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# Vocational rehabilitation for emergency services personnel: a scoping review.

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1 **Title:**

2 **Vocational rehabilitation for emergency services personnel: a scoping review**

3

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15 **Emergency services; Scoping review; Vocational rehabilitation**

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28 **Abstract**

29 **Objective:** The objective of this scoping review is to examine and map the range of vocational  
30 rehabilitation available for emergency services personnel.

31 **Introduction:** Employee work absence due to illness and injury is an international burden. The  
32 emergency service sector (police officers, firefighters and ambulance/paramedic staff) workforce has  
33 been shown to report a higher prevalence of illness/injury and sick leave compared to the general  
34 population. Despite the evidence of physical and psychological problems that emergency service  
35 sector workers can face, vocational rehabilitation (VR) interventions and the structure and  
36 effectiveness of VR for these workers are less well known.

37 **Inclusion criteria:** This scoping review considered studies that included adult emergency medical  
38 services (EMS) personnel (e.g. police officers, firefighters and ambulance/paramedic staff),  
39 regardless of age, sex or rank. EMS personnel from any developed nation were included. The  
40 interventions included any VR regardless of condition, work status (VR to prevent sick leave or for  
41 workers on sick leave) or focus (e.g. mental health issues, neurological problems or musculoskeletal  
42 conditions). VR interventions can include work conditioning, work hardening, physiotherapy,  
43 counseling, functional restoration and occupational rehabilitation.

44 **Methods:** Published and unpublished literature in English from 2007 to 2017 was included in this  
45 review. A three-step search strategy was followed that included five databases and nine websites.  
46 Data extraction was performed by two reviewers using a pre-determined data extraction form  
47 developed by the authors.

48 **Results:** This review identified 24,271 sources of information, of which 48 were screened at full-text  
49 stage, and 22 sources were eligible to be included in the final scoping review. The majority of the  
50 sources provided evidence of VR for police officers and firefighters. VR is typically provided in  
51 residential rehabilitation settings as well as some outpatient, off-site and workplace settings. The main  
52 type of VR provided is physical, but there is also evidence of psychological rehabilitation and  
53 addiction/substance misuse rehabilitation.

54 **Conclusions:** This review demonstrated that there is a lack of information in the public domain on VR  
55 for staff working in the emergency service sector, as well as a lack of rigorous evaluation available on  
56 the effectiveness of VR within the emergency service sector. There is inconsistent provision of VR  
57 internationally for emergency service sector staff.

58 **Keywords:**

59 Emergency services; scoping review; vocational rehabilitation

60 *JBI Database System Rev Implement Rep 2019; 17(??):??-??* (in italics and page numbers to be filled  
61 in when finalised – insert this in the box below keywords)

## 62 **Review questions/objectives**

63 The objective of this scoping review was to examine and map the range of vocational rehabilitation  
64 (VR) interventions available for emergency medical services (EMS) personnel. More specifically, the  
65 scoping review focused on the following questions:

66 i. Which types of VR interventions for police, firefighter and ambulance/paramedic personnel from  
67 developed countries have been reported?

68 ii. What are the characteristics of the VR (such as, but not limited to, physical interventions,  
69 psychological interventions or mixed content interventions) reported for police, firefighter and EMS  
70 personnel from developed countries?

71 iii. In what context (healthcare setting, work setting or rehabilitation setting) are VR interventions  
72 provided for police, firefighter and ambulance/paramedic personnel from developed countries?

## 73 **Introduction**

74 Employee work absence due to sickness and injury is a major cost to society and employers  
75 worldwide, with costs ranging from £14.1 billion in the United Kingdom,<sup>1</sup> to \$61.8 billion in Australia<sup>2</sup>  
76 and \$225.8 billion in the United States.<sup>3</sup> The emergency medical service sector (EMS), which includes  
77 police officers, firefighters and ambulance personnel/paramedics, is a common occupation globally,  
78 employing a significant number of people.<sup>4,5</sup> The sector employs around 2.1 million people in the  
79 United States, representing around 1.5% of the total workforce.<sup>6</sup> The EMS sector workforce has been  
80 shown to report a higher prevalence of illness/injury and sick leave compared to the general  
81 population, with musculoskeletal sprains and strains involving the lower trunk, lower limbs and  
82 neck/upper limbs the most commonly reported injuries.<sup>7-10</sup> The sector also reports higher blood  
83 pressure and higher rates of cardiovascular problems and metabolic syndrome than the general  
84 public,<sup>6,11</sup> along with high levels of job stress leading to mental health problems.<sup>12</sup>

85 Internationally, police officers have a higher incidence of work absence than the general population  
86 (women more than men)<sup>4,13,14</sup> due to illness and injury, and also a high incidence of sickness  
87 presenteeism, which reflects people working with an injury or illness that impacts their work  
88 productivity.<sup>15,16</sup> Police officers are recognized as having a higher risk of injury due to shift work, which  
89 has been shown to cause poor sleep quality and fatigue, increased systolic blood pressure in female  
90 police officers and increased injury and sick leave.<sup>4,17-20</sup> The profession has also been shown to cause  
91 stress-related psychological problems.<sup>21-23</sup> Research has highlighted stress and poor mental health at  
92 work for police officers (reported in up to 91% of officers) and occasional suicidal thoughts.<sup>24,25</sup> The  
93 most common musculoskeletal injury reported for police officers is low back pain.<sup>13,26-28</sup> A study in  
94 Norway found that female police officers demonstrate greater care-seeking behavior to address these  
95 issues compared to their male counterparts.<sup>29</sup>

96 Firefighters are also recognized as having a higher risk of musculoskeletal injury<sup>30</sup> and cardiovascular  
97 problems<sup>31,32</sup> than the general population, with 70% of the U.S. firefighter workforce reported as being

