INVESTIGATOR STUDY PLAN - REQUIRED

1. TITLE
Piloting *Signs of Safety*: A Deaf-accessible Therapy Toolkit for AUD and Trauma

2. EXTERNAL IRB REVIEW HISTORY*
N/A

3. PRIOR APPROVALS:
The current study is funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA).

4. OBJECTIVES*
The U.S. Deaf community – 500,000+ Americans who communicate using American Sign Language (ASL) – experiences nearly triple the rate of lifetime problem drinking compared to the general population and twice the rate of trauma exposure. Although there are validated treatments for comorbid alcohol use disorder (AUD) and posttraumatic stress disorder (PTSD) in hearing populations, there are no evidence-based treatments to treat any behavioral health condition with Deaf clients. Current treatments fail to meet Deaf clients' unique linguistic and cultural needs. Deaf people's median English reading level falls at the fourth grade, and many have low health literacy due to reduced incidental learning (e.g., inability to communicate with hearing parents, overhear family conversations, or understand spoken health information on TV/radio/public service announcements). Written treatment materials, therefore, require plain text revisions, ASL translations, or ASL narrative storytelling. Equally important are materials that incorporate Deaf values and social norms, increasing clinicians' cultural competence and enhancing client engagement.

To address these barriers, the PI conducted a KL2 pilot study to develop a prototype of *Signs of Safety:* a Deaf-accessible toolkit to be used alongside a widely-disseminated protocol for addiction/PTSD – *Seeking Safety*. *Seeking Safety* has demonstrated efficacy for reduction of AUD and PTSD symptoms in hearing populations. Among available evidence-based protocols, *Seeking Safety* is the optimal choice to adapt for Deaf clients – its focus on simple coping skills that simultaneously target AUD and PTSD (or either alone) is an ideal match for Deaf people's language and learning deficits, which prohibit use of verbal problem-solving and cognitive processing strategies that other psychotherapies require. Yet, *Seeking Safety*'s client materials rely on written English and are not well understood by Deaf clients. As such, the *Signs of Safety* toolkit includes a therapist guide and population-specific client materials (e.g., visual handouts; ASL teaching stories on digital video). It is designed for Deaf/signing clinicians, as well as non-signing clinicians working with ASL interpreters.

Data from the PI's KL2 *Signs of Safety* single-arm pilot study (n = 13) show significant reductions in alcohol use frequency and PTSD severity from baseline to immediate post-treatment follow-up. Participants also reported high levels of satisfaction with the model, and provided detailed feedback about how to further improve *Signs of Safety* for a professional-quality, second iteration (See Section 5. d. for more detailed results). The proposed study builds upon the PI's KL2 work by generating a final, professional iteration of *Signs of Safety* to be used in future efficacy work. Based on KL2 pilot results, we will create a second iteration of the *Signs of Safety* toolkit, including re-filming ASL teaching stories, re-designing visual handouts, and

revising the therapist companion guide. We will then develop a training program for *Signs of Safety* and certify four study clinicians.

We propose to conduct a **two-arm pilot RCT of *Signs of Safety*.** We aim to enroll 60 Deaf adults with past-month PTSD and past-month alcohol consumption to participate in 12 weekly individual treatment sessions. The pilot RCT will compare the 12-session protocol of *Seeking Safety* + *Signs of Safety* toolkit with an assessment-only waitlist control. Across conditions, assessment will occur at baseline, week 4, week 8, immediate post-treatment/week 12, and one-month follow-up/week 16. We will analyze key aspects of feasibility for both study arms (e.g., recruitment, retention, assessment process). Primary clinical outcomes at immediate post-treatment and one-month follow-up are past 30-day alcohol use frequency/quantity and past 30-day PTSD severity. Exploratory analyses will be conducted to examine potential moderators and mediators of change (e.g., motivation for treatment, provider cultural competency, coping skills, self-compassion, understanding of health information) leading to positive outcome. Results from this study will produce feasibility and preliminary efficacy data to support for a full-scale RCT to evaluate *Signs of Safety,* and a community-engaged model for conducting RCTs with Deaf participants**.**

5. BACKGROUND*

a. Deaf people experience triple the rate of lifetime problem drinking and double the rate of trauma exposure compared to the general population. The U.S. Deaf community – a group of 500,000+ Americans who communicate using American Sign Language (ASL) – reports nearly three times the rate of lifetime problem drinking compared to the general population (33.0% vs. 12.3%). An estimated 15% of Deaf Americans meet criteria for current alcohol use disorder (AUD). High rates of comorbid trauma complicate the treatment course for this unique clinical population, with Deaf people twice as likely to experience lifetime and past-year trauma exposure compared to individuals in the general population. While 25% of hearing women report lifetime prevalence of domestic violence, this figure surpasses 50% among Deaf women. This disparity has also been documented for rates of sexual assault, sexual harassment, and child abuse.

Risk for AUD is heightened among trauma survivors compared to individuals without history of trauma – 6.5 times more likely among hearing men with PTSD and 4.5 times more likely among hearing women with PTSD than those without PTSD. Among Deaf people in AUD treatment, 74% report lifetime and 44% report past-year physical, emotional, or sexual abuse, as compared to 60% and 34% of hearing peers in treatment, respectively. Comorbid AUD/PTSD complicates treatment and affects multiple domains of functioning. Hearing individuals with this comorbidity have greater physical and social impairment, higher rates of mood, anxiety, and personality disorders, and increased trauma-related craving (i.e., craving substances in response to PTSD symptoms) compared to those with AUD alone. Deaf people show even greater impairment than hearing peers, with poorer outcomes in socialization, employment, and physical health. Although AUD treatment in the general population doesn't typically focus on PTSD, given that most Deaf clients who enter behavioral health treatment have trauma histories and 74% of Deaf people in AUD treatment have experienced abuse, it is logical to integrate trauma treatment into interventions designed for this population.

b. Although there are validated treatments for comorbid AUD/PTSD in hearing populations, there are *no* evidence-based treatments for any behavioral health condition for use with Deaf people. Currently available treatments fail to meet the unique linguistic and cultural needs of Deaf clients. Deaf people's median reading level falls at the fourth grade, and many present with low health literacy due to reduced incidental learning throughout the lifespan (e.g., inability to communicate with hearing parents, understand spoken health information on TV/radio/PSAs). Written English treatment materials, therefore, require plain text revisions or ASL translations. Additionally, treatments commonly used for PTSD (e.g., Cognitive Processing Therapy, Prolonged Exposure, EMDR) rely on the client's ability to formulate a trauma narrative – either for restructuring maladaptive cognitions or exposing oneself to triggering content. Due to lack of early language exposure and poor educational experiences, many Deaf adults enter treatment unable to formulate a narrative or report a coherent timeline of events. This prohibits use of verbal problem-solving and cognitive processing strategies that these evidence-based therapies require.

Equally important are treatment materials that increase clinician cultural competence and enhance client engagement by being inclusive of Deaf values and social norms, acknowledging Deaf people's history of oppression, and embracing Deaf people's identity as a cultural – not disability – group. Whereas clinicians often adopt a medical view of "hearing impairment," most Deaf clients do not view themselves as "impaired," but as members of a rich community with shared experience, history, and culture.

c. To address these access barriers, during her KL2, the PI assembled a multidisciplinary Deaf and hearing research team to create "*Signs of Safety,"* a culturally and linguistically Deaf-accessible toolkit to be used alongside an existing, present-focused, first-stage manualized treatment for trauma and addiction – *Seeking Safety*. Although there is preliminary-to-promising evidence for a number of other manualized treatments for comorbid AUD/PTSD – Prolonged Exposure (PE), modified Prolonged Exposure (mPE), Eye Movement Desensitization and Reprocessing (EMDR), Cognitive Processing Therapy (CPT), integrated Cognitive Behavioral Therapy (ICBT), Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure (COPE) – these treatments rely on the client's ability to formulate a trauma narrative, either for restructuring maladaptive cognitions or exposing oneself to triggering content. Due to lack of early language exposure, poor educational experiences, and resulting long-term language dysfluency, most Deaf adults enter treatment unable to construct a narrative or a coherent timeline of events. Verbal problem-solving and cognitive processing strategies required by most evidence-based AUD/PTSD therapies are, therefore, contraindicated in the treatment of Deaf clients.

