# Probenecid as a pharmacotherapy for alcohol use disorder:

# STATISTICAL ANALYSIS PLAN

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**IND/FDA**: 147824 Exempt, probenecid (Holder: Haass-Koffler)

***Statistical analysis plan***

All outcomes (primary, secondary, and others) were analyzed using an intention-to-treat (ITT) approach where participant's data were included based on their *a priori* randomized code from the pharmacy and received at least one dose of the study medication (probenecid or placebo) (Schulz et al., 2010). Probenecid and placebo conditions were treated identically (medication administration and laboratory procedures) in a crossover design (Pearce et al., 1990).

Outcome measures were analyzed to evaluate normal distribution. Comparisons with sociodemographic and clinical characteristics, in relation to enrolled versus completer status, were performed using *t*-tests to analyze continuous variables (age) and $\chi^2$ for categorical variables (sex, race). Attrition rates between visit 1 and visit 4 were examined descriptively to assess for potential bias. Logistic regression was performed to test for possible bias due to period (probenecid first, then placebo and opposite conditions) or medication carryover (Haass-Koffler et al., 2021). Blinding measures were tested using the Pearson $\chi^2$ analysis. Effect size was reported as Cohen *d*.

Alcohol pharmacokinetics parameters were analyzed using data collected from the BrAC curve using confidence interval (*CI* 95%) and included max concentration ($C_{max}$) (target 0.08g/dL), time to reach $C_{max}$ ($T_{max}$) (target 20min), and area under the curve (AUC), calculated by $\int_{t=100}^{t=0}(BrAC)dx$ ($t_0$=pre-alcohol administration and $t_{100min}$=post-alcohol administration).

All outcomes were assessed in real-time in the laboratory testing probenecid compared to placebo condition during the alcohol administration procedure. We used a Generalized Estimating Equation (GEE) (Zeger and Liang, 1986) with standard errors, and an unstructured correlation matrix with medication (probenecid/placebo) and time ($T_{20min}$= ascending and $T_{40min}$=descending alcohol limb) as within-subject factors. The model was specified to evaluate the main effect of medication (probenecid vs placebo) and main effect for time (ascending vs descending alcohol limb). Also, the medication by time interaction was evaluated separately to assess if the probenecid effect differed with descending vs. ascending limb.

Sex as biological variable (SABV) for all outcomes was analyzed using GEE with medication (probenecid vs placebo) and time ($T_{20min}$= ascending and $T_{40min}$=descending alcohol limb) as within-subject factors. The SABV model was specified to evaluate the main effect for medication (probenecid vs placebo) and sex (females vs

males). The medication by sex interaction assessed if the probenecid effect differed for female compared to male participants.

*Primary and secondary outcomes.* The BAES was used to assess the stimulation (primary outcome) and sedation (secondary outcome) effect of alcohol. Alcohol craving (secondary outcome) was assessed using the AUQ and ACQ.

*Other outcomes.* Cognitive performance was assessed using two computer-based tasks: the DSST (number of trials attempted, the proportion of correct responses, errors and the latency between responses) (Jaeger, 2018) and the Go/no-Go (hit rate, false alarm rate, and the reaction time) (Holland and Ferner, 2017, Mellanby, 1919) tasks, with an alcohol-free session inserted as covariate in the model, and tested the effect of the study medications.

Biomarkers of inflammation were used to explore the effects of the co-administration of probenecid with alcohol on pro-inflammatory (leptin, CCL2, CD40, IL-6, IL-18, IL-1β, TNF-α) and anti-inflammatory (insulin, IL-10) markers. Insulin, IL-10, IL-18, IL-6 and TNF- α had a kurtosis in excess of four; consequently, an outlier analysis was performed and all outliers falling outside of ±3 interquartile range were treated as recommended (Tukey, 1962). Insulin and leptin serum levels were normalized to account for individual and sex-related variability using a hormone/body mass index (BMI) ratio (Haass-Koffler et al., 2015, Haass-Koffler et al., 2016). IL-1β serum level was below the lower limit of quantification (LLOQ) and was not analyzed. Serum levels were analyzed using GEE with baseline levels (visit 1: screening) inserted as a covariant in the model to test the effect of study medications on analyte levels.

