Digital Mental Health and Addiction Interventions for Adolescents, Young Adults and Families
1) The Impact of Substance Use on the Developing Adolescents Brain

2) Who's Doing What? The Epidemiology of Adolescent Substance Use

3) Substance Use Interventions for Adolescents and Transitional Age Youth

4) Integrating Stigmatized Loss and Disenfranchised Grief into the SBIRT Model

amersa.org/resources/tay-webinar-series
5) Substance Use in Adolescents and Transitional Age Youth: Justice Involvement and Homelessness

6) Digital Mental Health and Addiction Interventions for Adolescents, Young Adults and Families

amersa.org/resources/tay-webinar-series
Webinar Presenter

Fred Muench, Ph.D.
President,
Partnership to End Addiction
Partnership to End Addiction

Partnership to End Addiction is a national nonprofit that exists to:

- Empower families
- Advance effective care
- Shape public policy
- Change culture

We help the helpers
Presentation Acknowledgements

- Patricia Aussem
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- Partnership Staff (lots of people!)

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*No conflicts of interest related to addiction services. I have several patents on using passive stimulation to create cardiovascular resonance.
Presentation Objectives

• Ingredients of successful digital interventions

• The landscape of digital SUD interventions in general and for adolescents, young adults (AYA), and families

• Research on digital technologies from prevention to recovery for AYA

• Existing and low hanging fruit opportunities for practitioners and researchers
Technology is a Tool

The simplest form of technology is the development and use of basic tools.

The prehistoric discovery of how to control fire and the later Neolithic Revolution increased the available sources of food, and the invention of the wheel helped humans to travel in and control their environment.

Developments in historic times, including the printing press, the telephone, and the Internet, have lessened physical barriers to communication and allowed humans to interact freely on a global scale.

Tools can create new tools

https://en.wikipedia.org/wiki/Technology
But we have to use it the right way

And be mindful of its power and downside
Technology mediums / modes offer enhanced opportunities to connect and intervene based on how people live.

Episodic and continuous
Synchronous and asynchronous
Automated and human
Passive and active
Captured and ephemeral

*Effortless and Salient*
# Technology Features & Applications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Applications</th>
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</thead>
<tbody>
<tr>
<td>Voice &amp; Text</td>
<td>• SMS, IVR, push alerts, emotional tone, natural language processing, vocal prosody, repeated brief assessment, psycho-edu, information, peer and specialist support, virtual agents, therapy, etc.</td>
</tr>
<tr>
<td>Camera &amp; Video</td>
<td>• Telepsych, modeling, environmental monitoring, visual analysis, biomonitoring</td>
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<tr>
<td>Gyroscope &amp; Activity Monitoring</td>
<td>• Activity monitoring, behavioral activation, sleep monitoring, arm movement</td>
</tr>
<tr>
<td>Geolocation</td>
<td>• Location, triggers, activity scheduling, etc.</td>
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<tr>
<td>Ambient Light, Sound, environmental Sensors</td>
<td>• Improved understanding of environment (eg bar versus home, dark versus light)</td>
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<tr>
<td>Proximity Sensors</td>
<td>• Other phones, social gathering, peer triggers</td>
</tr>
<tr>
<td>Add-ons &amp; Wearables</td>
<td>• Physiological monitoring, reaction and arousal, alcohol sensing, drug sensing, passive stimulation for guidance and intervention</td>
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</table>
Technology mediums / modes have evolved to offer new opportunities that build off one-another.

**TV**
- Reach/Dissemination/Scale
- Standardization

**CD ROM**
- Interactivity
- Personalization/Tailoring
- Adaptability

**Web**
- Data capture/Analytics
- Social interaction
- Stigma reduction
- Disclosure

**Mobile Phone**
- Salience/Triggers
- Effort
- Just-in-time adaptability

**Sensors**
- Precision
- Objectivity (relative)
What is tech good – and less good at doing?

<table>
<thead>
<tr>
<th>Good</th>
<th>Concerns</th>
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<tbody>
<tr>
<td>Reach</td>
<td>Dehumanization</td>
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<tr>
<td>Disclosure</td>
<td>Reliance</td>
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<tr>
<td>Salience</td>
<td>Information Overload</td>
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<tr>
<td>Analytics-Predict</td>
<td>Messy/unreliable data</td>
</tr>
<tr>
<td>Personalization</td>
<td>Privacy</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Security</td>
</tr>
<tr>
<td>Connectivity/Just-in-time</td>
<td>Maintenance</td>
</tr>
</tbody>
</table>
Acceptability & Comfort

