

Impact exercises for individuals at risk of fractures

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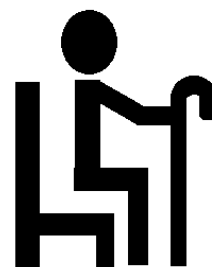
The Burden of Osteoporotic Fractures

1 in 3
women will
have an
osteoporotic
fracture

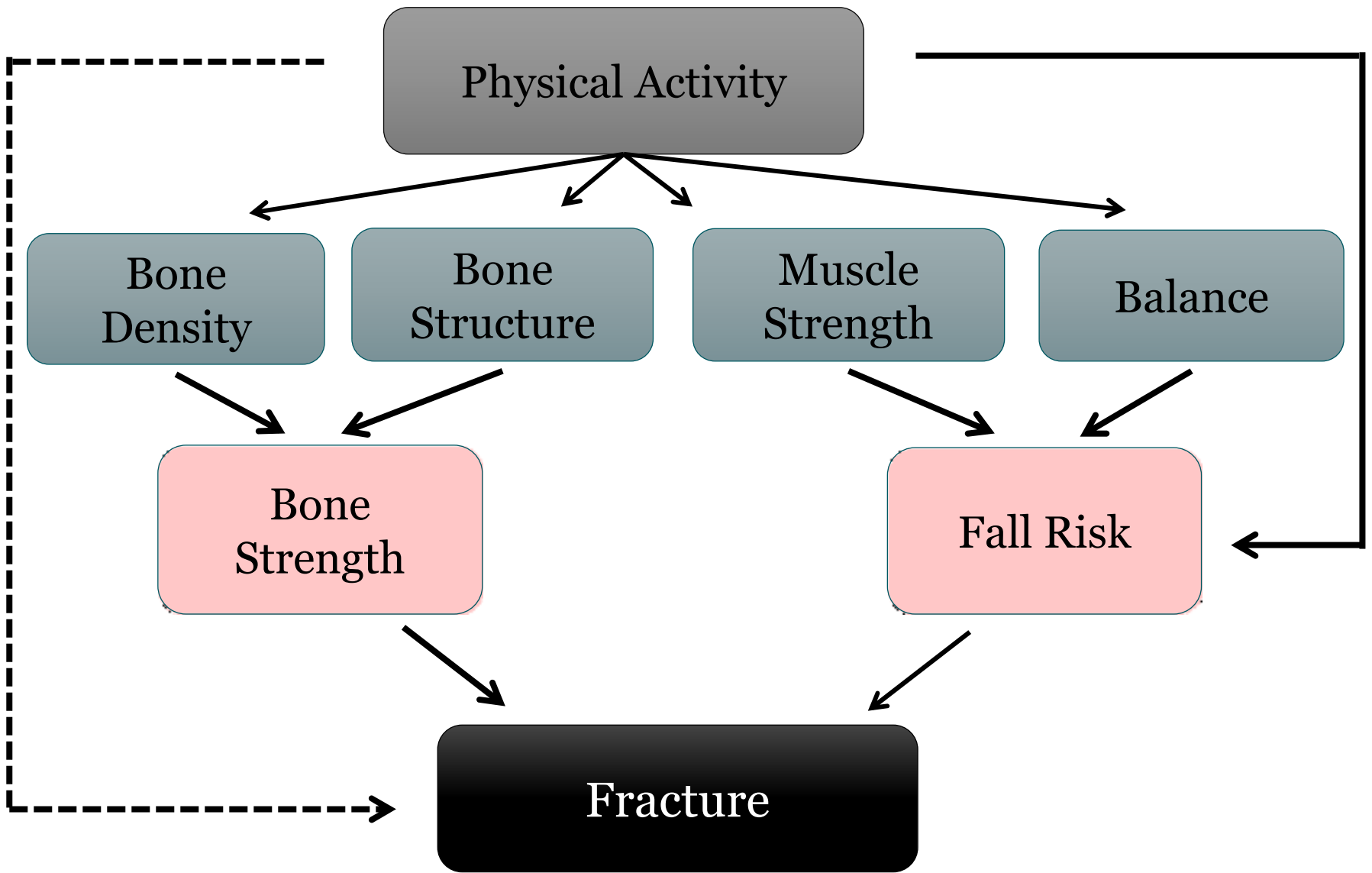
1 in 5 men
will have an
osteoporotic
fracture