All statistical analyses were performed after participants had completed their follow-up visits and the study database had been locked. All the statistical procedures were performed by IBM SPSS Statistics for Windows, version 29 (IBM Corp., Armonk, NY, USA), and GraphPad Prism (v.10) was used to generate figures (La Jolla, CA, USA). All statistical tests were two-tailed, and statistical significance was accepted if an alpha value $p<.05$ was obtained.

**FUNDING**

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## CONFLICT OF INTEREST

CLH-K received mifepristone and matching placebo for another trial and travel support to CA to present the data at the Corcept Therapeutic Conference (September 2022) and she holds two patents for the development of negative allosteric modulators targeting the stress system and one patent application on the development of a compound for noradrenergic blockade. All is unrelated to this work. The other authors declare no competing interests.

## DATA SHARING

The data that support the findings of this study are available at the National Institute of Mental Health Data Archive (NDA), Title: *Probenecid as pharmacotherapy for alcohol use disorder*, ID C3533 (PI: Haass-Koffler) and will be available on April 2025.

## REFERENCES


ALDO, P., MARUSOV, G., SVANCARA, D., DAVID, J. & MOR, G. 2016. Simple Plex™: a novel multi-analyte, automated microfluidic immunoassay platform for the detection of human and mouse cytokines and chemokines. Wiley Online Library.

BISAGA, A. & EVANS, S. M. 2006. The acute effects of gabapentin in combination with alcohol in heavy drinkers. *Drug Alcohol Depend,* 83**,** 25-32.

BOGER, W. P. & STRICKLAND, S. C. 1955. PROBENECID (BENEMID): Its uses and side-effects in 2,502 patients. *AMA archives of internal medicine,* 95**,** 83-92.

BOHN, M. J., KRAHN, D. D. & STAEHLER, B. A. 1995. Development and initial validation of a measure of drinking urges in abstinent alcoholics. *Alcohol Clin Exp Res,* 19**,** 600-6.

BRUZZONE, R., HORMUZDI, S. G., BARBE, M. T., HERB, A. & MONYER, H. 2003. Pannexins, a family of gap junction proteins expressed in brain. *Proc Natl Acad Sci U S A,* 100**,** 13644-9.

DAHL, G. & KEANE, R. W. 2012. Pannexin: from discovery to bedside in 11+/-4 years? *Brain Res,* 1487**,** 150-9.

DOHRMAN, D. P., DIAMOND, I. & GORDON, A. S. 1997. The role of the neuromodulator adenosine in alcohol's actions. *Alcohol Health Res World,* 21**,** 136-43.

DOSSI, E. & ROUACH, N. 2021. Pannexin 1 channels and ATP release in epilepsy: two sides of the same coin : The contribution of pannexin-1, connexins, and CALHM ATP-release channels to purinergic signaling. *Purinergic Signal,* 17**,** 533-548.

EVANS, S. M. & BISAGA, A. 2009. Acute interaction of baclofen in combination with alcohol in heavy social drinkers. *Alcohol Clin Exp Res,* 33**,** 19-30.

FILLMORE, M. T. & WEAFER, J. 2004. Alcohol impairment of behavior in men and women. *Addiction,* 99**,** 1237-46.

GILES, A., FOUSHEE, J., LANTZ, E. & GUMINA, G. 2019. Sulfonamide Allergies. *Pharmacy (Basel),* 7.

GUIDANCE, D. 2015. Alcoholism: developing drugs for treatment. *Center for Drug Evaluation and Research (CDER)*.

GUIDANCE, E. 2010. Development of medicinal products for the treatment of alcohol dependence - Scientific guideline. *European Medicie Agency.*

HAASS-KOFFLER, C. L., AKHLAGHI, F., SWIFT, R. M. & LEGGIO, L. 2017. Altering ethanol pharmacokinetics to treat alcohol use disorder: Can you teach an old dog new tricks? *J Psychopharmacol,* 31**,** 812-818.

