

"Protecting the Badge: Decreasing Musculoskeletal Problems in Law Enforcement Officers through Workplace Ergonomics"

The City of Pullman Police Department SHIP Grant was designed to evaluate the work environment of the officers in their office stations as well as their patrol cars. The initial assessment was to be of office seating, patrol car seating, seat belt extenders and duty belts. It became evident early in the duty belt assessment that none of the proposed duty belts were going to provide relief to the officers, so they were abandoned as a variable in the pursuit of reduced injury sources.

Project Purpose (from application text)

By practical application of workplace ergonomics to law enforcement, we hope to significantly reduce the incidents of short-term and chronic musculoskeletal problems in police officers. Our approach will attempt to address ergonomic issues in three areas (the officer, the office, and the patrol car) through duty testing of innovative products and technology.

Proposed deliverables

To reduce musculoskeletal pain and discomfort by at least 25% in law enforcement officers.

Problem Statement

Police work is dangerous. Whether driving in a high-speed pursuit, chasing a robbery suspect over uneven terrain, or grappling with an armed assailant, the occupation and environmental hazards faced by law enforcement personnel on a daily basis constitute severe risks to their personal health and welfare.

According to the U.S. Department of Labor 2009 report, *Nonfatal Occupational Injuries and Illnesses Requiring Days Away From Work*, law enforcement personnel at the state government level had an incident rate of days-away-from-work (DAFWs) 3.15 times higher than the total incident rate for all state government workers. At the local government level, the discrepancy was even higher, with the incident rate of DAFWs for law enforcement personnel being 3.65 percent higher than the incident rate for all local government workers. Evening more alarming was that fact that in 2009, law enforcement officers at the local government level —had the highest number of cases of reported DAFWs of any job category with 31,300, which was an increase of 30 percent from 2008 (DOL, 2010).

Many of these hazards are an unavoidable part of a law enforcement officer's commissioned duty to the citizens of their jurisdiction. However, some occupational hazards faced by law enforcement personnel are controllable in scope.

Specifically, ergonomic inadequacies of officer uniforms, work stations, and patrol cars can contribute to a myriad of preventable musculoskeletal disorders, most commonly in the form of lower back pain. According to the U.S. Department of Labor, musculoskeletal disorders —accounted for 28 percent of all workplace injuries and illnesses requiring time away from work in 2009 (DOL, 2010). Previous studies performed in 1998 had identified that —62 percent of police officers suffer from low back pain, with only 8 percent having had back pain before joining the force (Shea & Poliquin, 2011). However, a recent study published by *The Journal of Criminal Justice Research (JCJR)* reported that 86 percent of the participating law enforcement officers reported having lower back problems, ranging from occasional back pain (55%) to experiencing it often (25%) or daily (10%) (Anderson, et al, 2011). And while 77 percent of participants in the JCJR study reported that their sick leave related directly to their lower back pain was no greater than five working days in the past year, 63 percent of those officers also indicated that —additional sick leave was warranted, and in retrospect, think they should have used more sick time to expedite their recovery (Anderson, et al, 2011).

The City of Pullman Police Department has experienced first-hand the detrimental effects of employees suffering from lower back injuries. In the last decade, two officers have left the department due to disabling back injuries, and four additional officers have undergone various back surgeries. While their normal police work is inherently dangerous, it is widely believed in our department that the cumulative effects of duty belts and patrol cars can be more devastating to an officer's health in the long run.

While there is substantial research that points to a correlation between working in law enforcement and musculoskeletal problems, determining the direct causation of the problem has proven difficult. Due to the nature and duties of the job, researchers are unable to simply exclude variables in order to test which risk factors significantly contribute to the development of lower back pain in law enforcement officers. Instead, researchers are forced to rely on

self-assessments and general ergonomic science to identify controllable risk factors which contribute to officer musculoskeletal disorders. However, in spite of these difficulties, researchers have identified a primary suspect and two accomplices that work together to wreak havoc on a law enforcement officer's lower back; the gear-laden duty belt worn by law enforcement officers, in conjunction with inadequate office task chairs and patrol vehicle seats that fail to accommodate the duty belts and other equipment that officers must wear.