98 overweight or obese.<sup>33</sup> In Canada, strains and sprains are the main musculoskeletal injury for  
99 firefighters, most commonly involving the back or knee (knee injuries being the most costly).<sup>34</sup>  
100 Firefighters also have reported high rates of stress, poor mental health and post-traumatic stress, in  
101 addition to suicide.<sup>35</sup>

102 Ambulance and paramedic personnel report high rates of health problems in comparison to the  
103 general population, such as higher risk and incidence of elevated blood pressure, sleeping problems,  
104 low back pain, hearing problems, poor fitness levels,<sup>36,37</sup> musculoskeletal disorders<sup>38,39</sup> and problems  
105 related to shift work.<sup>40</sup> These personnel also have higher rates of work absence than police or  
106 firefighter personnel,<sup>8,41</sup> and a higher prevalence of care-seeking behavior compared to the general  
107 population.<sup>38</sup> Additionally, ambulance and paramedic personnel have higher reported mental health  
108 issues compared to other healthcare workers, with the highest risk for suicide.<sup>42,43</sup>

109 Workplace violence within the EMS sector is an additional issue for all staff, which can lead to serious  
110 physical and psychological effects for the worker.<sup>44,45</sup> Workplace violence including physical violence  
111 and verbal abuse is recognized as commonplace in the sector worldwide,<sup>46-48</sup> with a recent review  
112 reporting 53%-90% of workers had experienced workplace violence.<sup>49</sup>

113 Vocational rehabilitation (VR) has been recognized as a solution for reducing work absence and its  
114 associated costs.<sup>50</sup> Vocational rehabilitation is defined as “whatever helps someone with a health  
115 problem to stay at, return to, or remain in work”.<sup>50(p.5)</sup> Vocational rehabilitation is a multi-component  
116 approach that includes different interventions specific to a condition. These interventions should begin  
117 early and address any physical musculoskeletal problems, psychological disorders and employment  
118 factors to facilitate a sustained return to work.<sup>50</sup> Since the seminal work by Waddell and colleagues to  
119 produce an evidence base for VR policy development, the benefits of VR have been demonstrated in  
120 terms of improving participation at work, reducing sickness absence and reducing disability.<sup>50-52</sup> The  
121 majority of studies on VR focus on specific conditions such as psychological, neurological or  
122 musculoskeletal conditions, with less focus on specific occupational groups.<sup>53-56</sup>

123 Despite the evidence relating to the physical and psychological problems that EMS sector workers  
124 can face, VR interventions and the structure and effectiveness of VR for EMS personnel are less well  
125 known. There is a need to identify existing evidence on the provision of VR in the EMS sector to  
126 underpin the content, characteristics and outcomes of workplace VR interventions across the sector.  
127 A scoping review was indicated because it is unclear at this stage what specific questions should be  
128 asked in a systematic review on this area. This scoping review aimed to map the range of available  
129 evidence on VR interventions for EMS sector workers; this evidence will then guide the specific  
130 questions and inclusion/exclusion criteria for a future systematic review.<sup>57,58</sup> Identifying which VR  
131 interventions and/or EMS sector professional groups have not been investigated to date will also help  
132 to focus future primary research studies in these areas. Overall, the information generated by this  
133 scoping review is aimed at informing clinicians, managers, stakeholders and international EMS sector  
134 organizations regarding VR interventions for EMS sector workers.

135 A preliminary search for existing scoping reviews and/or systematic reviews on the topic was  
136 conducted in the *JB I Database of Systematic Reviews and Implementation Reports*, Cochrane  
137 Database of Systematic Reviews, International Prospective Register of Systematic Reviews  
138 (PROSPERO), Medline and CINAHL; however, no reviews (published or in progress) were identified.

139 The objectives, inclusion criteria and methods of analysis for this review were specified in advance  
140 and documented in a protocol.<sup>59</sup>

#### 141 **Inclusion criteria**

##### 142 Participants

143 This scoping review considered studies that included adult EMS personnel (police officers, firefighters  
144 and ambulance/paramedic staff) regardless of age, sex or rank. Retired personnel were not the focus  
145 of this review and were excluded.

##### 146 Concept

147 Vocational rehabilitation delivered to EMS personnel regardless of condition, work status (VR to  
148 prevent sick leave or VR for workers on sick leave) or focus (e.g. mental health issues, neurological  
149 problems or musculoskeletal conditions) was included in this scoping review. Interventions included  
150 work conditioning, work hardening, physiotherapy, counseling, functional restoration and occupational  
151 rehabilitation. Studies that included training programs, health promotion or prevention interventions to  
152 healthy workers were not included in this review as the focus was on VR for workers with  
153 conditions/injuries and not on primary prevention or general health promotion activities.

##### 154 Context

155 This scoping review included literature from developed nations and regions such as Australia, New  
156 Zealand, United States, Canada, Western Europe and Scandinavia. Developed countries  
157 demonstrating “very high human development”, as defined by the 2013 Human Development Index  
158 (HDI),<sup>60</sup> were included in this review. EMS sectors are more likely to be well developed and well  
159 established in these countries, thus enabling an international comparison. Studies that included  
160 emergency sector workers who were identified as living in developing countries or countries defined  
161 as low, medium or high human development were not included.<sup>60</sup>

##### 162 Types of studies

163 Published and unpublished studies (quantitative, qualitative and text/opinion sources) were  
164 considered, as well as reports on government policy, occupational health websites (such as the  
165 National Institute for Occupational Safety and Health [NIOSH] in the United States, the Health and  
166 Safety Executive [HSE] in the United Kingdom, the Canadian Centre for Occupational Health and  
167 Safety [CCOHS] and Safe Work Australia), and emergency services charities (such as the Police  
168 Treatment Centre and Fire Fighters Charity, United Kingdom). This review considered both  
169 experimental and quasi-experimental study designs including randomized controlled trials, non-

170 randomized controlled trials, before and after studies and interrupted time-series studies. In addition,  
171 descriptive and analytical observational studies including prospective and retrospective cohort  
172 studies, case-control studies, analytical cross-sectional studies, case series, individual case reports  
173 and descriptive cross-sectional studies were considered for inclusion. Qualitative study designs that  
174 were considered included phenomenological, ethnographic, grounded theory and feminist research.

