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1 **A Profile of Occupational Tasks Performed by Mounted Police Officers**

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7

ACCEPTED

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8 **ABSTRACT**

9 **BACKGROUND:** Within individual policing organisations, there are a wide variety of units and job  
10 roles. **OBJECTIVE:** To profile the occupational tasks performed by Australian mounted police  
11 officers, aiming to offer conditioning insight into this unique job role. **METHODS:** Thirteen fully  
12 qualified and operational mounted police officers (n=11 females), who served in the mounted police  
13 unit for ~3.3 ( $\pm$  2.3) years, participated in this observational cohort study. Participants completed a  
14 survey outlining common occupational tasks and were monitored throughout four consecutive  
15 shifts. Participants' heart rate (HR), respiratory rate (RR), and skin temperature (ST) data were  
16 collected via wearable monitoring (Equival EQ-02, Hidalgo, UK) and body position, physical activity  
17 undertaken, task effort, and load carriage were recorded by researchers. A one-way ANOVA was  
18 used to assess mean differences in physiological measures between the three most reported tasks.  
19 **RESULTS:** Survey identified 130 tasks, with 38 listed as most common. The three most reported  
20 mounted police tasks were: 'horse riding' (n=13, 34%), 'mounted patrols' (n= 10, 26%), and 'horse  
21 care' (n=10, 26%). These were also reported as the most physically demanding. HR during 'horse  
22 care' and 'horse riding' were significantly higher than when 'mounted patrolling' ( $27\pm 7$ bpm,  $p=0.001$   
23 and  $33\pm 8$ bpm;  $p=0.001$ , respectively). Mean RR was higher when 'horse riding' when compared to  
24 'horse care' ( $5.3\pm 1.6$ brpm) and 'mounted patrol' ( $8.5\pm 1.9$ brpm).  
25 **CONCLUSION:** Mounted police officers experience unique physiological challenges throughout their  
26 routine occupational tasks. This study highlights the significance of understanding occupation-  
27 specific tasks and stressors undertaken by mounted police to develop relevant conditioning,  
28 rehabilitation, and monitoring procedures.

29

30 **Keywords:** heart rate, tactical, horse, physiological monitoring, duties.

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31        **INTRODUCTION**

32        Employed in a tactical occupation, police officers are responsible for upholding the law and  
33        safeguarding the well-being, freedom, and belongings of individuals, while also deterring criminal  
34        activity and maintaining societal order. It is imperative for police officers to exhibit their actions with  
35        rationality, honesty, and sound judgement.<sup>1,2</sup> To fulfill such duties, police officers perform a variety  
36        of different tasks.<sup>3</sup> Some of these tasks are generally sedentary in nature (e.g., desk work,  
37        communications, car patrolling) while others are highly dynamic and physically demanding (e.g.,  
38        chasing an offender on foot, grappling with an uncooperative offender, pushing a vehicle to the side  
39        of a road).<sup>2,4</sup> A police officer may need to shift from one type of task to another instantly,<sup>5</sup> adding to  
40        the challenges of police job roles.

41        Within a single policing organisation, there are a wide variety of units and, consequently,  
42        different job roles.<sup>3</sup> These include, but are not restricted to, general duties, patrol officers, water  
43        police, mounted police, public order riot squad, and specialist police tactical groups. As such, within  
44        one police organisation, the tasks performed by officers can differ.<sup>3</sup> For example, general duties  
45        officers have reported that checking bona fides of an individual was one of the most frequently  
46        occurring tasks followed by attending a domestic incident.<sup>3</sup> In a specialist police tactical group, the  
47        most frequently reported tasks include warrant execution,<sup>5</sup> firing a semi-automatic weapon, and  
48        deploying from vehicles whilst performing close personal protection and/or high-risk escorts.<sup>6</sup>  
49        Therefore, policing organisations must have a clear understanding of each unit's distinct range of  
50        occupational tasks to ensure optimal recruitment, training, and return-to-work programs.