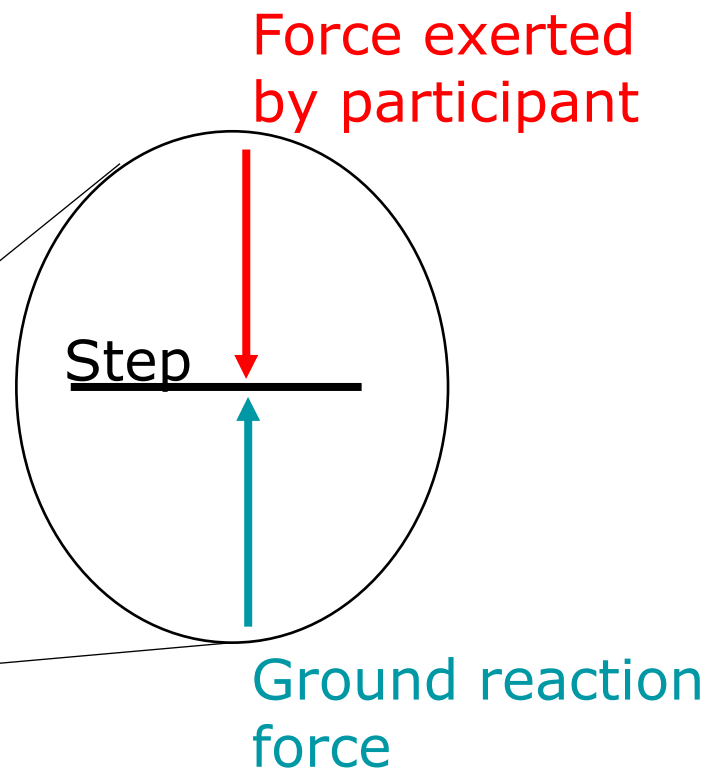
After a hip
fracture 40%
cannot walk
independently



Some
fracture can
increase
mortality
rate by 15-
20%



What are Impact Exercises?



What does this look like?