175 To ensure all sources of information were mapped for this review, press releases, websites and  
176 conference abstracts were also considered for inclusion.

## 177 **Methods**

### 178 Search strategy

179 The search strategy aimed to find both published and unpublished literature. A three-step search  
180 strategy was followed in this review. Initially, a limited database search was undertaken (MEDLINE  
181 and CINAHL) using the terms vocational rehabilitation and emergency medical services, followed by  
182 analysis of the text words contained in the title and abstract, and of the index terms used to describe  
183 each article. A second search using all identified keywords and index terms was then undertaken  
184 across all included databases. Thirdly, the reference lists of all identified reports and articles were  
185 searched for additional studies. The databases searched included: CINAHL, MEDLINE, AMED,  
186 Cochrane Database of Systematic Reviews and PEDro.

### 187 Information sources

188 The search for unpublished studies included: NIOSH, HSE, CCOHS, Safe Work Australia,  
189 BeyondBlue, Canada Institute for Work and Health, Fit for Work and Arbeidstilsynet (Norwegian  
190 Labour Inspection Authority websites, and a search of Google Scholar using a modified search  
191 (vocational rehabilitation AND police; vocational rehabilitation AND firefighters; vocational  
192 rehabilitation AND paramedics).

### 193 Study selection

194 Studies published in English language were included. To ensure inclusion of relevant literature since  
195 the publication of the work by Waddell et al,<sup>50</sup> all information available from the previous 10 years was  
196 included (2007-2017).

197 The initial keywords used were vocational rehabilitation, police officers, law enforcement, firefighters,  
198 emergency medical service, paramedics, ambulance and rehabilitation. A research librarian assisted  
199 in keyword and search strategy development. The detailed search strategy for MEDLINE, CINAHL,  
200 and AMED are presented in Appendix I. The searches were conducted in October 2017.

201 All sources of information (after de-duplication) were screened for inclusion in the review by two  
202 reviewers.

### 203 Data extraction

204 Data extraction was performed by two reviewers independently using a pre-determined data  
205 extraction form.<sup>59</sup> The main areas relevant to the review question that were extracted included author,  
206 country, aim of the project, type of study or source, participant details and sample size, context,  
207 intervention details, concept/type of VR and outcomes related to the intervention/VR. Any  
208 disagreements that arose were resolved via discussion. As per guidance on scoping review methods,  
209 there was no critical appraisal of methodological quality.<sup>57</sup>

## 210 **Results**

### 211 Study inclusion

212 As presented in the PRISMA flowchart (Figure 1)<sup>61</sup> there were 20,174 sources of information  
213 (published, unpublished/grey literature/text) screened, 48 full-text records assessed for eligibility by  
214 two independent reviewers and 22 records included in the final scoping review. Appendix II lists full-  
215 text studies excluded in the final review.

216 The sources of information included in this review were conducted in the following countries:  
217 Netherlands,<sup>62</sup> Australia,<sup>26,63,64</sup> United Kingdom<sup>65-73</sup> and United States,<sup>74-82</sup> and included police  
218 officers, firefighters and paramedics/ambulance personnel. The evidence included in this scoping  
219 review consists of a wide range of sources, such as a randomized controlled trial, cohort study, pilot  
220 study, case study, conference presentation, reports, websites and press releases.

221 Tables 1 through 5 describe the relevant data from the sources of information in this review related to  
222 the three review questions (i.e. which types of VR have been reported, what are the characteristics of  
223 the VR intervention; and in what context are VR interventions delivered). There were five types of VR  
224 identified in this review (psychological, physical, mixed physical and psychological,  
225 addiction/substance abuse, and mixed addiction/substance abuse and psychological). Each table  
226 focuses on one type of VR, describing the author, year of publication, country, source, participants,  
227 context, intervention and outcomes related to the intervention.

### 228 Types of vocational rehabilitation

229 The majority of VR is provided as physical (Table 2) or mixed physical and psychological (Table 3) to  
230 police officers, firefighters and paramedics. Only one source focused on primarily psychological VR  
231 for police officers (Table 1), and one focused on addiction/substance abuse for EMS personnel (Table  
232 4). Four sources of information describe mixed addiction/substance abuse and psychological VR for  
233 EMS personnel (Table 5).

### 234 Characteristics of vocational rehabilitation

235 The psychological interventions included guideline-based care to inform a three-step intervention  
236 (which includes early activation guidance, time-contingent process evaluation and cognitive  
237 behavioral principles), stress counselling, sleep relaxation, complementary therapies, psychological  
238 programs for specific mental health conditions (depression, anxiety, insomnia), stress management,



239 mindfulness, individual counselling, holistic therapy, music therapy, trauma therapy, yoga, art and  
240 creative therapies. Although the psychological interventions are described, they lack detail in delivery  
241 (such as how long the intervention occurred and how often); therefore, they are not reproducible.  
242 These interventions were delivered as one-to-one, group programs or as a mixture.

243 The physical interventions mainly included musculoskeletal physiotherapy; structured and supervised  
244 reconditioning programs (including movement pattern training, resistance and cardiovascular  
245 exercise); cardiac rehabilitation (including high intensity, occupational specific program); education;  
246 cognitive behavioral education; work-focused rehabilitation; Pilates; strength and conditioning;  
247 relaxation; goal setting; individual plans; self-managed exercise programs; hydrotherapy; and  
248 exercise therapy. These were delivered as one-to-one, group programs, phone guidance or self-  
249 managed by the individual.

250 Addiction/substance abuse rehabilitation also included psychological interventions as before (except  
251 addiction solutions) as well as holistic therapy (art and music, as well as trauma therapy), medication,  
252 exercise and addiction treatment via group and personalized one-to-one programs.