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51 To select, train, and retain the best officers for these different roles and units, fitness screening  
52 is often one of several pre-requisites.<sup>7,8</sup> The application of exercise science methodology and rigour  
53 to the development of occupational fitness screening tests is becoming increasingly prevalent,  
54 sophisticated, and standardized,<sup>9</sup> particularly for physically demanding occupations.<sup>10</sup> The  
55 importance of fitness screening is highlighted in several studies which have identified an increased  
56 risk of injury in police officers with lower levels of fitness.<sup>11-14</sup> More concerning, Bonneau and  
57 Brown,<sup>2</sup> conducting research with the Royal Canadian Mounted Police, found that, on average, the  
58 fitness capacity of a police officer was well below the average fitness capacity of the criminals they  
59 were required to subdue. With these lower fitness capacities, adding more equipment load onto the  
60 police personnel during their job tasks has been shown to pose an increased risk of musculoskeletal  
61 injuries.<sup>2</sup> Therefore, in order to reduce this risk and preserve performance, occupationally relevant  
62 physical training plays a role in matching the physical capacity of personnel with their job task  
63 demands.<sup>4</sup>

64 Developing a robust and comprehensive understanding of occupational roles requires the  
65 completion of a job task analysis, which identifies the physical capacities inherent to the tasks  
66 performed by incumbent personnel.<sup>4</sup> Once an accurate understanding of the police profession's  
67 roles and requirements are established, the application of appropriate screening tools can be used  
68 to expedite the recruitment process and ensure the best possible individual is chosen for service in  
69 each unit.

70 At face value, the requirements of a mounted police unit could be expected to be vastly  
71 different to that of a general policing unit: a main notable difference being the use of a police horse

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72 incorporated into their daily tasks. For a mounted police unit, a police horse can provide the riding  
73 officer with a 360-degree view of their surroundings from a much more advantageous height  
74 compared to an officer on foot. Furthermore, the speed and agility of the highly trained horse would  
75 allow a mounted police officer to cover more ground, on a wider range of terrain, and fit into  
76 confined areas with civilian populations present.<sup>15,16</sup> However, with the addition of a police horse  
77 comes the skills required to ride and perform tasks whilst working with the horse as well as the  
78 responsibilities of caring for the horse. As such, the physical requirements of a mounted police  
79 officer may differ substantially from those of a general duties police officer. Therefore, prior to  
80 determining any physical screening requirements for a police unit, it is imperative that the key tasks  
81 undertaken are determined and examined. The conduct of such research provides many benefits  
82 from establishing specific job-entry and return-to-work following injury requirements to the  
83 prescription of suitable physical conditioning and rehabilitation protocols. Therefore, the aim of this  
84 study was to establish the nature and contexts of occupational tasks performed by mounted police  
85 officers from an Australian state police force.

86

## 87 **METHODS**

88 This study used two study designs to address its aim: a cross-sectional survey and an  
89 observational cohort study design.<sup>17</sup> The survey allowed for information on tasks performed to be  
90 captured directly from the Australian state mounted police officers recruited, even when they were  
91 on leave or not rostered for duty. The observational cohort component consisted of physiological  
92 data monitoring throughout each shift as well as a notational analysis of tasks performed during  
93 these shifts (i.e., job task analysis) in a three-day period.

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94 Current active officers within an Australian state's only mounted police force were recruited  
95 for this study. The two inclusion criteria were: a) the officer was a fully qualified and operational  
96 member of the unit, and b) the officer was serving in a full-time capacity. Officers were excluded  
97 from the study if: a) the officer was on a return-to-work plan following injury, or b) the officer was  
98 unable to complete mounted job tasks during their shift. Ethics was approved through Bond  
99 University Human Research Ethics Committee (BUHREC Protocol Number BS02126) with gatekeeper  
100 approval obtained through the relevant state police force. Of the 13 mounted police officers that  
101 participated in this study, 11 (84.6%) were female (mean age =  $33.5 \pm 5.2$  years, height =  $171.8 \pm 6.2$   
102 cm, and body mass =  $69.2 \pm 10.3$  kg) and two were male (mean age =  $47.5 \pm 0.7$  years, height =  $187$   
103  $\pm 2.8$  cm, and body mass =  $83.7 \pm 8$  kg). The mean length of service among all participants was  $3.3 \pm$   
104  $2.3$  years for mounted police duties and  $8.8 \pm 6.3$  years for general duties.

105 The cross-sectional, paper-based survey questions were designed to elicit responses that would  
106 elucidate key aspects of the daily occupational tasks and their corresponding frequency and  
107 duration. The questionnaire contained a total of six open-ended questions. Two questions aimed to  
108 identify the officer's employment history at the police force and specifically the mounted unit. Four  
109 questions were used to discern between the most common tasks performed by general duties police  
110 and tasks specific to mounted police. Participants were requested to list three tasks for each of the  
111 following: (a) most common general duties task, (b) most common mounted police task, (c) least  
112 common mounted police task and (d) most physically demanding mounted police task. Participants  
113 were also required to report on the frequency and duration of the tasks they listed in each question.

