Daily smartphone assessments for substance use measurement in a methamphetamine clinical trial

Liam Acheson[1,2,3]; Krista J Siefried[1,2,3,4]; Brendan Clifford[1,2,3,4]; Carl Moller[5]; Jonathan Brett[6,7]; Michael Christmass[8]; Adrian Dunlop[4,9,10]; Paul Haber[4,11,12]; Didier Jutras-Aswad[13,14]; Nicholas Lintzeris[4,11,15]; Kirsten Morley[11,12]; Steve Shoptaw[16]; Madhukar Trivedi[17]; Nadine Ezard[1,2,3,4]

[1] The National Centre for Clinical Research on Emerging Drugs, c/o the University of New South Wales, Sydney, Australia, [2] St Vincent's Hospital Alcohol and Drug Service, Sydney, Australia, [3] The National Drug and Alcohol Research Centre, the University of New South Wales, Sydney, Australia, [4] New South Wales Drug and Alcohol Clinical Research and Improvement Network, c/o the New South Wales Ministry of Health, Sydney, Australia, School of Medicine, The Institute for Mental and Physical Health and Clinical Translation (IMPACT), Deakin University, Geelong, Australia [6] St. Vincent's Clinical School, the University of New South Wales, Sydney, Australia, [7] School of Population Health, the University of New South Wales, Sydney, Australia, [8] Next Step Drug and Alcohol Services, East Metropolitan Health Service WA, Perth, Australia, [9] Drug and Alcohol Clinical Services, Hunter New England Local Health District, Newcastle, Australia, [10] School of Medicine and Public Health, the University of Newcastle, Newcastle, Australia, [11] Faculty of Medicine and Health, Central Clinical School, Discipline of Addiction Medicine University of Sydney, Sydney, Australia, [12] Edith Collins Centre for Translational Research, Drug Health Services, Royal Prince Alfred Hospital, Sydney, Australia, [13] Research Centre, Centre Hospitalier de l'Université de Montreal (CRCHUM), Montreal, Quebec, Canada, [14] Department of Psychiatry and Addictology, Faculty of Medicine, Université de Montreal, Montreal, Quebec, Canada, [15] The Langton Centre, South East Sydney Local Health District, Sydney, New South Wales, Australia, [16] Department of Family Medicine, The University of California Los Angeles, Los Angeles, California, USA, [17] Peter O'Donnell Jr. Brain Institute, the University of Texas Southwestern Medical Center, Dallas, Texas, USA

Presenter's email: liam.acheson@svha.org.au

Introduction: Timeline followback (TLFB) is the gold standard for participant-reported substance use in clinical trials, however is at risk of recall bias. This study compared daily smartphone-based records of methamphetamine use using a free application (SEMA3) with researcher elicited 28-day timeline follow back (TLFB28) of methamphetamine use in a clinical pilot study.

Methods: Nested sub-study within an open-label pilot study of oral naltrexone/bupropion over 12-weeks for methamphetamine use disorder. Participants downloaded a smartphone application (SEMA3 [Smartphone Ecological Momentary Assessment]), and completed surveys each morning delivered via push notifications within a 2-hour window asking how many times and how much methamphetamine was used in the past 24 hours. Participants also completed TLFB28 with a study coordinator monthly. Participants were reimbursed (maximum $80) for attending study visits, but were not reimbursed for completing SEMA3 questionnaires.

Results: 20 people were enrolled in this trial. 95% (40/42) of TLFBs, and 40% of daily smart phone assessments were completed (563/1456) (survey completion rate 2-94%). By TLFB28, mean past 28-day methamphetamine use was 12.3 days at Week 4, 9.9 days at Week 8 and 11.8 days in Week 12. By EMA, mean past-28-day methamphetamine use was 5.5 days at Week 4, 4.5 days at Week 8, and 3.6 days at Week 12. Participants reported issues with the survey platform.

Discussions and Conclusions: Smartphone-delivered surveys provide an alternative assessment of substance use in clinical trials, limiting recall bias. While survey completion rates were low, further investigation is needed to understand the variability of survey

completion between participants. Importantly, remuneration was provided to people attending visits to complete the TLFB but nothing was provided to incentivise survey completion.

Implications for Practice or Policy: Future studies should include flexible data collection (smartphone application, paper diary, telephone check-in) to reduce potential technology issues, and consider incentives for survey completion.