253 The results supported physical VR<sup>64,65,72,74</sup> in terms of clinical effectiveness,<sup>69</sup> cost benefits<sup>26,69</sup> and  
254 return to work,<sup>26,63</sup> but there was a lack of outcomes available on the effects of psychological and  
255 addiction/substance misuse interventions.

256 Context of vocational rehabilitation

257 This review was interested in the context in which the VR was delivered to EMS personnel. The  
258 results identified that VR is delivered in the workplace, at external healthcare providers and also on a  
259 residential basis across interventions.

## 260 **Discussion**

261 This scoping review aimed to map the extent of VR for emergency service sector workers and  
262 specifically identify which types of VR have been reported, the characteristics of the reported VR  
263 interventions and the context in which they have been provided.

264 The review identified 22 sources of evidence that map the current extent of VR for EMS sector  
265 workers from both published and unpublished sources. The evidence retrieved demonstrates there is  
266 a heavy reliance on individual organizations sharing information about their VR services and content  
267 alongside any outcomes. This review found that although there appears to be evidence to support  
268 physical rehabilitation interventions for VR,<sup>26,63-66,69-71,74</sup> there is still a lack of rigorous evaluation  
269 published on the effectiveness of VR in the EMS sector, especially regarding mental health  
270 interventions across all services. This reflects current VR literature in that there is evidence for the  
271 effectiveness of VR for return to work and for reducing pain in workers with musculoskeletal  
272 disorders.<sup>83,84</sup> However, there is less evidence, providing mixed support, on the effectiveness of VR  
273 for workers with mental health problems.<sup>83,85</sup>

274 In addition, despite the evidence base demonstrating the physical and mental health issues for EMS  
275 personnel, the identified costs involved and working days lost, and a thorough and robust search  
276 strategy, this review identified a lack of information in the public domain regarding VR in the EMS  
277 sector. There may be local areas where VR is in place, but there appears to be a lack of  
278 process/systems to report this publically including any associated outcomes in terms of effectiveness,  
279 return-to-work effects and impact on lost productivity. There is a need to report VR interventions and  
280 their impact widely using standard international reporting guidelines.<sup>86</sup>

281 The evidence presented for EMS personnel demonstrates that there are VR programs to treat both  
282 physical and mental health problems for police officers, firefighters and paramedics, which reflect the  
283 main health problems reported for this sector<sup>6,14,30</sup>; however, this is not consistent across nations or  
284 professions. In the United Kingdom, VR is mainly provided by charities through residential programs  
285 for all three services for physical problems and more recently mental health problems,<sup>67,68,70,73</sup> but  
286 there is also workplace and off-site physical rehabilitation for firefighters.<sup>65,66</sup> In Australia, New South  
287 Wales provides workplace physical rehabilitation and external specialist support for psychological  
288 rehabilitation for police officers and firefighters,<sup>64</sup> whereas this review identified only  
289 addiction/substance abuse and mental health provision in the United States at residential settings with  
290 follow-up outpatient support for all three services.<sup>78,80-82</sup>

291 The main content of the physical VR utilized physiotherapy and exercise-based interventions; mental  
292 health VR included counseling and psychological interventions, as well as exercise based  
293 interventions, and addiction/substance abuse VR also included psychological interventions, which  
294 reflects the variety of VR content within the literature.<sup>87</sup> There was a lack of detail across the included  
295 evidence on each intervention (in terms of consistently reporting intervention content, how often it was  
296 delivered, the setting, the duration, and which outcome measures for impact were used, including the  
297 outcomes of these measures); therefore, future reporting of studies should ensure they follow  
298 standard reporting guidelines to address this issue. It has been acknowledged that there is a need to  
299 increase data sharing to improve outcomes in VR, and an initial move in this direction would require  
300 standardized reporting, as well as agreement on terminology, across organizations both nationally  
301 and internationally.<sup>88</sup>

302 The majority of sources identified in this review provided evidence on VR for police officers and  
303 firefighters, whereas there was less evidence identified for paramedics/ambulance personnel. Given  
304 that there are higher rates of work absence reported by paramedics/ambulance personnel in  
305 comparison to police officers and firefighters,<sup>8,41</sup> the results of this review would suggest that there is a  
306 greater need for identifying effective VR services for paramedics/ambulance personnel compared to  
307 the other two professions.

#### 308 Limitations of review

309 There are some limitations to our scoping review that are worth noting. First, we limited the included  
310 evidence to English language only due to a lack of interpretation services. As such, our results may

311 have omitted evidence in other languages, and this may be a reason why there was mainly evidence  
312 retrieved from English-speaking countries and a lack of evidence gained from non-English-speaking  
313 countries.

314 Secondly, scoping reviews are inherently limited because the focus is to provide breadth rather than  
315 depth of evidence on a particular area.<sup>57,58</sup> However, this method was appropriate for this review,  
316 given that our objective was to map the evidence on VR for the EMS sector and ultimately identify  
317 which specific questions should be asked in a systematic review in this area. Rather than informing a  
318 systematic review, however, the results of this scoping review have identified clear implications for  
319 practice and further high-quality primary research that is required before any systematic reviews can  
320 be conducted.

321 Our search strategy did not include the PsycINFO database, which may have led to the omission of  
322 additional sources of information for this review. The full search did identify a large body of evidence,  
323 but the authors acknowledge this omission may be a limitation of this review.

## 324 **Conclusion**

325 This review has identified varying evidence reporting VR for physical and mental health problems as  
326 well as addiction/substance abuse across developed nations for EMS personnel. A lack of published  
327 studies indicates that further high-quality primary research is required to identify the effectiveness of  
328 VR across different settings and conditions for EMS personnel, and the relative effectiveness of  
329 different intervention types should also be studied. Future studies need to clearly report the details of  
330 the VR interventions for the findings to be used in clinical practice and evidence synthesis.

### 331 Implications for practice

332 Robust audit or service evaluation of VR services for EMS workers should be made more readily  
333 available in the public domain and shared so that health professionals and organizations can identify  
334 effective models of practice.