HAASS-KOFFLER, C. L., AOUN, E. G., SWIFT, R. M., DE LA MONTE, S. M., KENNA, G. A. & LEGGIO, L. 2015. Leptin levels are reduced by intravenous ghrelin administration and correlated with cue-induced alcohol craving. *Transl Psychiatry,* 5**,** e646.

HAASS-KOFFLER, C. L., CANNELLA, N. & CICCOCIOPPO, R. 2020a. Translational dynamics of alcohol tolerance of preclinical models and human laboratory studies. *Exp Clin Psychopharmacol,* 28**,** 417-425.

HAASS-KOFFLER, C. L., GIOVENCO, D. E., LEE, M. R., ZYWIAK, W. H., DE LA MONTE, S. M., KENNA, G. A., SWIFT, R. M. & LEGGIO, L. 2016. Serum Insulin Levels Are Reduced by Intravenous Ghrelin Administration but Do Not Correlate with Alcohol Craving in Alcohol-Dependent Individuals. *Int J Neuropsychopharmacol,* 19.

HAASS-KOFFLER, C. L. & KENNA, G. A. 2013. Bacchus by Caravaggio as the Visual Diagnosis of Alcohol Use Disorder from the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). *Front Psychiatry,* 4**,** 86.

HAASS-KOFFLER, C. L., LEGGIO, L. & KENNA, G. A. 2014. Pharmacological approaches to reducing craving in patients with alcohol use disorders. *CNS Drugs,* 28**,** 343-60.

HAASS-KOFFLER, C. L. & PERCIBALLI, R. 2020. Alcohol Tolerance in Human Laboratory Studies for Development of Medications to treat Alcohol Use Disorder. *Alcohol Alcohol,* 55**,** 129-135.

HAASS-KOFFLER, C. L., PERCIBALLI, R., MAGILL, M., LOCHE, A., CACCIAGLIA, R., LEGGIO, L. & SWIFT, R. M. 2021. An inpatient human laboratory study assessing the safety and tolerability, pharmacokinetics, and biobehavioral effect of GET 73 when co-administered with alcohol in individuals with alcohol use disorder. *Psychopharmacology (Berl)*.

HAASS-KOFFLER, C. L., PIACENTINO, D., LI, X., LONG, V. M., LEE, M. R., SWIFT, R. M., KENNA, G. A. & LEGGIO, L. 2020b. Differences in Sociodemographic and Alcohol-Related Clinical Characteristics Between Treatment Seekers and Nontreatment Seekers and Their Role in Predicting Outcomes in the COMBINE Study for Alcohol Use Disorder. *Alcohol Clin Exp Res,* 44**,** 2097-2108.

HAMILTON, M. 1959. The assessment of anxiety states by rating. *Br J Med Psychol,* 32**,** 50-5.

HOLLAND, M. G. & FERNER, R. E. 2017. A systematic review of the evidence for acute tolerance to alcohol - the "Mellanby effect". *Clin Toxicol (Phila),* 55**,** 545-556.

HUANG, Y., GRINSPAN, J. B., ABRAMS, C. K. & SCHERER, S. S. 2007. Pannexin1 is expressed by neurons and glia but does not form functional gap junctions. *Glia,* 55**,** 46-56.

IGLESIAS, R., DAHL, G., QIU, F., SPRAY, D. C. & SCEMES, E. 2009. Pannexin 1: the molecular substrate of astrocyte "hemichannels". *J Neurosci,* 29**,** 7092-7.

JAEGER, J. 2018. Digit Symbol Substitution Test: The Case for Sensitivity Over Specificity in Neuropsychological Testing. *J Clin Psychopharmacol,* 38**,** 513-519.

JORGENSEN, C. H., PEDERSEN, B. & TONNESEN, H. 2011. The efficacy of disulfiram for the treatment of alcohol use disorder. *Alcohol Clin Exp Res,* 35**,** 1749-58.