114 After completing the survey, but prior to the observational data collection, all volunteering  
115 officers completed a familiarization session (< 30 minutes). The familiarization session involved  
116 collecting (a) descriptive information such as age and self-reported height and weight, which have  
117 been shown to be accurately reported within this population sample<sup>18</sup> and (b) baseline physiological  
118 data. For such, participants were fitted with a physiological monitoring device (EQ02, Equival,  
119 Hidalgo, UK). This device was used to collect a range of measures throughout the course of two to

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120 four daily shifts, depending on their roster. Continuous heart rate (HR) in beats per minute (bpm),  
121 respiratory rate (RR) in breaths per minute (brpm), and skin temperature (ST) in degrees Celsius (°C)  
122 were recorded throughout each shift to allow insight into the physiological responses to the  
123 occupational tasks.

124 Researchers shadowed selected participants during their shift, noting events for the job task  
125 analysis. The researchers manually recorded the participants' body positions (e.g. lying down,  
126 sitting, kneeling, squatting, upright on feet), physical activity engaged in (e.g. stationary sitting,  
127 stationary standing, walking, running, leading, riding, horse care, menial/admin tasks,  
128 lifting/lowering objects, carrying objects), effort (resting, light 10-30% HR, moderate 40-60% HR,  
129 high 70-90% HR, maximal 100% HR) and load carrying capacity (0-2 kg including boots, 3-5 kg, 6-10  
130 kg, 11-20 kg, >20 kg) during each task completed. This approach to documenting physical tasks has  
131 been drawn from previously validated research.<sup>19,20</sup> At the end of each shift, these observations  
132 were transformed into an electronic datasheet (Microsoft Excel) where each task was time coded  
133 and aligned with data obtained from the physiological monitoring devices.

#### 134 *Statistical Analysis*

135 Data from the survey and observations were first cleaned, with missing data simply recorded  
136 as missing and not replaced by interpolation or any other method. Survey data reporting occupation  
137 tasks, frequency, and duration were tallied to determine the top three tasks in each category.  
138 Observational data were tallied and then collapsed into naturally occurring groups consisting of  
139 tasks completed during shifts: for example, washing horse, tacking up/down, feeding horse were  
140 merged into 'horse care'.

141 Data from the individual physiological monitors were imported to the Equivital Manager  
142 software (Version 2.5.3.130) for analysis. Physiological measures (HR, RR, and ST) for participants  
143 across each occupational task, were analysed using the JASP Statistical Software.<sup>21</sup> Manual cleaning



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144 of the data removed notable cell errors (e.g. non-numeric entries). Data points that were  
145 improbable or impacted by artifacts (i.e., distorted signals), for example, HR below 40 bpm or above  
146 230 bpm were excluded.<sup>22</sup> The range, mean, and standard deviation for each variable were then  
147 calculated.

148 The top three most common mounted police tasks and three most physically demanding  
149 mounted police tasks reported by police officers within the study were identified based on the  
150 number of survey responses and their frequency per week. These were then subjected to further  
151 analysis. Differences in HR, RR, and ST between these tasks were investigated through a one-way  
152 ANOVA. Effect size of ANOVA was reported through partial eta squared. Post-hoc Bonferroni  
153 correction was performed to identify pairwise significance. Means ( $\bar{x}$ ), standard deviation (SD),  
154 significance (p), and effect size (ES; assessed through Cohen's  $d^{23}$ ) were reported as  $\bar{x}\pm SD$ ; p, ES.  
155 Alpha levels were set at  $p < 0.05$  *a priori*.

156

## 157 RESULTS

158 Survey responses of the 13 participants, considering all four survey categories combined,  
159 yielded 130 tasks, outlined in Table 1 with their reported frequencies. Of these, 38 task instances  
160 were listed under 'most common mounted police tasks', 31 under the 'most common general duties  
161 tasks', and 25 under 'least common mounted police tasks'. The three most common tasks specific  
162 to mounted police were: 'horse riding' (n=13, 34%), 'mounted patrols' (n= 10, 26%) and 'horse care'  
163 (n=10, 26%). 'Horse riding' was defined as riding tasks undertaken as training, drills, horse warm-  
164 up and exercise, often performed in the confines of the mounted police station or on an adjacent

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165 training field. This task differs from the 'mounted patrol' task, where officers are in full gear, out in  
166 the public, performing patrolling police duties. 'Horse care' included lifting gear, tacking, washing,  
167 and grooming (e.g., picking out hoofs). A total of 36 task instances were listed under the 'most  
168 physically demanding mounted police task' category. Of these, the three most physically demanding  
169 mounted police tasks were 'horse riding' (n= 17, 68%), 'mounted patrols' (n= 7, 28%) and 'horse  
170 care' (n= 6, 24%).