### 335 Implications for research

336 There is a need for further research to investigate the effectiveness of VR interventions for EMS  
337 workers, especially those with psychological and/or addiction/substance misuse problems. Primary  
338 research in VR for EMS workers should also be reported widely, including in peer-reviewed journals  
339 (adhering to reporting guidelines), to enable systematic reviews into the effectiveness of VR in this  
340 area to be conducted and clinical guidelines developed for health professionals.

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343 United Kingdom.

### 344 Conflicts of interest

345 There is no conflict of interest in this project.

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566 and-disability-green-paper-improving-lives](https://www.gov.uk/government/consultations/work-health-and-disability-improving-lives/work-health-and-disability-green-paper-improving-lives)

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568 **Appendix I: Search strategy**

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MEDLINE	CINAHL	AMED
"vocational rehab*" OR rehab* OR	"vocational rehab*" OR rehab* OR	"vocational rehab*" OR rehab* OR

physio* AND police OR "law enforcement" OR "fire-fighters" OR "emergency medical*" OR paramedic OR ambulance	physio* AND police OR "law enforcement" OR "fire-fighters" OR "emergency medical*" OR paramedic OR ambulance	physio* AND police OR "law enforcement" OR "fire-fighters" OR "emergency medical*" OR paramedic OR ambulance
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570 Limits: adults, English language, 2007-2017.

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572 **Appendix II:** Excluded articles at full-text stage

573 Hou WH, Chi CC, Lo HLD, Kuo KN, Chuang HY. Vocational rehabilitation for enhancing return-to-  
574 work in workers with traumatic upper limb injuries (Review). Cochrane Database Syst Rev.  
575 2013;(10):CD010002. **Not emergency medical services**

576 Smith DL, Haller JM, Benedict R, Smith LMM. Firefighter incident rehabilitation: interpreting heart rate  
577 responses. Prehosp Emerg Care. 2016;20:28-36. **Not vocational rehabilitation**

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580 Metropolitan Police OH Services. Occup Health. 10 January 2013. **Not vocational rehabilitation**

581 Summers K, Jinnett K, Bevan S. White Paper: musculoskeletal disorders, workforce health and  
582 productivity in the United States [Internet]. The Work Foundation; June 2015 [cited June 30 2017].  
583 Available from: [www.theworkfoundation.com](http://www.theworkfoundation.com) **Not vocational rehabilitation**

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587 Black C. Working for a healthier tomorrow. London: TSO; 17 March 2008. **Not vocational**  
588 **rehabilitation; not EMS**

589 Oyeflaten I, Lie SA, Ihlebæk CM, Eriksen HR. Multiple transitions in sick leave, disability benefits, and  
590 return to work. A 4-year follow-up of patients participating in a work-related rehabilitation program.  
591 BMC Public Health. 2012;12:748. **Not emergency medical services**

592 Baxter M. Safe Work Australia Annual Report 2015-2016 [Internet]. [cited June 30 2017]. Available  
593 from: <http://www.safeworkaustralia.gov.au/sites/swa/about/annual-reports/pages/annual-reports> **Not**  
594 **vocational rehabilitation; not emergency medical services**

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596 work-related PTSD: a systematic review. BMC Public Health. 2011;11:838. **Not emergency medical**  
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598 Safe Work Australia. Return to work survey, the role of the employer and workplace, Australia and  
599 New Zealand: 2013 [Internet]. [cited June 30 2017]. Available from: [www.safeworkaustralia.gov.au](http://www.safeworkaustralia.gov.au)  
600 **Not vocational rehabilitation**

601 Smith GR. Workers compensation administration annual report 2008 [Internet]. [cited June 30 2017].  
602 Available from: <http://www.workerscomp.state.nm.us> **Not vocational rehabilitation**

603 White M, Wagner S, Schultz I, Williams-Whitt K, Koehn C, Dionne CE, et al. Interventions to reduce  
604 work absence: a stakeholder-centred, best-evidence synthesis of systematic reviews. Canadian  
605 Institute for the Relief of Pain and Disability, 2014 [Internet]. Available from: [www.cirpd.org](http://www.cirpd.org) **Not**  
606 **emergency medical services**

607 Bambra C, Whitehead M, Sowden A, Akers J, Petticrew M. "A hard day's night?" The effects of  
608 Compressed Working Week interventions on the health and work-life balance of shift workers: a  
609 systematic review. J Epidemiol Community Health. 2008;62(9):764-777. **Not emergency medical**  
610 **services**

611 Conn VS, Hafdahl AR, Cooper PS, Brown LM, Lusk SL. Meta-analysis of workplace physical activity  
612 interventions. Am J Prev Med. 2009;37(4):330-339. **Not emergency medical services**

613 Czabała C, Charzynska K, Mroziak B. Psychosocial interventions in workplace mental health  
614 promotion: an overview. Health Promot Int. 2011;26 suppl 1:i70-84. **Not emergency medical**  
615 **services within date range**

616 Osilla KC, Van Busum K, Schnyer C, Larkin JW, Eibner C, Mattke S. Systematic review of the impact  
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618 **services**

619 Parks KM, Steelman LA. Organizational wellness programs: a meta-analysis. J Occupational Health  
620 Psychology. 2008;13(1):58-68. **Not emergency medical services within date range**

621 Pomaki G, Franche RL, Murray E, Khushrushahi N, Lampinen TM. workplace-based work disability  
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624 Richardson KM, Rothstein HR. Effects of occupational stress management intervention programs: a  
625 meta-analysis. J Occup Health Psych. 2008;13(1):69-93. **Not emergency medical services**

626 Soler RE, Leeks KD, Razi S, Hopkins DP, Griffith M, Aten A, et al. A systematic review of selected  
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628 **rehabilitation**

629 van Dongen JM, Proper KI, van Wier MF, van der Beek AJ, Bongers PM, van Mechelen W, et al.  
630 Systematic review on the financial return of worksite health promotion programmes aimed at  
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632 **rehabilitation**