- Youth use technology and like it
- Youth prefer digital health connections for stigmatizing topics
- There is no digital divide by race, ethnicity or SES in youth
- The greatest digital divide is in older adults and lack applications in different languages
Reach / Connection

Cognitive Salience
Emotional Salience
Behavioral Salience
Environmental Salience
Social Salience
Object Salience
Disclosure

- Youth and adults disclose significantly more to digital platforms than in person.
- Digital mental health communication vs. in-person preferences moderated by condition (anxiety) and type of disclosure (stigmatizing).
- Youth prefer to talk about sensitive topics over text but in-person for less stigmatizing topics.
Passive & Active Data in the Real World

- accelerometer
- geofence
- call log
- screen
- status
- BART
- survey
Mixed Just-in-Time Adaptive Models

Self-Regulation Theory

Nahum-Shani, Hekler, Spruijt-Metz, 2015
If you usually start drinking before the message gets to you, you have worse relative outcomes.

Ongoing Connection

Engage

Sustain

Micro interventions foster salience and timely support
Adolescent Developmental Needs

- Peer connection
- Independence
- Exploration
- Resilience/Confidence
- Identity formation
- Security
Predictors of Adolescent Substance Use

- Availability
- Access
- Environment
- Culture
- Peers
- Parents and Family
- Alternate Activities
- Mental Health / Resilience
- Attitudes and beliefs
- Personality
- Temperament/Genetics

Expectancies and Motivations for Use

- Social
- Situational/Conformity
- Experimentation
- Enhancement
- Coping
Technology Aligns with Developmental Reinforcers

- Social connections
- Entertainment
- Information-seeking
- Passing time
- Reinforcement
- Affective learning
- Mastery & Self-efficacy

AYA Review References

*Sanci L. (2020). The Integration of Innovative Technologies to Support Improving Adolescent and Young Adult Health. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*, 67(2S), S1–S2


Broad Statements

- The largest literature on digital interventions for AYA is for nicotine and alcohol.
- The largest literature is for college age AYA.
- There is a heavy emphasis on prevention/early intervention in the computer/web literature while SMS, online social support, and mobile apps trend more severe.
- After the brief digital feedback literature, text messaging and general social support are the most studied mediums of mobile intervention.
- We need more research on digital interventions for more severe AYA SUD populations and for different substances.
- We need more research on caregiver and family based digital interventions.
Qualitative Research Findings with AYA

- Majority of AYA don’t feel consequences of use until interferes with developmental milestones
- AYA get turned off by fear based messaging - works for younger adolescents
- Believable and credible
  - Independence and resilience (Truth, ATI)
- Reflect their values and views about their own health and well-being
- Connection and peer support
Serious games, defined as games with a primary purpose other than pure entertainment to educate, communicate, and improve health.*

Both active and passive mechanisms

Reviews suggested that serious games have small positive effects on health-related behaviors and their determinants but that the effect is largely fleeting.
Stealth Skill Building

Night of the Gummies
Flavor Monsters
DXM Labworks
Tunnel Tail

*Use metaphors that build on key prevention concepts to reduce peer pressure
Digital Normative Feedback and Brief Personalized Feedback (Primary & Secondary)

Normative Feedback, Personalized Feedback, Costs/Consequences, Reduction Strategies

• Increase problem awareness
• Primarily with college students
• Results are mixed and depend on numerous factors
• Reviews of social norms feedback reveal little effect
• Overall, personalized may be better than normative and normative should be tailored to the experiences.
• Targeted (e.g. specific event) may be better
• In-lab appears better than remote
• Overall positive effects fleeting
Social Connection Interventions (Secondary & Tertiary)

- Multiple mediums with emphasis on social media sites, SMS and app-based group connection.
- Peers and interactive social elements.
- Overall efficacy of interventions that use various social connection interventions promising, but varies among target and program.
- Peer Recovery Support and helplines.
- Real world, real world, real world!
- It is easy – anyone can do it.

