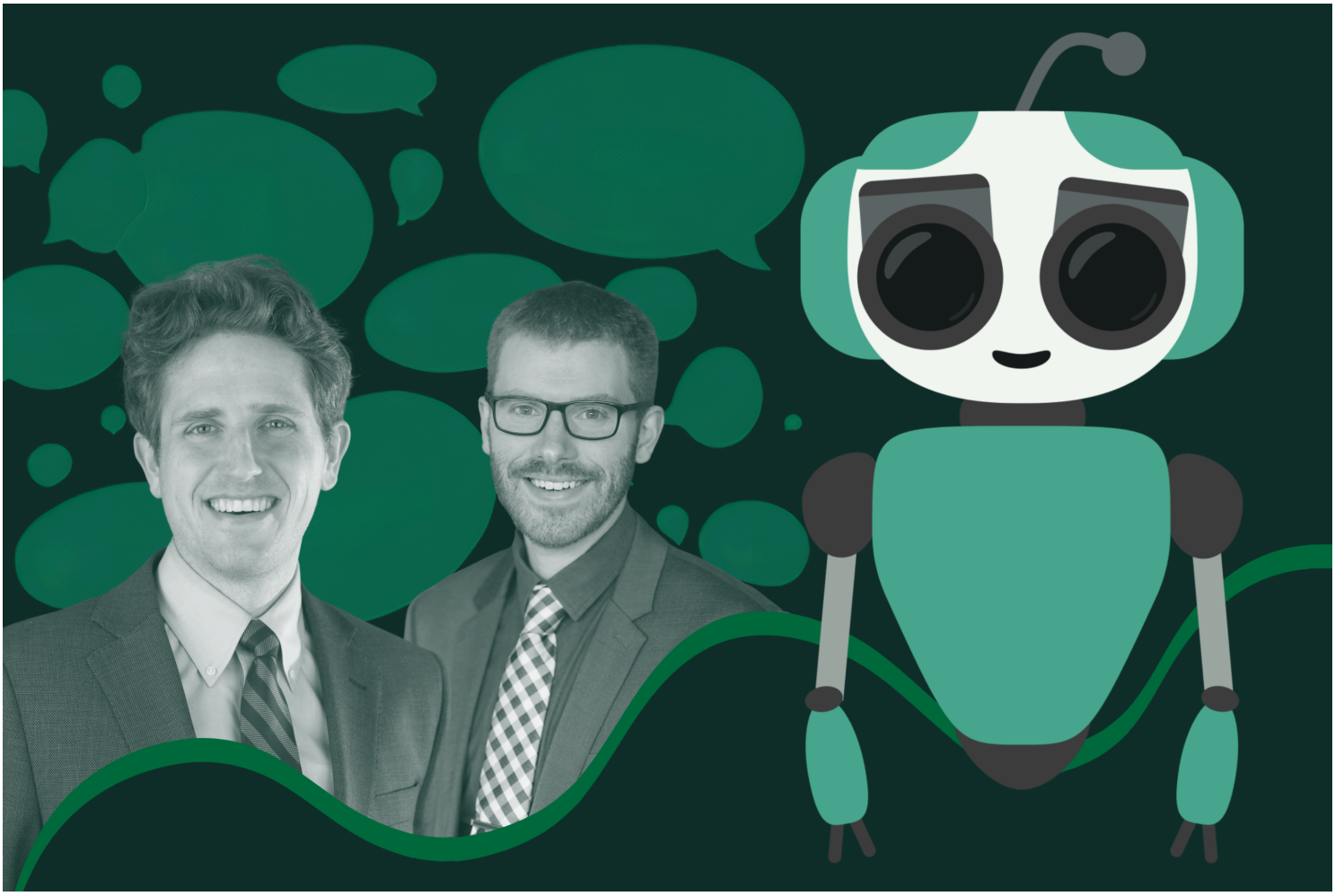
Telephone: (800) 374-2721; (202) 336-5500 | TDD/TTY: (202) 336-6123

Articles

MORE NEWS

First Therapy Chatbot Trial Yields Mental Health Benefits

Study participants likened Dartmouth's AI-powered "Therabot" to working with a therapist.



Geisel School of Medicine professors Michael Heinz, left, and Nicholas Jacobson led the first clinical trial of any generative-AI therapy chatbot with their Therabot software. (Graphic by Katie Lenhart)

3/27/2025

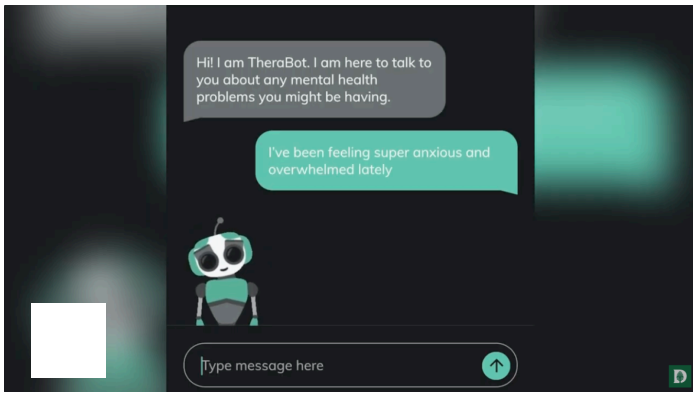
Dartmouth researchers conducted the first-ever clinical trial of a generative AI-powered therapy chatbot and found that the software resulted in significant improvements in participants' symptoms, according to results published March 27 in NEJM AI.

People in the study also reported they could trust and communicate with the system, known as Therabot, to a degree that is comparable to working with a mental health professional.

The trial consisted of 106 people from across the United States diagnosed with major depressive disorder, generalized anxiety disorder, or an eating disorder. Participants interacted with Therabot through a smartphone app by typing out responses to prompts about how they were feeling or initiating conversations when they needed to talk.

People diagnosed with depression experienced a 51% average reduction in symptoms, leading to clinically significant improvements in mood and overall well-being, the researchers report. Participants with generalized anxiety reported an average reduction in symptoms of 31%, with many shifting from moderate to mild anxiety, or from mild anxiety to below the clinical threshold for diagnosis.

Among those at risk for eating disorders—who are traditionally more challenging to treat—Therabot users showed a 19% average reduction in concerns about body image and weight, which significantly outpaced a control group that also was part of the trial.



This demonstration video shows Therabot responding to a user with generalized anxiety with open-ended dialog developed from therapy best practices. (Video courtesy of Michael

Morgan Kelly

SHARE THIS

MORE READING

Meeting the Moment in Artificial Intelligence →

Heinz and Nicholas Jacobson)

The researchers conclude that while AI-powered therapy is still in critical need of clinician oversight, it has the potential to provide real-time support for the many people who lack regular or immediate access to a mental-health professional.

“The improvements in symptoms we observed were comparable to what is reported for traditional outpatient therapy, suggesting this AI-assisted approach may offer clinically meaningful benefits,” says Nicholas Jacobson, the study’s senior author and an associate professor of biomedical data science and psychiatry at the Geisel School of Medicine.

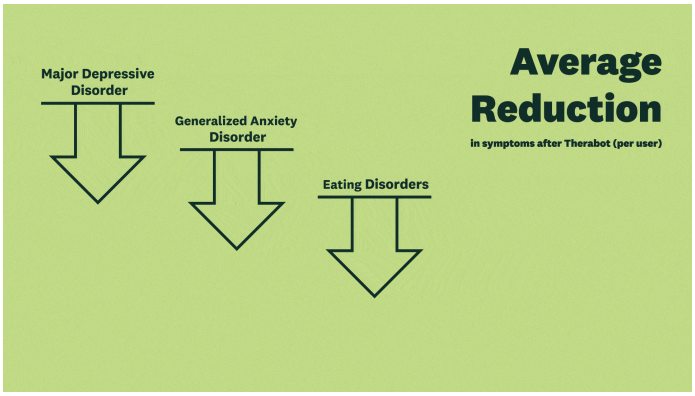
“There is no replacement for in-person care, but there are nowhere near enough providers to go around,” Jacobson says. For every available provider in the United States, there’s an average of 1,600 patients with depression or anxiety alone, he says.

“We would like to see generative AI help provide mental health support to the huge number of people outside the in-person care system. I see the potential for person-to-person and software-based therapy to work together,” says Jacobson, who is the director of the treatment development and evaluation core at Dartmouth’s Center for Technology and Behavioral Health.

Michael Heinz, the study’s first author and an assistant professor of psychiatry at CTBH and Geisel, says the trial results also underscore the critical work ahead before generative AI can be used to treat people safely and effectively.

“While these results are very promising, no generative AI agent is ready to operate fully autonomously in mental health where there is a very wide range of high-risk scenarios it might encounter,” says Heinz, who also is an attending psychiatrist at Dartmouth Hitchcock Medical Center. “We still need to better understand and quantify the risks associated with generative AI used in mental health contexts.”

Therabot has been in development in Jacobson's AI and Mental Health Lab at Dartmouth since 2019, and included continuous consultation with psychologists and psychiatrists affiliated with Dartmouth and Dartmouth Health.



Therabot users, all previously diagnosed with a mental health disorder, experienced significant improvements in symptoms after eight weeks. (Graphic by LaDarius Dennison)

When people initiate a conversation with the app, Therabot answers with natural, open-ended text dialog based on an original training set the researchers developed from current, evidence-based best practices for psychotherapy and cognitive behavioral therapy, Heinz says.

For example, if a person with anxiety tells Therabot they have been feeling very nervous and overwhelmed lately, it might respond, "Let's take a step back and ask why you feel that way." If Therabot detects high-risk content such as suicidal ideation during a conversation with a user, it will provide a prompt to call 911, or contact a suicide prevention or crisis hotline, with the press of an onscreen button.

The clinical trial provided the participants randomly selected to use Therabot with four weeks of unlimited access. The researchers also tracked the control group of 104 people with the same diagnosed conditions who had no access to Therabot.