171

172

*Insert Table 1 here*

173

174 The three most observed tasks were as follows: 'Horse care' (n = 14, 31%), 'horse riding' (n = 7,  
175 15%), and 'mounted patrol' (n = 7, 15%). The complete list of all 45 tasks observed is detailed in  
176 Table 2. The self-reported frequency ranges of these same tasks were 'mounted patrol' 2 to 15  
177 occasions per week, 'horse care' 2 to 15 occasions per week, and 'horse riding' 2 to 18 occasions per  
178 week (Table 1).

179

180

*Insert Table 2 here*

181

182 The participants' body position and physical activity being conducted were typically  
183 standing or sitting. 'Horse care' involved being upright on their feet, with occasions of  
184 bending/squatting to clean hooves and wash the horse. 'Horse riding' consisted of leading the horse  
185 (upright on feet while holding horse reins), with most of the task completed while sitting on the

---

186 horse. Of note, sitting in this instance is not a passive action as the officer needs to respond to the  
187 proprioceptive input received from the horse's movements. Further, depending on the speed of the  
188 horse (e.g., trot, canter, or gallop), the officer was required to shift their weight and either alternate  
189 constantly from a sitting to rising position or stand on the stirrups, in a semi-squat position, matching  
190 the rhythm of the horse. Body position and physical activity varied from each patrol, dependent on  
191 the requirement to engage or interact with the public. For instance, during a patrol, an officer was  
192 required to complete a high dismount off their horse to engage in a body search of a member of  
193 public and then remount. This requires end ranges of motion at the hip joint as well as upper and  
194 lower limb strength and power for the officer to pull themselves up to the saddle, particularly if no  
195 mounting block is available.

196         Lifting and carrying loads of 6-20 kg (inclusive of saddle, stirrups, grooming utensils, and  
197 protective helmet), was completed during each occasion of 'horse care'. One participant engaged in  
198 'horse care' on six occasions in a single shift, resulting in an estimated 32 kg of cumulative load lifted  
199 and carried per each grooming session; an approximate cumulative total of 192 kg lifted and carried  
200 across the 8-hour working day. Worn loads also differed depending on the task to be completed. On  
201 average, the participants' uniforms, inclusive of riding boots, weighed approximately 2.4 kg. When  
202 donning the patrol uniform (inclusive of accoutrements belt, weapon, radio, and handcuffs), there  
203 was an average increase of 4.5 kg absolute weight worn resulting in a total worn load of 6.9 kg.

204         Results of the survey indicated that duration between the common tasks varied. 'Horse care'  
205 was reported to range 20-600 min per week, 'horse riding' 40-600 min per week and 'mounted  
206 patrol' 120-1,200 min per week. Of note, lower ranges may indicate officers that were only rostered

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207 for one shift /week and may have only completed that task once. Monitored mean durations of  
208 these tasks during the observed shifts ranged from 6-41 min for 'horse care', 18-168 min for 'horse  
209 riding', and 61-180 mins for 'mounted patrol'. There were significant differences between the mean  
210 duration of each task ( $F(2,25) = 18.813, p < .001, \eta^2=0.601$ ). As shown in Figure 1, significantly less  
211 time was spent performing single instances of 'horse care' ( $19.5 \pm 10.3$  min) when compared to  
212 'horse riding' ( $76.1 \pm 64.1$  min;  $p=0.008$ ;  $ES=1.549$ ) and 'mounted patrol' ( $120.4 \pm 35.2$  min;  $p<0.001$ ;  
213  $ES=2.760$ ).

214  
215 *Insert Figure 1 here*  
216

217 Similar to the duration, physiological demands for each task also varied. These are presented below.

#### 218 *Heart Rates*

219 Heart rate readings varied depending on the task completed. Significant differences in mean HR  
220 between 'horse care', 'horse riding' and 'mounted patrol' were noted ( $F(2,25) = 10.818, p < .001,$   
221  $\eta^2=0.464$ ). Pairwise post-hoc analysis demonstrated that HR recorded during 'mounted patrol' ( $87$   
222  $\pm 16$  bpm) was on average lower than the HR recorder for both 'horse care' ( $115 \pm 9$  bpm;  $p=0.001,$   
223  $ES=1.862$ ) and 'horse riding' ( $120 \pm 20$  bpm;  $p<0.001, ES=2.260$ ) (Figure 2). These averages, when  
224 considered as percentages of age-calculated  $HR_{max}^{24}$  indicate that officers are working at 66%  
225  $HR_{max}$ , 63%  $HR_{max}$ , and 46%  $HR_{max}$  during 'horse riding', 'horse care', and 'mounted patrol',  
226 respectively.