(Wong et al., 2020; Gilmour et al. 2020)
Skills Training & Role Play (Web & Apps)

- CBT
- Skills training
- Role Play
- Contingency Management
- *Mostly +21

(CBT4CBT, Carroll et al; Check-up and choices, Hester et al; TES/PEAR, Marsch et al.; Dynamicare, Gastfriend et al. and many more! but few <25.)
Sustained Engagement is a Problem

App 30-day retention by primary incorporated technique.

AYA Text Messaging

- Best outcomes for binge drinking
- Mixed outcomes other but overall positive
- Focus on commitment and goals
- Proactive = high engagement
- Just-in-time features highlighted

*Refer to Brian Suffoletto’s work!


TRAC II Study

- April to June, 2016
- 1 urban ED
- Screened n=143 YAs 18-25 years
  - AUDIT-C score >3 for women or >4 for men
- Enrolled n=50 in 2-week SMS Run-In
  - SMS Assessments only
- Responded to at least 50% SMS queries & opted-in (n=38)
  - 4-weeks (n=9)
  - 8-weeks (n=10)
  - 12-weeks (n=10)
  - >12-weeks (n=9)

![Graph showing mean drinks in average week, any HDE (%), and mean # negative consequences for baseline and 3-months.]

**Thursday**

- Weekend Drinking Plan
  - 48% yes, no
- Adaptive Drinking Limit Goal*
  - 95% yes, no
- Goal Support Message

**Friday & Saturday***

- Drinking Plan Today
  - 42% Score 1 to 3
  - 58% Score 4 to 5
- Goal Self-Efficacy Score
- Low Self Efficacy Boost Message
- High Self Efficacy Reinforcing Message

**Sunday**

- Weekend Max Drinks (X)
  - X> goal
    - Goal Not Met Message 5%
    - Goal Met Message 35%
    - Hazardous Drinking Message 6%
    - Non-hazardous Drinking Message 34%
  - X≤ goal
    - Abstinence Message 20%

*If Weekend Drinking Limit Goal Made

*If Weekend Drinking Limit Goal Not Made or No Weekend Drinking Plan
Conversational Agents / AI

• Artificial intelligence (AI) conversational agents have the ability to offer contextual and always-available support.
  • Include text based conversational agents (chatbots) and virtual avatars (animation/VR).

• Studies have shown feasibility and overall positive for mental health improvements in mental health in adolescents and adults.

• Addiction studies primarily smoking with good feasibility but limited overall literature base.

*Adolescents like conversational agents – they add distance and can be a great initial strategy for engagement to triage care and 24-7 care.

One note...

I did not talk about video-chat because it is just general therapy now
For Profit Digital Behavioral Health Companies Targeting or Allowing for Interaction with Teens and Families

MENTAL HEALTH TECH LANDSCAPE

CCBT
- Headspace
- joyable
- Big Health
- Calm
- PEAR
- pacifica
- Happify
- INSCAPE

10% HAPPIER
33% OF COMPANIES ANALYZED / $5.8M AVG FUNDING AMOUNT

TELEPSYCHIATRY
- Talkspace
- BlueCall
- Competence
- Selfapy
- iES
- Kip
- AbleTo
- lyra
- Ginger.io
- Workit Health
- Breakthrough
- 1DOC WAY
- wecounsel

16% OF COMPANIES ANALYZED / $6.7M AVG FUNDING AMOUNT

PROVIDER TOOLS
- Quartet
- inflexion
- CMHC Systems
- vālant
- core
- Silvercloud
- mindstrong
- agile health
- MINDCARE
- Valera Health

15% OF COMPANIES ANALYZED / $5.7M AVG FUNDING AMOUNT

CONSUMER TOOLS
- WEConnect
- webpsychology
- inquisith.jpeg
- huddle
- connected health
- THRIVE GLOBAL
- findcircles
- Remente

13% OF COMPANIES ANALYZED / $1.8M AVG FUNDING AMOUNT

HARDWARE
- ybrain
- neuroflow
- neurowear
- psious
- findme
- sana
- Limbix
- Kognito
- Woebot
- spring
- toko
- meQuilibrium
- xshine
- neurotrack

12% OF COMPANIES ANALYZED / $1.1M AVG FUNDING AMOUNT

APPLIED AI
- BioBeats
- Amazon AI
- bark
- Pyomics

11% OF COMPANIES ANALYZED / $3.8M AVG FUNDING AMOUNT
Note: Includes companies intended to treat people with a diagnosed SUD as well companies assisting people who want to minimize their use of substances but do not have a diagnosis; Excludes medication adherence, mental health, and pain management companies whose primary focus is not addiction.
Self-Guided Apps
Traditional Treatment Centers are Embracing Digital (Hazeldon, Caron, Wellbridge, etc)
Non-Profits, States and Mutual Support Groups Are Embracing and Leveraging Technology

Text JOIN to 55753

All Recovery Meetings

GO ASK ALICE!