Almost 75% of the Therabot group were not under pharmaceutical or other therapeutic treatment at the time. The app asked about people's well-being, personalizing its questions and responses based on what it learned during its conversations with participants. The researchers

evaluated conversations to ensure that the software was responding within best therapeutic practices.

After four weeks, the researchers gauged a person's progress through standardized questionnaires clinicians use to detect and monitor each condition. The team did a second assessment after another four weeks when participants could initiate conversations with Therabot but no longer received prompts.

After eight weeks, all participants using Therabot experienced a marked reduction in symptoms that exceed what clinicians consider statistically significant, Jacobson says.

> "We did not expect that people would almost treat the software like a friend. It says to me that they were actually forming relationships with Therabot."
>
> **NICHOLAS JACOBSON, ASSOCIATE PROFESSOR OF BIOMEDICAL DATA SCIENCE AND PSYCHIATRY**

These differences represent robust, real-world improvements that patients would likely notice in their daily lives, Jacobson says. Users engaged with Therabot for an average of six hours throughout the trial, or the equivalent of about eight therapy sessions, he says.

"Our results are comparable to what we would see for people with access to gold-standard cognitive therapy with outpatient providers," Jacobson says. "We're talking about potentially giving people the equivalent of the best treatment you can get in the care system over shorter periods of time."

Critically, people reported a degree of "therapeutic alliance" in line with what patients report for in-person providers, the study found. Therapeutic alliance relates to the level of trust and collaboration between a patient and their caregiver and is considered essential to successful therapy.

One indication of this bond is that people not only provided detailed responses to Therabot's prompts—they frequently initiated conversations, Jacobson says. Interactions with the software also showed upticks at times associated with unwellness, such as in the middle of the night.

"We did not expect that people would almost treat the software like a friend. It says to me that they were actually forming relationships with Therabot," Jacobson says. "My sense is that people also felt comfortable talking to a bot because it won't judge them."

The Therabot trial shows that generative AI has the potential to increase a patient's engagement and, importantly, continued use of the software, Heinz says.

"Therabot is not limited to an office and can go anywhere a patient goes. It was available around the clock for challenges that arose in daily life and could walk users through strategies to handle them in real time," Heinz says. "But the feature that allows AI to be so effective is also what confers its risk—patients can say anything to it, and it can say anything back."

The development and clinical testing of these systems need to have rigorous benchmarks for safety, efficacy, and the tone of engagement, and need to include the close supervision and involvement of mental-health experts, Heinz says.

"This trial brought into focus that the study team has to be equipped to intervene—possibly right away—if a patient expresses an acute safety concern such as suicidal ideation, or if the software responds in a way that is not in line with best practices," he says. "Thankfully, we did not see this often with Therabot, but that is always a risk with generative AI, and our study team was ready."

In evaluations of earlier versions of Therabot more than two years ago, more than 90% of responses were consistent with therapeutic best-practices, Jacobson says. That gave the team the confidence to move forward with the clinical trial.

“There are a lot of folks rushing into this space since the release of ChatGPT, and it’s easy to put out a proof of concept that looks great at first glance, but the safety and efficacy is not well established,” Jacobson says. “This is one of those cases where diligent oversight is needed, and providing that really sets us apart in this space.”

Morgan Kelly can be reached at **morgan.kelly@dartmouth.edu**.

CATEGORIES

MENTAL HEALTH AND WELLNESS INNOVATION AND IMPACT SCIENCE & HEALTH

TAGS

ARTIFICIAL INTELLIGENCE MENTAL HEALTH FACULTY RESEARCH

GEISEL SCHOOL OF MEDICINE CENTER FOR TECHNOLOGY AND BEHAVIORAL HEALTH STEM

NEWS RELEASE DARTMOUTH HEALTH UNDP

Articles

Geisel Researchers to Evaluate Teen Opioid Treatment

12/16/2025

Geisel

Articles

Dartmouth Welcomes First Members of Class of 2030

12/16/2025

FOUNDED IN 1769 • HANOVER, NEW HAMPSHIRE •

New Hampshire Colleges and Universities

Native American Studies

Department of Art History

Privacy

A-Z Index

Site or Accessibility feedback

Original Paper

Your Robot Therapist Will See You Now: Ethical Implications of Embodied Artificial Intelligence in Psychiatry, Psychology, and Psychotherapy

Amelia Fiske[1], BA, PhD; Peter Henningsen[2], PhD, MD; Alena Buyx[1], MPhil, PhD, MD

[1]Institute for History and Ethics of Medicine, Technical University of Munich School of Medicine, Technical University of Munich, Munich, Germany
[2]Department of Psychosomatic Medicine and Psychotherapy, Klinikum rechts der Isar at Technical University of Munich, Munich, Germany

Corresponding Author:
Amelia Fiske, BA, PhD
Institute for History and Ethics of Medicine
Technical University of Munich School of Medicine
Technical University of Munich
Ismaninger Straße 22
Munich, 81675
Germany
Phone: 49 8941404041
Email: a.fiske@tum.de

Abstract

Background: Research in embodied artificial intelligence (AI) has increasing clinical relevance for therapeutic applications in mental health services. With innovations ranging from 'virtual psychotherapists' to social robots in dementia care and autism disorder, to robots for sexual disorders, artificially intelligent virtual and robotic agents are increasingly taking on high-level therapeutic interventions that used to be offered exclusively by highly trained, skilled health professionals. In order to enable responsible clinical implementation, ethical and social implications of the increasing use of embodied AI in mental health need to be identified and addressed.

Objective: This paper assesses the ethical and social implications of translating embodied AI applications into mental health care across the fields of Psychiatry, Psychology and Psychotherapy. Building on this analysis, it develops a set of preliminary recommendations on how to address ethical and social challenges in current and future applications of embodied AI.

Methods: Based on a thematic literature search and established principles of medical ethics, an analysis of the ethical and social aspects of currently embodied AI applications was conducted across the fields of Psychiatry, Psychology, and Psychotherapy. To enable a comprehensive evaluation, the analysis was structured around the following three steps: assessment of potential benefits; analysis of overarching ethical issues and concerns; discussion of specific ethical and social issues of the interventions.

Results: From an ethical perspective, important benefits of embodied AI applications in mental health include new modes of treatment, opportunities to engage hard-to-reach populations, better patient response, and freeing up time for physicians. Overarching ethical issues and concerns include: harm prevention and various questions of data ethics; a lack of guidance on development of AI applications, their clinical integration and training of health professionals; 'gaps' in ethical and regulatory frameworks; the potential for misuse including using the technologies to replace established services, thereby potentially exacerbating existing health inequalities. Specific challenges identified and discussed in the application of embodied AI include: matters of risk-assessment, referrals, and supervision; the need to respect and protect patient autonomy; the role of non-human therapy; transparency in the use of algorithms; and specific concerns regarding long-term effects of these applications on understandings of illness and the human condition.

Conclusions: We argue that embodied AI is a promising approach across the field of mental health; however, further research is needed to address the broader ethical and societal concerns of these technologies to negotiate best research and medical practices in innovative mental health care. We conclude by indicating areas of future research and developing recommendations for high-priority areas in need of concrete ethical guidance.

(J Med Internet Res 2019;21(5):e13216) doi: 10.2196/13216

KEYWORDS

artificial intelligence; robotics; ethics; psychiatry; psychology; psychotherapy; medicine

Introduction

Research in embodied artificial intelligence (AI) has increasing clinical relevance for therapeutic applications in mental health services, that is, in psychiatry, psychology, and psychotherapy. Innovations range from 'virtual psychotherapists' [1] to social robots in dementia care and autism disorder [2] and robots for sexual disorders [3]. Increasingly, artificially intelligent virtual and robotic agents are not only available for relatively low-level elements of mental health support, such as comfort or social interaction, but also perform high-level therapeutic interventions that used to be offered exclusively by highly trained, skilled health professionals such as psychotherapists [4]. Importantly, such 'virtual' or 'robotic therapists' include an artificially intelligent algorithm that responds independently of any expert human guidance to the client or patient through a virtually embodied presence, such as a face icon, or a physically embodied presence, such as a robotic interface. As such, these emerging applications are distinct from the many varieties of Web-based therapy, which usually involve either a human therapist, albeit remotely (telemedicine), or the patient herself, working independently with manuals, questionnaires, or other self-help materials [5].

Embodied AI applications in mental health care carry hopes of improving quality of care and controlling expenditure [6]. In addition, they also hold the promise of reaching underserved populations in need of mental health services and improving life opportunities for vulnerable groups. However, there is a persistent gap between current, rapid developments in AI mental health and the successful adoption of these tools into clinical environments by health professionals and patients. In addition, it has been demonstrated that the interventions are often designed without any explicit ethical considerations [7]. Furthermore, although studies often examine the effectiveness or ethical use of a single application, rarely do they consider the implications for the integration of AI across the field of mental health more broadly. In this paper, we argue that virtually and physically embodied artificially intelligent agents and applications have great potential in mental health care. However, their societal and ethical implications require further probing to identify pertinent concerns surrounding trust, privacy, and autonomy, as well as to anticipate concerns that may arise in the future. Identifying the broader ethical and societal implications of embodied AI is crucial for negotiating best research and medical practices in innovative mental health care. We conclude by indicating areas of future research and identifying points in need of ethical caution.

Overview: Existing Embodied Intelligent Applications

Although AI-enabled virtual and robot therapy has long been used across a number of medical fields [8-10], the integration of AI through the use of embodied agents is still at an early stage in mental health care; it is arguably the most recent addition to psychotherapeutic practice, supporting a host of emotional, cognitive, and social processes [11]. In what follows, we have sketched a range of applications with the aim of characterizing some of the embodied artificially intelligent innovations across the field of mental health. To maintain focus amid a broad and growing field, we have chosen to exclude from our analysis applications that are not intended to interact with patients, or that have no virtual presence or robotic interface; this includes AI-supported scanning and diagnostic tools. We have also excluded applications that may have a virtual or robotic interface but do not employ AI, such as telemedicine therapy (for further scholarship on this topic, please see [12-19]).