Given this contraindication, our team selected *Seeking Safety* as the base intervention due to its present-focus (i.e., no need to retell the trauma narrative) and reliance on simple coping skills that simultaneously target AUD and PTSD. Session content engages clients in themes relevant to addiction and PTSD, and to help them learn a specific skill to target symptoms of both disorders (e.g., "Coping with Triggers," "Asking for Help"). It has been used successfully with diverse populations, translated into 12 foreign languages, and aligns with many recommended practices

for Deaf-friendly treatment (i.e., skill-building and psychoeducation, structured sessions, case management, present focus, strength-based work).

Recent studies of *Seeking Safety* with comorbid AUD/PTSD outcomes are as follows:

(1) Najavits et al. (2018) conducted an RCT with 52 male and female veterans comparing 17 sessions of *Seeking Safety* with *Creating Change.* There were no significant differences between conditions. Both led to reductions in alcohol use and PTSD symptoms from baseline to end-of-treatment. PTSD gains were sustained and reductions in alcohol use continued to improve through three-month follow-up.

(2) A 2016 pilot study evaluating *Seeking Safety* among 24 outpatient military members reported significant reduction in alcohol and drug use as measured by the *Brief Addiction Monitor*, with both alcohol and drug abstinence among all participants at end of treatment.

(3) Hien et al. (2015) conducted an RCT comparing 12-session *Seeking Safety* plus sertraline versus *Seeking Safety* plus placebo among 69 men and women with AUD/PTSD. Both conditions evidenced clinically significant improvement in AUD and PTSD at end of treatment and at 12-month follow-up.

(4) Kaiser et al. (2015) evaluated 12-session *Seeking Safety* in a sample of 53 German female outpatients with current substance use disorder and PTSD. Among minimum completers (i.e., 6+ sessions attended, PTSD symptoms improved significantly by end-of-treatment, with gains sustained through three-month follow-up. Alcohol use improved significantly only at follow-up.

(5) Myers at al. (2015) conducted an RCT comparing 25 sessions of *Seeking Safety* with Facilitated Twelve-Step among female survivors of intimate partner violence. There were no differences in PTSD or AUD outcomes between conditions at post-treatment; however, given the small sample size entered into the analyses (*Seeking Safety* $n = 14$; 12-Step $n = 4$), the study may have been underpowered.

(6) Zlotnick et al. (2009) conducted a pilot RCT comparing *Seeking Safety* plus TAU to TAU-only among 49 incarcerated women with substance use disorder and PTSD. Neither condition was superior; both showed improvements in PTSD and substance use from intake to 3- and 6-month follow-up. Only women in TAU showed a significant decrease in alcohol use from intake to 3-month follow-up.

(7) Hien et al. (2009) compared 12 sessions of *Seeking Safety* versus *Women's Health Education* among 353 women with substance use disorder and PTSD as part of NIDA's Clinical Trials Network (CTN). Results indicated large, clinically significant reductions in PTSD, but no differences between conditions. No improvement in substance use was found for either condition, likely due to a 46% abstinence rate at baseline and resulting floor effects. Specific to alcohol outcomes, a secondary analysis by Hien et al. (2010) reported that participants with baseline alcohol misuse enrolled in *Seeking Safety* showed

significantly greater reductions in PTSD at follow-up compared to those enrolled in health education.

Despite mixed results among general population samples, the PI's secondary analysis of NIDA CTN data found that, among women with physical disabilities, those treated with *Seeking Safety* experienced sustained reductions in PTSD symptoms while women in *Women's Health Education* experienced full PTSD recurrence by 12-month follow-up. Changes in AUD over time could not be investigated, as the majority of the sample reported no baseline alcohol use. Despite this limitation, our analysis provided preliminary support that *Seeking Safety* might be an engaging and effective approach for individuals with disabilities, including Deaf individuals.

d. Results from the PI's KL2 single-arm pilot study show reductions in alcohol use frequency and PTSD severity from baseline to immediate post-treatment. Participants in the *Signs of Safety* single-arm pilot study (n = 13) reported high levels of satisfaction, supported by a 23% attrition rate (3/13), lower than the average rate of 27% observed in addiction longitudinal studies. Reported reasons for attrition were lack of interest, readiness, or motivation to engage in the study protocol. Our attrition rate is especially noteworthy given that participants retained in treatment completed the full 25-session treatment protocol and end-of-treatment assessment. 8 participants (61.5%) became abstinent or evidenced clinically meaningful reduction in percent days of alcohol use by the end of treatment. Participants also exhibited a 10-point mean reduction on the *PTSD Checklist for DSM-5* (*PCL-5),* a clinically meaningful improvement on this measure.

Pilot participants also provided vital feedback about how to produce an improved version of *Signs of Safety.* Suggestions included, but are not limited to: revised ASL translations of certain recovery concepts; specific plot changes in the ASL Teaching Stories to better reflect the process of recovery from AUD and PTSD; changing gender of the therapist character; and inclusion of greater diversity with respect to age and sexual orientation of ASL Teaching Story characters. Our proposed aims will, therefore, build upon the PI's KL2 work by generating a final, professional iteration of *Signs of Safety,* training study clinicians, and moving this behavioral therapies research program to a two-arm feasibility and pilot testing.

6. INCLUSION AND EXCLUSION CRITERIA*

We aim to enroll 60 Deaf adults from New England using rolling recruitment across two years. Based on the KL2 pilot results, we predict that 45 of 60 participants (conservative retention rate of 75%) will complete end-of-treatment assessment.

Inclusion criteria:

- Self-identification as a Deaf ASL user
- Age 18 or older
- Past-month alcohol consumption, as measured by the *Alcohol Use Disorder Identification Test*
- Subthreshold or full PTSD on the *PTSD Checklist for DSM-5* (past-month referent time period; "subthreshold" = endorsement of at least two B-E criteria at a severity of "moderate" or higher)

- Ability to attend weekly study sessions at one of four study locations (Eastern, Central, or Western MA)
- Ability to access a videophone (the standard telecommunication device for the Deaf community)

Exclusion criteria:

- Participation in concurrent therapies (*Note: Participants in both study conditions will be asked to refrain from concurrent formal psychotherapy; however, aligning with the Seeking Safety model, AA/NA/DRA attendance will be encouraged and attendance will be tracked as a potential outcome mediator*).
- Members of the following special populations: Adults unable to consent; Individuals younger than 18; Prisoners; Pregnant women (*Note: We will not knowingly include pregnant women as participants; however, we will not assess participants' pregnancy status.)*

Exclusion criteria are intentionally minimal to recruit a diverse sample. Other behavioral health comorbidities (e.g., mood/anxiety disorders, substance use disorders other than AUD) will not be excluded, given high rates of comorbidity.

7. STUDY-WIDE NUMBER OF SUBJECTS*
N/A

8. STUDY-WIDE RECRUITMENT METHODS*
N/A

9. STUDY TIMELINES*
The total duration of the study will be 3 years (Table 1). Primary analyses will be completed by end of year 3. We anticipate that it will take 2 years of rolling recruitment to enroll all study participants (Table 2). Participation in the study will last at most 6 months.