Drugs, Alcohol, Gambling

Hope/Help

1-877-8-HOPENY
1-877-846-7369

There is hope and help.

Office of Alcoholism and Substance Abuse Services

Assistance Services for Prevention, Addiction Recovery

Call or Text

1.800.889.9789

Call or Text

TN Redline
Family and Caregiver Treatments

AYA

- parents
- mentors
- grandparents
- aunts
- foster parents
- mom
- uncles
- siblings
- stepparents
- dad
Barriers to Family Engagement

A review of the barriers to family and concerned significant other focused care highlights the opportunity for digital therapies:

• Trouble with travel, coordinating schedules, insufficient time, lack of resources, location barriers etc.

• Stigma, family blaming, unengaged family members, prior experiences, etc.

• Organizational expertise, scheduling, billing that does not reward family engagement, etc.

• Alanon philosophy, ignoring relevance of concerned other.

• Ignoring treating the family as the unit of intervention.
Parent and Family Training

• Limited empirical literature for addiction prevention and SUD digital interventions for parents and families.

• Large literature on online digital parent training for childhood disruptive disorders.
  • Overall effective for both self-care and child symptoms

• Telehealth / video chat literature more prevalent for parent and family mental health care.

• Provider and peer phone based interventions effective

• Emerging literature on text messaging to increase parental self-efficacy and care in mental health.

• Large window of opportunity!
Family / Caregiver Digital Intervention References

• Jansen R, Reid M. Communication Technology Use by Caregivers of Adolescents With Mental Health Issues: Systematic Review. JMIR Mhealth Uhealth. 2020 Aug 19;8(8):e13179.
Consumer Programs (Prevention & Intervention)

SMART Recovery Family & Friends
Help For You and Your Loved Ones

Are you looking for resources to help you support someone with addiction? Is someone else's addiction negatively affecting your life? We provide effective strategies for both you and your loved one. Our methods are based on the SMART Recovery model and CRAFT Therapy (Community Reinforcement & Family Training) to support family caregivers.
Partnership Consumer Programs

Helpline
Bilingual specialists provide support, guidance and resources
Personalized plan for your family

Drugfree.org
Science-based information and resources to help you and your family
Guides, e-books, videos and more

Help & Hope by Text
Personalized and supportive messages sent straight to your mobile device

E-Learning
Self-paced course addressing teen substance use
10 lessons strengthen parenting skills and offer tools and strategies

Peer Parent Coaching
Work one-on-one with a peer parent coach who has "been there" and can relate to your family's experience with substance use

Online Support Community
Live online gatherings hosted by Peer Parent Coaches
Opportunity to find support and connection

*Note: Does not include our provider training technical assistance programming for families
The Support Journey

Multi-channel Engagement
- Preferred Mode of Communication (Phone, video-chat, SMS, Chat, Facebook, WhatsApp)

Assess
- Passive & Active Assessment

Curate (Feedback)
- Personalize to each person’s unique needs with immediate and ongoing feedback

Synchronous & Asynchronous
Automated & Human Support

Adapt
- Adapt through ongoing assessment that changes the program with the changing needs

Localize
- Embedded referrals to in-person services
Omni-Channel Communication
Partnership Helpline Example
Families supported data include all families who reached out to the helpline in 2020. They are split up by mode of service: Facebook, Text, Phone Call, Email, and Phone Call & Digital. These categories are the methods through which families can access the helpline. Families who enter the helpline through a digital mode of service (i.e., Facebook, Email, or Text) and schedule at least one phone call with the helpline are included in the Phone Call & Digital category. This category is only effective beginning in May 2020.
2020 Helpline Stats (Sample Only)

Client Language
- Spanish: 22%
- English: 78%

Client Gender - Calls Only
- Male: 27%
- Female: 72%
- Other/Prefer not to answer: 1%