Higher
magnitude



Higher
frequency



More
dynamic

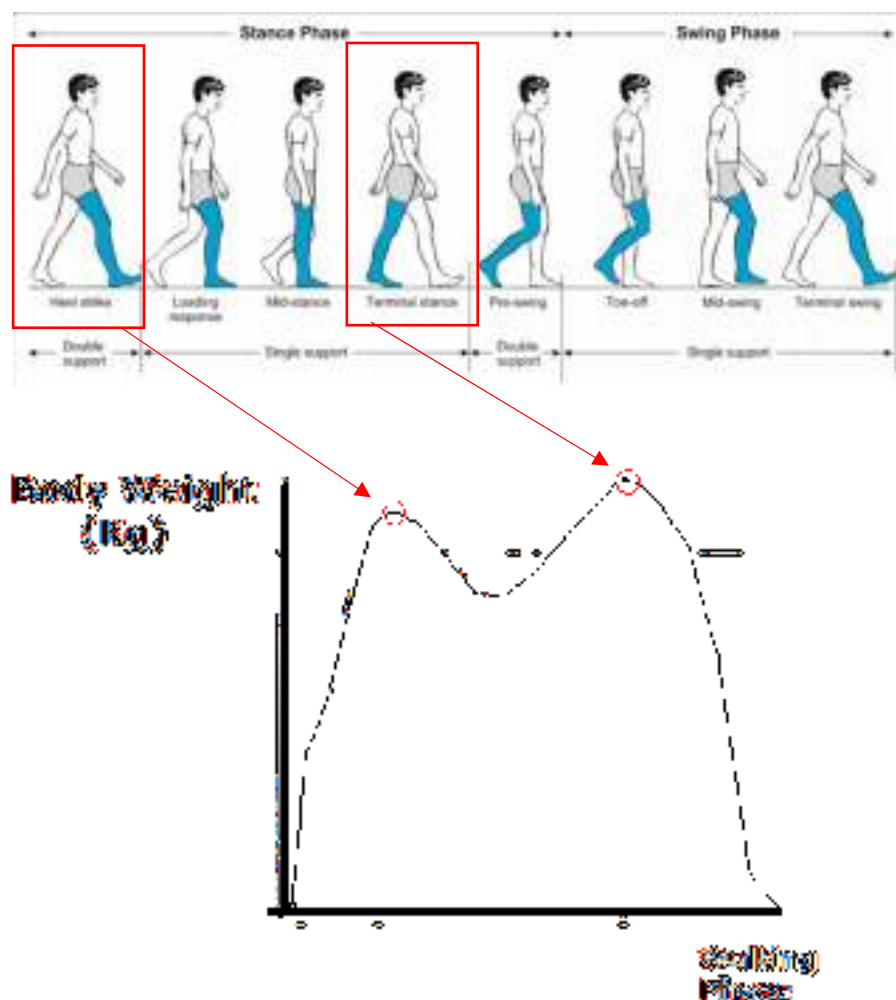


Shorter
bouts

What are Impact Exercises?

- Impact exercise have a ground reaction force
- Stepping-up, dancing, jumping
- Low ≤ 1.00 to $1.50 \times BW$
- Moderate 1.51 to $3.10 \times BW$
- High $\geq 3.11 \times BW$