633 Faghri PD, Blozie E, Gustavesen S, Kotejshyer R. The role of tailored consultation following health-  
634 risk appraisals in employees' health behavior. *J Occup Environ Med.* 2008;50(12):1378-1385. **Not**  
635 **vocational rehabilitation**

636 MacKinnon DP, Elliot DL, Thoemmes F, Kuehl KS, Moe EL, Goldberg L, Burrell G. Long-term effects  
637 of a worksite health promotion program for firefighters. *Am J Health Behav.* 2010;34(6):695-706. **Not**  
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639 Lamplugh M. All responders treatments programs: Just another gimmick? *Addiction professional,*  
640 *Winter.* 2015:38-39. **Not vocational rehabilitation**

641 MacDonald H, Colotla V, Flamer S, Karlinsky H. Posttraumatic stress disorder (PTSD) in the  
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643 *Rehab.* 2003;13(2):63. **Out of date range**

644 Mcleod J. The effectiveness of workplace counselling: a systematic review. *Couns Psychotherapy*  
645 *Res.* 2010;10(4):238-248. **Not emergency medical services within date range**

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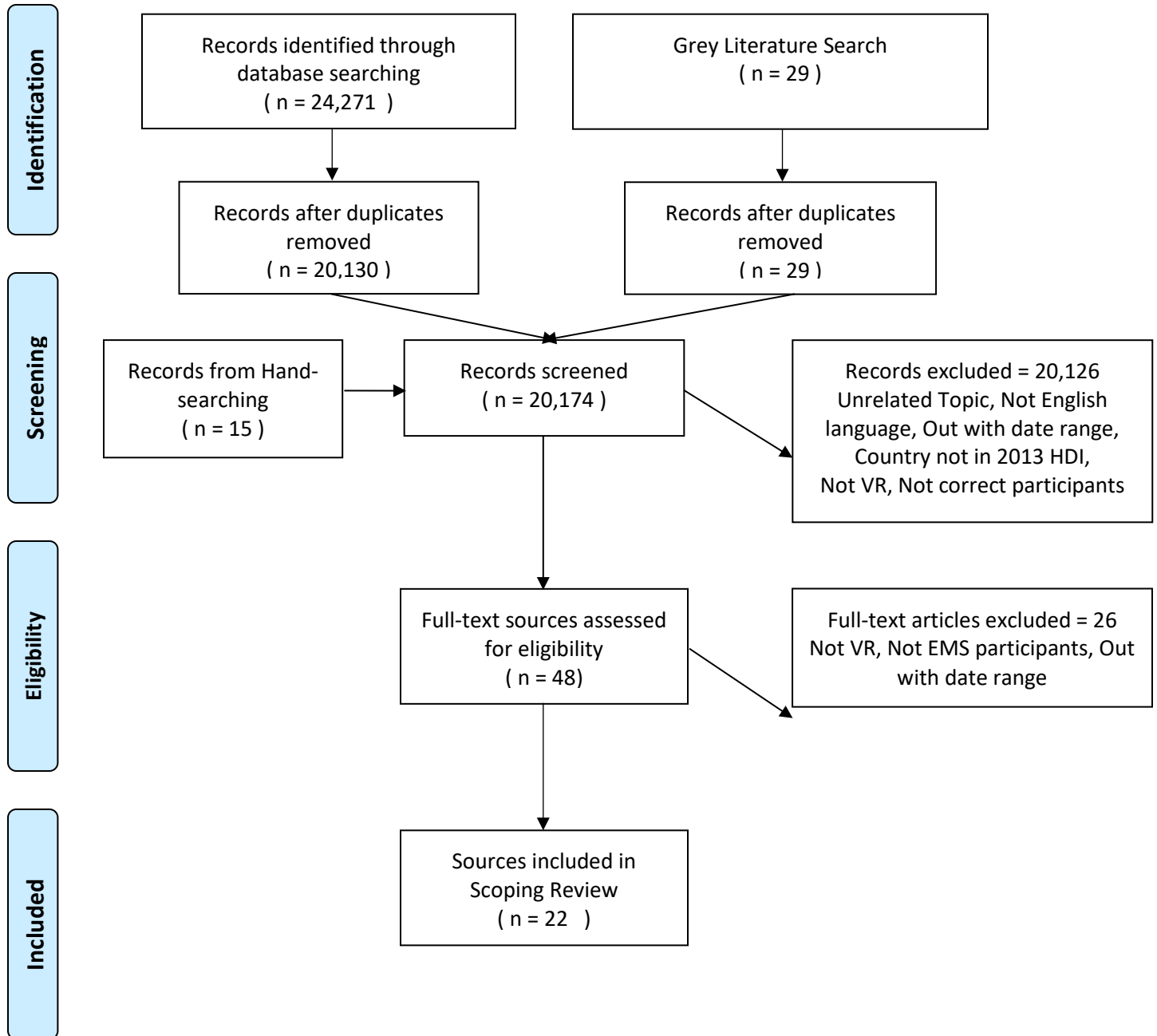
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## PRISMA 2009 Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit [www.prisma-statement.org](http://www.prisma-statement.org).

