

**Evidence-Based Practice Group Answers to Clinical  
Questions**

**“Use of Service Dogs for Treating Post-  
Traumatic Stress Disorder – 2021 Update”**

**A Rapid Systematic Review**

By

**WorkSafeBC Evidence-Based Practice Group**

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## About this report

# Use of Service Dogs for Treating Post-Traumatic Stress Disorder – 2021 Update

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### About the Evidence-Based Practice Group

The Evidence-Based Practice Group was established to address the many medical and policy issues that WorkSafeBC officers deal with on a regular basis. Members apply established techniques of critical appraisal and evidence-based review of topics solicited from both WorkSafeBC staff and other interested parties such as surgeons, medical specialists, and rehabilitation providers.

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## Objective

To determine whether there is any new evidence for the efficacy or effectiveness in the use of animal-assisted therapy (service dogs, in particular) for treating Post-Traumatic Stress Disorder (PTSD) since the publication of our previous systematic review (February 2016) titled “**Use of Service Dogs for Treating Post-Traumatic Stress Disorder**”.

## Introduction

- In 2015, WorkSafeBC was asked to conduct a systematic review to determine whether there is any evidence for the efficacy or effectiveness in the use of service dogs for treating Post-Traumatic Stress Disorder (PTSD). The review concluded that there maybe some low level (small case series, level of evidence 4. Appendix 1), low quality evidence that support the efficacy/effectiveness in using dog- or horse-assisted therapy in reducing symptoms of PTSD.
- An update on the role of animal-assisted therapy in treating PTSD was completed in 2016 which identified two new primary studies and one systematic review. However, these new findings did not alter previous findings/conclusion.
- Recently, two Canadian reports looked into the use of animal therapy for treatment of PTSD and other mental health issues, the INESSS and CADTH reports respectively<sup>1,2</sup>.
- This current review seeks to update the literature from the 2016 update, to investigate whether there is new evidence to determine the efficacy or effectiveness in the use of service dogs for treating PTSD.

## Methods

- A comprehensive systematic literature search was conducted on October 08, 2020.
- The literature search was done on commercial medical literature databases, including Cochrane Database of Systematic Reviews®, ACP Journal Club®, University of York Database of Abstracts of Reviews of Effects®, Cochrane Central Register of Controlled Trials®, University of York Health Technology Assessment®, UK NHS Economic Evaluation Database®, BIOSIS Previews®, Embase®, MEDLINE®, MEDLINE In-Process & Other Non-Indexed Citations®, MEDLINE Daily Update® and OLDMEDLINE®, that are available through the OVID® platform/interface.

- The search was done by employing combinations of keywords. Full search strategies seen in Appendix 2.
- Since the purpose of this systematic review is to update our previous review, a publication date perimeter was set on the literature search, from February 15, 2016 to October 8, 2020.
- Limitations such as on language of publication, were not employed in any of these searches.
- A manual search was also conducted on the references of the articles that were retrieved in full.

## Results

### Search results:

- 77 published studies were identified from the searches conducted based on the criteria described. After duplicates were removed, 69 published studies remained.
- Upon examination of the titles and abstracts of these 69 studies, twenty-nine<sup>3–31</sup> were thought to be relevant and were retrieved in full for further appraisal.
- After full text screen was completed, ten studies<sup>3–5,8,21,24,27–30</sup> looked into animal-assisted therapies. Six<sup>3,4,21,27,29,30</sup> of those studies that specifically looked at service dogs that were included in this review.

### Study Characteristics

- A description of study characteristics of included studies is included in Table 1.
- All six studies<sup>3,4,21,27,29,30</sup> included were from a military/veteran population.
- None of the studies were randomized controlled trials. Four studies had a controlled study design<sup>3,4,21,29</sup>, and two studies had a pre-post study design<sup>27,30</sup>.
- Two studies compared service dog therapy to usual care or no intervention<sup>3,21</sup>, three studies compared service dog therapy to waitlist control<sup>4,29,30</sup>, and one study had no comparator<sup>27</sup>. No study compared service dogs alone vs. a standard PTSD intervention.
- There was substantial heterogeneity in the service dog therapy intervention in terms of intervention duration and frequency. Intervention duration ranged from four weeks<sup>3</sup> to 52 weeks<sup>4</sup>. One study had an intervention duration of four weeks<sup>3</sup>, one study had a duration of 12 weeks<sup>27</sup>, one study had a duration of 14 weeks<sup>29</sup>, one study had a

duration of 52 weeks<sup>4</sup>, and two studies were cross sectional and had heterogeneity of duration within study ranging from 1 month to 7 years<sup>21,30</sup>.