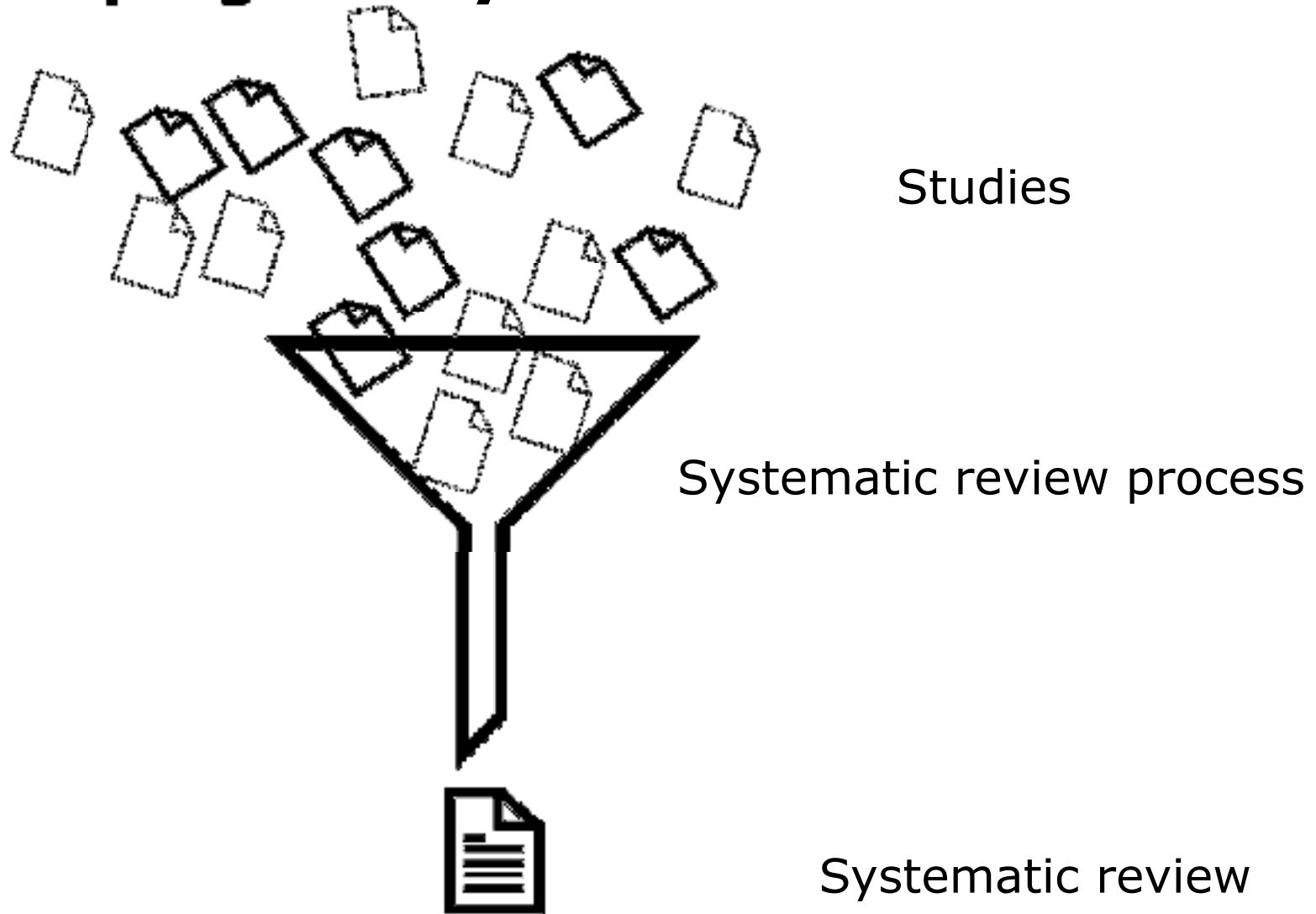
BW = body weight



Examples of Impact Exercises

	Activity	Peak vGRF (body weight)
Low Impact	Lunge	1.1
	Walk	1.2
Moderate Impact	Stride jump	2.1
	Side-step	2.9
High Impact	Jump	4.7
	Drop jump	5.5

Developing the Systematic Review



Developing the Systematic Review



Step One:

- Defining the project
- Setting up the team



Step Two:

- Developing the Systematic Review



Step Three:

- Evaluating the evidence (GRADE)

Sept 2017

April 2019

March 2020

July 2020



Developing the Systematic Review

- Working group composed of:



- Patient advocate



- Physiotherapists
- Physicians



- Researchers
- Graduate students

Developing the Systematic Review

- Canadian Osteoporosis Patient Network (COPN)
- 10,000 Canadians affected by osteoporosis or low bone mass
- Survey - COPN members



COPN Participant Characteristics



96% women



94% native
English speakers



85%
Osteoporosis



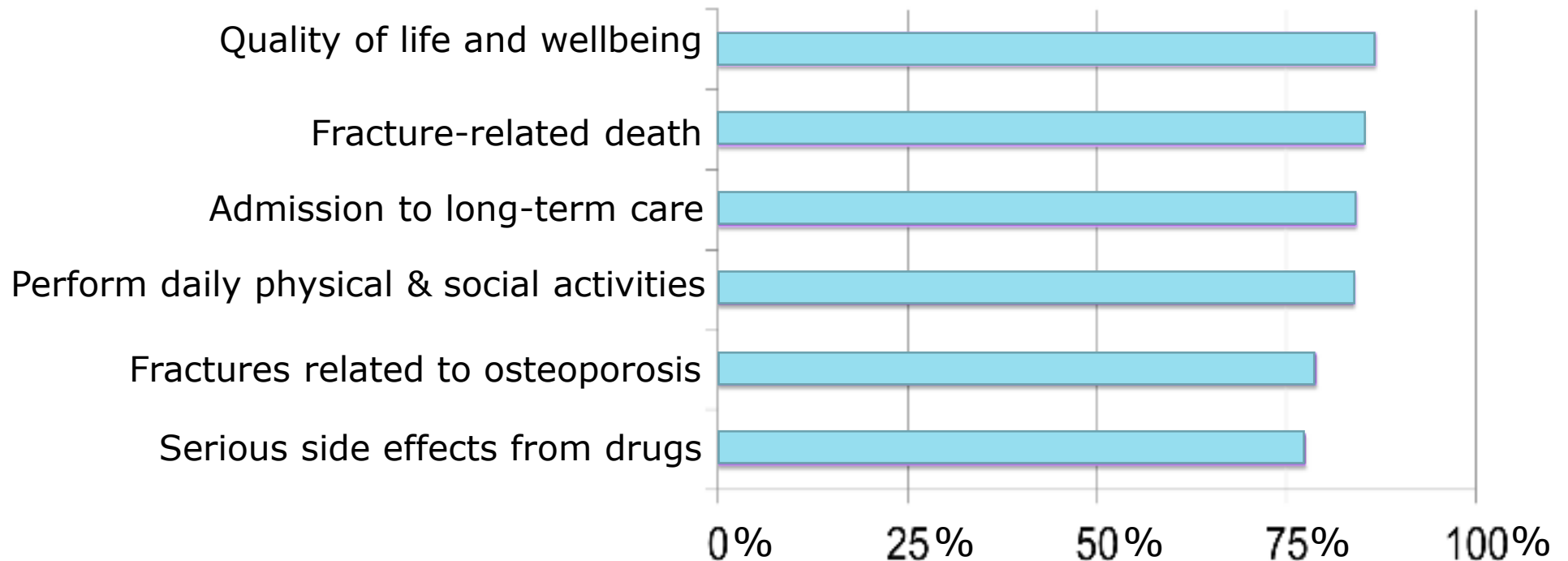
2.6% cared for someone
with osteoporosis



85% osteoporosis
knowledge

COPN Results

What outcomes are critical to consider in the osteoporosis management guidelines?