Table 1: Study Timeline	**YEAR:**	**1**				**2**				**3**			
	QUARTER:	1	2	3	4	1	2	3	4	1	2	3	4
Create final, professional iteration of *Signs of Safety* toolkit		■	■										
Develop clinician training and supervision program		■											
Train and certify study clinicians (+back-up clinician)			■										
Pilot RCT preparation, IRB approval, registration on ClinicalTrials.gov		■	■										
Pilot RCT: Rolling recruitment, enrollment, and randomization (n=60)				■	■	■	■	■	■	■	■	■	
Ongoing fidelity rating, data entry, and analyses for safety monitoring				■	■	■	■	■	■	■	■	■	
Final data analyses, report/paper writing, and R01 preparation													■

Table 2: Study Recruitment Flow Chart ("E" = # of participants actively enrolled in study protocol; "✓" = # of participants completed study protocol)											
YEAR 1											
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Study start-up							*Rolling recruitment and study period (recruitment rate ≈ 1 per month x 3 sites)*				
• Create professional iteration of *Signs of Safety* • Train and certify study clinicians							E = 3 ✓= 0	E = 6 ✓= 0	E = 9 ✓= 0	E = 12 ✓= 0	E = 15 ✓= 0

YEAR 2											
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Rolling recruitment and study period (recruitment rate ≈ 3 per month; length of study period ≈ maximum 6 months per participant)											
E = 18 ✓= 0	E = 18 ✓= 3	E = 18 ✓= 6	E = 18 ✓= 9	E = 18 ✓= 12	E = 18 ✓= 15	E = 18 ✓= 18	E = 18 ✓= 21	E = 18 ✓= 24	E = 18 ✓= 27	E = 18 ✓= 30	E = 18 ✓= 33
YEAR 3											
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
			No recruitment; study period only (length of study period ≈ maximum 6 mo./participant)						*Study wrap-up*		
E = 18 ✓= 36	E = 18 ✓= 39	E = 18 ✓= 42	E = 15 ✓= 45	E = 12 ✓= 48	E = 9 ✓= 51	E = 6 ✓= 54	E = 3 ✓= 57	E = 0 ✓= 60	• Final follow-up • Data analyses • Optional exit interview		

10. STUDY ENDPOINTS*

The primary and secondary clinical outcome measures are outlined in Table 3 below.

Table 3: Clinical Outcome Measures

Variable	Measure (primary outcome measures noted in ***bold*** font)	Time Point					
		Screen	*Baseline/ Pre-TX*	*Week 4*	*Week 8*	*Week12/ Post-TX*	*1-month Follow-up*
Alcohol Use and Craving	*AUD Identification Test (AUDIT)*	X					
	Alcohol Timeline Followback		X	X	X	X	X
	Comprehensive Effects of Alcohol Scale - Brief		X	X	X	X	X
	Penn Alcohol Craving Scale (PACS)		X	X	X	X	X
PTSD	***PTSD Checklist for DSM-5 (PCL-5)***	X	X	X	X	X	X
	Trauma Symptom Checklist – 40 (TSC-40)		X			X	X
Behavioral Health	*Behavior and Symptom Identification Scale (BASIS-24)*		X			X	X
Mediators and Moderators of Change	*Coping Self-Efficacy Scale*		X	X	X	X	X
	Self-Compassion Scale – Short Form		X	X	X	X	X
	Ask, Understand, Remember Assessment (AURA)		X	X	X	X	X
	Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES 8A)		X			X	X
	Healthcare Provider Cultural Competency		X			X	X

Identification of serious psychiatric problem. If at any time a participant is identified as having a serious psychiatric problem that requires a higher level of care than our study can provide, this concern will be immediately reported to the PI, who will provide referral and bridging to appropriate treatment options for stabilization. Once stabilized, the participant will have the option to return to our study.

Clinical emergencies. Study clinicians and Study Assessor will contact 911 in the event of a dangerous situation (or the PI for less urgent clinical crises), and will complete adverse events

reports. The PI will intervene if at any time a participant's distress cannot be contained or in cases where one appears truly unsafe (suicidal intent, threatening harm, or other unsafe behavior). Although it is anticipated that this reaction is highly unlikely, should it occur, the PI will provide debriefing and, if needed, will implement any actions required by Massachusetts law.

Deterioration. After each assessment time point, the PI will review data to ascertain if any particular participants are reporting significant clinical deterioration (i.e., "clinically meaningful" increase of 10+ points on the *PTSD Checklist for DSM-5*, increase in AUD category of severity based on DSM-5 criteria). Should a participant be identified as experiencing significantly worsening distress over the course of the study, the PI will determine appropriate course of action (e.g., withdrawal from study and referral to outside treatment). Again, once stabilized, the participant would have the option to return to our study.

11. PROCEDURES INVOLVED*

The procedures are informed by data generated during the PI's KL2 single-arm pilot study. We will create a professional-quality iteration of the *Signs of Safety* toolkit (see attached scripts), develop a clinician training program, and certify four study clinicians. Procedures for the proposed two-arm pilot RCT are as follows:

Recruitment. Across two years of rolling recruitment, 60 Deaf adults with past-month PTSD and high-risk alcohol consumption, drinking behaviors, and alcohol-related problems will be enrolled in a two-arm pilot RCT. Recruitment materials will direct individuals to contact the research team via videophone. See *Section 24: Local Recruitment Methods* for more detail.

Informed Consent. Interested individuals will be offered a one-hour videophone appointment during which the PI will conduct informed consent procedures and, for consenting individuals, eligibility screening. Prior to the scheduled video call, the PI will provide each participant with an electronic copy of the IRB-approved, written English informed consent form (e-Consent) via Research Electronic Data Capture (REDCap). See *Section 30: Consent Process* and *Section 31: Process to Document Consent in Writing* for additional detail.

Screening. Individuals who consent to participate will then be immediately screened by the PI to determine eligibility. The PI will conduct a structured clinical interview via videophone to determine whether each individual satisfies inclusion and exclusion criteria. Past-month alcohol consumption will be assessed with the *Alcohol Use Disorder Identification Test.* "Subthreshold or full PTSD" will be assessed with the *PTSD Checklist for DSM-5 (PCL-5)*.

Study Conditions. After enrollment, the Study Assessor will conduct the baseline assessment via videophone. Participants will then be randomly assigned to one of two conditions: (1) *Seeking Safety* + *Signs of Safety* toolkit, or (2) assessment-only waitlist control. Randomization will occur within each study site and stratified by gender. The Biostatistician will generate a computerized random number series and place numbers in individual sealed opaque envelopes. The RC will open an envelope to randomly assign a treatment condition to the participant. Both the PI and Study Assessor will be blind to study condition. (*Note: the Study Assessor will remain blind to study condition until the end of the post-treatment assessment, at which point she will*

administer a client satisfaction measure that will unblind the Co-I to which subjects are in the waitlist control group.)

Intervention: Participants randomized to receive the intervention will be provided weekly individual treatment with one of four ASL-fluent study clinicians, based on preferred location and transportation needs. Each participant in this condition will receive 12 one-hour sessions of treatment. The maximum length of treatment will be capped at six months and the total number of completed sessions will be tracked as a measure of participant adherence. Therapists will treat an approximately equal percentage of participants, in order to minimize confounding of therapist effect and study site on treatment outcome.