- Intervention frequency varied from either weekly sessions<sup>3,4,29</sup> to seven days a week (full time service dog ownership)<sup>21,27,30</sup>.
- Timepoint of when outcomes were followed up and measured also varied between studies. Treatment followup ranged from four weeks<sup>3</sup> to 52 weeks<sup>4</sup>. One study had a followup of four weeks<sup>3</sup>, one study had a followup of 12 weeks<sup>27</sup>, one study had a followup of 39 weeks<sup>29</sup>, one study had a followup of 52 weeks<sup>4</sup>, and three studies were cross sectional and follow up duration was not available<sup>21,23,30</sup>.

### Study Quality

- Study quality was deemed low to low/moderate for most studies: three studies showed low/moderate quality<sup>3,21,30</sup> while the other three had low study quality<sup>4,27,29</sup> (Appendix 1).
- Study quality was lowered in most studies due to methodological limitations due to risk of bias. Specifically study quality was lowered for all primary studies as the studies were not randomized controlled studies. Furthermore, the studies included were not able to fully control for performance bias (blind participants, investigator).
- Study quality was also lowered due to imprecision because of low numbers of participants in the included studies

### Outcomes

- A description of study outcomes of included studies is included in Table 2.
- For PTSD outcomes, three studies used the PTSD Checklist, military version (PCL-M) score<sup>4,21,27</sup>, one study used PTSD Checklist, civilian version (PCL-C) score<sup>30</sup>, one study used Hopkins Symptom Checklist 25 (HSCL-25) score<sup>3</sup> and one study used Trauma Symptom Inventory-2 (TSI-2) score<sup>29</sup>.
- Four of the six studies<sup>3,21,29,30</sup> had PTSD interventions other than dog interventions, while in the other two studies it was not reported<sup>4,27</sup>.
- Two studies compared change in PTSD symptom severity pre vs. followup<sup>3,29</sup>, while four compared change in PTSD symptom severity after getting a service dog<sup>4,21,27,30</sup>.
- Five of the six studies showed a statistically significant difference between the comparator (vs. usual care, vs. waitlist, no comparator)<sup>4,21,27,29,30</sup>. Specifically, one of two *vs. usual care*, all three *vs. waitlist*, and one *vs. no comparator*.

- For the PCL score for DSM-IV, response to treatment is defined as somewhere between a 5-10 point change while a clinically meaningful response is defined as between a 10-20 point change. The studies using the PCL scores used the minimum threshold for determining whether both the response to treatment and clinically meaningful improvement (5 and 10 respectively).
- Three of the six studies showed both a response to treatment and clinical meaningful change based on minimal thresholds<sup>21,27,30</sup>.
- A cut-off score of 50 is established as optimal for indicating a probable diagnosis of combat-related PTSD for PCL-M, while for civilian populations it is lower, at 33. Of the 4 studies using a PCL checklist, none of study participants had scores below the cutoff of ( $\leq 50$ ) after intervention. The other two studies did not report on rates of participants scoring above or below cut- after intervention.

## Discussion

- The two recent reports looked into the use of animal therapy for treatment of PTSD and other mental health issues, the INESSS and CADTH reports respectively<sup>1,2</sup>.
- INESSS SLR included 17 papers broken down into 14 papers for 11 studies looking at assistance dogs for PTSD<sup>32-45</sup>, and 3 studies looking at companion dogs for PTSD<sup>46-48</sup>. Seven of these are dissertations and not peer reviewed<sup>35,36,38,39,42,46,48</sup>.
- Four of the included studies in our SLR were identified in the included studies of the INESSS<sup>4,21,27,30</sup> while the other six were not included for various reasons (not published when search conducted in January 2019<sup>3,24,29</sup>, equine study<sup>5,8,28</sup>)
- The CADTH paper had a stricter inclusion criteria than the INESSS report, sourcing only peer-reviewed studies that had a psychotherapy comparator, although including both canine and equine service animals.
- The CADTH paper looked at a broader scope of mental health issues (i.e. PTSD, generalized anxiety disorder, major depressive disorder)
- Only one non-randomized study was included and looked at equine assisted therapy<sup>5</sup>.
- in our SLR on service dogs, the majority of included studies were identified in the initial text screen of the CADTH paper but were excluded due to stricter inclusion criteria, such as waitlist comparator<sup>8,21</sup>, no comparator<sup>28,30</sup>, and case series<sup>24</sup>.
- Furthermore, we only looked at service dogs as an intervention as compared to the other two reports as this was an update to our

previous service dogs SLR (i.e. no other animal assisted interventions such as companion animals/equine therapy)