COPN Results

Outcomes to Consider in the Review



Fracture-related mortality



Hip fractures



Other fragility fractures



Health-related quality of life



Falls and fall-related injuries



Physical Functioning and Disability



Mortality



Serious adverse events

Outcomes to Consider in the Review



Bone Mineral Density

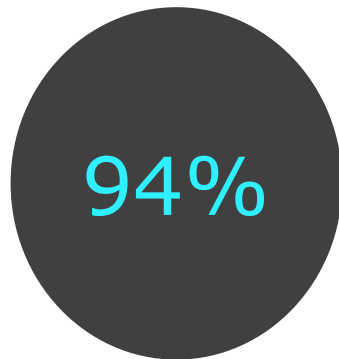


Pain

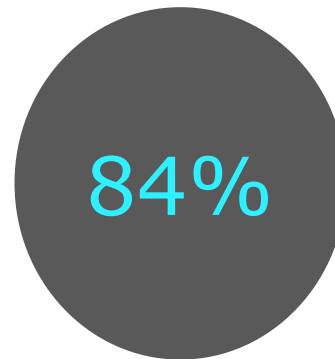
Developing the Systematic Review

- Surveyed > 100 exercise professionals:

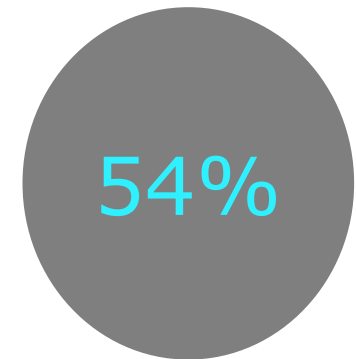
How comfortable are exercise professionals in teaching exercises to the following groups?



Low risk of fractures group



Moderate risk of fractures group



High risk of fractures group

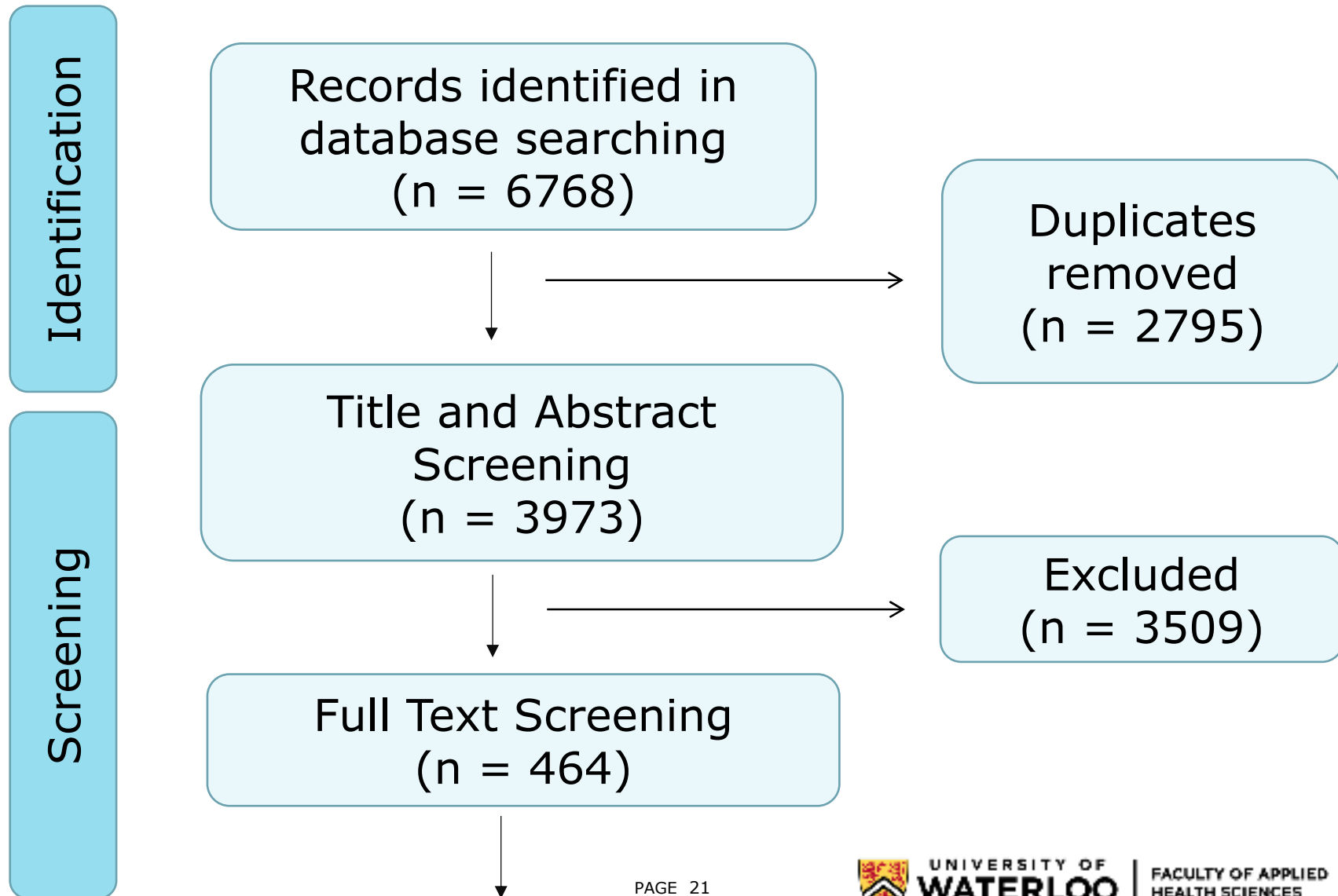
What is the effect of impact exercises in men and women, 50 years and older, at risk of fracture on falls, fractures, and health related outcomes?