**Results:**

**Table 1 – Psychological vocational rehabilitation**

Author/year country	Aims/purpose	Study type/Source	Participants Sample size	Context	Intervention	Outcomes/findings
Rebergen et al 2009 Netherlands	Examine effect of Dutch national guideline on management of employees with mental health problems by OPs	RCT	240 Dutch police officers	Police officers treated in external psychotherapeutic center	Guideline based care (GBC) for mental health problems by OPs trained to provide treatment v usual care with minimal involvement of OP and if applicable, access to psychologist. GBC consisted of early activating guidance from OP (mean 3.4 consultations); a time contingent process evaluation and cognitive behavioral principles (stress inoculation training and graded activity). Gradual RTW with regular contact with support and work accommodations were also implemented.	GBC by OPs did not differ in RTW compared to usual care. GCB may be beneficial for majority of workers with “minor” stress related disorders. Healthcare utilization costs significantly lower in intervention group (mean diff -€520; 95% CI -€980, -€59), no significant diff in sick leave and productivity loss costs

**Key:** RCT – randomized controlled trial; OP – Occupational Physician; RTW – return to work; diff – difference; CI – confidence interval

**Table 2: Physical vocational rehabilitation**

Concept Type of VR	Author/year country	Aims/purpose	Study type/Source	Participants Sample size	Context	Intervention	Outcomes/findings
Physical reconditioning program	Orr et al 2013 Australia	To determine if a structured and supervised reconditioning program	Pilot study	6 injured police officers Mean age 38.8 years	Workplace setting for police officers	3 officers allocated to training group – 8 training sessions (up to 60 mins) over 4 weeks of a tailored	A workplace reconditioning program under supervision showed improved physical

		improved RTW prospects				reconditioning program (general body reconditioning program devised & supervised by qualified PTI included movement pattern retraining, resistance ex and CV ex). Control group = 3 officers. Both groups received standard medical care also.	performance and attitude towards their physical health compared to standard medical care.
Physical - Physiotherapy	Orr et al 2015 Australia	Profile police attendees of workplace physiotherapy and reconditioning program	Conference presentation	42 Injured police officers: 30 male (mean age 43.3 years) & 12 female (Mean age 38.2 years) attending workplace rehabilitation	Workplace setting for NSW police officers	Workplace physiotherapy and rehabilitation program. Mainly lumbar spine injury (40.5%, n=17)	In-house physiotherapy and rehabilitation program eliminates cost of travel to external physiotherapy services and can limit lost productivity (savings \$317.14 per person)
Physical - Physiotherapy	Lothian and Borders Fire and Rescue Service (LBFRS) Best value review 2010 Scotland	Review of Fitness Advisory Unit of LBFRS	Report	No information	External physiotherapy service to Scottish fire-fighters	Physiotherapy service provided by Fitness Assessment and Sports Injuries Centre (FASIC) part of Edinburgh University. Two x two hour sessions per week covering max of 8 patients per session	Employees (81%) off work reported FASIC intervention enabled them to RTW earlier. Employees still at work reported FASIC intervention helped them remain at work (100%)
Cardiac rehabilitation	McBee 2015 Adams 2013a, 2013b, 2014 USA	Aimed to design occupation and sport specific high intensity exercise program	Press article; case study x2 and cohort study	48 year old Mesquite Fire Captain; 39 year old police officer post coronary	Cardiac rehabilitation centre – out patient	High intensity, occupational specific cardiac rehabilitation designed specifically for firefighters, police	Subjectively increased strength and confidence and ready to RTW.



				artery bypass graft; 6 male fire-fighters (mean age 54 years) post coronary revascularization; 40 year old fire-fighter		officers and others with physically demanding jobs. Minimum 18 ex training sessions (3 days a week) of gradually increasing high intensity ex with monitoring and endurance training (treadmill walking, recumbent bike). RTW program included work related equipment such as a 165 pound mannequin to simulate a rescue or wore 10-55lb vests for occupation specific tasks.	RTW and resumed playing ice hockey 6 weeks post-surgery.
Functional Restoration program (FRP)	RehabWorks 2017 UK	Investigate solutions to problems relating to musculoskeletal issues in the workplace for UK Metropolitan Fire Service	Case study	28 firefighters	External centre	3.5 hour assessment then attend average of 6 rehabilitation sessions weekly as part of a group of 8 people. Each session involved group education, cardiovascular ex, rehabilitation ex, cognitive behavioral education, work focused rehabilitation, and 1 to 1 with appointed therapist	585 days absence saved between year prior to and post intervention. Full year return on investment of 700%
Physical rehabilitation	TASC 2015 UK	Rehabilitation pilot for 15 ambulance staff to access physical rehabilitation	website	First Paramedic to use service	Paramedic 2 week residential intensive rehabilitation at Police	Daily physiotherapy, Pilates, strength and conditioning, hydrotherapy, relaxation and counselling	Improved mobility and strength of shoulder after rehabilitation

					Treatment Centre		
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**Key:** Sig – significant; ex – exercise; PTI – Physical training instructor; RTW – return to work; CV- cardiovascular; PTSD – Post traumatic stress disorder; OP – Occupational Physician; RCT – randomized controlled trial; LBFRS – Lothian and Borders Fire and Rescue Service; MSK – musculoskeletal; PTSD – Post traumatic stress disorder; Inc – including; TASC – The Ambulance Services Charity; min – minutes; max – maximum; NSW – New South Wales

**Table 3: Mixed physical and psychological vocational rehabilitation**

Concept Type of VR	Author/year country	Aims/purpose	Study type/Source	Participants Sample size	Context	Intervention	Outcomes/findings
Psychological and physical.  NSW Police employ 36 injury management advisors to case manage and refer officers to support services, working closely with officers and the workplace.	Crawford 2016 Australia	Examined program and practices to promote health & prevent injuries; support injured workers RTW and workers compensation & death & disability schemes costs & outcomes	Report	NSW Police officers	Worksite programs for police officers	Workforce improvement program expanded since 2014 to include rehabilitation provides 90 different activities, has ~300 PTI  RECON – Reconditioning and physiotherapy program trial to help injured officers RTW sooner. In-house physiotherapy and rehabilitation services. Since 2014, 151 officers completed program at 3 sites.	Workforce Improvement program - A mental health research body evaluated the program in June 2015 and found the program had a good mix of mental and physical initiatives across prevention and rehabilitation.  RECON - Returned officers to pre-injury duties 18 weeks sooner than standard care. Estimated cost savings of 68% reduction in weekly claim costs compared to standard care (\$625/wk)