Virtually Embodied Artificially Intelligent Agents

AI-supported virtually embodied psychotherapeutic devices are currently developing at a rapid speed. For example, therapeutic apps such as Tess and other "chatbots" such as Sara, Wysa, and Woebot, which work over short message service text messaging, WhatsApp, or internet platforms, are being explored for addressing depression and anxiety. These applications come with interactive screen presences. Woebot and other programs engage with the patient like a virtual psychotherapist, with the aim of helping patients to recognize their emotions and thought patterns and to develop skills such as resilience or techniques for reducing anxiety. For example, using natural language processing, Tess is programed to flag expressions that indicate emotional distress. Often cited as a digital tool to reach underserved populations across the world that lack mental health services, the bots can explain to users the clinical terms for what they are experiencing—such as cognitive distortions—or provide concrete advice for recognizing and dealing with difficult situations [20]. Initial studies found that depression symptoms decreased with the use of Woebot more than groups who relied on electronic book resources [21], and another study found that Tess helped to reduce depression and anxiety among users [20].

A similar approach involves the use of avatars, such as the Avatar Project, for addressing persistent auditory hallucinations for patients with psychosis [22]. These usually involve computer-generated images of faces on computer screens or tablets that interact with a patient via intelligent algorithms. Avatars are also being explored in treatment of schizophrenia, for example, to improve medication adherence [23]. Similar to the Avatar Project, virtual reality–assisted therapy for schizophrenia often encourages patients to engage with the voices they hear through the use of an AI avatar. Initial studies found that the therapy could help in developing therapeutic targets [24] and also in particularly difficult cases of schizophrenia [25]. Another study found improvements in auditory visual hallucinations, symptoms of depression, and overall quality of life following therapy sessions for treatment-resistant schizophrenia patients [26]. 'Avatar coaches' have also been employed as part of an immersive virtual reality situation for treating the fear of heights [27] or as 'virtual patients' to provide medical students with lifelike interviewing practice [28]. Finally, avatars are also being implemented in risk prevention education, such as the Kognito program, which

uses an avatar to help college students and faculty identify others at risk for suicide [29].

Artificially Intelligent Robot Therapy

In addition to these virtually embodied therapeutic applications, clinicians and scientists are exploring the translation of innovations at the intersection of AI and robotics into the clinic. For example, intelligent animal-like robots such as Paro, a fuzzy harp seal, are increasingly being used to help patients with dementia. Paro, along with the large furry eBear, is part of a class of 'companion bots,' engaging individuals as at-home health care assistants, responding to speech and movement with dynamic 'dialog', or seeking to help elderly, isolated, or depressed patients through companionship and interaction. Several studies have examined the role of such robots in reducing stress, loneliness, and agitation and in improving mood and social connections [30,31]. Thus far, the outcomes are promising [32,33].

AI robots also provide opportunities for different forms of engagement with children suffering from autism spectrum disorders (ASDs) [34]. Children with autism have been found to react positively to robots, even in cases where they have trouble interacting with others [35]. The Kaspar robot has demonstrated potential for integration in current education and therapy interventions [36] and is being investigated for the potential to improve social skills among children [37]. Similarly, RoboTherapy is an example of socially assistive robotics designed to help children with ASDs to develop social skills, and the robot Nao is designed to improve facial recognition and appropriate gaze response. The aim of such robotic interaction is to learn appropriate social skills (eg, imitation, taking turns, staying engaged, and empathy), with the hope that children can then apply the skills learned with the robot peer to their relationships with human peers. Initial studies are promising; individuals with ASDs performed better with their robot partners than human therapists, responded with social behaviors toward robots, and improved spontaneous language during therapy sessions [38]. However, the devices are still being developed and are not yet in wider therapeutic use.

AI-enabled robots are also being explored across a variety of other mental health areas including mood and anxiety disorders, children with disruptive behavior, and patients who may not have a specific diagnosis but who would benefit from assistance with mental health concerns [39]. Perhaps, most controversially, artificially intelligent robots have entered the field of human sexuality. Companies are now offering adult sex robots such as Roxxxy, which can speak, learn their human partners' preferences, register touch, and provide a form of intimate companionship. Although the range of medical applications that sex robots can reportedly address remains debated, these include meeting the sexual needs of disabled and elderly individuals or as part of therapy for concerns such as erectile dysfunction, premature ejaculation, and anxiety surrounding sex [40]. Furthermore, some researchers have asked if sex robots could help to reduce sex crimes such as rape and assault or be used for treatment of paraphilia, such as pedophilia [3,41].

Methods

Based on a thematic literature analysis and established principles of medical ethics, an analysis of the ethical and social aspects of currently embodied AI applications was conducted across the fields of Psychiatry, Psychology, and Psychotherapy. To enable a comprehensive evaluation, the analysis was structured around the following three steps: assessment of potential benefits; analysis of overarching ethical issues and concerns; discussion of specific ethical and social issues of the interventions.

Results

Ethical and Social Implications and Concerns

The devices and applications described above have yet to be integrated into widespread clinical use. However, in view of the speed of research and development trajectories of these applications, it is reasonable to expect that therapeutic chatbots, avatars, socially assistive devices, and sex robots will soon translate into broader clinical applications in earnest. In some cases, initial ethical assessments are already available [42,43]; however, most of these studies focus on a single application. In general, for most of the applications we are discussing, large-scale rigorous research studies have not yet been conducted or are still in pilot stages [44-47]. Even in Web-based non-AI applications, evidence of patient acceptance and treatment outcomes in routine care is still limited and mixed [48,49]; there has so far been very little research on patient acceptance and contingent treatment outcomes of embodied AI applications in mental health fields. As with any medical innovation, the effects, impacts, and clinical utility of the applications can only be fully assessed once evidence has improved [50,51].

To enable responsible and responsive innovation and clinical translation into the field of mental health, further and more in-depth analysis of the ethical and social implications of embodied AI is necessary to flag areas of concern. Early identification of ethical issues can help researchers, designers, and developers consider these concerns in the design and construction of the next generation of AI agents and robots for mental health. In the following sections, we have provided an analysis of benefits, challenges, and risks of embodied AI in mental health from an ethical perspective. Beginning with a discussion of potential benefits, we have then turned to risks and challenges, followed by immediate concerns in clinical application and long-term effects.

Anticipated Benefits

All of the aforementioned intelligent applications promise significant benefits for the field of mental health, satisfying many aspects of the ethical principle of beneficence [52]. From a clinical point of view, the use of embodied AI applications holds the potential to open new avenues for intervention in places where there are still significant unmet health needs. AI interventions might be particularly well placed for detecting mental health concerns early on, for reaching high-risk groups such as veterans, or for those who are concerned about the social

stigma associated with psychotherapy [53]. In some cases, patients may respond positively and productively to the fact that the counterpart is *not* a human therapist [54-56]. In one study, subjects overwhelmingly preferred the virtual agent over the human counterpart when being discharged from the hospital because they could self-direct the pace of information—something that is especially important for low-literacy patients [57]. Thus, in mental health services, nonhuman virtual or robotic applications might be preferable for some patients, reducing embarrassment when asking for specific information or services or feelings of shame when admitting noncompliance with a treatment plan. Embodied AI in mental health could also help to empower particular patient groups (such as those who are less familiar with the medical system), thereby helping to improve trust and openness between patients and the medical system. Another important advantage of AI applications is that many of them are low-threshold and self-administered, such that people who do not have an acute condition can elect services without going through the time-consuming process of being screened and admitted into the health care system.

Arguably, the greatest benefit of AI applications is structural, namely the potential to reach populations that are difficult to treat via traditional routes of provision. The provision of some mental health services, for example, through low-threshold, convenient therapeutic interventions via chatbots or avatars may be particularly beneficial for populations living in resource-poor settings. For those living in remote or rural locations or in settings where on-site mental health services are scarce, intelligent applications can increase geographical access and provide some minimal mental health care services where they are otherwise absent. The same may also be true for individuals living in higher income countries who do not have insurance or whose insurance does not cover therapy. Furthermore, it is likely that there are individuals who, for various reasons, do not respond to more traditional clinical services and might prefer low-threshold interventions that can be conducted in the privacy of their homes or on the go. For all of these patients, AI applications could complement existing services or constitute an entry point for pursuing more standard clinical interventions in the future.

In sum, embodied AI interventions may offer entirely new modes of treatment that are potentially more successful than traditional modalities either because they address hard-to-reach populations or because patients respond better to them. Whether, and for which conditions this is the case, requires further investigation. However, given that broadly speaking, conditions such as ASD and sexual dysfunction are increasing in incidence and patient populations with these and many other mental health conditions continue to have unmet health needs [58-62], increased exploration of embodied AI in these fields is promising.

Finally, there are also clear benefits of having a virtual or robotic therapist that is always accessible, has endless amounts of time and patience, never forgets what a patient has said, and does not judge [63,64], thus potentially offering a service that is highly reliable and particularly well-suited to certain patient populations. If integrated into a scaled provision of services, AI-enabled applications could provide support for mild cases of depression and other nonacute conditions [65], therefore helping health professionals to devote more time to the most severe cases. In view of overall increasing burden of illness in mental health and against a background of limited resources, these are important benefits to consider. However, it is likely that embodied AI may not be warmly received by all mental health care professionals, and some may even have serious misgivings about its use because of ethical or clinical concerns. Thus far, there has been no substantial review of the reception of AI across or within specific mental health fields, marking an area in need of further research.