Pain Profile

Assessments of the officer's perception of discomfort were made with two instruments, a questionnaire "Pain Profile" of eight distinct areas of the body and a more detailed "Symptom Survey" of 12 sites on both sides of the body (total of 24). The symptom survey was applied to be able to provide more detail against the Pain Profile. Assessments were done at three points in time October, 2012, April, 2013, and July, 2013. Table 1 expresses the aggregate raw score and The overall pain of those sampled dropped one full point on a 10 point scale. Chart 1 represents average of all officers for the Pain Profile. Officers' perception of pain or discomfort declined in all areas except the mid back. Lower Back pain dropped from the moderate pain category to the mild pain category.

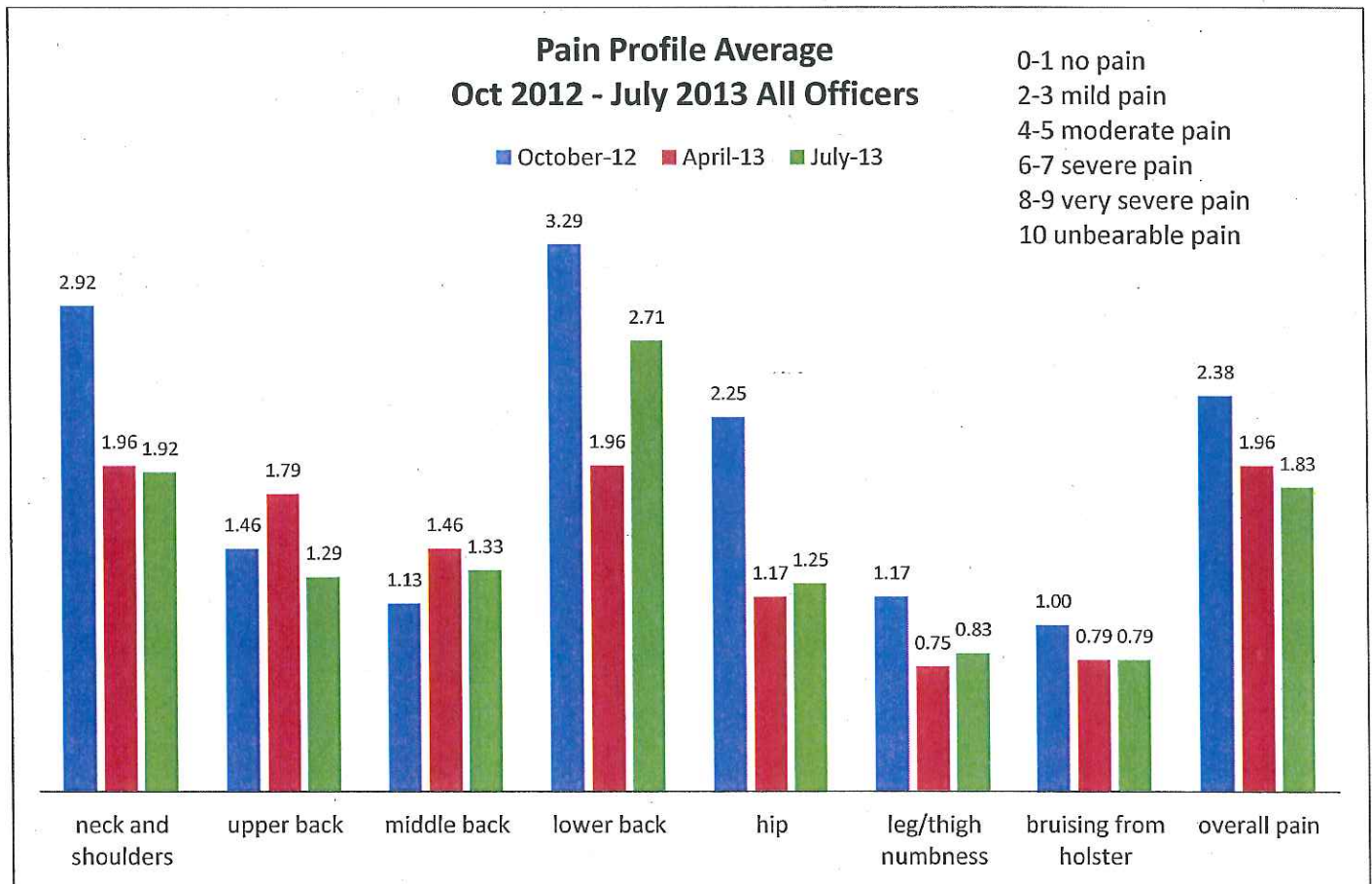


Chart 1

New Equipment

The grant objectives included an assessment of new vehicle seating and office chairs to see if they played a role in reducing discomfort among the officers. The results are shown in Charts 2&3 and 4&5.

Office Chairs

The new office chairs were very popular with the officers. Some mentioned they liked the ability to swing back the arms. It seems like they are an appropriate replacement for the variety of existing chairs. Some may wish to keep their existing chair.