227

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228

*Insert Figure 2 here*

229

230 *Respiratory Rate*

231 Across all observed tasks, the lowest and highest RR was identified in 'loading horses onto the float'  
232 with a RR range of 9 to 46 brpm. Amongst the three most common tasks, significant differences in  
233 mean RR between 'horse care', 'horse riding', and 'mounted patrol' were noted ( $F(2,25) = 10.120$ ,  
234  $p < .001$ ,  $\eta^2 = 0.447$ ). RR recorded during 'horse riding' ( $31.1 \pm 5.5$  brpm) was, on average, higher than  
235 the RR recorder for both horse care ( $25.8 \pm 1.0$  brpm;  $p = 0.011$ ,  $ES = 1.477$ ) and mounted patrol ( $22.6$   
236  $\pm 2.2$  brpm;  $p < 0.001$ ,  $ES = 2.369$ ) (Figure 3).

237

*Insert Figure 3 here*

238

239 *Skin Temperature*

240 ST did not differ significantly between the most common mounted police tasks ( $F(2,14) = 0.080$ ,  
241  $p = 0.924$ ,  $\eta^2 = 0.011$ ). The widest ST range was recorded during horse riding tasks ( $34.6$ - $37.4^\circ\text{C}$ ).

242

243 **DISCUSSION**

244

245 This study aimed to profile the occupational tasks performed by Australian mounted police officers  
246 from a state police force across two-four consecutive shifts. A secondary aim was to investigate the  
247 physiological demands experienced by this cohort during these routine daily tasks. A total of 130  
248 tasks were reported in the survey with 'horse riding', 'mounted patrols', and 'horse care' being the  
249 most common. These were also reported as the most physically demanding. Forty-five tasks were  
250 observed, and further analysis of the most common tasks identified different physiological demands

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251 between them. HR during 'horse care' and 'horse riding' were significantly higher than when  
252 patrolling. Mean RR was higher whilst riding the horse when compared to 'horse care' and  
253 'mounted patrol'.

254 Bonneau and Brown<sup>2</sup> suggested that police work is mainly a sedentary job alternated with physically  
255 highly strenuous peak moments. However, consideration of the findings of this study suggest that  
256 mounted police officers are continually physically active from the commencement through to the  
257 cessation of their shift. During shifts, there were minimal instances where officers were standing or  
258 sitting in a stationary manner, besides designated break times. As such, mounted police work  
259 appears to be notably different to that of general duties policing, a supposition supported by the  
260 survey in which there was no cross-over reported by officers between the most common mounted  
261 duties performed and general duties performed.

262         Much of the research pertaining to police officers has only focused on general police work  
263 such as the nature and frequency of occupational activities, which suggest that police tasks are  
264 highly varied in terms of type and, notably, duration and add operational context to the current  
265 literature focusing on physical activities and postures.<sup>3,25</sup> While previous research has noted the  
266 more seated, sedentary nature of general duties policing, it is important to note that while mounted  
267 police officers are 'seated' for a common task (riding and patrol), the physiological demands  
268 resulting from the task may be vastly different to that of sitting at a desk, as made evident by the  
269 mean HRs of officers while riding and patrolling. Similarly, general duties officers create postural  
270 adaptations to driving tasks by changing limb posture while torso posture remains largely  
271 unaffected<sup>26</sup>; whereas mounted police officers are required to make dynamic, full body postural  
272 adaptations when riding or patrolling.