Treatment sessions will be provided in each study clinician's private practice office, in direct response to findings from the PI's NIDCD R21, which revealed Deaf people's communal fear of academic research settings due to a long history of mistreatment by doctors and biomedical researchers (e.g., eugenics) (Anderson, Wolf Craig, & Ziedonis, 2016; Anderson et al., 2018; Anderson, Wolf Craig, & Ziedonis, 2017; McKee, Schlehofer, & Thew, 2013; Lane, 2005). As such, study therapists must be independently licensed in MA and will take on professional liability for the cases that they see. Study therapists will be compensated $80 a session – a rate that is comparable to the average insurance reimbursement for individual therapy sessions with Deaf clients. Proof of sufficient liability insurance will be obtained from each study therapist prior to beginning the RCT.

Waitlist Control: Following the final assessment at 16 weeks, waitlist control participants will be offered the opportunity to receive the 12-session *Seeking Safety + Signs of Safety* protocol. This 16 week waiting period is equivalent to the current waitlist to receive psychotherapy services through the PI's outpatient clinic. Participants who are randomized to the waitlist, but express immediate need for services during the waitlist period will be provided referral to non-study treatment options (i.e., supportive psychotherapy provided either directly in ASL or with an ASL interpreter) and subsequently coded as a non-retained waitlist participant.

Assessments. Using measures validated in the general population, we will assess clinical outcomes and mechanisms of change at baseline, two within-treatment time points (after session 4 and 8), immediate post-treatment (within one week after session 12), and one-month follow-up. The Study Assessor, blind to study condition, will administer assessments as structured ASL interviews via videophone. (*Note: the Study Assessor will remain blind to study condition until the end of the post-treatment assessment, at which point she will administer a client satisfaction measure that will unblind the Co-I to which subjects are in the waitlist control group.)* Any Likert-scale-type questionnaires that are administered during the study interview will be presented directly in American Sign Language; the interviewer will also display a visual aid of the response options to assist participants in keeping track of changing Likert scales between various measures.

Compared to in-person assessments, our proposed method of remote videophone assessment is more responsive to Deaf people's transportation barriers, financial barriers, and technology preferences. This videophone method was used successfully in the *Signs of Safety* one-arm pilot study, as well as other previous studies with Deaf individuals. Participants will be compensated

$25 at each assessment time point (1 hour for baseline, 30 minutes for follow-up) via a Visa gift card sent to the mailing address of their choice. Participants not retained in treatment will be contacted for follow-up assessments at each scheduled time point for intent-to-treat analyses and examination of potential biases due to non-adherence.

In the control condition, assessment will occur at baseline, week 4, week 8, week 12 (to approximate immediate post-treatment), and week 16 (to approximate one-month follow-up). Such repeated assessment in the control arm will allow us to quantify and control for participants' natural change over time and assessment reactivity.

Feasibility measures: We will collect data on recruitment, retention, and other key aspects of feasibility (Table 3). We will augment client satisfaction measures with questions specific to *Signs of Safety.* All intervention sessions will be videotaped, with 25% (3 sessions per participant) rated for fidelity on an ongoing basis by the Fidelity Consultant To quickly correct fidelity concerns, capture fidelity throughout the treatment process, and evaluate impact of site differences on study findings, one tape will be randomly selected from sessions 1 - 4; one from 5 - 8; and one from 9 - 12. Sessions will be rated with the *Seeking Safety Adherence Scale* plus the *Signs of Safety Fidelity Scale*.

Table 3: Feasibility Measures

Component	Feasibility Quantification
Client Satisfaction	- *Seeking Safety End of Session Questionnaire** - *Seeking Safety End of Treatment Questionnaire** - *Client Satisfaction Questionnaire* (post-TX)
Treatment Fidelity	- Rates of therapist integrity to the experimental condition
Participant Adherence	- Treatment receipt (i.e., number of sessions completed, comprehension of session content) - Rates of participants' treatment enactment (i.e., completing "homework" between sessions)
Assessment Process	- Proportion of planned ratings completed - Duration of assessment call - Psychometrics of clinical outcome measures

**Measures that include open-ended items for qualitative data analysis.*

Measures of clinical outcome, moderators, and mediators: Using measures validated in the general population, we will assess clinical outcomes and mechanisms of change at baseline, two within-treatment time points (week 4 and 8), immediate post-treatment (within one week after session 12), and one-month follow-up. We will report internal consistency of all measures in our study sample when administered in ASL format, compared with the general population. Measures of **clinical outcome** are: the *Alcohol Timeline Followback,* which assesses daily drinking frequency and quantity for a selected range of 30 to 360 days (we will use 30 days); the *Comprehensive Effects of Alcohol Scale – Brief Version*, a 15-item measure of positive/negative expectancies and valuations of various possible consequences of drinking; the *Penn Alcohol Craving Scale (PACS)*, a 5-item instrument assesses study participants' self-report craving levels for alcohol; the *PTSD Checklist for DSM-5 (PCL-5),* a 20-item measure of DSM-5 PTSD symptoms that is reliably used to monitor symptom change; the *Trauma Symptom Checklist – 40 (TSC-40)*, a 40-item measure of the long-term effects of complex trauma; and the *Behavior and*

Symptom Identification Scale – 24 (BASIS-24), a 24-item measure of psychiatric and substance-related symptoms and level of functioning.

Given the limited scope of the proposed study and the resulting proposed sample size, we will collect only preliminary data on **mechanisms of change** and conduct exploratory analyses of these potential mechanisms. We identified potential mechanisms from published studies of *Seeking Safety*, the alcohol treatment literature, and Deaf mental health literature. Potential mediators are participants' reported ability to use coping skills, practice self-compassion, and understand health information. Potential moderators are motivation for treatment and participant-reported provider cultural competency. These constructs will be measured by the *Coping Self-Efficacy Scale,* a 26-item measure of perceived ability to cope with past-month challenges; the *Self-Compassion Scale – Short Form,* a 12-item measure of self-compassion in instances of perceived failure, inadequacy, or suffering; the *Ask, Understand, Remember Assessment (AURA),* a 4-item measure of one's ability to obtain, understand, and remember health information communicated by a provider; the *Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES 8A)*, a 19-item measure assessing readiness for change among individuals with AUD; and *Patient-Reported Healthcare Provider Cultural Competency,* a 9-item measure rating a provider's ability to interact with patients from one's cultural group.

Exit Interview (optional). After a participant's participation in the study is complete, they will be given the option to participate in a videophone exit interview. This interview will be conducted by an ASL-fluent interviewer. The participants will be asked their opinions about how the current study was designed and if any improvements can be made for future research studies (see *Signs of Safety* Exit Interview questions attached). For example, participants will be asked questions about their experience of participating in the research study, including logistics, accessibility, communication, and technology. The exit interview will take approximately 60 minutes. Participants will receive an additional $50 Visa gift card if they choose to participant in the exit interview.

12. DATA AND SPECIMEN BANKING*
N/A

13. Data Analysis and Management*

Data will be entered into Research Electronic Data Capture (REDCap), a secure web-based data capture application that provides real-time data entry validation (e.g., data types, range checks). UMass Quantitative Methods Core personnel will customize the database to track recruitment, intervention delivery, and outcome assessments. Data will be exported to *SAS* and *ATLAS.ti* for analysis.

Analyses will be conducted as intent-to-treat, with all randomized participants included in the analysis regardless of treatment adherence or missing data in any time points. We will use the mixed procedure (PROC MIXED) in *SAS* to analyze the longitudinal data by fitting the models described below – a procedure that allows for data that are missing at random by including all available data from each participant in the analysis. In the event that a participant has no

available outcome data, we will examine their sociodemographic characteristics to compare with those participants who do have available outcome data.

Analytic plan for feasibility. For quantitative feasibility outcomes, we will calculate descriptive statistics for the overall sample and separated by treatment arm: mean number of participants screened and enrolled per week; rate of retention; clinician treatment fidelity (rates of integrity, rates of differentiation); participant adherence (number of sessions completed, rates of between-session homework completion); and assessment process (proportion of assessments completed, mean duration of assessment calls). We will compare retention, fidelity, and adherence between the two treatment conditions using chi-square and t-tests.