LANNOY, S., DUKA, T., CARBIA, C., BILLIEUX, J., FONTESSE, S., DORMAL, V., GIERSKI, F., LOPEZ-CANEDA, E., SULLIVAN, E. V. & MAURAGE, P. 2021. Emotional processes in binge drinking: A systematic review and perspective. *Clin Psychol Rev,* 84**,** 101971.

MARCZINSKI, C. A. & FILLMORE, M. T. 2003a. Dissociative antagonistic effects of caffeine on alcohol-induced impairment of behavioral control. *Exp Clin Psychopharmacol,* 11**,** 228-36.

MARCZINSKI, C. A. & FILLMORE, M. T. 2003b. Preresponse cues reduce the impairing effects of alcohol on the execution and suppression of responses. *Exp Clin Psychopharmacol,* 11**,** 110-7.

MARTIN, C. S., EARLEYWINE, M., MUSTY, R. E., PERRINE, M. W. & SWIFT, R. M. 1993. Development and validation of the Biphasic Alcohol Effects Scale. *Alcoholism, clinical and experimental research,* 17**,** 140-6.

MC, K. S., PECK, H. M., BOCHEY, J. M., BYHAM, B. B., SCHUCHARDT, G. S. & BEYER, K. H. 1951. Benemid, p-(DI-n-propylsulfamyl)-benzoic acid; toxicologic properties. *J Pharmacol Exp Ther,* 102**,** 208-14.

MELLANBY, E. 1919. *Alcohol: its absorption into and disappearance from the blood under different conditions*, The University Press.

MOUSSEAU, M., BURMA, N. E., LEE, K. Y., LEDUC-PESSAH, H., KWOK, C. H. T., REID, A. R., O'BRIEN, M., SAGALAJEV, B., STRATTON, J. A., PATRICK, N., STEMKOWSKI, P. L., BIERNASKIE, J., ZAMPONI, G. W., SALO, P., MCDOUGALL, J. J., PRESCOTT, S. A., MATYAS, J. R. & TRANG, T. 2018. Microglial pannexin-1 channel activation is a spinal determinant of joint pain. *Sci Adv,* 4**,** eaas9846.

NAM, H. W., BRUNER, R. C. & CHOI, D. S. 2013. Adenosine signaling in striatal circuits and alcohol use disorders. *Mol Cells,* 36**,** 195-202.

NOSENGO, N. 2016. Can you teach old drugs new tricks? *Nature,* 534**,** 314-6.

PASCALE, L. R., DUBIN, A. & HOFFMAN, W. S. 1952. Therapeutic value of probenecid (benemid) in gout. *J Am Med Assoc,* 149**,** 1188-94.

PEARCE, K., FISHER, L., DIXON, D., HERSON, J., FRANKOWSKI, R. & HEARON, M. 1990. Intention to treat in clinical trials, Statistical Issues in Drug Research and Development. Edited by Pearce KE. New York, Marcel Dekker.

REHM, J., DAWSON, D., FRICK, U., GMEL, G., ROERECKE, M., SHIELD, K. D. & GRANT, B. 2014. Burden of disease associated with alcohol use disorders in the United States. *Alcohol Clin Exp Res,* 38**,** 1068-77.

ROBBINS, N., GILBERT, M., KUMAR, M., MCNAMARA, J. W., DALY, P., KOCH, S. E., CONWAY, G., EFFAT, M., WOO, J. G., SADAYAPPAN, S. & RUBINSTEIN, J. 2018. Probenecid Improves Cardiac Function in Patients With Heart Failure With Reduced Ejection Fraction In Vivo and Cardiomyocyte Calcium Sensitivity In Vitro. *J Am Heart Assoc,* 7.

ROBBINS, N., KOCH, S. E., TRANTER, M. & RUBINSTEIN, J. 2012. The history and future of probenecid. *Cardiovasc Toxicol,* 12**,** 1-9.

ROBERTS, A. J., HEYSER, C. J., COLE, M., GRIFFIN, P. & KOOB, G. F. 2000. Excessive ethanol drinking following a history of dependence: animal model of allostasis. *Neuropsychopharmacology,* 22**,** 581-94.