- When DSM-V was implemented in 2013, PCL checklist definitions changed to reflect the addition of new symptoms and modification of previous symptoms. The current iteration of the checklist, PCL-5, has a threshold score of 31-33 which suggests a patient might benefit from PTSD treatment.
- For the PCL for DSM-IV, a cutoff score of 30-50, (50 for military population) for the PTSD definition.
- None of the participants of the six studies were below the diagnostic cutoff of PTSD (PCL-M<50, PCL-5<31-33) after follow-up.
- While these studies reported a reduction in PTSD symptoms among participants, it should be strongly noted that bias, especially selection bias and confounders (including co-intervention such as usual care) limit the confidence in which these results are considered.
- All surveys (i.e. HSCL-25, PCL-M, PCL-C, TSI-2) were self-administered and no clinician-administered measures were used; thus, the potential for bias cannot be excluded when interpreting the findings.
- As PTSD is a 'chronic disease', longer term data will be needed in assessing the efficacy/effectiveness of service dogs intervention in PTSD.

## Summary

- This update on the role of animal-assisted therapy in treating PTSD identified six new primary studies that used service dogs as an intervention.
- The low/moderate- to low-quality evidence, suggest that service dogs may be more effective than waitlist control in reducing PTSD symptomology.
- None of the participants in the six studies had scores were below the diagnostic cutoff of PTSD (PCL-M<50, PCL-5<31-33) in the service dog intervention group after follow-up.
- Service dog interventions should not be considered as sole treatment for PTSD.
- Future studies should look into the use of service dogs as complimentary/adjunct therapy to conventional PTSD therapy using well controlled, larger scale studies.

- While most studies showed some improvement in post-traumatic symptomatology, with several indicating a clinically meaningful change, methodological limitations with respect to heterogeneity in intervention frequency and duration, as well as with outcome ascertainment, make it difficult to come to reach conclusions with confidence. Therefore, these new findings did not alter our previous findings/conclusions.



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Primary Study	n	Experimental Group (n)	Comparison Group(s) (n)	Study type	Intervention duration/frequency (weeks)	PTSD symptom severity outcome	Other Outcomes
<b>Beetz et al., 2019</b>	60	Service Dog + Standard Treatment (29)	Standard Treatment (31)	Pilot study, non randomized	Weekly for 4 weeks	HSCL-25	
<b>Bergen-Cico et al., 2018</b>	48	Service Dog (34)	Waitlist (14)	Longitudinal study	Weekly for 52 weeks	PCL-M	
<b>O'Haire et al., 2018</b>	141	Service Dog (75) + Usual Care	Usual Care (66)	Non-randomized study	Daily for 1 month to 4 years	PCL-M	
<b>Vincent et al., 2017</b>	15	Service Dog (15)	None	Case series	Daily for 12 weeks	PCL-M	
<b>Whitworth et al., 2019</b>	30	Service Dog (15)	Waitlist (15)	Pilot study	Weekly for 14 weeks	TSI-2	
<b>Yarborough et al., 2017</b>	78	Service Dog (24)	Waitlist (54)	Cross-sectional study (non-randomized)/ Observational study (subset)	Daily for mean of 26.9 ± 13.6 months	PCL-C	

Table 1. Description of study characteristics for the treatment of PTSD using service dogs. Abbreviations: Hopkins Symptom Checklist 25 (HSCL-25), PTSD Checklist – Civilian Version (PCL-C), PTSD Checklist – Military Version (PCL-M), Post-traumatic stress disorder (PTSD), Trauma Symptom Inventory-2 (TSI-2).