Loved One Gender
- Male: 69%
- Female: 30%
- Other Gender: 1%

Sample Size
- Client Language: 9,501
- Client Gender: 2,016
- Loved One Gender: 3,387
2020 Helpline Stats (Sample Only)

**Loved One Age**
- 18-30: 50%
- 31-40: 15%
- 41 or older: 7%
- 12 or younger: 1%
- 13-17: 27%

**Client's Relationship to Loved One**
- Parent: 69%
- Other relationship: 10%
- Other family member: 4%
- Grandparent: 2%
- Partner: 7%
- Friend: 5%
- Sibling: 2%

**Loved One's Need State**
- Struggling: 75%
- Early Use: 19%
- Prevention: 2%
- Recovery: 3%
- Treatment: 1%
2020 Helpline Stats (Sample Only)

Primary Substance of Concern
- Prescription painkillers: 8%
- Prescription stimulants: 1%
- Alcohol: 11%
- Benzodiazepines: 3%
- Cocaine or crack: 6%
- Heroin: 12%
- Inhalants: 0%
- Multiple substances: 3%
- Methamphetamine: 10%
- Other: 5%
- Not sure: 5%
- Nicotine: 3%

Sample Size: 3,550

Client Race/Ethnicity
- White/European Descent: 60%
- Hispanic/Latina Descent: 28%
- Black/African Descent: 11%
- Asian Descent: 4%
- Middle Eastern Descent: 1%

Sample Size: 1,282
Help & Hope Mobile Intervention

• Personalized feedback and mobile messaging from prevention to recovery (some in beta)

Text "JOIN" to 55753 to start receiving messages
The helpline received over 100,000 digital messages in 2020.

27% of clients receiving automated messages texted "chat" to connect with a specialist.

The helpline replied to clients' initial contact in under 1 hour on average in 2020.

39% of families reported re-engaging with the Partnership after contacting the helpline in 2020.
Suggestions for Integration into Practice

• **Review** the literature

• Then, **question** the literature

• Then, try it yourself and **don’t cheat**

• Then, try it with the **target population**

• Then try it with your population when **nobody cares** about it happening (e.g. no monitoring or incentives).
Other References Cited


Thank you
fmuench@toendaddiction.org

Produced in Partnership:

attcnetwork.org/centers/global-atcc/tay-webinar-series
Related Products & Resources from the ATTC Network

- [CLAS Standards in Behavioral Health: Working with Youth and Adolescents](https://attcnetwork.org/centers/global-attc/tay-webinar-series) (Recorded webinar)
- Adolescent Brain Maturation and Health: Intersections on the Developmental Highway
  - [Recorded presentation](https://attcnetwork.org/centers/global-attc/tay-webinar-series)
  - [Handouts](https://attcnetwork.org/centers/global-attc/tay-webinar-series)
- [Effects on Marijuana Use on Developing Adolescents](https://attcnetwork.org/centers/global-attc/tay-webinar-series) (Recorded webinar)
- [Vaping Overview and CATCH My Breath Program](https://attcnetwork.org/centers/global-attc/tay-webinar-series) (Recorded webinar)
- [Vaping 2: Education vs Punishment Using Deferred Citation](https://attcnetwork.org/centers/global-attc/tay-webinar-series) (Recorded webinar)
- [Understanding Suicide Part 2 Adolescents and the Changing Brain](https://attcnetwork.org/centers/global-attc/tay-webinar-series) (Recorded webinar)
Related Products & Resources from the PTTC Network

- Underage Alcohol Use: An Overview of Data and Strategies (Recorded webinar)
- Youth Opioid Addiction: What Preventionists Need to Know (Recorded webinar)
- Selecting and Implementing Evidence-Based Practices to Address Substance Misuse Among Young Adults: Webinar on SAMHSA’s Resource Guide
- Preventing Youth Vaping (Webinar Series) Part 1 of 2: The Extent and Risk Factors for Youth Vaping (Recorded webinar)
- Preventing Youth Vaping Part 2 of 2: Policy Recommendations and Promising Practices for Addressing Youth Vaping (Recorded webinar)
- The Benefits of Engaging Youth in Communities: Insights and Evidence from Developmental Science (Recorded webinar)
- Vaping and LGBTQ Youth (Recorded webinar)
- Informing Prevention 6-Part Webinar Series on Adolescents: Mountain Plains PTTC

- Adolescent SBIRT Pocket Card
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