Precision of rate estimation: Based on pilot results, we anticipate at least 45 of the 60 enrolled participants will be retained through immediate post-treatment. See *Section 25. Local Number of Subjects* for more information on the estimated post-attrition sample size and retention rate.

For qualitative feasibility outcomes, open-ended responses to the *End of Session* and *End of Treatment Questionnaires* will be analyzed in *ATLAS.ti* for themes regarding satisfaction with each study arm (e.g., *What comments or suggestions do you have about today's session?, How could this treatment be more helpful to you?*). We will use an iterative, grounded theory approach employing two major techniques: (1) content analysis, where the number of similar responses will be tallied and described; and, (2) a summary of the answers to questions outlined by Casey (e.g., *What ideas will be especially useful for the intervention?*).

Analytic plan for preliminary clinical outcomes. We will compare treatment arms using two primary clinical outcomes at immediate post-treatment and one-month follow-up: (1) past 30-day alcohol use frequency/quantity (from *Alcohol Timeline Followback*); and, (2) past 30-day PTSD severity (from *PCL-5*). For **alcohol use**, outcome variables are: % drinking days per week (i.e., days with 1+ drink); % binge drinking days per week (i.e., days with 5+ drinks for men, 4+ for women); and mean number of drinks per week. These variables will be calculated from daily data collected with the *Alcohol Timeline Followback* for 30 days (4 weeks) prior to the last drink before baseline assessment, throughout the 12-week intervention or waitlist period, and throughout the one-month follow up period. Such a weekly measure will allow for estimation of changes per weekly intervention session in the experimental condition as compared to waitlist control.

Our initial unadjusted group comparisons at immediate post-treatment/week 12 and at the end of the one-month follow-up period/week 16 will use a standard t-test (or Wilcoxon non-parametric test, depending on the outcome distribution). Below, we describe models for analyzing adjusted group differences and for analyzing the longitudinal data. We acknowledge that, with the small sample size of this feasibility study, the following models may be optimistic in terms of their capability to reliably estimate and to test interactions. However, they will provide insight into possible effect sizes for planning the larger clinical trial.

We will first compare differences in weekly drinking between the two study conditions at pre-, during, and post- intervention periods using mixed effects models (Model 1):

Y = b0 + b1*int_pr + b2*fu_pr + b3*e + b4*int_pr*e+ b5*fu_pr*e + other predictors (p_chars, c_chars, clinician, study site, etc.) + random effects

Where: Y = alcohol use dependent variable; int_pr = 1 for intervention period, = 0 otherwise; fu_pr = 1 for follow-up period, = 0 otherwise; e = 1 for experimental arm, = 0 for control arm; p_chars are participant characteristics (e.g, age, gender); c_chars are clinician characteristics (e.g, age, gender); clinician indicators will capture differences in clinician approaches; and, study site indicators will capture differences in location of intervention delivery. Random effects (i.e., participants) will account for unmeasured participant characteristics.

We will examine the linear time trend of intervention effects using interrupted time series analysis (Model 2):

Y = a0 + a1*wk + a2*int_pr + a3*wk_aft + a4*e + a5*wk*e + a6*int_pr*e + a7*wk_aft*e + other predictors (p_chars, c_chars, clinician, study site, etc.) + random effects

Where: Y = alcohol use dependent variable; wk = week number starting with 1 for the first week of data collection; int_pr = 1 for intervention period, = 0 otherwise; wk_aft = # of week after the intervention starts; e = 1 for experimental arm, = 0 for control arm; and other predictors and random effects as defined in Model 1. Both models will include multilevel clustering to account for repeated measures from the same participant, as well as correlation among participants receiving intervention in the same study site.

For **PTSD symptoms**, the primary outcome is past 30-day total symptom severity on the *PCL-5*. We will compare study conditions on the *PCL-5* total symptom severity score at each time point using a mixed effects model (Model 3). Fixed effects are: study condition (experimental vs. control), time point (four indicator variables with baseline as the reference group), and interaction of study condition and time point. Similar to Models 1 and 2, we will adjust for participant and clinician characteristics; within-clinician, within-site, and repeated measures correlation; and random effects (i.e., unmeasured participant characteristics).

Sample size and power calculation: Our proposed sample size is based on pilot results and the limited scope of the proposed pilot RCT. A clinically significant effect should be used for planning a future full-scale RCT. For example, a clinically significant change score for the *PCL-5* is 10 points, equal to an effect size of 0.47 using a standard deviation of 21.2. Our projected sample size of 22 completers per study arm will have 80% power to detect a large effect size (0.80) comparing two means using a two independent sample t-test for the unadjusted group comparisons. To detect a smaller effect size (e.g., clinically significant effect size of 0.47), a larger sample size would be needed, but is not feasible due to the scope of the proposed pilot RCT. We used the unadjusted t-test for the power calculations due to the largely unknown assumptions required to calculate the power for a mixed effects model; however, the mixed effects models will have more power than the unadjusted t-test due to the partitioning of the variance among the various components.

Analytic plan for potential mechanisms of change. We will examine potential moderators and mediators of intervention effects. We will compare the two treatment arms on these variables at

each time point using mixed effects regression models similar to Model 3, described above. To test for a significant effect of moderators/mediators, we will follow the approach of Kraemer et al., as described below, and will classify baseline factors (e.g., stable patient characteristics, motivation for treatment, perceived provider cultural competency) as moderators and factors that may be related to the intervention as mediators, such as coping skills, self-compassion, and understanding of health information.

In the mixed effects models, we will include the individual mediator (or moderator) as well as the treatment*mediator (or moderator) interaction term. We will maintain the hierarchy of the interaction and main effect, so that the main effect will stay in the model regardless of its significance if the interaction shows a significant effect. The interpretation of the treatment*mediator interaction is that the treatment has a differential effect on the outcome through the mediator; for example, participants who understood more of the health information presented during the intervention may have a different response to the treatment than those who understood less. In the case of moderators, the interaction would indicate a differential treatment effect in various subgroups of patients. The interpretation of the model will vary depending on whether the main effects are significant (and which ones) and whether the interaction is significant (with or without significant main effects). Because of the sample size for this pilot RCT, we cannot power the study to identify significant interactions (except for large effects), but can use the interaction effect size to better plan for future efforts.

14. PROVISIONS TO MONITOR THE DATA TO ENSURE THE SAFETY OF SUBJECTS*

The PI, Co-I/AUD Research Consultant, and Biostatistician will monitor individual data over the course of the study to identify any participants who may need additional intervention. Frequency and quantity of weekly alcohol and drug use will be collected at the beginning of each session during the structured check-in process. PTSD symptoms will be collected at baseline, after session 4, after session 8, immediate post-treatment, and one-month post-treatment follow-up. Suicidal thoughts, plans, or intent will be assessed at the beginning of each session during the structured check-in if the participant reports feelings of depression, as well as at baseline, after session 4, after session 8, immediate post-treatment, and one-month post-treatment follow-up if the participant endorses suicidal ideation during clinical outcome assessments. Additionally, there is a check-out process at the end of each session (part of the manualized *Seeking Safety*/*Signs of Safety* protocol) that asks participants what they got out of the session and if any problems arose for them, and participants complete an end-of-session satisfaction questionnaire that assesses any points of dissatisfaction about the session.