RUBY, C. L., ADAMS, C. A., KNIGHT, E. J., NAM, H. W. & CHOI, D. S. 2010. An essential role for adenosine signaling in alcohol abuse. *Curr Drug Abuse Rev,* 3**,** 163-74.

SAMHSA, C. F. B. H. S. A. Q. 2022. Alcohol use disorder in past year: among people aged 12 or older. *In:* SAMHSA, C. F. B. H. S. A. Q. (ed.).

SCHULZ, K., ALTMAN, D. & MOHER, D. 2010. Consolidated Standards of Reporting Trials Group CONSORT 2010 Statement: Updated Guidelines for Reporting Parallel Group Randomised Trials. *Bmj,* 340**,** c332.

SELEN, A., AMIDON, G. L. & WELLING, P. G. 1982. Pharmacokinetics of probenecid following oral doses to human volunteers. *J Pharm Sci,* 71**,** 1238-42.

SEO, J. H., DALAL, M. S. & CONTRERAS, J. E. 2021. Pannexin-1 Channels as Mediators of Neuroinflammation. *Int J Mol Sci,* 22.

SILVERMAN, W., LOCOVEI, S. & DAHL, G. 2008a. Probenecid, a gout remedy, inhibits pannexin 1 channels. *Am J Physiol Cell Physiol,* 295**,** C761-7.

SILVERMAN, W., LOCOVEI, S. & DAHL, G. 2008b. Probenecid, a gout remedy, inhibits pannexin 1 channels. *American Journal of Physiology-Cell Physiology,* 295**,** C761-C767.

SINGLETON, E. 1995. Alcohol craving questionnaire, short-form (revised; ACQ-SF-R): background, scoring, and administration. *Baltimore, MD, USA*.

SINGLETON, E., TIFFANY, S. & HENNINGFIELD, J. Development and validation of a new questionnaire to assess craving for alcohol: problems of drug dependence. Proceeding of the 56th Annual Meeting, The College on Problems of Drug Dependence. National Institute on Drug Abuse, Rockville, MD, 1994. 289.

SOBELL, L. C. & SOBELL, M. B. 1992. Timeline follow-back: A technique for assessing self-reported alcohol consumption. *Measuring alcohol consumption: Psychosocial and biochemical methods***,** 41-72.

SOLIMAN, P., AMAEFUNA, I., GULLY, B. & HAASS-KOFFLER, C. L. 2023. Evaluating the Readability of Online Patient Facing Resources for Alcohol Use Disorder. *Alcohol*.

SPIELBERGER, C. D., GORSUCH, R. L. & LUSHENE, R. E. 1970. Manual for the state-trait anxiety inventory.

SULLIVAN, J. T., SYKORA, K., SCHNEIDERMAN, J., NARANJO, C. A. & SELLERS, E. M. 1989. Assessment of alcohol withdrawal: the revised clinical institute withdrawal assessment for alcohol scale (CIWA-Ar). *Br J Addict,* 84**,** 1353-7.

TUKEY, J. W. 1962. The future of data analysis. *The annals of mathematical statistics,* 33**,** 1-67.

TUNSTALL, B. J., LORRAI, I., MCCONNELL, S. A., GAZO, K. L., ZALLAR, L. J., DE GUGLIELMO, G., HOANG, I., HAASS-KOFFLER, C. L., REPUNTE-CANONIGO, V., KOOB, G. F., VENDRUSCOLO, L. F. & SANNA, P. P. 2019. Probenecid Reduces Alcohol Drinking in Rodents. Is Pannexin1 a Novel Therapeutic Target for Alcohol Use Disorder? *Alcohol Alcohol,* 54**,** 497-502.

VERZIJL, C. L., AHLICH, E., SCHLAUCH, R. C. & RANCOURT, D. 2018. The role of craving in emotional and uncontrolled eating. *Appetite,* 123**,** 146-151.

VOLPICELLI, J. R., WATSON, N. T., KING, A. C., SHERMAN, C. E. & O'BRIEN, C. P. 1995. Effect of naltrexone on alcohol "high" in alcoholics. *Am J Psychiatry,* 152**,** 613-5.