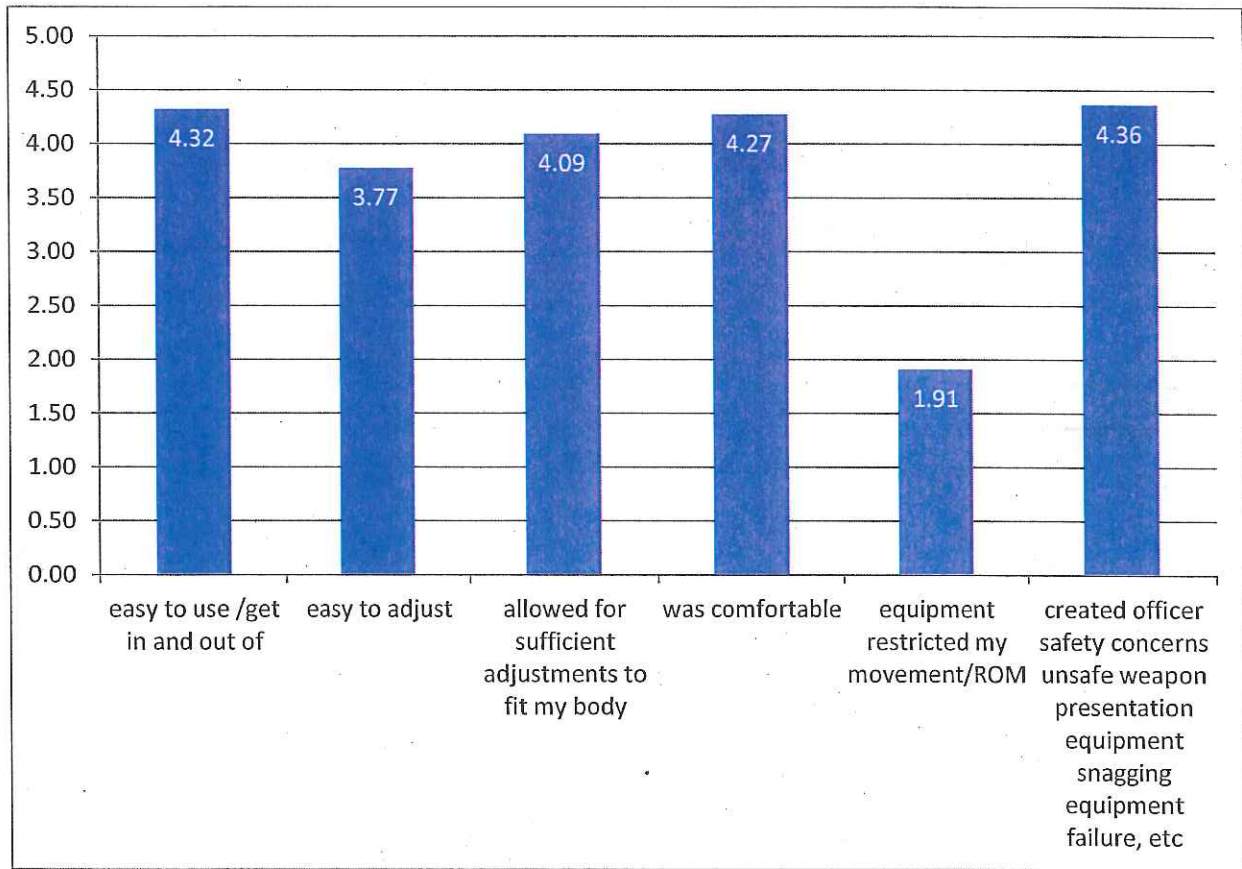


Chart2

1 strongly disagree 2 somewhat disagree 3 neutral 4 somewhat agree 5 strongly agree

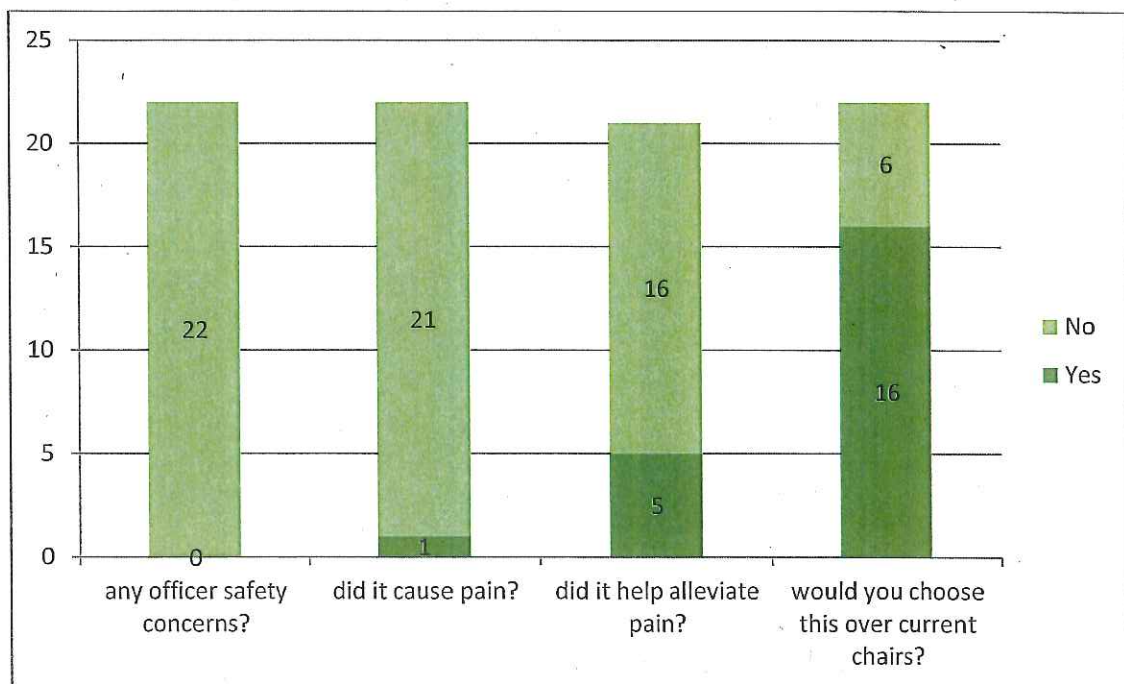


Chart 3

Vehicle Seats

The vehicle seats did not elicit a strong reaction on either side of the preference spectrum. Most scores were in the neutral range. The comments for the most part did not prefer the new seats to the old. One gentleman expressed that they were higher in the cab, which affected his headroom.

