

Background: Post-traumatic stress disorder (PTSD) is a significant health concern among Canadian military veterans, and this diagnosis increases the risk of a substance use disorderⁱ. This is due to veterans' high rate of prescribed medication with potential for misuse (e.g., opioids) as well as high-risk use of other licit and illicit substances to combat complex PTSD symptoms. Veterans Affairs Canada indicates that “[a]round 50% of males and 25% of females with chronic PTSD have major problems with alcohol and drugs; the figures for [v]eterans are even higher”ⁱⁱ.

Veterans often delay seeking help for PTSD because of stigmaⁱⁱⁱ, and are frequently engaging in unhealthy coping strategies, including problematic substance use, when they do access services^{iv}. Although the exact numbers are complicated to determine, veterans in Canada are effected by the problematic use of opioids at higher rates than the general population. A US study concluded that veterans are twice as likely then non-veterans to die of an accidental opioid overdose.^v We also know that opioids are widely used to control chronic pain and that our current response needs to broaden to address underlying social determinants of health. For veterans, addressing chronic pain management and the mental health impacts of trauma are paramount for reducing opioid use. Complementary practices such as psychiatric service dogs to augment traditional interventions are worthy of examination at this time^{vi}.

What the research tell us: There is growing evidence about the beneficial role of service dogs to address veterans' PTSD symptoms, but nothing specific to problematic substance use. For example, in an examination of a program in which veterans trained service dogs for fellow veterans, it was witnessed that participants had “increased patience, impulse control, [and] emotional regulation, improved ability to display affect [and] decrease in emotional numbness, improved sleep..., decreased depression..., decrease in pain medications ...[and] lowered stress levels”, among other benefits^{vii}. A recent study commissioned by Veterans Affairs Canada (VAC) of 18 PTSD diagnosed veterans living with service dogs, concluded the veterans had “[d]ecreased nightmares, improved sleep and a slight increase in physical activity; [n]o reduction in medication use, [m]oderate, long lasting reduction in depressive symptoms, [i]mproved quality of life [and] [m]ore social integration in the community, [d]ecreased PTSD symptoms, [and] [n]o reduction in reliance on a caregiver”^{viii}. Problematic substance use, including opioids, is not considered. There is a need for more research.

Responding to veterans' problematic substance use, including opioids: Recovery from problematic substance use is increasingly recognized as an individualized process comprised of various pathways, supports and connections^{ix}. The human-animal connection, or bond, is a form of attachment that develops between a person and an animal involving unconditional love, security, trust, and attention^x. A recent Canadian survey found that 88% of respondents identified their relationship with animals or pets as an important support in their recovery from addiction^{xi}. In the words of a veteran in one of our studies: “*One night I had a bad nightmare and she couldn't wake me so she rolled me off the bed. She brought me back from the dead. The dogs and people bond very tightly*”^{xii}. There is a fairly solid amount of research linking the role of companion animals in supporting individuals' mental health generally^{xiii}.

Our Study Findings: Our exploratory case study of four veterans indicates that psychiatric service dogs assisted with decreasing PTSD symptoms, and in turn decreased the problematic use of licit and illicit substances and stabilized or moderately decreased prescription medication use^{xiv}. This is part of a larger CIHR-supported, patient-oriented research^{xv} project examining how service dogs bond with veterans and whether the tasks they perform address veterans' problematic substance use, and specifically opioid use disorder. This in-depth, 18 month study is documenting the experiences of 6 veterans through interviews, an electronic application for movement (e.g., measuring time spent outdoors) and self-reported data (e.g., substance use), a medication review, heart rate/sleep quality, and blue tooth to measure proximity of the dog to the veterans. We also have a project under review with Health Canada's Substance Use and Addiction Program to assist service dog organizations working with PTSD-diagnosed veterans to address recovery from problematic substance use, including opioids, in their training programs. We recently completed an exploratory study with methadone maintenance treatment clients and found that pets supported recovery from opioid addiction; the finding aligns with the four dimensions of a life in recovery outlined by the Substance Abuse and Mental Health Services Administration: purpose, community, health, and home^{xvi}.

Explanation: A One Health framework addresses contemporary health issues by understanding the human, animal and environmental interface. Specifically, zooeyia acknowledges the beneficial role of animals in our lives^{xvii}. This is akin to an Indigenous worldview in which “[c]entral to wellness is belief in one's connection to language, land, beings of creation, and ancestry, supported by a caring family and environment”^{xviii}.