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273 A notable finding from this current study was the mounted police officers most common  
274 completed tasks were also the most physiologically demanding. This finding was not only expressed  
275 in self-reported survey, but also confirmed in the task observation and physiological data collected.  
276 During their most common task of 'horse riding', officers were sustaining an average HR of  $120 \pm$   
277  $20.5$  bpm and RR of  $31 \pm 5.5$  brpm. This would equate to working at 65% of age-predicted  $HR_{MAX}$ ,<sup>24</sup>  
278 considered a moderate intensity exercise,<sup>27</sup> for up to 170 minutes, in one instance of this task. Sainas  
279 et al <sup>28</sup> demonstrated that a 20 min riding exercise with incremental increase in horse speed  
280 (walking, trotting, and cantering) elicited a light to moderate demand to riders' metabolic and  
281 cardiovascular systems, with reported maximal oxygen consumption of  $34.7 \pm 7.1$  mL/kg/min and  
282 HR of  $169.1 \pm 19.1$  bpm. These findings are in similar to those presented by Westerling <sup>29</sup> and the  
283 current study. Consistent with increased HR, O'Reilly et al <sup>30</sup> reported that a 45 min walk-trot-canter  
284 session resulted in a total energy expenditure of  $194.7 \pm 3.8$  Kcal and average energy requirement of  
285  $3.8 \pm 0.2$  MET. Together these studies indicate that the metabolic and HR demands of riding are at  
286 almost those of 'moderate physical activity' outlined in the ACSM position stand.<sup>31</sup> The  
287 cardiovascular demands of this mounted police task, surpasses those typically, but not always,  
288 observed in the most common general duties police tasks such as checking bona fides, driving  
289 urgently, and attending domestic incidences.<sup>5</sup> Physiological demands of mounted police identified  
290 in this study suggest that mounted police are required to have and maintain their physical fitness to  
291 fulfil occupational requirements safely and competently.

292 The requirement of physical fitness is also made evident by the load carried by police  
293 officers, such as specialised equipment and protective clothing.<sup>15</sup> In this study, the researchers

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294 identified instances of repeated loads lifted throughout a routine 8-hour shift. Most of this external  
295 load carried was during the task 'horse care' which required officers to repeatedly lift the saddle,  
296 stirrups, reins, and grooming utensils weighing up to 20 kg. With some saddles requiring a step  
297 ladder to be reached, completing 'horse care' tasks could potentially create a precarious  
298 environment for the officers and as such, it is not surprising that animal handling makes up the vast  
299 majority (65%) of mounted police officer injuries with manual handling also in the top five activities  
300 causing injuries in mounted officers whilst neither of these two activities are in the top 10 activities  
301 associated with causing injuries in general duties officers.<sup>32</sup> Working in precarious environments can  
302 lead to increased risks of injury, which can impact on work capacity. Identifying these situations and  
303 ensuring individuals have the required physical capabilities can lead to interventions increasing  
304 officer safety. Preventing injuries in this population is vital to ensure occupational performance and,  
305 as one of the biggest predictors of injury is previous injury.<sup>33</sup>

306 Similarly, during patrols, the mounted police officers were wearing, on average, a total of  
307 6.5 kg in required operational equipment. With previous research noting the typical weight of  
308 personal protective equipment worn by police officers being 10 kg,<sup>1</sup> the additional burden imparted  
309 by load carriage during occupational tasks can increase the physiological demand of a task  
310 significantly. Given the possible effects of load carriage on task performance such as increasing  
311 thermoregulatory and cardiovascular demands,<sup>34</sup> there is also a need to establish what the  
312 minimum physiological requirements for such tasks are, to ensure individuals have the capability to  
313 perform these tasks safely and effectively.



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314 Loads lifted, carried, and worn are also associated with injury risk. In this study the worn  
315 loads ranged from 2–6.5 kg and those lifted and carried of up to 20 kg, sometimes in awkward  
316 positions. Long periods of seated load carriage have been found to result in decreases in mobility<sup>35</sup>  
317 and cause specific injuries, like meralgia paresthetica.<sup>36</sup> A study by Roberts et al.<sup>37</sup> also showed that  
318 static load carriage increased postural sway, with carrying as little as 5% of body weight increasing  
319 anterior-posterior centre of pressure displacement. This could particularly effect mounted police  
320 officers who, like general duties police, are seated for long periods, but do so in different positions  
321 and while having to work with, and control, a horse. This is of note as horses have to adapt their  
322 movements to account for the riders shifts in posture, which can impact synchronicity between the  
323 rider and horse and potentially lead to injury.<sup>38</sup> Future research is necessary regarding this specific  
324 population and the impact of load carriage on job performance and injury risk. It is important to  
325 understand the load carriage requirements of mounted police officers to assist development of  
326 relevant physical training and rehabilitation programs. Occupationally relevant physical training can  
327 therefore play a role in matching the physical capacity of personnel and job task demands to  
328 preserve performance and reduce injury risk.<sup>39</sup>

329 A final observation identified in this study the lack of significant findings for skin  
330 temperature between the three most common and physically demanding tasks. It may be the case  
331 that the observed tasks did not provide enough stimulus to cause a detectable change in skin  
332 temperature. It is important to note that during one shift, temperature at the mounted police facility  
333 reached over 40°C, resulting in rescheduling of rides and patrols. Researchers can infer that

---

334 temperature protocols, in place to minimise risk of heat exhaustion for both officers and horses,  
335 may have contributed to this result.