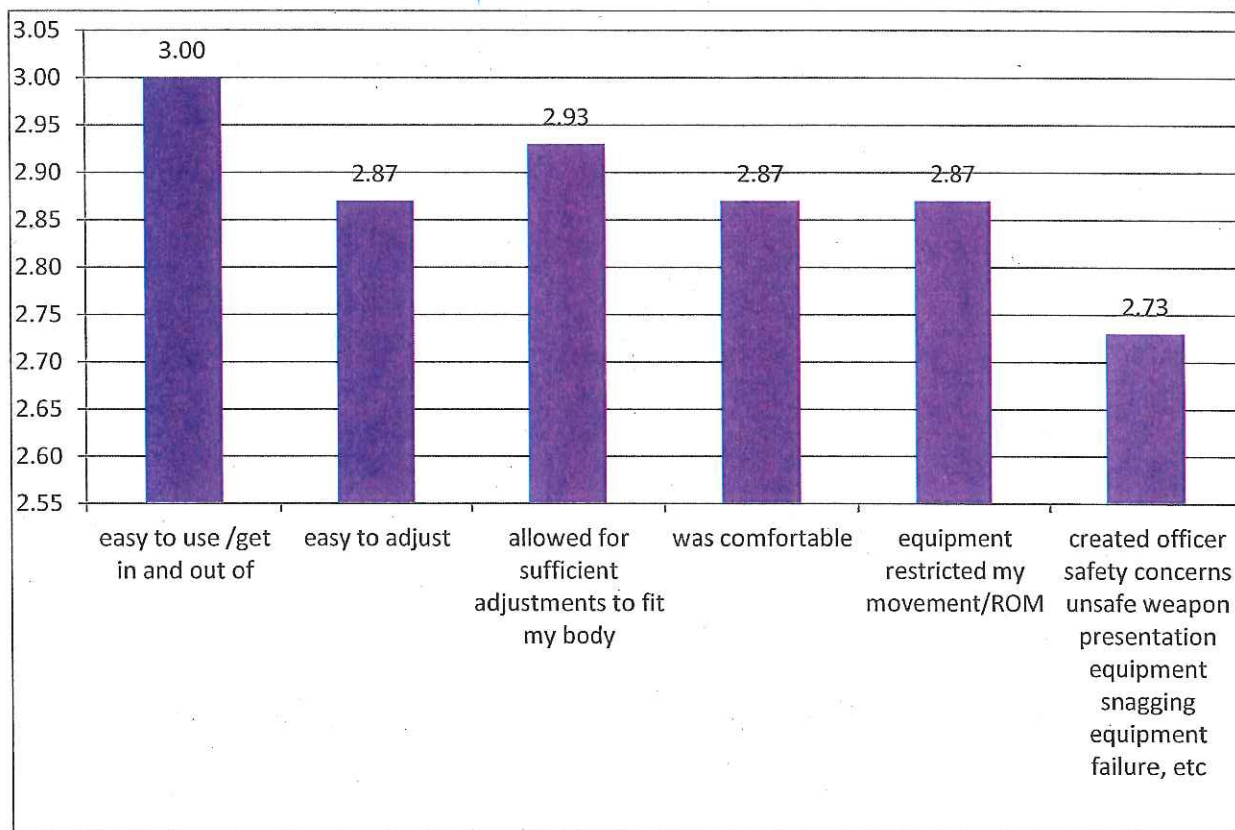


Chart 4

1 strongly disagree 2 somewhat disagree 3 neutral 4 somewhat agree 5 strongly agree



Chart 5

In conclusion, the effort that Pullman PD put into the project was impressive and they worked within the prescribed study design (L&I's), which upon reflection may have confounded some of the discomfort data. The duty belts proved early to not be worthy of trial due to safety issues when confronting combative "customers" by providing additional points with which to grab hold. The rigid seatbelt extenders were preferred, but they seemed to break, and to some provide a possible deterrent to egress.

The results of the **Pain Profile** showed a one point reduction in overall discomfort on a ten scale which may be attributable more to the office chairs than the vehicle seating. However, in terms of the outcome I would say they got good information about equipment with which to help the officers better and more comfortably do their jobs.

In terms of their stated goal of reducing officer discomfort by 25%, the results of the Pain Profile shows a reduction of 23.109%, which is darn close. Good work!