



***A Cost-Effectiveness Analysis of
Vitamin D and Calcium Therapy to
Reduce Falls and Fall-Related
Injuries in Community-Dwelling
Elderly Women in Ontario - Results
from the Falls/Fractures Economic
Model in Ontario Residents
(FEMOR) Aged 65 Years and Over***

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Falls in Elderly

- Definition of a “fall”:
 - Unintentionally coming to rest on the ground, floor, or other lower level
 - Does not usually include falls from a moving car or bicycle
 - May or may not include falls associated with syncope
- Falls occur in 30-60% of older adults each year*
- 10-20% of falls result in injury, hospitalization and/or death*
- Fall-related injuries are the leading cause of injury-related ED visits, hospitalizations, and inpatient deaths among Ontario’s elderly (aged 65+) §
- In FY2005 in Canada, 21.9% of ED visits for falls in elderly (65+) resulted in hospital admission (*Discharge Abstract Database*)

*Source: Rubenstein, 2006

§Source: ICES Injuries Atlas

Risk of Admission to an LTC Home

- A prospective cohort study (Tinetti, 1997) was designed to assess the risk of admission to an LTC home after falls and fall injuries
- Outcome: Number of days from initial assessment to a first long-term admission to a skilled-nursing facility
- After adjusting for other risk factors*, the hazard ratios of LTC home admission for each of the fall categories (with “no fall” as the referent) were:
 - One fall without serious injury: HR=3.1 (1.9-4.9)
 - 2 or more falls without serious injury: HR=5.5 (2.1-14.2)
 - At least one fall causing serious injury: HR=10.2 (5.8-17.9)

**Adjusted for demographic characteristics, psychosocial and cognitive characteristics, and health-related and functional characteristics*

Objective

To assess the cost-effectiveness of vitamin D + calcium therapy vs. no intervention in reducing falls and fall-related injuries in community-dwelling female seniors from the Ontario Ministry of Health perspective.

Literature Search

➤ Inclusion Criteria:

- Population of community-dwelling elderly (majority aged 65+)
- RCT, systematic reviews/meta-analyses
- Must measure at least one of: number of fallers, number of falls resulting in injury/fracture

➤ Exclusion Criteria:

- Special populations (such as stroke or osteoporosis)
- Studies including a mix of older and younger individuals
- Studies only reporting surrogate outcomes (such as balance or strength improvements), with no fall outcomes measured