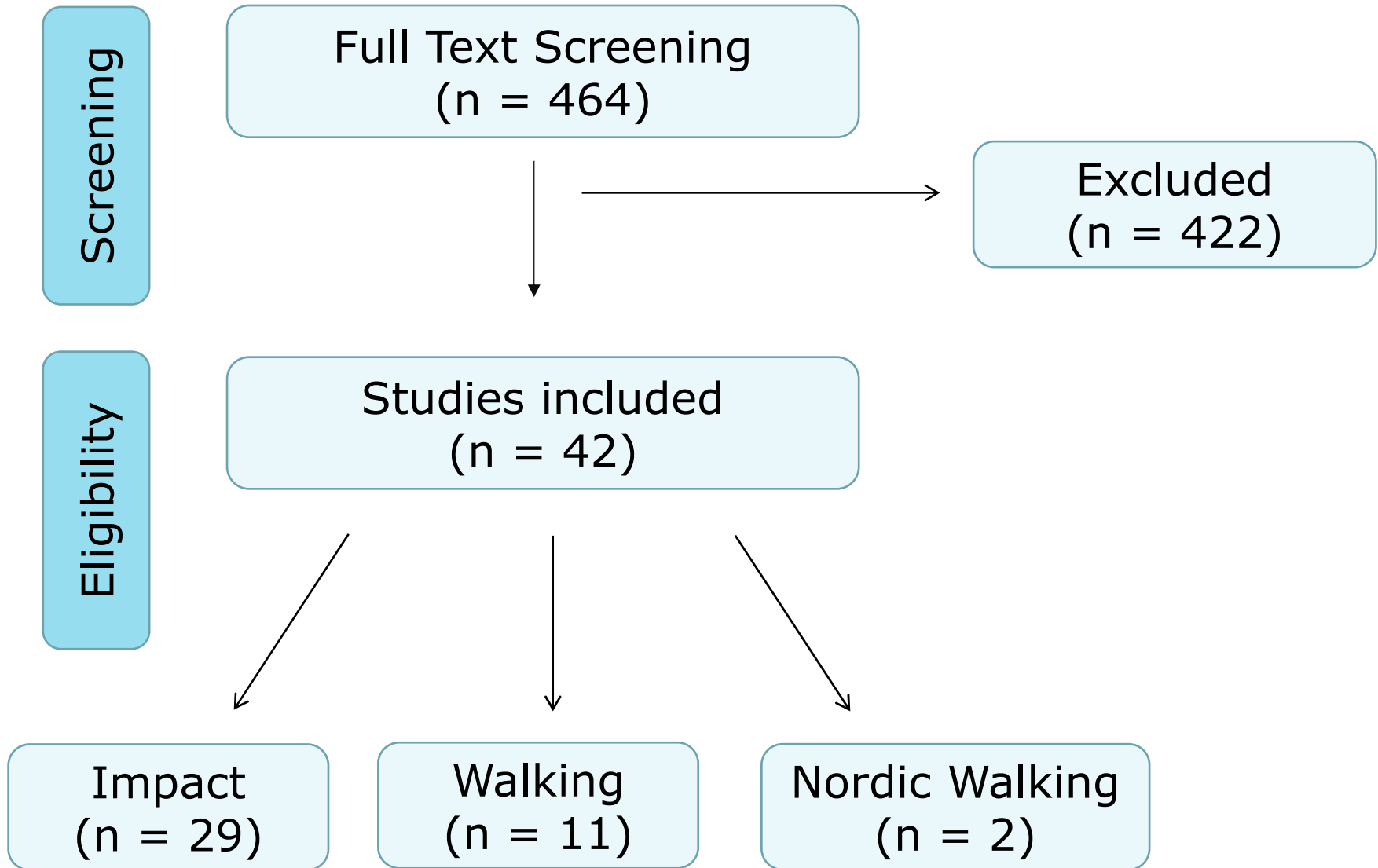
What is the effect of walking and Nordic walking in men and women, 50 years and older, at risk of fracture on falls, fractures, and health related outcomes?