- ⁱ Banducci, A.N., Bujarski, S.J., Bonn-Miller, M.O., Patel, A., & Connolly, K. M. (2016). The impact of intolerance of emotional distress and uncertainty on veterans with co-occurring PTSD and substance use disorders. *Journal of Anxiety Disorders*, 41, 73-81. doi: 10.1016/j.janxdis.2016.03.003.
- ⁱⁱ Veterans Affairs Canada [VAC]. (2017). *Post-traumatic stress disorder (PTSD) and war-related stress*. Ottawa ON: Government of Canada. Retrieved from: <http://www.veterans.gc.ca/eng/services/health/mental-health/publications/ptsd-warstress>. para. 25.
- ⁱⁱⁱ Dell, C., Arratoon, C., Lapointe, M., & Lohnes, C. (2017). The impact of service dogs in the lives of Veterans who problematically use substances. *Canadian Vet*, September/October, 12. Retrieved from: <http://www.colleendell.ca/wp-content/uploads/2018/08/Cvet-September-October-2017.pdf>; Harnish, A., Corrigan, P., Byrne, T., Pinals, D., Rodrigues, S., & Smelson, D. (2016). Substance use and mental health stigma in veterans with co-occurring disorders. *Journal of Dual Diagnosis*, 12(3-4), 238-243. DOI:10.1080/15504263.2016.1245066.
- ^{iv} Bennett, A.S, Elliott, L., & Golub, A. (2013). Opioid and other substance misuse, overdose risk, and the potential for prevention among a sample of OEF/OIF Veterans in New York City. *Substance Use and Misuse*, 48(10), 894-907. Retrieved from: <https://www.tandfonline.com/doi/abs/10.3109/10826084.2013.796991>; Seal, K.H, Shi, Y., Cohen, G., Cohen, B.E., Maguen, S., Krebs, E.E., & Neylan, T.C. (2012). Association of mental health disorders with prescription opioids and high-risk opioid use in US veterans of Iraq and Afghanistan. *JAMA*, 307(9), 940-947. doi: 10.1001/jama.2012.234.
- ^v Childress S. Veterans face greater risks amid opioid crisis. PBS Frontline. 2016 March 28; [January 10, 2017]; <http://www.pbs.org/wgbh/frontline/article/veterans-face-greater-risks-amid-opioid-crisis>. [Reference list]
- ^{vi} Wynn, G.H. (2015). Complementary and alternative medicine approaches in the treatment of PTSD. *Current Psychiatry Reports*, 17(62), 1-7. Retrieved from: <https://link.springer.com/content/pdf/10.1007%2Fs11920-015-0600-2.pdf>, p.61
- ^{vii} Yount, R.A., Ritchie, E.C., St. Laurent, M., Chumley, P., & Olmert, M. (2013). The role of service dog training in the treatment of combat-related PTSD. *Psychiatric Annals*. 43:6. Retrieved from: <http://m3.wyanokecdn.com/a99b4d412b37210586055a1e04e58ad3.pdf>, p. 293; Yount, R.A., Olmert, M.D., & Lee, M.R. (2012). Service dog training program for treatment of posttraumatic stress in service members. *U.S Army Medical Department Journal*, Apr-June, 63-69. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/22388685>.
- ^{viii} Veterans Affairs Canada [VAC]. (2018). *Service Dog Pilot Study Results*. Ottawa, ON: Government of Canada. Retrieved from: <https://www.veterans.gc.ca/eng/news/info-graphics/service-dog>
- ^{ix} Mate, G. (2009). *In the Realm of Hungry Ghosts: Close Encounter with Addictions*. Toronto: Random House of Canada; Weiss, R. (2015, September 30). The opposite of addiction is connection. *Psychology Today*. Retrieved from: <https://www.psychologytoday.com/ca/blog/love-and-sex-in-the-digital-age/201509/the-opposite-addiction-is-connection>.
- ^x Fine, A. (2019). The human-animal bond over the lifespan: A primer for mental health professionals. (p. 2-19). In L. Kogan & Blazina, C. (2019). *Clinician's Guide to Treating Companion Animal Issues. Addressing Human-animal Interaction*. UK: Elsevier; Terpin, J. L. (2004). *Exploring the Human-animal Bond in an Animal-assisted Therapy Program for At-risk Youth* (Thesis, Antioch University, Keene NH). Retrieved from: <https://search.proquest.com/docview/305056392>
- ^{xi} McQuaid, R., Malik, A., Moussouni, K., Baydack, N., Stargardter, M., & Morrissey, M. (2017). *Life in Recovery from Addiction in Canada*. Ottawa ON: Canadian Centre on Substance Use and Addiction. Retrieved from: <http://www.ccsa.ca/Resource%20Library/CCSA-Life-in-Recovery-from-Addiction-Report-2017-en.pdf>
- ^{xii} Husband, A., Ahmed, A. & Dell, C. An exploratory case study of the impact of psychiatric service dogs on problematic substance use among PTSD-diagnosed veterans". *Journal of Substance Use*. Under review.
- ^{xiii} Chandler, C. (2019). Eight domains of pet-owner wellness: Implications for counsellors and counsellor training. (p. 103-114). In L. Kogan & Blazina, C. (2019). *Clinician's Guide to Treating Companion Animal issues. Addressing human-animal interaction*. UK: Elsevier.
- ^{xiv} Husband, A., Ahmed, A. & Dell, C. An exploratory case study of the impact of psychiatric service dogs on problematic substance use among PTSD-diagnosed veterans". *Journal of Substance Use*. Under review.
- ^{xv} For more information, see: <https://crismprairies.ca/home-2/projects-2/the-impact-of-service-dogs-in-the-lives-of-veterans-who-problematically-use-opioids/>.
- ^{xvi} Kosteniuk, B. & Dell, C. How companion animals support recovery from opioid addiction: An exploratory study of patients in a Methadone Maintenance Treatment Program. *APORIA Journal*. Under review.
- ^{xvii} Hodgson, K. & Darling, M. (2011). Zooeyia: An essential component of One Health. *The Canadian Veterinary Journal*. 52(2): 189-191; Chalmers, D. & Dell, C.A. (2015). "Applying One Health to the Study of Animal Assisted Interventions". *EcoHealth Journal*. 12(4), pp. 560-562.
- ^{xviii} Elder Jim Dumont, National Native Addictions Partnership Foundation, Honouring Our Strengths: Indigenous Culture as Intervention in Addictions Treatment Project - University of Saskatchewan. (2014). *Reference Guide*. Bothwell, Ontario: Author. Canadian Institutes of Health Research, Funding Reference Number AHI-120535.