After each assessment time point, the PI, Co-I/AUD Research Consultant, and Biostatistician will review data to ascertain if any particular participants are reporting significant clinical deterioration (i.e., “clinically meaningful” increase of 10+ points on the PTSD Checklist for DSM-5, increase in AUD category of severity based on DSM-5 criteria). Should a participant be identified as experiencing significantly worsening distress over the course of the study, the PI, Co-I/AUD Research Consultant, and Biostatistician will determine appropriate course of action (e.g., withdrawal from study and referral to outside treatment). Once stabilized, the participant would have the option to return to our study.

If at any time a participant is identified by study clinicians or Study Assessor as having a serious psychiatric or substance use problem that requires a higher level of care than our study can provide, this concern will be immediately reported to the PI, who will provide referral and bridging to appropriate treatment options for stabilization. Again, once stabilized, the participant will have the option to return to our study.

Should a participant arrive at a study session under the influence of drugs or alcohol, the study clinician will be trained to discontinue the session, reschedule the visit for a later date, and work with the participant to arrange safe transport home (e.g., being picked up by family member or friend, taking a taxi, etc.).

Should a participant communicate distress and intent to withdraw from the study, the PI will provide the participant with a list of Massachusetts therapists who specialize in AUD and/or trauma therapy and provide services in ASL, should they desire treatment outside of the research study.

Study clinicians and Study Assessor will be trained to follow written protocols and contact 911 in the event of a dangerous situation. The PI will also be available for on-call phone consultation for less urgent clinical crises. The PI will intervene if at any time a participant's distress cannot be contained or in cases where anyone appeared truly unsafe (e.g., suicidal intent, threatening harm, or other unsafe behavior). Although it is anticipated that this reaction is highly unlikely, should it occur, the PI will provide debriefing and, if needed, will call for assistance.

As the PI is a licensed psychologist, in the event that a participant is found to pose imminent harm to themselves or others, the PI will implement any actions required by Massachusetts law with regard to individuals who are determined to pose imminent harm to themselves or others. Therefore, an additional risk, though highly unlikely, is that a participant would need to be admitted to a psychiatric inpatient hospital against his or her will.

15. WITHDRAWAL OF SUBJECTS WITHOUT THEIR CONSENT*

It is unlikely that we will need to withdraw participants from the study. Participants will only be withdrawn if they pose harm to themselves or others (i.e., physical aggression, verbal threats). Although this reaction is highly unlikely, should it occur, the PI would debrief the participant and provide referral to crisis or therapy services outside of the research study as needed. In the event that a participant is found to pose imminent harm to themselves or others, as a licensed psychologist, the PI will implement any actions required by Massachusetts law with regard to individuals who are determined to pose imminent harm to themselves or others. Available data collected prior to withdrawal will be included in statistical analyses, unless the participant revokes consent during the withdrawal process.

16. RISKS TO SUBJECTS*

There is a potential risk of loss of confidentiality. There is a potential risk of discomfort or increased mental health symptoms associated with completing study interventions and

assessments. There is also a potential risk of experiencing alcohol withdrawal symptoms. We address each below:

Risks associated with potential loss of confidentiality. There is a slight risk that research records (e.g., assessments, video recordings) might be obtained by unauthorized persons. There is a slight risk that research data files might be compromised and obtained or viewed by unauthorized persons. Our procedures for protecting against such risks are described in *Section 26: Confidentiality*.

Risks associated with study interventions and assessments. Potential risks to participants include an increase in mental health symptoms while participating in *Seeking Safety/Signs of Safety* therapy, a known risk of participating in treatment in general, but not a pattern that has previously been identified with *Seeking Safety* or in the *Signs of Safety* one-arm pilot study. Rather, participants in *Seeking Safety* are instructed not to delve deeply into trauma details, with the purpose of minimizing exposure and adverse responses to trauma triggers. Additionally, completing study-related assessments may cause potential risk to participants, including discomfort, embarrassment, triggers of PTSD symptoms, or triggers of substance cravings. Every possible effort will be made to ensure the safety of participants. Any adverse events will be reported to the UMMS Institutional Review Board. Our procedures for protecting against and managing such risks are described in *Section 14: Provisions to Monitor the Data to Ensure the Safety of Subjects.*

Risks associated with reductions in alcohol use. Another potential risk to participants with severe AUD is symptoms of alcohol withdrawal. Study clinicians and Study Assessor will assess withdrawal symptoms on an as-needed basis (e.g., if participants report abrupt alcohol discontinuation) using the *Clinical Institute Withdrawal Assessment for Alcohol (CIWA-Ar)*. Team members will be instructed to discuss minor concerns during weekly research meetings; moderate-to-severe concerns will immediately be discussed with the Addiction Psychiatrist, who will be available for on-call phone consultation. Adverse events reports will be completed and submitted to the UMMS Institutional Review Board.

Any serious adverse events, unanticipated problems, or breaches of confidentiality that occur during the intervention period and/or the one-month follow-up period will be reported to the UMMS Institutional Review Board and the NIAAA project officer within 48 hours. Additionally, an annual report will be submitted to the NIAAA project officer summarizing all adverse events.

17. POTENTIAL DIRECT BENEFITS TO SUBJECTS*

The following potential benefits cannot be guaranteed. Potential benefits to participants include:

- Access to an evidence-based intervention (*Seeking Safety*) and treatment materials that they may not otherwise be able to access.
- Decrease in mental health symptoms and addiction severity.
- Increase in safe coping skills and ability to manage their trauma symptoms.

Additionally, Deaf individuals are often not consulted for their opinions about services rendered within their own community. Therefore, by being asked for input on future interventions and services for Deaf people, participants may experience increased feelings of empowerment and self-efficacy.

18. VULNERABLE POPULATIONS*

We will not specifically recruit members of vulnerable populations. We will not knowingly include pregnant women as participants; however, we will not assess participants' pregnancy status.

19. MULTI-SITE RESEARCH*
N/A

20. COMMUNITY-BASED PARTICIPATORY RESEARCH*

Community-based participatory research is a central value in the planning and execution of the proposed study. The majority of our research team is composed of ASL-fluent researchers and/or members of the Deaf community. We will also hire a Deaf Community Advisor with lived experience of addiction and trauma recovery to provide expertise and input on *Signs of Safety* materials. See *Section 23: Resources Available* for more detail on our research team.

21. SHARING OF RESEARCH RESULTS WITH SUBJECTS*

A summary of the research findings will be shared through conference presentations, publications in peer-reviewed journals, and dissemination of SPARC research products- via ASL videos and plain written English products (written in simple, non-academic language and intended to be more accessible for community members). Individual data will not be available for release.

22. SETTING

Department of Psychiatry
The UMMS Department of Psychiatry is home to the Division of Addiction Psychiatry, whose mission is to enhance understanding of the causes and consequences of addictive behavior, to strengthen recovery and rehabilitation methodologies, to develop new approaches to treatment, and to share knowledge in the field across the country and around the world. The Division's current research efforts include, but are not limited to, developing cognitive behavioral therapy protocols for various subpopulations of individuals with alcohol use disorder, treating opioid dependence in young adults, treating nicotine use disorder, and developing mobile technology for improving the lives of individuals with substance use disorder. Current initiatives are intended to produce novel pharmacological interventions for treatment, identify brain regions associated with addictive behavior and inhibitory control, and develop treatments and cessation techniques specifically tailored to individual needs. To achieve these aims, the Division of Addiction Psychiatry collaborates with partner agencies, such as Veterans Affairs, and draws on the rich experience of highly acclaimed faculty members – leaders in their fields – whose

expertise ranges from psychopharmacology, to multiculturalism and addiction, to state-of-the-art psychosocial intervention techniques. While collaborating with our community-based partners and other research and educational institutions, the Division nurtures rising academic careers in the study of addiction and translates evidence-based treatments into clinical care practices.

