Wieslander G, Norback D, et al. Carpal tunnel syndrome (CTS) and exposure to vibration, repetitive wrist movements, and heavy manual work: a case-referent study. Br J Ind Med 1989:46:43-47.

Design: case-control study

Population/sample size/setting:

- 34 men aged 20-66 who were operated on for CTS in Uppsala, Sweden during 1975-1980
- Patients were excluded if the carpal ligament had been divided because of a traumatic injury
- For each case, two controls were chosen from other surgical cases at the same hospital, and 2 controls were drawn from the general population, matched for age and year of operation; all subjects were men

Main outcome measures:

- Both cases and controls were interviewed on the telephone by the same physician using a standardized questionnaire
- Interviews covered use of vibrating handheld tools, performance of repetitive movements of the hand at work, and work involving a heavy load on the wrist
- Performance of repetitive hand movements was also classified by an occupational hygienist; duration of exposure (<1 year, 1-20 years, and >20 years) was also assessed (not clear if by physician or hygienist)
- The CTS cases had elevated odds ratios for hand held vibrating tools (OR=3.3) and repetitive movements of the wrist (OR=2.7) when compared with all of the control subjects, but the OR for a heavy load on the wrist was not significantly elevated (OR=1.8)
- The odds ratios for vibrating tool use and for repetition were greater when only the general population controls were used for comparison; for vibration the OR was 6.1 and for repetitive movement the OR was 4.5 in addition, the OR for heavy work load was significantly increased (OR=2.7)

Authors' conclusions:

- Exposure to handheld vibrating tools, work with repetitive movements of the wrist, and work with heavy loads on the wrist, are probably of importance for the development of CTS
- The odds ratios for hospital controls could have been biased because of a selection for blue collar workers in hospital inpatient populations in the Swedish health care system

Comments:

- Telephone interview by physicians who were not blind to the case status of the subjects could be biased; if there was strict adherence to a standardized questionnaire, this bias may have been minimized, but the potential for bias is present

- There are many well-known problems with hospital controls in case-control studies, and the general population controls present fewer difficulties in interpretation
- Repetition is not defined in terms (cycles per minute, duration of tasks) that would allow a meaningful statement to be made; similarly for heavy loads, no units are presented for a meaningful exposure to be estimated

Assessment: Adequate for an evidence statement that handheld vibrating tool use is associated with CTS