### Study

**Wang 2001**

- **US**
- **Case control study for Hip Fractures occurring from January 1, 1994 to December 31, 1994**

**Subject population:** Medicare, Medicaid and/or the Pharmaceutical Assistance to the Aged and Disabled program of New Jersey

**Purpose:** The study had three specific aims, each designed to shed light on characteristics of benzodiazepine use that increase the risk for hip fracture: 1) to compare long-acting benzodiazepines to agents with shorter elimination half-lives in terms of their risks for hip fracture; 2) to quantify the risks associated with a variety of benzodiazepine dosages, including the relatively low dose levels currently recommended for older adults but which may still pose hazards; and 3) to examine the risks associated with continuous benzodiazepine use over a wide range of treatment durations.

### Intervention

- **Outcome:** hip fractures occurring from January 1, 1994 to December 31, 1994

**Assessment**

- **Drugs Considered:**
  - Long-acting benzodiazepines: diazepam, flurazepam, chlordiazepoxide, and clonazepam
  - Non-long-acting (other) benzodiazepines: alprazolam, clorazepate, estazolam, halazepam, lorazepam, oxazepam, prazepam, quazepam, temazepam, or triazolam

**Assessment method/tools**

- Covariates adjusted for:
  - Sociodemographic characteristics:
    - Age, gender, race, socioeconomic status
  - Other medication use: antipsychotic medications, antidepressants, other psychoactive medications (including barbiturates, nonbenzodiazepine sedatives and anxiolytics, stimulants, and lithium), estrogen replacement therapy, oral corticosteroids, and thiazide diuretics.
  - Medical variables:
    - Number of medications (generic entities) used,
    - Days hospitalized,
    - Days in a nursing home, and number of outpatient physician visits.
  - Charlson comorbid illness severity score

**Conclusion:** Even at modest doses, including some low doses currently advocated in prescribing guidelines for older patients, treatment with benzodiazepines appears to increase the risk of hip fracture. Patients appear to be particularly vulnerable immediately after initiating therapy and after more than 1 month of continuous use. Benzodiazepines with shorter half-lives appear to be no safer than longer half-life agents. In fact, significantly higher risks of hip fracture with use of benzodiazepines with shorter elimination half-lives was found in this study. Clinicians should be aware of these risks and weigh them against potential benefits when prescribing for elderly patients.