ZEGER, S. L. & LIANG, K.-Y. 1986. Longitudinal data analysis for discrete and continuous outcomes. *Biometrics***,** 121-130.

Figure Legends

**Figure 1 - Drug-alcohol Administration Protocol.** 90min following probenecid administration participants received two drinks designed to raise the BrAC to 0.08g/dL within the next 30 min (probenecid pharmacokinetics: $C_{max}$ ~2 h). Pre-alcohol assessments were administered to monitor safety and to ensure the participant was eligible to proceed with the alcohol administration procedure. A battery of physiological and psychological assessments was administered to measure potential adverse events both on the alcohol ascending and descending limbs. Post-alcohol assessments were administered to monitor safety prior to discharging the participant. The BrAC was collected 20, 40, 60, 80, and 100 min post alcohol administration. Probenecid plasma levels reflect expected pharmacokinetics. Image created with Biorender and Graphpad.

**Figure 2 – Study Design.** Visit 1: medical and psychiatric screen (ECG, blood, saliva, and urine analysis). Participants (counterbalanced with visit 4) also underwent the computer-based cognitive test. Visit 2: randomization, and laboratory I (single oral dose of probenecid, or placebo, and underwent an alcohol challenge). After a 1-3-day washout period, participants returned to Visit 3: alternate condition and the same alcohol laboratory session. Visit 4: follow-up visit and final assessments. Image created with Biorender.

**FIGURE 3** – **CONSORT Diagram**

**FIGURE 4** – **Alcohol pharmacokinetics and subjective response to alcohol.** Probenecid did not exert any significant effect on the main pharmacokinetics of alcohol ($C_{max}$, $T_{max}$, AUC) in the: **A**) overall sample (*p's*>.05) and **B**) between female and male participants (*N*=34, 50% females) (*P's*>.05). *Stimulant and sedative effect of alcohol when co-administered with study drug.* The BAES **C**) stimulation subscale: there was no main effect of medication or medication by time interaction. There was a significant main effect for time ($B_1$=-6.696; *p*<.001). **D**) sedation subscale: there no main effect of medication, time, or medication by time interaction (*p*>.05). All data presented as mean±*SEM*. **p* (main effect); $^{\#}p$ (interaction). All Cohen's *d* reported in **Supplementary**, **Table S1**.

**FIGURE 5** – **Alcohol craving and urge. A**) AUQ: there was a significant main effect for medication ($B_1$=-3.757; *P*=.006), medication by time interaction ($B_1$=-6.111; *p*<.001), and main effect for time ($B_1$=-2.519; *p*=.002) **B**)

ACQ total score: there was a significant main effect for medication ($B_1$=-4.235; $P$=.005), medication by time interaction ($B_1$=-4.943; $p$=.014) and a main effect for time ($B_1$=-3.643; $P$=.015). **C**) ACQ Expectancy sub-score: there was a significant a main effect for medication ($B_1$=-.366; $p$=.043) and main effect of time ($B_1$=-.664; $p$<.001). **D**) ACQ Emotionality sub-score: there was a significant a main effect for medication ($B_1$=-.609; $p$=.004) sub-score and medication by time interaction (ascending limb: $B_1$=-718; $P$=.008 and descending limb: ($B_1$=-.442; $p$=.042). All data presented as mean±*SEM*. **p* (main effect); #*p* (interaction). All Cohen's *d* reported in **Supplementary Table S2**.

**Figure 6 – Inflammatory Biomarkers. A)** Insulin: there was a main effect of sex ($B_1$=1.993; $p$=.008), but no medication by sex interaction. **B)** TNF-α: there was no main effect of sex or medication. There was a significant medication by sex interaction in males ($B_1$=-1.350; $p$=.012) probenecid, relative to placebo, significantly reduced TNF-α serum concentrations in males but not females. **p* (main effect); #*p* (interaction). All Cohen's *d* reported in **Supplementary**, **Table S3**.

