

Development and implementation of a culturally competent teaching template (CCTT)



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ABSTRACT

Background and Objective

The objective of this project was to create a culturally competent teaching template (CCCT) aimed to reach the Hispanic custodial staff at university teaching hospital. The goal was to reduce the number of shoulder injuries among the custodial staff performing a specific trash disposal task. The work task involves repetitive unloading and lifting of heavy trash bags into a large dumpster. This task requires frequent extreme force on the shoulder, which puts these workers at an increased risk of shoulder injury. The 2010 OSHA 300 log revealed that among 140 custodial workers there were 5 shoulder injuries that could be specifically attributed to trash handling. These 5 injuries resulted in 89 lost calendar days.

Method

Known successful workplace education programs aimed at Hispanic workers were adapted to create the CCCT (identify and analyze, train, implement). Implementing this CCCT we identify and analyze a task that was particularly concerning. The analysis of the trash disposal task was analyzed through direct observation, measurements, and video recordings of two workers. The job analysis includes calculations of the moment about the shoulder and the duty cycle. Recommended rest allowances for workers were determined using the Rohmert curve. Our interventions are made beginning at the substitution and engineering levels.

Findings

Using the CCCT, a task that was concerning to the workers was identified. During this task workers exert frequent high force on their shoulder while disposing of trash. During the task they are working at 75-80% of maximum strength during the task. The duty cycle through the work task is nearly 100%. Instead of the 10+ minutes of rest recommended, the workers often have only about 30 seconds of rest between work cycles.

Conclusions

Equipment design and the frequency of exertion contribute to the risk of shoulder injuries. Modification to trash bin housing areas and trash compactor retrofits are both substitution intervention options that will eliminate the current risk of shoulder injury during this task. A change to the work process would allow for adequate rest between task cycles and slow the work process by <8%. The CCCT's collaborative approach to the shoulder injury problem led to ergonomic interventions that should be readily adopted and reduce the occurrence of shoulder injuries among this custodial staff. The staff's direct involvement in the project has helped facilitate the push toward implementation of these recommendations.

The CCTT Model



THE MODEL DEVELOPMENT

This project began in January 2011 and is ongoing. Originally conceived as a single intervention with the housekeeping group to reduce injuries related to slips, trips, and falls. However, the constitution of the housekeeping group suggested that perhaps building a HealthStream module and handing down directives is not the most effective method to affect change and promote safety. Further evaluation revealed that the housekeeping group receives very little safety education of any sort and that these low wage employees have frequent occupational injuries.

The housekeeping group consists of 169 employees working approximately 360,000 paid hours annually. 17% of these hours are non-productive (administrative, training, etc.). Of the non-administrative staff, a significant portion are English as a second language (ESL) employees. Among the 169 housekeeping employees there were 46 injuries resulting in a total of 453 lost calendar days (260 lost work days). The are few proven culturally competent teaching programs for the ESL workforce in an occupational setting.

The education level of the non-administrative housekeeping staff is not definitely known. The traditional methods of employee education involve classroom style teaching and/or computer modules or testing. For our target audience these methods are not the most effective teaching methods.

Unfortunately, effective teaching methods are not mandated. In fact, OSHA does not have any standards for quality or excellence in training (Wallerstein and Winger, 1992). There have been a few key studies that effective occupational education can be done with ESL workers, despite the lack of OSHA guidance.

This model incorporates elements of several existing and proven models: Camp Health Aid (CHA) model (more commonly known as a Health Promoter) was used to successfully implement an eye injury prevention program in South Florida (Luque, Monaghan, Contreras, August; 2007). In Massachusetts, a campaign to promoted construction safety in Hispanic workers was implemented (Brunette, 2005). The California Department of Education offers a training module on occupational health and safety (Kissam and Dorsey, 1997).

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THE ERGONOMICS

At Stanford Medical Center of the 140 custodial workers there were 46 recorded injuries noted in the 2010 OSHA 300log. These injuries resulted in 453 lost calendar days. Of these 46 injuries there were 5 shoulder injuries that could be specifically attributed to trash handling. These 5 injuries resulted in 89 lost calendar days.

The work task involved unloading and lifting heavy trash bags into a large dumpster. This task requires frequent extreme force on the shoulder, which puts these workers at increased risk of shoulder injury.

Workers haul (push/pull) 2 large trash bins 10 minutes from LPCH to a large dumpster at SHC and manually unload by lifting each bag (avg. 17lbs) out of the 44inch high bin and throw it into a 40 yard dumpster. Each bin takes 61-82 seconds to unload, both carts are unloaded and the task is repeated every 45 minutes to 1 hour.