336 Despite providing new and much required evidence on a specialist police cohort, the current  
337 study has some limitations. Firstly, the short duration of data collection period may not account for  
338 possible seasonal variation of tasks or the demands of certain events such as protests. Secondly, the  
339 more sedentary tasks, while not often performed were not included in the data capture to allow for  
340 comparison to less typical tasks. Future research should focus on monitoring mounted police officers  
341 for a longer timeframe to endeavour to capture possible seasonal variations in the types, durations  
342 and frequency of tasks performed.

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#### 344 **CONCLUSION**

345 The duties of mounted police officers appear to differ notably from those of general duties  
346 officers reported in the literature. The three most reported mounted police tasks were 'riding',  
347 'patrols' and 'horse care' which are not typical of general duties police. These tasks were also the  
348 three most demanding mounted police tasks suggesting that mounted police officers experience  
349 numerous physiological challenges throughout their routine working day and perform tasks with  
350 significantly increase their HR and RR. Considering this, even within the three most coming tasks  
351 significant differences were found in mean durations, HR, and RR. The results of this study could be  
352 used to inform future fitness assessments and return-to-work screening and guide appropriate  
353 rehabilitation protocols for injured mounted police officers to ensure they encompass the job task  
354 context and physiological demands required of their occupation.

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357 **Ethical approval:** Ethics was approved through Bond University Human Research Ethics Committee  
358 (BUHREC Protocol Number BS02126) with gatekeeper approval obtained through the relevant state  
359 police force.

360

361 **Informed consent:** Informed consent was obtained by each participant, in accordance with ethical  
362 requirements.

363

364 **Conflicts of Interest:** None of the authors of this study has a financial or personal relationship with  
365 other people or organisations that could inappropriately influence or bias the content of the study.

366

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369

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Tasks	Survey responses (n)	Frequency (range)
<b>Most Common GD Tasks</b>		
Sitting at desk (completing paperwork)	11	1 - 4 /week
Patrol	9	2 - 8 /week
Driving	7	1 - 4 /week
Attending jobs	4	1 - 4 /week
<b>Most Common MP Tasks</b>		
Horse riding	13	2 - 18 /week
Mounted patrol	10	2 - 10 /week
Horse care	10	2 - 15 /week
Driving	2	2 - 3 /week
Mucking stable / yard maintenance	2	1 - 4 /week
Sitting at desk (completing paperwork) / supervising roster	1	1 - 4 /week
<b>Least Common MP Tasks</b>		
Driving	7	1 - 4 /week
Sitting at desk (completing paperwork)	6	1 - 4 /week
Cleaning / sweeping / raking	5	1 - 2 /week
Horse attendant shift / feeding horses	3	1 - 4 /week
Attending jobs	3	1 - 4 /week
Patrolling in car	1	when raining
<b>Most physically demanding MP Tasks</b>		
Horse riding	17	2 - 18 /week
Mounted patrol	7	2 - 10 /week
Horse care	6	2 - 15 /week
Mucking stable / yard maintenance / packing truck	6	1 - 4 week
<b>Total number of reported tasks</b>	<b>130</b>	

\* Frequency of 1-4/week are tasks noted to occur at least once every shift. Weekly number of shifts are roster-dependent and can range from 1 to 4 shifts/week

476 **Table 2.** Tally of observed tasks

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<b>Survey Tasks</b>	<b>Number of instances</b>
Horse care	14
Riding	13
Patrol	7
Weapons training	4
Packing Truck/Floats	3
Lunging/Instructing	2
Driving	2
<b>TOTAL</b>	<b>45</b>