Another division of the Department of Psychiatry and home of the PI's research lab, the Systems and Psychosocial Advances Research Center (SPARC), is a Massachusetts Department of Mental Health (DMH) Center of Excellence. SPARC is an internationally-recognized academic center conducting research on the development, implementation, and effectiveness of behavioral health services. SPARC provides a collaborative environment within which to conduct multifaceted research. SPARC faculty and staff are a multidisciplinary team of researchers, psychiatrists, psychologists, sociologists, rehabilitation professionals, statisticians, trainers, attorneys, policy-advisors, and persons with lived mental health experience dedicated to preventing the development or recurrence of mental health conditions, and improving the lives of individuals living with these challenges. Research consultation and analytic support are available on a daily basis from UMMS colleagues and staff.

SPARC has a strong track record of NIH funding, long-standing partnerships with many national foundations, and is deeply committed to state and local issues – as evidenced by our numerous research and training grants with various state agencies and regional foundations. In FY 2016, SPARC leveraged Massachusetts DMH-supported infrastructure into over $9.8 million in external funding for research, training, and services. Some examples of our areas of expertise include clubhouses through the Program for Clubhouse Research, vocational rehabilitation models, parenting and mental health, women's perinatal mental health, integrated care, multicultural research, and wellness, including tobacco cessation and mindfulness-based interventions. Additionally, SPARC has strong ties in the UMMS Department of Psychiatry with colleagues in the Divisions of Child/Adolescent and Addiction Psychiatry, the Center for Comparative Neuroimaging, and the National Center on Homelessness among Veterans. Their partnerships also extend to Commonwealth Medicine, several other UMMS departments, and the UMass Boston and Lowell campuses.

SPARC encourages and supports lived experience and multicultural voice in all SPARC activities, and contributes to the development of dissemination strategies and products targeted to diverse users. National dissemination activities have grown to include a newsletter, issue briefs available via email and on the SPARC website, and two eJournals available through the Lamar Soutter Library institutional repository web site. SPARC leads efforts to disseminate evidence-based practices and information on the latest mental health research; engage academics, providers, and individuals with lived mental health experience in a dialogue about research and evaluation; and assist faculty and staff in conducting clinical research and developing research partnerships with community agencies. SPARC is particularly focused on non-traditional translation of academic research, both in target audience (i.e., individuals with lived experience of utilizing mental health services and their families) and mechanism (i.e., user-friendly web-based platforms that are accessible to individuals with severe mental illness). This infrastructure provides the platform for knowledge translation activities that actively engage individuals with severe mental illness, providers and researchers.

SPARC is located on two floors of the Chang Building on the UMMS campus on Maple Avenue in Shrewsbury, MA. The SPARC space includes offices, break rooms, and both small and large conference rooms. The space is clean, modern, handicap-accessible and facilitates teamwork and efficiency among SPARC faculty and staff and our collaborators. SPARC's computer hardware and software equipment are located in this space and SPARC employees utilize restricted access UMMS servers encrypted with password protection that can be accessed both on site and remotely (Note: When the camcorder SD card is full, study therapists will secure card in a password-protected lock box and mail to UMMS research staff using UPS Next Day Air shipping. Research staff will then download and store the data onto our secure, encrypted drive at UMMS.) PCs are equipped with data management programs (e.g., Microsoft Access, Microsoft Excel, EndNote) for data coding and storage, statistical and qualitative data analysis software (e.g., SAS, SPSS, N6, STATA), and desktop publishing programs (e.g., Adobe PhotoShop, Quark Express, Microsoft Publisher) for use in knowledge dissemination. SPARC and UMMS provide our faculty access to the full range of telecommunication methods, including web-based video-conferencing options and wireless accessibility.

Department of Quantitative Health Sciences

The UMMS Department of Quantitative Health Sciences (QHS) is the newest UMMS department and was conceptualized by institutional leadership in 2007 and formed in 2009 with the recruitment of an inaugural chair, Dr. Catarina Kiefe, and vice-chair, Dr. Jeroan Allison. Drs. Kiefe and Allison are nationally-known quantitative scientists who were previously at the University of Alabama at Birmingham (UAB). Since establishing the Department in 2009, four senior researchers have also been recruited to lead the Divisions of the QHS: Dr. Arlene Ash (Biostatistics and Health Services Research), Dr. Robert Goldberg (Epidemiology), Dr. Thomas Houston (Health Informatics and Implementation Science), and Dr. John Ware (Outcomes Measurement). The Department has a complement of approximately 35 faculty in the various divisions as well as nearly 80 technical and professional staff, including project managers, biostatisticians, and data analysts. Our Biostatistician is Research Professor in QHS and the Director of the UMass Quantitative Methods Core.

The vision of QHS is to contribute to the health of populations and individuals and to the transformation of health care through methodological innovation. In particular, QHS will become a premier nationally and internationally recognized resource for T2/T3 research, while contributing to UMMS's prominence in T1 research. This includes not only bringing basic science progress to fruition for individual patient-level and population health, but also, in a truly bidirectional fashion, allowing T2/T3 research to suggest lines of basic science research with the potential to fill important knowledge and health care gaps.

The Mission of QHS is (a) to fulfill the quantitative health science needs of the academic medical center to become a leader in clinical and translational research; (b) to weave service to the academic medical center into discovery of new approaches to address the health care needs of the Nation; and (c) to train the next generation of scientists to fulfill the Vision. QHS also houses the Quantitative Methods Core, led by our Biostatistician. The Quantitative Methods Core provides integrated services for study design, development of measurement tools, study logistics, data collection, data management, and data analysis expertise for clinical and

translational researchers at UMMS. QHS is housed in the newly-completed Albert Sherman Center, a state-of-the-art biomedical facility that was designed around QHS' needs.

Clinician Private Practices in Massachusetts

We will recruit and train four ASL-fluent study clinicians with private practices located in Eastern Massachusetts, Central Massachusetts, and Western Massachusetts (for participant convenience). Treatment sessions will be provided in each study clinician's private practice office, in direct response to findings from the PI's NIDCD R21, which revealed Deaf people's communal fear of academic research settings due to a long history of mistreatment by doctors and biomedical researchers (e.g., eugenics) (Anderson, Wolf Craig, & Ziedonis, 2016; Anderson et al., 2018; Anderson, Wolf Craig, & Ziedonis, 2017; McKee, Schlehofer, & Thew, 2013; Lane, 2005). As such, study therapists must be independently licensed in Massachusetts and will take on professional liability for all the cases that they see. Proof of sufficient liability insurance will be obtained from each study therapist prior to beginning the pilot RCT. Study therapists will be compensated at hourly rates comparable to the average insurance reimbursement for individual therapy sessions with Deaf clients ($80 a session).

23. RESOURCES AVAILABLE

PI: The Principal Investigator will be responsible for the overall administration and coordination of the proposed research project, including participant recruitment, informed consent procedures, eligibility screening, data collection, data analysis, and dissemination of results. Qualifications include: licensed psychologist, expertise in Deaf community health and Deaf clinical research; ASL fluency.

Study Assessor: The Study Assessor will be responsible for conducting all outcome assessments. Qualifications include: expertise in Deaf community health and Deaf clinical research; ASL fluency; proficient interview skills.

Co-I/AUD Research Consultant: The Co-I/AUD Research Consultant is an expert in AUD research and will provide guidance and consultation on AUD RCT methodological design.

Addiction Psychiatrist: The Addiction Psychiatrist will be responsible for responding to on-call phone consultations regarding medical concerns (e.g., withdrawal symptoms).

Biostatistician: The Biostatistician will oversee all statistical aspects of the study (e.g., data management, analysis) and supervising the database developer and statistical analyst.