Overarching Ethical Concerns

Harm Prevention and Data Ethics Issues

To satisfy the well-established ethical principle of nonmaleficence, more robust research is needed on embodied AI applications in mental health to prevent harm both within therapeutic encounters and in cases where robots could malfunction or operate in unpredictable ways. For instance, in interviewing respondents working with AI robotic technologies, Cresswell et al discuss an example of a woman who was stuck in an elevator with a robot and another who was run over by a robot [6]. Chatbots and avatars could also stop working or malfunction. Hence, it needs to be discussed if embodied AI devices—potentially including virtual agents and freely available mental health applications—should require the same kind of rigorous risk assessment and regulatory oversight that other medical devices are subject to before they are approved for clinical use.

Similar to other devices employed in medical settings, the use of any AI applications in mental health care requires careful consideration surrounding data security of devices that communicate personal health information, the ways that the data generated is used, and the potential for hacking and nonauthorized monitoring [66,67]. Clear standards are needed on issues surrounding confidentiality, information privacy, and secure management of data collected by intelligent virtual agents and assistive robots as well as their use for monitoring habits, movement, and other interactions [68,69]. Concerns around privacy may be amplified as the amount of data collected continues to expand; for example, we anticipate that applications that integrate video data would need to have specific privacy protections in place for the communication of sensitive information, or information pertaining to individuals other than the consenting patient.

Lack of Guidance on Development, Clinical Integration, and Training

With embodied AI being one of the newest and most rapidly changing areas of psychological and psychiatric research and treatment, existing legal and ethical frameworks are often not closely attuned to these changes. Rather than providing regulatory guidance, there is the risk that the ‘gaps’ between application and ethical frameworks would only be addressed once harm had already occurred [6]. Again, this is the case with many forms of emerging medical technologies; however, in view of the rapid pace of translation of embodied AI into

practice in settings where traditional health technology assessment and medical oversight systems are not fully applicable—for example, through freely available therapy chatbots—this is an important concern. Although anticipating the ethical and legal questions that will emerge alongside future developments is difficult, active reflection on the 'regulatory fit' for embodied mental health AI is necessary. Initiatives for establishing guidelines are emerging, including the online collaboratively generated document "Moral Responsibility for Computing Artifacts: The Rules," or the recent "An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations" [70]. However, thus far, no guidance exists that is specific to the field of mental health services; pointing to the need for the development of further recommendations to better guide advances in this area.

In addition to a lack of guidance on the development of these interventions for design, use, and regulatory questions, so far, there are also no frameworks available on how medical professionals can effectively engage with and train for increased use of embodied AI in the clinic; that is, although there is an increasing body of both academic and popular literature on how embodied AI can be integrated into clinical practice in mental health, there remains a lack of high-level guidance from professional bodies on the best use of AI in mental health services [15,71-73]. There are also no recommendations available on how to train and prepare young doctors for a mental health field in which such tools will increasingly be used by patients. Thus, further ethical guidelines are needed that are specific to assisting mental health professionals who will be supervising patients who have, or possibly will, engage with AI services.

Potential for Misuse to Reduce Service Provision

An ethically informed integration of AI should also consider questions of a just provision of mental health care [52]. There is the worry that the incorporation of embodied AI in mental health could be a justification for replacing established services, resulting in fewer available health resources or principally AI-driven services, thereby potentially exacerbating existing health inequalities. Many proponents insist that although informed by evidence-based psychotherapeutic approaches, chatbots, for instance, are not intended to replace therapists entirely. In some cases, forms of 'blended' care involving both in-person and virtual forms of therapy are being explored [74], which might also be appropriate for intelligent applications. Blended care models potentially offer the opportunity to draw on the strengths of both AI applications and in-person clinical supervision. However, whether or not it is appropriate to implement AI applications in mental health care depends in part on the availability of other resources in that area. As noted, in cases with limited mental health services, AI applications could provide a needed resource that is decidedly better than no services at all. However, at this point, AI mental health services are not a substitute or a stand-in for the kind of robust, multitiered mental health care available in high-resource health care systems. Appropriately considering the status quo of mental health resources in each context is thus highly relevant from an ethical perspective [75]. Otherwise, AI tools in mental health could be used as an excuse for reducing the provision of high-quality, multilayered care by trained mental health professionals in low-resource settings.

Discussion

Specific Challenges in Application

Risk-Assessment, Referrals, and Supervision

Considering the application of embodied AI tools in mental health practice, a host of specific challenges need to be kept in mind: mental health professionals have an ethical responsibility to inform other service providers as well as third parties or authorities if a patient indicates that they are a threat to themselves or to another individual. How this would work in artificially intelligent interventions, particularly when there is no supervision of the interaction between the AI agent and the patient by a qualified health professional, remains to be determined. It is unclear when, and how, assistive robots that patients have in their homes, or freely available virtual agents and chatbots, would effectively connect at-risk individuals with appropriate services, including hospitalization and other protections. This scenario is particularly relevant in the aforementioned situation of using AI mental health applications to extend access to rural, hard to reach, or uninsured populations. In these cases, some provision of service is arguably better than nothing. However, what should be done if, for example, a therapy bot detects through speech patterns that an individual is at higher risk for self-harm, yet appropriate referral services are not available in the area?

AI applications engaged in therapeutic relationships with clients will likely also need to be bound by similar ethical guidelines as those that bind mental health professionals. However, so far, how an AI duty of care or a code of practice on reporting harm should be operationalized is entirely unclear. An obvious suggestion would be to always mandate supervision through a qualified mental health clinician—when a human therapist evaluates a patient's expression of self-harm, she also considers contextual information in her interpretation of the level of risk. Whether, and to what degree, robotic therapists are able to do this remains unclear. However, many AI applications are available outside established mental health settings; in addition, the capacity of computerized methods to identify and predict psychiatric illness are increasing [12,13], as are their skills of therapeutic interaction and communication. Thus, the question of whether supervision of embodied AI in health should always be provided, and how such a requirement could be successfully implemented, remains a subject for further debate.

Respecting and Protecting Patient Autonomy

Another concern for the application of embodied AI in mental health practice centers on enabling and respecting patient autonomy [52]. These are novel technologies that require assessment to guarantee that patients fully understand how the application or avatar works in order to ensure that a patient does not misunderstand or mistake the intelligent system for a human-driven application. For instance, it would be problematic if a patient were to assume that 'at the other end' of the chatbot there is a doctor communicating or reviewing her messages. Furthermore, obtaining consent for applications used outside

of medical systems raises thorny concerns. For instance, an elderly person or a person with intellectual disabilities may not be able to understand what a robot is or what a robot does when it is installed at home to monitor the patient's activities, risking privacy infringement [42], manipulation, and even coercion if the conditions for informed consent are not satisfied. Such questions make consenting to surveillance, interaction, and data collection with the robot challenging matters. Distinctions could be drawn between interventions that are seen as helping and monitoring, as opposed to those that run the risk of manipulation and coercion; however, these lines are often blurred both in theory and in practice [76]. How AI applications should evaluate if a patient has fully understood the information provided when giving consent, and how to proceed in cases where it is not possible for individuals to provide consent, such as children, patients with dementia, those with intellectual disabilities, or those in acute phases of schizophrenia, needs to be addressed.

Another area of particular concern in relation to matters of promoting autonomy in the use of AI in mental health care is the engagement of vulnerable populations. People have been shown to be more compliant when a robot asks them to do something as compared with a person [9]. Although this could lead to better results when helping patients with autism or those needing to make difficult behavioral changes, the concern exists that people could be manipulated or coerced into doing things that they should not or that they have not fully thought through, either because of the novelty of the device or because of a lack of companions with whom to discuss alternatives. Some studies have made a distinction between a "suspension of disbelief" when anthropomorphizing a robot caregiver and deception *per se* [42,77], but this is a line that requires further investigation in practice.

Nonhuman Therapy?

In general, the question remains as to whether there are aspects of the therapeutic encounter that cannot be achieved through AI. Some therapeutic benefits may be difficult to anticipate, or highly specific to a particular individual's relationship to his or her therapist. One study found that embodied conversational agents had difficulty evaluating a user's emotional state in a real-time dialog and that the absence of a human therapist in Web-based mental health interventions for treating depression and anxiety had a negative effect on user adherence to the programs [78]. In the treatment of insomnia, some patients indicated that they missed having a human therapist [79]. Relatedly, because robots and artificially intelligent systems blur previously assumed boundaries between reality and fiction, this could have complex effects on patients. Similar to therapeutic relationships, there is the risk of transference of emotions, thoughts, and feelings to the robot. In particular, given that many of the target populations are vulnerable because of their illness, age, or living situation in a health care facility, there is the additional concern that patients would be vulnerable in their engagements with the robot because of their desire for company or to feel cared for [80]. Unlike with a therapist, however, there is no person on the other side of this transference. Whether robot therapists will ever be able to deal adequately with such transference remains to be seen. Further concerns are likely to emerge in practice; thus, embodied AI therapeutic aids need to also be evaluated carefully for unanticipated differences with standard therapy modalities.

Ethical Issues in Algorithms

It is necessary to note that AI mental health interventions work with algorithms, and algorithms come with ethical issues. It has been well-established that existing human biases can be built into algorithms, reinforcing existing forms of social inequality [81]. This raises the concern that AI-enabled mental health devices could also contain biases that have the potential to exclude or harm in unintended ways, such as data-driven sexist or racist bias or bias produced by competing goals or endpoints of devices [82,83]. Following other calls for transparency [84], the algorithms used in artificially intelligent applications for mental health purposes could be similarly open to scrutiny. This may require investing additional time in explaining to patients (and their families) what an algorithm is and how it works in relation to the therapy provided [85]. However, how to best do this, in particular with patients with compromised mental capacities, requires further consideration.

