

Gardner BT, Dale AM, et al. Predictors of Upper Extremity Symptoms and Functional Impairment Among Workers Employed for 6 Months in a New Job. Am J Ind Med 2008;51:932-40.

Design: Prospective cohort study

Population/sample size/setting:

- 962 workers (65% male, mean age 30.5) who had been newly hired into various industries in Washington State and completed a 6 month follow-up questionnaire (1108 had completed a baseline evaluation)
- Industries included both high and low hand-intensive full time (at least 30 hr/week) jobs: manufacturing, construction, health care, and biotechnology
- Potential subjects were excluded if they had a contraindication to nerve conduction testing, had previous diagnosis of CTS or peripheral neuropathy, or were pregnant at the time of hire

Main outcome measures:

- Initial testing included a brief physical exam of upper extremities, a bilateral nerve conduction test, and a self-administered questionnaire
- Questionnaire included information on personal characteristics, hand symptoms with Katz diagram, physical work exposures of current or most recent job, and psychosocial measures
- Several endpoints were measured: prevalent symptoms of any severity, prevalent symptoms of a least moderate severity, incident symptoms (occurring in workers who had no symptoms at baseline), and functional impairment related to upper extremity symptoms
- Functional impairment was scored as present for (1) limited ability to work, (2) decreased productivity, (3) lost time, (4) placed on job restrictions, (5) change in job because of symptoms, or (6) a defined increase in the Levine Functional Status Scale
- Physical work exposures were wrist bending >4 hr/day, forceful gripping > 4 hr/day, lifting more than 2 lb >4 hr/day, or vibrating tools >4 hr/day
- Logistic regression analyses were done on the outcomes of interest, and were adjusted for personal risk factors (age, sex, BMI, baseline upper extremity symptoms), for physical work exposures, and for psychosocial factors such as social support, job decision latitude, and job insecurity
- At 6 months, there were 212 workers with incident symptoms; the logistic regression showed adjusted odds ratios for female sex (OR=1.76), wrist bending (OR=1.75), forceful gripping (OR=2.00); BMI and the psychosocial variables were not associated with incident symptoms
- Functional impairment at 6 months was reported for 192 workers; the highest odds ratio was for presence of severe symptoms at baseline (OR=4.73); wrist bending (OR=1.76) was also associated with functional impairment at 6 mo; social support appeared protective (OR=0.37)
- 32% of workers who had symptoms at baseline did not have symptoms at the 6 month follow-up

Authors' conclusions:

- Both personal and workplace factors contribute to the development of upper extremity symptoms
- Risk factors for symptoms may be different than the risk factors for functional impairment; low social support was associated with functional impairment but not with symptom development
- Few workers performed the same task all day long, even though many workers had repetitive work tasks

Comments:

- Many of the limitations are pointed out by the authors; the lack of a measure of physical work factors means that their assessment relies on self-report
- Because a large number of (n=212) of incident cases occurred during the 6 months, the logistic regression models are able to accommodate a fairly large number of independent variables (12 independent variables in Table II) without the evaporation of precision that often occurs when too many variables try to fit into a regression model
- Nothing can be concluded about the effect of work on specific diagnoses, but only on the development of a wide variety of regional symptoms

Assessment: Adequate for evidence that wrist bending and forceful gripping for more than 4 hours a day are associated with symptom development, and that both wrist bending and low social support are associated with functional impairment