Statistical Analyst: The Statistical Analyst will work under the Biostatistician to assist with all statistical aspects of the study (e.g., data management, analysis).

Research Coordinator: The research coordinator will be responsible for assisting the PI's with the overall administration and coordination of the proposed research project, including participant recruitment, data collection, data analysis, and dissemination of results. Qualifications include: 2 years of experience working as a UMMS Research Coordinator.

Fidelity Consultant: The Fidelity Consultant will be responsible for conducting fidelity ratings for the study. Qualifications include certification in *Seeking Safety* fidelity rating.

Study Therapists: Four ASL-fluent study clinicians independently licensed in Massachusetts will provide treatment sessions to participants within their own private practice. Clinicians will take on professional liability for all the cases, which will be seen in their own psychotherapy offices. Proof of sufficient liability insurance and will be obtained from each study therapist prior to beginning the pilot RCT.

Deaf Community Advisor: The Deaf Community Advisor (DCA) is a member of the Deaf community with lived experience of recovery from trauma and addiction as well as experience working with the PI on previous research projects. The DCA will provide consultation and feedback on *Signs of Safety* toolkit and create recruitment materials. The DCA will not have contact with participants or access to study data.

PTSD Research Consultant: The PTSD Research Consultant will not have contact with participants or access to study data.

Exit Interviewer: The Exit Interviewer will conduct optional exit interviews that take place after all study procedures are completed. The exit interview will focus on participants' experience the research study, including logistics, accessibility, communication, and technology.

All study staff will be CITI trained and either added to the Project Personnel tab in eIRB or submitted to the IRB office with HRP-215 Non-UMass Personnel Form.

24. LOCAL RECRUITMENT METHODS

We will recruit participants using ASL YouTube videos and plain English flyers disseminated on Deaf listservs (e.g., MassDeafCare, MassDeafTerp), Deaf Facebook groups (e.g., The Voice of the Deaf Community in MA, MA Commission for the Deaf and Hard of Hearing, MA State Association of the Deaf), and sent to local Deaf-specialized agencies (e.g., Center for Living & Working, Deaf Inc., Advocates, Alternatives, Our Deaf Survivors Center, North Suffolk Mental Health, Northeast Independent Living Program). The PI has used these methods successfully in five previous and ongoing studies involving Deaf research participants. Please note that recruitment materials for the proposed study (ASL YouTube videos, flyers) will be created using expertise of the Deaf Community Advisor and, therefore, will be submitted to the UMMS IRB as a modification.

25. LOCAL NUMBER OF SUBJECTS

We will enroll 60 Deaf adults from Massachusetts. Based on pilot results, we anticipate at least 45 participants will be retained through immediate post-treatment (60 enrolled participants x a conservative 0.75 retention rate), or 22 participants per treatment arm. This post-attrition sample size falls within the guidelines for a pilot RCT behavioral therapy study - "15 to 30 participants per cell" - and is "based on the pragmatics of recruitment and the necessities for examining feasibility."

26. CONFIDENTIALITY

Every effort will be made to protect participants' confidentiality. Only members of the research team (except for the Deaf Community Advisor and PTSD Research Consultant) will have access to identifying information, which will be kept separate from participant data. An NIH Certificate of Confidentiality will be obtained to protect participants from disclosure of sensitive data, especially information related to substance use, similar to procedures used for the *Signs of Safety* one-arm pilot study. Any breach of confidentiality will be reported to the UMMS Institutional Review Board.

All intervention sessions will be videotaped by study clinicians. The video camcorders will be stored in locked file drawers in locked therapy offices. When the camcorder SD card is full, the study therapists will secure the SD card in a password-protected lock box and mail to UMMS research staff using UPS Next Day Air shipping. Research staff will then download and store the data onto our secure password-protected, encrypted internal server hosted within the UMMS Systems and Psychosocial Advances Research Center (SPARC). Video recordings of intervention sessions are for fidelity testing only and will not be used for participant data collection; as such, the recordings will not be transcribed. Video recordings of the exit interview will be used for data analysis only. Any results will be reported by overall themes across participants; data will not be individually tied to specific participants.

All data will be entered into Research Electronic Data Capture (REDCap), a secure, web-based application designed exclusively to support data capture for research studies. REDCap is hosted locally by UMMS and employs user authentication and role-based security. The REDCap application resides in an isolated secure network segment designed for PHI, PII, and other types of regulated data. Web-based data entry is via an SSL cryptographic transport protocol. Additional security procedures are in place for data access. The environment logs are audited by IS. Paper data will be stored in locked file cabinets in locked offices.

At the end of each treatment session, participants will complete the *Seeking Safety End of Session Questionnaire* via the web-based REDCap Survey interface using a 32GB 12.9inch iPad Pro that will be provided to each study clinician for the duration of the study. (These iPads will also be used to of show Signs of Safety video materials to participants.) Both the REDCap database and the iPad will be password-protected.

Data will be exported to *SAS* and *ATLAS.ti* for quantitative and qualitative analysis, respectively. All analytic files will be stripped of personal identifiers. Only CITI-trained personnel with appropriate authorization and relevant project need will be allowed data access. All paper records, video recordings, and electronic data records will be destroyed three years after completion of the grant period, in accordance with NIH policy. Individual data will not be available for release.

27. PROVISIONS TO PROTECT THE PRIVACY INTERESTS OF SUBJECTS

During the informed consent process, participants will be informed that they have the right to refrain from answering any questions. It will be emphasized that any information provided by the participant is completely voluntary and that they can leave the study at any time if they choose.

28. COMPENSATION FOR RESEARCH-RELATED INJURY

Prior to the beginning of the study, participants will be informed that there is no available compensation for research-related injury. This information will also be located on the Informed Consent Form.

29. ECONOMIC BURDEN TO SUBJECTS

We do not anticipate economic burden to participants. Our proposed method of remote videophone assessment is responsive to Deaf people's transportation barriers, financial barriers, and technology preferences. This method was used successfully in the *Signs of Safety* pilot study and previous studies with Deaf individuals. With clinicians in Eastern, Central, and Western MA, maximum travel time from highly Deaf-populated towns (e.g., Boston, Framingham, Springfield) to an available treatment site is less than 30 minutes. Such travel time will not be a barrier to recruitment and retention as this population is accustomed to traveling lengthy distances to receive treatment due to the rarity of Deaf-accessible providers.

30. CONSENT PROCESS

Interested individuals will be offered a one-hour videophone appointment during which the PI will conduct informed consent procedures. The PI will follow the UMMS Investigator Guidance for Informed Consent (HRP-802).

Prior to the call, the PI will provide each participant with an electronic copy of the IRB-approved, written English informed consent form (e-Consent) via Research Electronic Data Capture (REDCap). During the call, the PI will present each section of the e-Consent form in ASL (e.g., *"What are the risks of being in this study?", "What happens to information about me?"),* pausing after each section for questions and discussion. Individuals who wish to enroll will sign the e-Consent form in REDCap, by typing in their name or using the "wet signature" feature. Rather than conduct informed consent in person, which would require study staff to travel across the state of MA, e-Consent is a newly evolving platform that can be leveraged to overcome these logistical barriers. e-Consent can be accessed by participants via computer, mobile phone, or tablet.

Individuals who consent to participate will then be immediately screened by the PI to determine eligibility.

31. PROCESS TO DOCUMENT CONSENT IN WRITING

The PI will follow the UMMS Investigator Guidance for Documentation of Informed Consent (HRP-803). Written informed consent will be documented electronically using an e-Consent form via REDCap, a HIPAA-compliant, web-based electronic capture database. All study

procedures, potentials risks, and benefits will be explained in detail by the PI in ASL prior to obtaining written consent.

32. DRUGS OR DEVICES
N/A