Concerns Regarding Long-Term Effects

Apart from these more immediate concerns, the implementation of embodied AI into mental health services also raises a number of broader questions regarding long-term impacts on patients, the mental health community, and society more widely. For instance, it has been noted that long-term use of AI interventions could lead to some patients or patient groups becoming overly attached to these applications. A study by Cresswell et al noted that robots that aim to alleviate loneliness or provide emotional comfort carry the risk that the patients they work with could become dependent on them [6]. More broadly, others have raised questions about ways that robots could contribute to changing social values surrounding care or situations in which caregiving is increasingly 'outsourced' to robotic aids. The impact of intelligent robots on relationships, both human-robot and human-human relationships, is an area that requires further probing, as do potential effects on identity, agency, and self-consciousness in individual patients. Specifically, research into the effectiveness of these applications needs to cover not only if the social skills of children with ASD are improved by working with robots but also their ability to apply these skills to relationships with other humans. Similarly, if a sex robot is provided therapeutically to an individual with paraphilia, the effects of this on the targeted behaviors with other humans also needs to be evaluated. The risk exists that if robotic interventions are not translatable to improving human interaction, that they merely remain a way of improving human relations with machines, or worse, an outlet that further limits human-to-human relationships. Similarly, engagement with embodied intelligent devices could also have important effects on the individual, such as on personal sense of identity or agency.

The integration of AI devices into our everyday lives and medical care is undoubtedly changing social expectations and practices of communication. There are essential differences between communicating with an AI device and communicating with another human. Anecdotal findings suggest that some users often speak to assistive devices such as Siri or Alexa in a curter or ruder manner than they would to a human [86]. Importantly,

perceptions of the devices can vary by users: children often understand these devices differently than adults, sometimes attributing human characteristics to the device or believing that the device has a real individual inside [87]. Extrapolating from this example, it is clear that the ways that individuals interact with the AI applications in their lives can have implications for communication and social interaction. How this will evolve as more patients have the opportunity to interact with AI applications as part of their mental health care requires further empirical investigation to catch problematic trends early and correct for future development.

A related concern of objectification exists for some areas of AI applications, such as sex robots. The use of 'sexbots' has already been notably controversial, with scholars objecting that sexual dysfunction depends on a range of physical, psychological, and sociocultural factors that are profoundly relational and reciprocal. Rather than addressing issues of isolation associated with sexual dysfunction, robots might aggravate it or contribute to reductionist understandings of sexual violence [88]. It has been cautioned that the use of sex robots—also available in childlike models or programed with personalities such as "Frigid Farrah" to resist sexual advances—could instead increase the occurrence of sex crimes, normalize the production of social inequalities surrounding the male gaze [89], and contribute to unwanted sexual encounters. Furthermore, the creation of humanoid robots for use in sexual dysfunction raises concerns that it could reinforce or even legitimize the objectification of humans, in particular women and children [3,88]. As the use of AI in many therapeutic applications has not yet been validated in randomized controlled trials (RCTs), there is the risk that particular applications might make problems such as sexual violence worse. More broadly, embodied AI applications necessarily involve a relatively narrow understanding of illness. For instance, sex robots may help with some medical concerns but do not address other determinants of illness that would have to be taken into account from a bio-psycho-social understanding of mental health illness. Widespread AI use could thus exacerbate trends of reductionism in mental health.

Ideas around embodied AI are culturally and historically shaped. Whether providing motivational interviews in therapy [64], acting as embodied conversational agents for mental disorders [47], or working with populations with intellectual disabilities [90], discussion of embodied AI often turns to worries surrounding the limits of human control over technology. Conjuring images of the Terminator or other depictions of the nonhuman in science fiction or cinema, such tools can carry with them negative or scary associations that bring the issue of trust in medical practice into new light [6]. However, exposure to robotic devices, or living in places with positive or caring associations with robots, can influence the adoption of AI devices in different settings [91]. Initiatives that integrate embodied AI into health care practices need to be duly attuned to existing cultural understandings of the role of technology in social lives, and work to ensure that trust between patient and provider, or patient and the health care system, is not eroded.

Finally, AI agents for mental health raise fundamental questions about what it is to be human [6]. One of the principal contributions of science and technology studies scholarship has been to show how humans do not simply act upon objects but rather our relationships with objects also alters, transforms, and imposes limits upon human activity [92]. Interaction with embodied AI agents, just like interaction with other individuals or a therapist, alters behaviors and understandings of the world. Although social relationships are characterized by reciprocity, relationships with intelligent devices are neither mutual nor symmetric. In particular, some have raised the concern that interacting more with artificial agents may lead some individuals to engage less with other people around them or to develop forms of intimacy with intelligent robots [93], raising concerns specific to the use of robots with children or those with intellectual disabilities. As mentioned, people develop attachments to objects and have been shown to also develop attachments to simpler robotic systems such as AIBO. Thus, it is likely that as more intelligent and autonomous devices are developed, human relationships with them will become even more complicated [94].

Conclusions

In light of the demonstrated benefits and potential, such as expanding the reach of services to underserved populations or enhancing existing services provided by mental health professionals, embodied AI has emerged as an exciting and promising approach across the field of mental health. At present, the quality of research on embodied AI in psychiatry, psychology, and psychotherapy is varied, and there is a marked need for more robust studies including RCTs on the benefits and potential harms of current and future applications.

This is still an emerging field, and any analysis of ethical implications can only be preliminary at this point. However, a few conclusions and recommendations are warranted, based on the considerations presented in this paper:

1. It is necessary to develop clear guidance on whether (and which) embodied AI applications should be subject to standard health technology assessment and require regulatory approval. This should include a set of broader provisions for the use of AI services outside the supervision of a health care professional.
2. Professional associations in mental health should develop guidelines on the best use of AI in mental health services as well as recommendations on how to train and prepare young doctors for wide-spread use of embodied AI in mental health, including blended care models.
3. AI tools in mental health should be treated as an additional resource in mental health services. They should not be used as an excuse for reducing the provision of high-quality care by trained mental health professionals, and their effect on the availability and use of existing mental health care services will need to be assessed.
4. To satisfy duties of care and reporting of harm, ideally embodied AI should remain under the supervision of trained mental health professionals. Any applications offered outside of mental health care settings, such as apps and bots, should be required to demonstrate reliable pathways of risk-assessment and referral to appropriate services.
5. Embodied AI should be used transparently. Guidance on how to implement applications in a way that respects patient

autonomy needs to be developed, for example, regarding when and how consent is required and how to best deal with matters of vulnerability, manipulation, coercion, and privacy.

6. AI algorithms in mental health need to be scrutinized, for example, for bias. Ideally, health professionals should be trained in communicating to their patients the role of the algorithms used in different applications they might be using or consider using, and such algorithms should be open for public debate and shaping.
7. Increased use of embodied AI should be accompanied by research that investigates both direct and indirect effects on the therapeutic relationship, other human-human relationships, and effects on individual self-consciousness, agency, and identity. Long-term effects, ranging from health reductionism to increased objectification and impacts on our understandings of what it means to be human, need to be monitored.

Conflicts of Interest

None declared.

References

1. Martinez-Martin N, Kreitmair K. Ethical issues for direct-to-consumer digital psychotherapy apps: addressing accountability, data protection, and consent. JMIR Ment Health 2018 Apr 23;5(2):e32 [FREE Full text] [doi: 10.2196/mental.9423] [Medline: 29685865]
2. Góngora Alonso S, Hamrioui S, de la Torre Díez I, Motta Cruz E, López-Coronado M, Franco M. Social robots for people with aging and dementia: a systematic review of literature. Telemed J E Health 2018 Aug 23 Epub ahead of print(forthcoming). [doi: 10.1089/tmj.2018.0051] [Medline: 30136901]
3. Torjesen I. Sixty seconds on . . . sex with robots. Br Med J 2017 Dec 11;358:j3353. [doi: 10.1136/bmj.j3353] [Medline: 28698234]
4. Inkster B, Sarda S, Subramanian V. An empathy-driven, conversational artificial intelligence agent (Wysa) for digital mental well-being: real-world data evaluation mixed-methods study. JMIR Mhealth Uhealth 2018 Nov 23;6(11):e12106 [FREE Full text] [doi: 10.2196/12106] [Medline: 30470676]
5. Mehrotra S, Kumar S, Sudhir P, Rao GN, Thirthalli J, Gandotra A. Unguided mental health self-help apps: reflections on challenges through a clinician's lens. Indian J Psychol Med 2017;39(5):707-711 [FREE Full text] [doi: 10.4103/IJPSYM.IJPSYM_151_17] [Medline: 29200577]
6. Cresswell K, Cunningham-Burley S, Sheikh A. Health care robotics: qualitative exploration of key challenges and future directions. J Med Internet Res 2018 Jul 04;20(7):e10410 [FREE Full text] [doi: 10.2196/10410] [Medline: 29973336]
7. Ienca M, Wangmo T, Jotterand F, Kressig RW, Elger B. Ethical design of intelligent assistive technologies for dementia: a descriptive review. Sci Eng Ethics 2018 Dec;24(4):1035-1055. [doi: 10.1007/s11948-017-9976-1] [Medline: 28940133]
8. Calderita LV, Manso LJ, Bustos P, Suárez-Mejías C, Fernández F, Bandera A. THERAPIST: towards an autonomous socially interactive robot for motor and neurorehabilitation therapies for children. JMIR Rehabil Assist Technol 2014 Oct 07;1(1):e1 [FREE Full text] [doi: 10.2196/rehab.3151] [Medline: 28582242]
9. Broadbent E. Interactions with robots: the truths we reveal about ourselves. Annu Rev Psychol 2017 Jan 03;68:627-652. [doi: 10.1146/annurev-psych-010416-043958] [Medline: 27648986]
10. Liu C, Liu X, Wu F, Xie M, Feng Y, Hu C. Using artificial intelligence (Watson for Oncology) for treatment recommendations amongst Chinese patients with lung cancer: feasibility study. J Med Internet Res 2018 Sep 25;20(9):e11087 [FREE Full text] [doi: 10.2196/11087] [Medline: 30257820]
11. Eichenberg C, Küsel C. Deutsches Ärzteblatt. 2018. Roboter in der Psychotherapie: Intelligente artifizielle Systeme URL: https://www.aerzteblatt.de/pdf.asp?id=199391 [accessed 2019-04-24] [WebCite Cache ID 77rn5Im3V]
12. Bedi G, Carrillo F, Cecchi GA, Slezak DF, Sigman M, Mota NB, et al. Automated analysis of free speech predicts psychosis onset in high-risk youths. NPJ Schizophr 2015;1:15030 [FREE Full text] [doi: 10.1038/npjschz.2015.30] [Medline: 27336038]
13. LaFrance A. The Atlantic. 2015 Aug 26. Computers Can Predict Schizophrenia Based on How a Person Talks URL: https://www.theatlantic.com/technology/archive/2015/08/speech-analysis-schizophrenia-algorithm/402265/ [accessed 2019-04-22] [WebCite Cache ID 77pavCxgw]
14. Venturi D. Medium Corporation. 2017 Jan 26. How AI is revolutionizing mental health care URL: https://medium.com/@davidventuri/how-ai-is-revolutionizing-mental-health-care-a7cec436a1ce [accessed 2019-04-24] [WebCite Cache ID 77rnD5WjU]
15. Luxton D. Artificial Intelligence in Behavioral and Mental Health Care. Amsterdam, Boston: Academic Press; 2015:308.
16. Poulin C, Shiner B, Thompson P, Vepstas L, Young-Xu Y, Goertzel B, et al. Predicting the risk of suicide by analyzing the text of clinical notes. PLoS One 2014;9(1):e85733 [FREE Full text] [doi: 10.1371/journal.pone.0085733] [Medline: 24489669]
17. Kuwamura K, Nishio S, Sato S. Can we talk through a robot as if face-to-face? Long-term fieldwork using teleoperated robot for seniors with Alzheimer's disease. Front Psychol 2016;7:1066 [FREE Full text] [doi: 10.3389/fpsyg.2016.01066] [Medline: 27486416]