*a. Service dogs vs. Usual care*

Primary Study	n	Experimental Group (n)	Comparison Group(s) (n)	Outcome
<b>Beetz et al., 2019</b>	60	Service Dog + Standard Treatment (29)	Standard Treatment (31)	(=) The comparison of intervention and control group over the four times of measurement did not indicate a significant advantage of the dog assisted intervention regarding PTSD symptom severity (HSCL-25), perceived stress (PSS-14), functional problems with emotions and actions due to the PTSD (SEASL), and the therapeutic alliance
<b>O'Haire et al., 2018</b>	141	Service Dog (75)	Usual Care (66)	(+/=) Mixed model analyses revealed clinically significant reductions in PTSD symptoms from baseline following the receipt of a service dog but not while receiving usual care alone (Clinically meaningful change in PTSD symptomology: >10 points). Though clinically meaningful, average reductions at follow up were not below the diagnostic cutoff on the PTSD Checklist (58.2 vs cutoff of PCL-M at 50).

*b. Service dogs vs. Waitlist*

Primary Study	n	Experimental Group (n)	Comparison Group(s) (n)	Outcome
<b>Bergen-Cico et al., 2018</b>	48	Service Dog (34)	Waitlist (14)	(+/=) Using linear regression, veterans participating in the Dogs2Vets owner-trainer program experienced significant reductions scores of post-traumatic stress (PCL-M ( $p=0.01$ )), perceived stress ( $p\leq 0.001$ ) and self-judgment ( $p=0.002$ ), accompanied by significant increases in self-compassion ( $p\leq 0.001$ ). The mean decline was just below the 5-point change in PCL-M score that is considered to be the threshold for clinically determining whether an individual has responded to PTSD treatment (-4.5 vs 5).
<b>Whitworth et al., 2019</b>	30	Service Dog (15)	Waitlist (15)	(+) Significant decreases in posttraumatic symptomatology (TSI-2), intra/interpersonal difficulties associated with psychological trauma, and in disabilities secondary to their PTSD specifically in Domain 6 Participation in society (WHO-DAS). Specially the Posttraumatic Stress subscale of TSI-2 was significant (group mean difference: 26.3, $t=3.42$ )
<b>Yarborough et al., 2017</b>	78	Service Dog (24)	Waitlist (54)	(+/=) For cross-sectional study, Baseline value comparison only, fewer symptoms of PTSD (PCL-C) ( $p=0.001$ ); better quality of life / strong effect size ( $p=0.001$ ); No clinically meaningful change reported. PCL-C score after receiving service dog not below the diagnostic cutoff on the PTSD Checklist (51.8 vs cutoff of PCL-M at 50).

*c. Service dogs (No comparator)*



Primary Study	n	Experimental Group (n)	Comparison Group(s) (n)	Outcome
Vincent et al., 2017	15	Service Dog (15)	None	(+/-) Positive changes sleeping, post-traumatic symptoms and depression, no change observed yet in the quality of life and in movements in community. For the treatment group, the change was clinically significant (13 vs >10), but not below the diagnostic cutoff on the PTSD Checklist (52.5 vs cutoff of PCL-M at 50).

Table 2. Description of study outcomes for the treatment of PTSD using service dogs. a) Service dogs vs. usual care. b) Service dogs vs. waitlist. c) No comparator. Abbreviations: PTSD CheckList – Civilian Version (PCL-C), Post-traumatic stress disorder (PTSD), Trauma SymptomInventory-2 (TSI-2), WHO Disability Assessment Schedule (WHODAS 2.0)

## Appendix 1

### WorkSafeBC - Evidence-Based Practice Group Levels of Evidence

(adapted from 1,2,3,4)

<b>1</b>	Evidence from at least 1 properly randomized controlled trial (RCT) or systematic review of RCTs.
<b>2</b>	Evidence from well-designed controlled trials without randomization or systematic reviews of observational studies.
<b>3</b>	Evidence from well-designed cohort or case-control analytic studies, preferably from more than 1 centre or research group.
<b>4</b>	Evidence from comparisons between times or places with or without the intervention. Dramatic results in uncontrolled
<b>5</b>	Opinions of respected authorities, based on clinical experience, descriptive studies or reports of expert committees.

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## Appendix 2

### Search 1. Search strategy for MEDLINE (via OVID)

1	post-traumatic stress disorder.mp.	14297
2	ptsd.mp.	31199
3	post traumatic stress disorder.mp.	14297
4	posttraumatic stress disorder.mp.	23720
5	or/1-4	42214
6	dog*.mp.	373531
7	horse*.mp.	121769
8	animal-assisted therapy.mp.	772
9	animal assisted therapy.mp.	772
10	or/6-9	489083
11	5 and 10	122
12	limit 11 to yr="2016 -Current" [Limit not valid in DARE; records were retained]	77