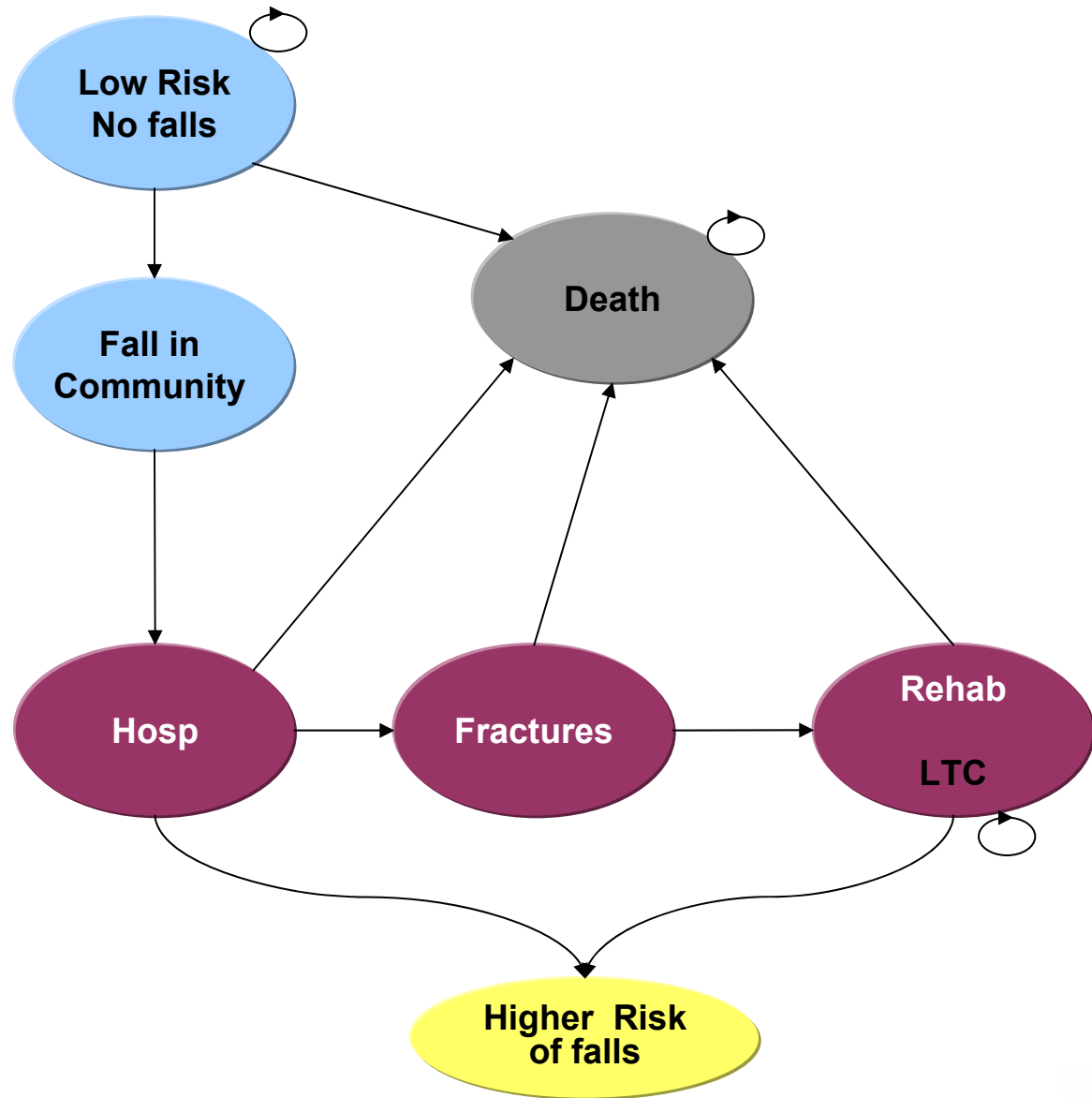
Proportion of Women Falling: Literature Review Results

Parameter	Outcome
# Studies	2
Total N (case/control)	720/1401
RR (95% CI)	0.83 (0.73, 0.95)
Quality (GRADE)	Moderate

Falls/Fractures Economic Model in Ontario Residents (FEMOR) Aged 65 Years and Over

- Model probabilities driven by Ontario MOH specific data – hospitalizations from DAD and ED visits from NACRS
- Period of 2002-2006 - identified a cohort of patients with falls and fractures
- Looked back 2 years to identify groups by risk of falling
 - Low risk – no previous medical contact for falls
 - Moderate risk – one medical contact for falls
 - High risk – two or more medical contacts for falls and/or any medical contact for fractures
- Medical contact defined as a hospitalization or ED visit not OHIP
- Aggregate by age, gender and risk
- Markov model - lifetime

FEMOR



Female Lifetime Outcomes (per Patient) – FEMOR Results

Females	Lifetime Cost	Cost Avoided	Lifetime Falls	Falls Avoided	Life Years
Base case	\$42,140		0.885		8.798
Vitamin D + calcium	\$41,956	\$183.93	0.875	0.010	8.296

Costs are in 2008 Canadian dollars.

Ontario Lifetime Savings in Women Aged ≥ 65

Females	Lifetime Cost per Patient	Lifetime Cost Avoided per Patient	N	Ontario Lifetime Savings
Base case	\$42,140			
Vitamin D + calcium	\$41,956	\$183.93	385,012	\$71 M

Costs are in 2008 Canadian dollars.

Vitamin D + Calcium Supplementation - Conclusions

- A combination of Vitamin D and Calcium effectively reduces falls in Ontario's elderly female population with cost-savings.