18. Yamazaki R, Nishio S, Ishiguro H, Nørskov M, Ishiguro N, Balistreri G. Acceptability of a teleoperated android by senior citizens in Danish society. Int J of Soc Robotics 2014 Jul 15;6(3):429-442. [doi: 10.1007/s12369-014-0247-x]
19. Cavallo F, Esposito R, Limosani R, Manzi A, Bevilacqua R, Felici E, et al. Robotic services acceptance in smart environments with older adults: user satisfaction and acceptability study. J Med Internet Res 2018 Sep 21;20(9):e264 [FREE Full text] [doi: 10.2196/jmir.9460] [Medline: 30249588]
20. Sachan D. Self-help robots drive blues away. Lancet Psychiatry 2018 Jul;5(7):547. [doi: 10.1016/S2215-0366(18)30230-X]
21. Fitzpatrick KK, Darcy A, Vierhile M. Delivering cognitive behavior therapy to young adults with symptoms of depression and anxiety using a fully automated conversational agent (Woebot): a randomized controlled trial. JMIR Ment Health 2017 Jun 06;4(2):e19 [FREE Full text] [doi: 10.2196/mental.7785] [Medline: 28588005]
22. Craig TK, Rus-Calafell M, Ward T, Leff JP, Huckvale M, Howarth E, et al. AVATAR therapy for auditory verbal hallucinations in people with psychosis: a single-blind, randomised controlled trial. Lancet Psychiatry 2018 Jan;5(1):31-40. [doi: 10.1016/S2215-0366(17)30427-3]
23. Bain EE, Shafner L, Walling DP, Othman AA, Chuang-Stein C, Hinkle J, et al. Use of a novel artificial intelligence platform on mobile devices to assess dosing compliance in a phase 2 clinical trial in subjects with schizophrenia. JMIR Mhealth Uhealth 2017 Feb 21;5(2):e18 [FREE Full text] [doi: 10.2196/mhealth.7030] [Medline: 28223265]
24. Dellazizzo L, Percie du Sert O, Phraxayavong K, Potvin S, O'Connor K, Dumais A. Exploration of the dialogue components in Avatar Therapy for schizophrenia patients with refractory auditory hallucinations: A content analysis. Clin Psychol Psychother 2018 Nov;25(6):878-885. [doi: 10.1002/cpp.2322] [Medline: 30221431]
25. Dellazizzo L, Potvin S, Phraxayavong K, Lalonde P, Dumais A. Avatar therapy for persistent auditory verbal hallucinations in an ultra-resistant schizophrenia patient: a case report. Front Psychiatry 2018;9:131 [FREE Full text] [doi: 10.3389/fpsyt.2018.00131] [Medline: 29713292]
26. du Sert OP, Potvin S, Lipp O, Dellazizzo L, Laurelli M, Breton R, et al. Virtual reality therapy for refractory auditory verbal hallucinations in schizophrenia: a pilot clinical trial. Schizophr Res 2018 Feb 24 Epub ahead of print(forthcoming). [doi: 10.1016/j.schres.2018.02.031] [Medline: 29486956]
27. Freeman D, Haselton P, Freeman J, Spanlang B, Kishore S, Albery E, et al. Automated psychological therapy using immersive virtual reality for treatment of fear of heights: a single-blind, parallel-group, randomised controlled trial. Lancet Psychiatry 2018 Aug;5(8):625-632. [doi: 10.1016/S2215-0366(18)30226-8]
28. Ohio State University. 2015 Feb 25. Virtual patient: Avatar shows emotions as he talks to med students URL: https://www.sciencedaily.com/releases/2015/02/150225151639.htm [accessed 2019-04-22] [WebCite Cache ID 77pci9R3P]
29. Rein BA, McNeil DW, Hayes AR, Hawkins TA, Ng HM, Yura CA. Evaluation of an avatar-based training program to promote suicide prevention awareness in a college setting. J Am Coll Health 2018 Jul;66(5):401-411. [doi: 10.1080/07448481.2018.1432626] [Medline: 29461940]
30. Wada K, Shibata T. Living with seal robots—its sociopsychological and physiological influences on the elderly at a care house. IEEE Trans Robot 2007 Oct;23(5):972-980. [doi: 10.1109/TRO.2007.906261]
31. Yu R, Hui E, Lee J, Poon D, Ng A, Sit K, et al. Use of a therapeutic, socially assistive pet robot (PARO) in improving mood and stimulating social interaction and communication for people with dementia: study protocol for a randomized controlled trial. JMIR Res Protoc 2015 May 01;4(2):e45 [FREE Full text] [doi: 10.2196/resprot.4189] [Medline: 25934173]
32. Griffiths A. The Guardian. 2014 Jul 08. How Paro the robot seal is being used to help UK dementia patients URL: https://www.theguardian.com/society/2014/jul/08/paro-robot-seal-dementia-patients-nhs-japan [accessed 2019-04-22] [WebCite Cache ID 77pdxW9XI]
33. Bemelmans R, Gelderblom GJ, Jonker P, de Witte L. Socially assistive robots in elderly care: a systematic review into effects and effectiveness. J Am Med Dir Assoc 2012 Feb;13(2):114-120.e1. [doi: 10.1016/j.jamda.2010.10.002] [Medline: 21450215]
34. Grossard C, Palestra G, Xavier J, Chetouani M, Grynszpan O, Cohen D. ICT and autism care: state of the art. Curr Opin Psychiatry 2018 Nov;31(6):474-483. [doi: 10.1097/YCO.0000000000000455] [Medline: 30256263]
35. Scassellati B, Admoni H, Matarić M. Robots for use in autism research. Annu Rev Biomed Eng 2012;14:275-294. [doi: 10.1146/annurev-bioeng-071811-150036] [Medline: 22577778]
36. Huijnen CA, Lexis MA, Jansens R, de Witte LP. How to implement robots in interventions for children with autism? A co-creation study involving people with autism, parents and professionals. J Autism Dev Disord 2017 Oct;47(10):3079-3096 [FREE Full text] [doi: 10.1007/s10803-017-3235-9] [Medline: 28685411]
37. Mengoni SE, Irvine K, Thakur D, Barton G, Dautenhahn K, Guldberg K, et al. Feasibility study of a randomised controlled trial to investigate the effectiveness of using a humanoid robot to improve the social skills of children with autism spectrum disorder (Kaspar RCT): a study protocol. BMJ Open 2017 Dec 22;7(6):e017376 [FREE Full text] [doi: 10.1136/bmjopen-2017-017376] [Medline: 28645986]
38. Pennisi P, Tonacci A, Tartarisco G, Billeci L, Ruta L, Gangemi S, et al. Autism and social robotics: a systematic review. Autism Res 2016 Feb;9(2):165-183. [doi: 10.1002/aur.1527] [Medline: 26483270]
39. Rabbitt SM, Kazdin AE, Scassellati B. Integrating socially assistive robotics into mental healthcare interventions: applications and recommendations for expanded use. Clin Psychol Rev 2015 Feb;35:35-46. [doi: 10.1016/j.cpr.2014.07.001] [Medline: 25462112]