RISK PRIORITIZATION

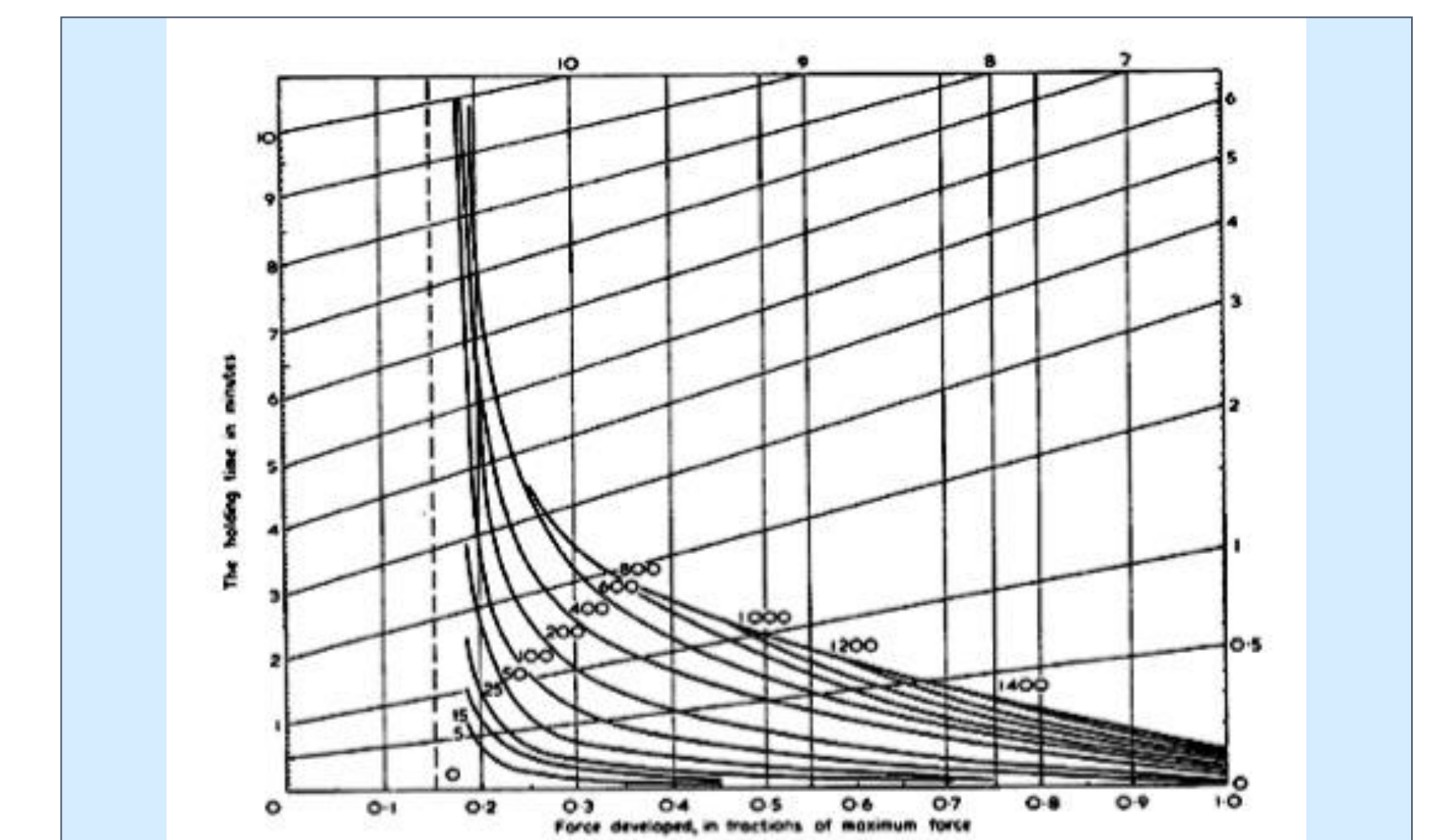
1. Inadequate rest for the shoulder muscles between work cycles.
2. High forces on the shoulder during bag unloading
3. Awkward postures during the unloading and during the push/pull for the carts in transit. Particularly external rotation of the shoulder



METHODS & INFORMATION

With written consent we video recorded 2 different workers performing the task repeatedly. We calculated the static moment about the shoulder in 3 positions (45, 90, 135 degrees forward flexion) for each worker. Recommended rest was determined through application of the moment calculations relative to average shoulder strength of industrial workers using the Rohmert curve.

Average moment about the shoulder for Worker 1 = 42.4Nm/ maximum muscle strength = 77% of maximum force
Per Rohmert curve the percentage rest allowance for this task exceeds 1000%.
The work task cycle for Worker 1 is 84 seconds (required rest is 14minutes).
Average moment about the shoulder for Worker 2 (work cycle is 61 sec.) = 43.27Nm (required rest is 10 minutes)



Bins for unloading trash bags to the main dumpster
Wheeled trash bin :43" height and 68" length
weight of average bag = 17 pounds



MAIN DUMPSTER IS 30 FEET LONG (40 YARD VOLUME)