Psychological and physical	Crawford 2016 Australia	Examined programme and practices to promote health & prevent injuries; support injured workers RTW and workers compensation & death & disability schemes costs & outcomes	Report	NSW Fire fighters	Worksite programs and external specialist support for fire fighters	<p>Örebro Musculoskeletal Pain Questionnaire is used as a screening tool to determine whether injured workers require additional psychological and well-being support to help recover from their injuries. If identified, workers are referred for internal and external psychological and well-being support.</p> <p>RTW Durability program aims to improve the functional capability of injured Firefighters and reduce the risk of further injury. Delivered by health &amp; fitness advisor (qualified ex physiologist). 4-6 contacts (face to face or via phone), with assessments, goal setting, individual plan and self-managed ex program.</p>	RTW Durability program – since 2015 92 firefighters have participated with only 1 injury reoccurrence after the program.
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Physical, wellbeing and psychological	The Police Rehabilitation Trust 2017 UK	To assist officers in their return to full health and fitness	Website	Police officers in UK	Residential rehabilitation at one 158 bed centre	Physiotherapy and wellbeing programs (including physiotherapy, hydrotherapy, stress counselling, general nursing care, health classes, rehabilitation classes, sleep relaxation, & complementary treatments). Psychological programs for depression, anxiety, stress & insomnia (including group and individual sessions and structured exercise).	No outcomes available
Physical and psychological	The Police Treatment Centres 2017; Alexander et al 2017 UK	To promote and improve health and well being	Website and 2017 Final report	Police officers in UK	Intensive 2 week residential programs at 2 centers in UK. Can also offer out-patient physiotherapy	Physiotherapy and psychological programs. Includes group and individual treatment. Psychological wellbeing program includes group sessions on stress management, workshops focusing on relaxation, sleep, mindfulness, group exercise sessions and individual counselling and complementary therapy sessions.	2017 evaluation found Physiotherapy service was clinically effective and cost-efficient ( $p < 0.01$ )

Mainly physical (MSK) rehabilitation (but also includes cardiac, neurological and general physical unfitness) and psychological programs more recently	Hunt L 2010 UK; Dawson, Deary & Fielden 2014; And The Fire Fighters Charity 2017 UK	Provider of services that enhance the quality of life for serving and retired firefighters, fire personnel and their families	Press release, qualitative study and charity website	Firefighters in UK	Intensive 1-2 week (choice of 4, 7 or 10 day stays) residential program at 3 rehabilitation centers in UK.	Provides range of physiotherapy, nursing and psychological support programs. Self-referral program includes physiotherapy, exercise therapy, health and lifestyle talks and relaxation.	A pilot study at one centre found patients experienced an average improvement of 13% in their physical condition 3 months after leaving the centre.  Study showed a shared background with peers was key in enabling clients return to fire service 'banter', (missing during previous isolated rehabilitation). Focus groups also demonstrated sharing rehabilitation stories with peers was enabling and restorative.
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Key: Sig – significant; ex – exercise; PTI – Physical training instructor; RTW – return to work; CV- cardiovascular; PTSD – Post traumatic stress disorder; OP – Occupational Physician; RCT – randomized controlled trial

**Table 4: Addiction/substance abuse vocational rehabilitation**

Concept Type of VR	Author/year country	Aims/purpose	Study type/Source	Participants Sample size	Context	Intervention	Outcomes/findings
Addiction service	Addictions solutions Florida, USA		Website	Emergency response services (Police officers, fire	Fire fighters. Male only residential and	Group and 1 to 1 personalized programs including 12	No available outcomes

				fighters and paramedics)	out-patient service	step and "Break free" plan	
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**Table 5: Mixed addiction/substance abuse and psychological vocational rehabilitation**

<b>Concept Type of VR</b>	<b>Author/year country</b>	<b>Aims/purpose</b>	<b>Study type/Source</b>	<b>Participants Sample size</b>	<b>Context</b>	<b>Intervention</b>	<b>Outcomes/findings</b>
Substance abuse and mental health	Rosecrance Florian Program USA		Website	Uniformed service personnel such as firefighters, paramedics, law enforcement and military	Residential and out-patient rehabilitation in 97 bed centre with 14 bed unit for co-occurring substance abuse and mental health disorders	Addresses substance abuse and mental health issues while offering coping skills and building resiliency	No outcomes available
Addiction - Alcohol and substance abuse and psychological health	American Addiction Centres USA	To effectively treat officers in need, and prepare them to return to the communities they have pledged to protect and serve.	Website	Police, fire-fighters and their immediate families	Confidential free hotline with counsellors. Provides residential and out-patient services in 8 states (Florida, Texas, Nevada, California, Rhode Island, Missouri, New Jersey, & Louisiana)	Addiction and psychological services	No outcomes available
Drug and alcohol treatment centre + PTSD	Station House, Florida, USA	To be the top addiction treatment center for police, firefighters, paramedics, and other first responders	Website	First responders (police, fire fighters, ambulance/paramedics)	Residential and out-patient services	Addiction and PTSD treatment via holistic therapy including art and music therapy (non-verbal therapy) and trauma therapy (rapid reduction	No outcomes available

						technique, cognitive processing therapy, eye movement desensitization and reprocessing and impact of trauma, trauma bonding and trauma responses) using task orientated, competency approach (goal setting). 1 to 1 and peer group sessions	
Addiction and mental health (inc. therapy for depression, PTSD, acute stress disorder & anxiety)	First Responders Recovery, Florida, USA	Work with police officers, firefighters, paramedics, EMTs, emergency dispatchers, members of the military or anyone else that has a career in public safety	Website	First responders (police, fire-fighters and paramedics)	Residential rehabilitation centre (male and female) with out-patient and 24 hour intervention phoneline for follow-up.	Treatment includes counseling; medication; addition treatment services and holistic therapies (inc. art & creative therapy, group therapy, exercise & physical fitness, yoga & mindfulness)	No outcomes available

Key: Inc – including; PTSD – Post-traumatic stress disorder; EMT – Emergency medical technician