40. Sharkey N, van Wynsberghe A, Robbins S, Hancock E. Foundation for Responsible Robotics. 2017. Our Sexual Future with Robots URL: https://responsible-robotics-myxf6pn3xr.netdna-ssl.com/wp-content/uploads/2017/11/FRR-Consultation-Report-Our-Sexual-Future-with-robots-.pdf [accessed 2019-04-24] [WebCite Cache ID 77rnzVe17]
41. Torjesen I. Society must consider risks of sex robots, report warns. Br Med J 2017 Dec 05;358:j3267. [doi: 10.1136/bmj.j3267] [Medline: 28679604]
42. Vandemeulebroucke T, Dierckx de Casterlé B, Gastmans C. The use of care robots in aged care: a systematic review of argument-based ethics literature. Arch Gerontol Geriatr 2018 Jan;74:15-25. [doi: 10.1016/j.archger.2017.08.014] [Medline: 28926749]
43. Coeckelbergh M, Pop C, Simut R, Peca A, Pintea S, David D, et al. A survey of expectations about the role of robots in robot-assisted therapy for children with ASD: ethical acceptability, trust, sociability, appearance, and attachment. Sci Eng Ethics 2015 Apr 17;22(1):47-65. [doi: 10.1007/s11948-015-9649-x]
44. Riek L. Robotics technology in mental health care. In: Artificial Intelligence in Behavioral Health and Mental Health Care. Cambridge, Massachusetts: Academic Press; 2015:185-203.
45. Piette JD, Krein SL, Striplin D, Marinec N, Kerns RD, Farris KB, et al. Patient-centered pain care using artificial intelligence and mobile health tools: protocol for a randomized study funded by the US Department of Veterans Affairs Health Services Research and Development Program. JMIR Res Protoc 2016 Apr 07;5(2):e53 [FREE Full text] [doi: 10.2196/resprot.4995] [Medline: 27056770]
46. Suganuma S, Sakamoto D, Shimoyama H. An embodied conversational agent for unguided internet-based cognitive behavior therapy in preventative mental health: feasibility and acceptability pilot trial. JMIR Ment Health 2018 Jul 31;5(3):e10454 [FREE Full text] [doi: 10.2196/10454] [Medline: 30064969]
47. Provoost S, Lau HM, Ruwaard J, Riper H. Embodied conversational agents in clinical psychology: a scoping review. J Med Internet Res 2017 Dec 09;19(5):e151 [FREE Full text] [doi: 10.2196/jmir.6553] [Medline: 28487267]
48. Dockweiler C, Kupitz A, Hornberg C. Acceptance of online-based therapy by patients with light to moderate depressive disorders. Gesundheitswesen 2018 Nov;80(11):1013-1022. [doi: 10.1055/s-0043-119287] [Medline: 29126341]
49. Rojas G, Guajardo V, Martínez P, Castro A, Fritsch R, Moessner M, et al. A remote collaborative care program for patients with depression living in rural areas: open-label trial. J Med Internet Res 2018 Dec 30;20(4):e158 [FREE Full text] [doi: 10.2196/jmir.8803] [Medline: 29712627]
50. Diehl JJ, Schmitt LM, Villano M, Crowell CR. The clinical use of robots for individuals with autism spectrum disorders: a critical review. Res Autism Spectr Disord 2012 Jan;6(1):249-262 [FREE Full text] [doi: 10.1016/j.rasd.2011.05.006] [Medline: 22125579]
51. Broekens J, Heerink M, Rosendal H. Assistive social robots in elderly care: a review. Gerontechnology 2009 Apr;8(2):94-103. [doi: 10.4017/gt.2009.08.02.002.00]
52. Beauchamp T, Childress J. Principles of Biomedical Ethics. New York: Oxford University Press; 2012.
53. Stix C. World Economic Forum. 2018 Mar 05. 3 ways AI could help our mental health URL: https://www.weforum.org/agenda/2018/03/3-ways-ai-could-could-be-used-in-mental-health/ [accessed 2019-04-24] [WebCite Cache ID 77roplA75]
54. Pugh A. The New Yorker. 2018 May 22. Automated Health Care Offers Freedom from Shame, But Is It What Patients Need? URL: https://www.newyorker.com/tech/annals-of-technology/automated-health-care-offers-freedom-from-shame-but-is-it-what-patients-need [accessed 2019-04-22] [WebCite Cache ID 77pfV94W6]
55. Costescu CA, Vanderborght B, David DO. Reversal learning task in children with autism spectrum disorder: a robot-based approach. J Autism Dev Disord 2015 Nov;45(11):3715-3725. [doi: 10.1007/s10803-014-2319-z] [Medline: 25479815]
56. Warren Z, Zheng Z, Das S, Young EM, Swanson A, Weitlauf A, et al. Brief report: development of a robotic intervention platform for young children with ASD. J Autism Dev Disord 2015 Dec;45(12):3870-3876 [FREE Full text] [doi: 10.1007/s10803-014-2334-0] [Medline: 25503680]
57. Bickmore TW, Pfeifer LM, Jack BW. Taking the Time to Care: Empowering Low Health Literacy Hospital Patients with Virtual Nurse Agents. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. 2009 Presented at: SIGCHI Conference on Human Factors in Computing Systems; 2009; New York p. 1265-1274.
58. Balon R. Burden of sexual dysfunction. J Sex Marital Ther 2017 Jan 02;43(1):49-55. [doi: 10.1080/0092623X.2015.1113597] [Medline: 26683616]
59. Baio J, Wiggins L, Christensen DL, Maenner MJ, Daniels J, Warren Z, et al. Prevalence of autism spectrum disorder among children aged 8 years - autism and developmental disabilities monitoring network, 11 sites, United States, 2014. MMWR Surveill Summ 2018 Dec 27;67(6):1-23 [FREE Full text] [doi: 10.15585/mmwr.ss6706a1] [Medline: 29701730]
60. McCabe MP, Sharlip ID, Lewis R, Atalla E, Balon R, Fisher AD, et al. Incidence and prevalence of sexual dysfunction in women and men: a consensus statement from the Fourth International Consultation on Sexual Medicine 2015. J Sex Med 2016 Feb;13(2):144-152. [doi: 10.1016/j.jsxm.2015.12.034] [Medline: 26953829]
61. Messias EL, Chen CY, Eaton WW. Epidemiology of schizophrenia: review of findings and myths. Psychiatr Clin North Am 2007 Sep;30(3):323-338 [FREE Full text] [doi: 10.1016/j.psc.2007.04.007] [Medline: 17720026]
62. Brown AS, Lau FS. Review of the Epidemiology of Schizophrenia. In: Pletnikov MV, Waddington JL, editors. A Handbook of Behavioral Neuroscience. Netherlands: Elsevier; 2016:17-30.

63. Gionet K. The Guardian. 2018 Apr 25. Meet Tess: the mental health chatbot that thinks like a therapist URL: https://www.theguardian.com/society/2018/apr/25/meet-tess-the-mental-health-chatbot-that-thinks-like-a-therapist [accessed 2019-04-22] [WebCite Cache ID 77pgIMS3h]
64. Galvão Gomes da Silva J, Kavanagh DJ, Belpaeme T, Taylor L, Beeson K, Andrade J. Experiences of a motivational interview delivered by a robot: qualitative study. J Med Internet Res 2018 Dec 03;20(5):e116 [FREE Full text] [doi: 10.2196/jmir.7737] [Medline: 29724701]
65. Schröder J, Berger T, Meyer B, Lutz W, Hautzinger M, Späth C, et al. Attitudes towards internet interventions among psychotherapists and individuals with mild to moderate depression symptoms. Cogn Ther Res 2017 Apr 22;41(5):745-756. [doi: 10.1007/s10608-017-9850-0]
66. Deutscher Ethikrat. 2017 Nov 30. Big Data und Gesundheit – Datensouveränität als informationelle Freiheitsgestaltung URL: https://www.ethikrat.org/fileadmin/Publikationen/Stellungnahmen/deutsch/stellungnahme-big-data-und-gesundheit.pdf [accessed 2019-04-24] [WebCite Cache ID 77rpJezPa]
67. Nuffield Council on Bioethics. 2014 Jul 01. The collection, linking and use of data in biomedical research and health care: ethical issues URL: http://nuffieldbioethics.org/wp-content/uploads/Biodata-a-guide-to-the-report-PDF.pdf [accessed 2019-04-24] [WebCite Cache ID 77rpMHI9y]
68. Feil-Seifer D, Mataric M. Socially assistive robotics. IEEE Robot Automat Mag 2011 Mar;18(1):24-31. [doi: 10.1109/MRA.2010.940150]
69. Körtner T. Ethical challenges in the use of social service robots for elderly people. Z Gerontol Geriatr 2016 Jun;49(4):303-307. [doi: 10.1007/s00391-016-1066-5] [Medline: 27220734]
70. Floridi L, Cowls J, Beltrametti M, Chatila R, Chazerand P, Dignum V, et al. AI4People - an ethical framework for a good AI society: opportunities, risks, principles, and recommendations. Minds Mach (Dordr) 2018;28(4):689-707 [FREE Full text] [doi: 10.1007/s11023-018-9482-5] [Medline: 30930541]
71. Luxton DD. Recommendations for the ethical use and design of artificial intelligent care providers. Artif Intell Med 2014 Sep;62(1):1-10. [doi: 10.1016/j.artmed.2014.06.004] [Medline: 25059820]
72. Oliveira T, Novais P, Neves J. Development and implementation of clinical guidelines: an artificial intelligence perspective. Artif Intell Rev 2013 Mar 13;42(4):999-1027. [doi: 10.1007/s10462-013-9402-2]
73. Fulmer R. The Medical Futurist. 2018 May 24. 5 Reasons Why Artificial Intelligence Won't Replace Physicians URL: https://medicalfuturist.com/5-reasons-artificial-intelligence-wont-replace-physicians [accessed 2019-04-22] [WebCite Cache ID 77pgpQRMQ]
74. Wentzel J, van der Vaart R, Bohlmeijer ET, van Gemert-Pijnen JE. Mixing online and face-to-face therapy: how to benefit from blended care in mental health care. JMIR Ment Health 2016 Feb 09;3(1):e9 [FREE Full text] [doi: 10.2196/mental.4534] [Medline: 26860537]
75. Ienca M, Jotterand F, Vică C, Elger B. Social and assistive robotics in dementia care: ethical recommendations for research and practice. Int J of Soc Robotics 2016 Jun 22;8(4):565-573. [doi: 10.1007/s12369-016-0366-7]
76. Anderson S. Stanf Encycl Philos Arch. 2017. Coercion URL: https://plato.stanford.edu/entries/coercion/ [accessed 2019-04-24] [WebCite Cache ID 77rpcS2YC]
77. Sharkey A, Sharkey N. Children, the elderly, and interactive robots. IEEE Robot Automat Mag 2011 Mar;18(1):32-38. [doi: 10.1109/MRA.2010.940151]
78. Scholten MR, Kelders SM, Van Gemert-Pijnen JE. Self-guided web-based interventions: scoping review on user needs and the potential of embodied conversational agents to address them. J Med Internet Res 2017 Dec 16;19(11):e383 [FREE Full text] [doi: 10.2196/jmir.7351] [Medline: 29146567]
79. Heim E, Rötger A, Lorenz N, Maercker A. Working alliance with an avatar: how far can we go with internet interventions? Internet Interv 2018 Mar;11:41-46 [FREE Full text] [doi: 10.1016/j.invent.2018.01.005] [Medline: 30135758]
80. Johnston A. KALW Local Public Radio. 2015 Aug 17. Robotic seals comfort dementia patients but raise ethical concerns URL: https://www.kalw.org/post/robotic-seals-comfort-dementia-patients-raise-ethical-concerns [accessed 2019-04-22] [WebCite Cache ID 77phfBLmf]
81. Tett G. Financial Times. 2018 Feb 09. When algorithms reinforce inequality URL: https://www.ft.com/content/fb583548-0b93-11e8-839d-41ca06376bf2 [accessed 2019-04-22]
82. Corea F. Machine Ethics and Artificial Moral Agents. In: Applied Artificial Intelligence: Where AI Can Be Used In Business. Switzerland: Springer; 2019:33-41.
83. Hammond K. TechCrunch. 2016. 5 unexpected sources of bias in artificial intelligence URL: https://techcrunch.com/2016/12/10/5-unexpected-sources-of-bias-in-artificial-intelligence/?guccounter=1&guce_referrer_us=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_cs=oDTg6AcZIiq57jAEze2jlw [accessed 2019-04-22]
84. Powles J. The New Yorker. 2017 Dec 20. New York City's Bold, Flawed Attempt to Make Algorithms Accountable URL: https://www.newyorker.com/tech/annals-of-technology/new-york-citys-bold-flawed-attempt-to-make-algorithms-accountable [accessed 2019-04-22] [WebCite Cache ID 77pieWwCj]
85. Fiske A, Buyx A, Prainsack B. Health information counselors: a new profession for the age of big data. Acad Med 2019 Jan;94(1):37-41 [FREE Full text] [doi: 10.1097/ACM.0000000000002395] [Medline: 30095453]