**Figure 7 – Proposed Mechanism. A)** *Baseline:* equilibrative nucleoside transporter type 1 (ENT1) transports adenosine across the membrane according to the gradient. Pannexin 1 channels are open, releasing ATP into the extracellular space. **B)** *Alcohol:* in the presence of alcohol, ENT1 is believed to be inhibited, leading to an increase in extracellular adenosine. **C)** *Alcohol + Probenecid:* the introduction of probenecid inhibits pannexin 1 channels, decreasing extracellular ATP and potentially inhibiting the increase in extracellular adenosine produced by alcohol. Image created with Biorender.

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| **Table 1** – *Sociodemographic and clinical characteristic of participants at baseline (N=35)***Variable** | | ***M (SD)*** | ***N* (%)** |
|---|---|---|---|
| **Sociodemographic** | Sex<br>• Male<br>• Female | | 17 (48.6)<br>18 (51.4) |
| | Age (years) | 40 (15.7) | |
| | Race (*N*=35)<br>• Black<br>• Asian<br>• White<br>• Other or Multiracial<br>Ethnicity: Hispanic/Latino | | 4 (11.4)<br>1 (0.03)<br>25 (71.4)<br>5 (14.3)<br>4 (11.4) |
| | Education<br>• High School graduate<br>• Vocational Training<br>• College Graduate | | 6 (17)<br>2 (6)<br>27 (77) |
| | Marital status<br>• In a relationship (married, partnered, etc.)<br>• Not in a relationship (single, never married, etc.) | | 15 (43)<br>20 (57) |
| | Employment status<br>• Working (full or part time)<br>• Not currently working (retired, disable, unemployed)<br>• Student | | 20 (57)<br>7 (20)<br>8 (23) |
| **Alcohol and other substances use** | Family History of Drinking Questionnaire (yes to any relative) | | 26 (74) |
| | AUD Status: Structured Clinical Interview for Current DSM Disorders- 5<br>• No<br>• Mild<br>• Moderate<br>• Severe | <br>9<br>12<br>8<br>6 | |
| | Alcohol Urge (*N*=33)<br>Alcohol Craving (*N*=31) | 17 (11.8)<br>33 (16.1) | |
| | 90-day TimeLine Follow Back Alcohol Use<br>• Number of Drinks/Week (DPW)<br>• Number of Drinking Days (DD)<br>• Number of Drinks per Drinking Days (DDD) | <br>21.9 (23)<br>55.2 (32)<br>4.4 (2.9) | |
| | Other Substance Use Past Month (yes)<br>• Cannabis<br>• Tobacco | | 8 (22.9)<br>12 (34.3) |
| **Psychiatric** | Currently under the care of a psychiatrist or psychologist (yes) | | 13 (37.1) |
| | Diagnosed comorbidities (Yes)<br>• Depression or Bipolar Disorder<br>• Anxiety Disorder<br>• Attention Deficit Hyperactivity Disorder | | 17 (48.6)<br>14 (40)<br>5 (14.3) |
| | Hamilton Anxiety Scale (HAM-A) | 3.11 (4.107) | |
| | Hamilton Depression Scale (HAM-D) | 2.17 (2.72) | |
| | Perceived Stress Scale (PSS) (*N*=34) | 15 (7.86) | |
| | Self-Evaluation Questionnaire (state) (STAI-y1) (*N*=34) | 32.67 (10.09) | |
| | Self-Evaluation Questionnaire (trait) (STAI-y2) (*N*=34) | 36.28 (14.3) | |
| **Medical** | Systolic Blood Pressure (mmHg) | 126.46 (16.326) | |
| | Diastolic Blood Pressure (mmHg) | 77.60 (10.120) | |
| | Heart Rate (b/min) | 74.74 (13.37) | |
| | Alanine Transaminase (ALT) | 22 (13.7) | |
| | Aspartate Transaminase (AST) | 23 (6.71) | |
| | Blood Urea Nitrogen (BUN) | 11 (3.78) | |
| | Bilirubin | 0.49 (0.23) | |
| | Creatinine | 0.84 (0.18) | |
| | Estimated Glomerular Filtration Rate (eGFR) | 101 (18) | |

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