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479 **Figures**

480 **Figure 1 - Average duration of the three most common occupational tasks**

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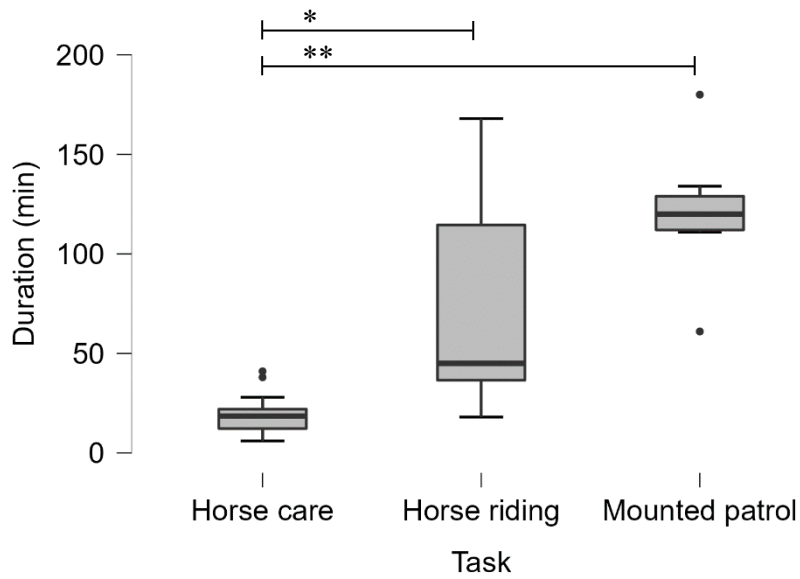
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489 \*p<0.01 \*\* p<0.001

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491 **Figure 2 - HR during the three most common occupational tasks**

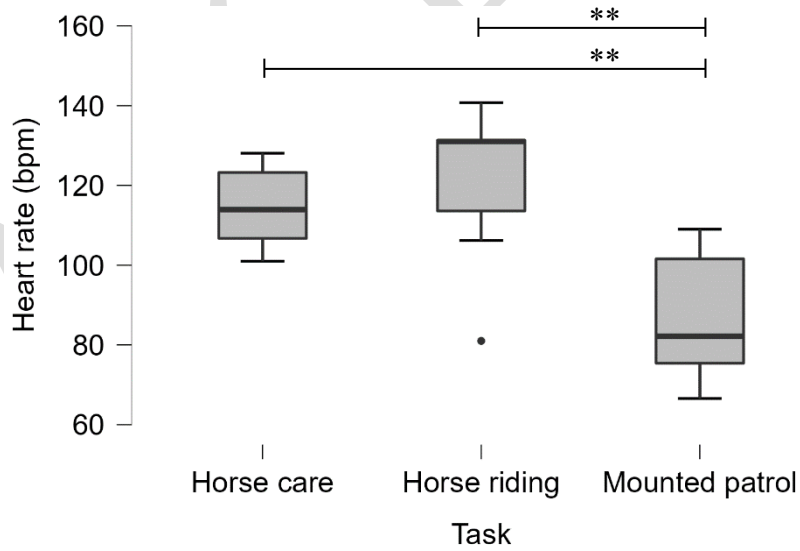
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**Figure 3** - RR during the three most common occupational tasks

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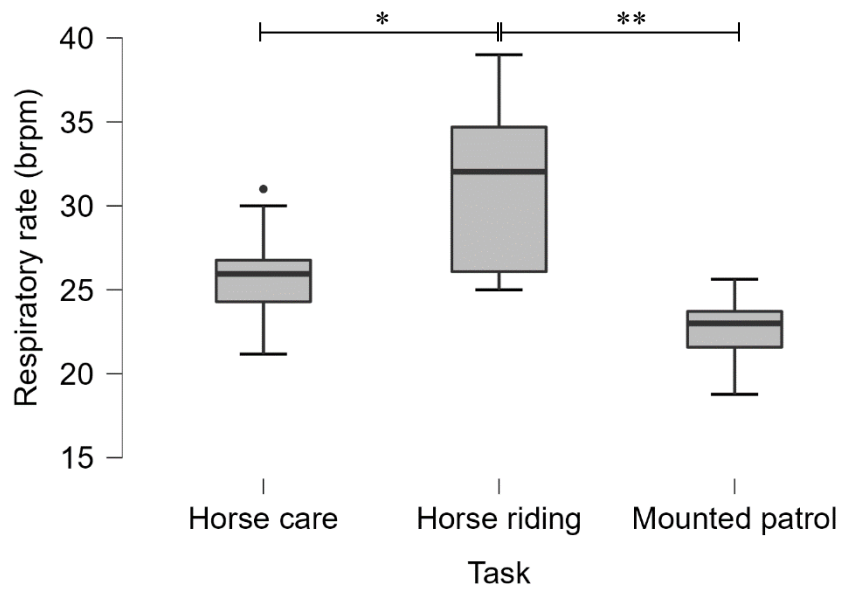
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