86. Calfee I. Center for Mobile Communication Studies. 2017 Nov 16. Growing up with Alexa, Siri, and other A. I. technology URL: https://sites.bu.edu/cmcs/2017/11/16/growing-up-with-alexa-siri-and-other-a-i-technology/ [accessed 2019-04-22] [WebCite Cache ID 77piq3K2W]
87. Doucleff M, Aubrey A. National Public Radio. 2017 Oct 30. Alexa, Are You Safe For My Kids? URL: https://www.npr.org/sections/health-shots/2017/10/30/559863326/alexa-are-you-safe-for-my-kids [accessed 2019-04-22] [WebCite Cache ID 77pj2oDUT]
88. Facchin F, Barbara G, Cigoli V. Sex robots: the irreplaceable value of humanity. Br Med J 2017 Dec 15;358:j3790. [doi: 10.1136/bmj.j3790] [Medline: 28811272]
89. Scheutz M, Arnold T. Are we ready for sex robots? 2016 Presented at: 11th ACM/IEEE International Conference on Human-Robot Interaction; 2016; Christchurch, New Zealand p. 351-358.
90. Hall V, Conboy-Hill S, Taylor D. Using virtual reality to provide health care information to people with intellectual disabilities: acceptability, usability, and potential utility. J Med Internet Res 2011 Nov 14;13(4):e91 [FREE Full text] [doi: 10.2196/jmir.1917] [Medline: 22082765]
91. Misselhorn C, Pompe U, Stapleton M. Ethical considerations regarding the use of social robots in the fourth age. GeroPsych 2013 Jan;26(2):121-133. [doi: 10.1024/1662-9647/a000088]
92. Latour B, Woolgar S. Laboratory Life. Princeton: Princeton University Press; 1986.
93. Melson G, Kahn P, Beck A, Friedman B, Roberts T, Garrett E. Robots as dogs?: children's interactions with the robotic dog AIBO and a live australian shepherd. In: CHI '05 Extended Abstracts on Human Factors in Computing Systems. 2005 Apr Presented at: CHI EA '05; April 02-07, 2005; Portland, OR, USA p. 1649-1652. [doi: 10.1145/1056808.1056988]
94. Dodig Crnkovic G, Çürüklü B. Robots: ethical by design. Ethics Inf Technol 2011 Aug 24;14(1):61-71. [doi: 10.1007/s10676-011-9278-2]

Abbreviations

AI: artificial intelligence
ASD: autism spectrum disorder
RCT: randomized controlled trial

Edited by C Eichenberg; submitted 21.12.18; peer-reviewed by M Beutel, D Johnson; comments to author 03.02.19; revised version received 21.02.19; accepted 26.02.19; published 09.05.19

Please cite as:
Fiske A, Henningsen P, Buyx A
Your Robot Therapist Will See You Now: Ethical Implications of Embodied Artificial Intelligence in Psychiatry, Psychology, and Psychotherapy
J Med Internet Res 2019;21(5):e13216
URL: https://www.jmir.org/2019/5/e13216/
doi: 10.2196/13216
PMID: 31094356

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: Executive Director

TITLE: Master's Level Licensure

INTRODUCTION TO THE TOPIC:

Updates on master's level licensing.

BOARD ACTION REQUESTED:

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: Executive Director

TITLE: Executive Director's Report

INTRODUCTION TO THE TOPIC:

The Executive Director Report communicates, in advance, information that brings board members up to date on what has occurred since the last board meeting and is intended to lead to engagement and interaction at the next board meeting. The Executive Director Report seeks to offer reminders to board members on upcoming commitments, relevant dates and events, and to raise issues for board members to address during the board meeting. The Executive Director Report is also intended to give board members information that is useful in their role as board members and in stakeholder outreach.

BOARD ACTION REQUESTED:

ATTACHMENTS:

Description	Upload Date	Type
ED Report	12/18/2025	Cover Memo

MINNESOTA
BOARD OF PSYCHOLOGY

Minnesota Board of Psychology Executive Director Report
December 19, 2025

Introduction

The mission of the Board is to protect the public through licensure, regulation, and education to promote access to safe, competent, and ethical psychological services. The work of the Board is strategically aligned to accomplish this mission, including prioritization of Board action and the assignment of resources (both human and financial).

The work of the Board has focused on the following since the last Board meeting:

I. Administrative Updates

a. Assistant Executive Director Licensing Update

The Licensure Team has continued to support the Mission and Vision of the Board by processing Psychologist and Behavior Analyst license applications. Board staff have issued close to 900 Behavior Analyst licenses as of this week. New applications continue to be submitted where licensure fees have been satisfied. The timeline to licensure in the last review steps continues to be within a day or two. Board staff continue to contact BA applicants that have not had movement in their application for more than one year.

Board staff have issued licenses to a few more applicants whose applications have been open for more than one year. Over the last couple of months, the Board has issued licenses to applicants that have completed teach out programs after the Argosy closure as well.

II. Executive Director's Report

a. Website Updates: Board staff have updated the Board's website and .gov website to permit the public to file behavior analyst complaints.

b. Education: A presentation proposal has been submitted to MPA for the 2026 Annual Conference. The scope of the presentation will discuss how the Board reviews and approves supervision for licensure. If selected, the Executive Director will partner with three Board members for the presentation. The opportunity will afford the public an eye into the application review process from Board members' experiences.

c. PeakAgenda: The Board is moving away from NovusAgenda to a new application called PeakAgenda. Board staff will be training on PeakAgenda in January.

MINNESOTA
BOARD OF PSYCHOLOGY

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY:

TITLE: Officer Election

INTRODUCTION TO THE TOPIC:

Each Year the Board holds elections for its officers.

BOARD ACTION REQUESTED:

- MINNESOTA BOARD OF PSYCHOLOGY

DATE: 12/19/2025

SUBMITTED BY: State Program Administrator

TITLE: Board Administrative Terminations

INTRODUCTION TO THE TOPIC:

The Board shall terminate the license of a licensee whose license renewal is at least 60 days overdue and to whom notification has been sent as provided in the administrative rules. Failure of a licensee to receive notice is not grounds for later challenge of the termination.

Licensees are provided several opportunities to renew the license prior to Board termination. Licensees are sent a notice within 30 days after the renewal date when they have not renewed the license. This letter is sent via certified mail to the last known address of the licensee in the file of the board. This notifies the licensee that the license renewal is overdue and that failure to pay the current renewal fee and the current late fee ($250.00) within 60 days after the renewal date will result in termination of the license. A second notice is sent to the licensee at least seven days before a board meeting (which occurs 60 days or more after the renewal date). Minn. R. 7200.3510.

BOARD ACTION REQUESTED:

License	Name	Expiration Date
LP6977	Rachel Wasson	9/30/2025
LP6700	Maria Graf	9/30/2025
LP6444	Tishanna Hollins	9/30/2025
LP0216	Jay Wilimek	9/30/2025
LP3818	Heather Mundis	9/30/2025
LP0199	Marc Schiappacasse	9/30/2025
LP3800	Catherine Mjos	9/30/2025
LP3788	Janis Johnson	9/30/2025
LP0150	Thomas Hainlen	9/30/2025
LP0139	Larraine Pierce	9/30/2025
LP0072	Linda Hammer Burns	9/30/2025
LP3764	Betsy Bateman	9/30/2025
LP0104	Dennis Andersen	9/30/2025