Systematic Review & Meta-Analysis

- Inclusion Criteria
 - Men and postmenopausal women ≥ 50 years
 - T-score < -1.00 or fragility fracture
 - Impact exercise
 - Control group
 - Randomized controlled trial

Systematic Review & Meta-Analysis





Results - Walking

- Participants characteristics:



Older adults
(mean age 69)



70% women



90% lived in
the community



25% had a
prior fracture

Results - Walking

- Intervention characteristics



20 to 60 minutes
2 to 3x/week



Brisk walking
Habitual walking
Nordic walking



Outdoors



Group-based

Results – Walking/Nordic Walking

Outcomes

Intervention

Result

Certainty

op and co,

Results – Walking/Nordic Walking

Outcomes

Intervention

Result

Certainty

Results – Impact Exercises

- Participants characteristics:



Older adults
(50 to 90 years)



60% women



85% lived in
the community



15% had a
prior fracture

Results – Impact Exercises

- Intervention characteristics:



20 to 60 minutes
2 to 3x/week



Indoors



Supervision

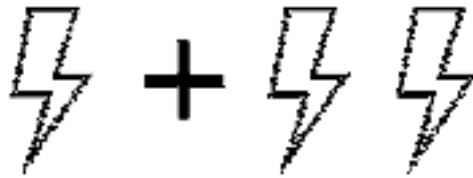


Group-based

Results – Impact Exercises



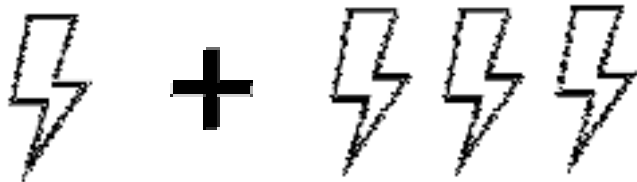
52% low
impact programs



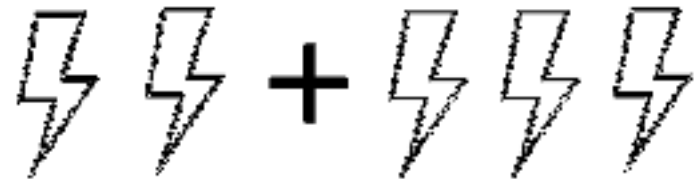
21% low-to-moderate
impact programs



14% high
impact programs



10% low and high
impact programs



3% moderate-to-high
impact programs

Results – Impact Exercises

Outcomes

Intervention

Result

Certainty

Results – Impact Exercises

Outcomes

Intervention

Result

Certainty

Summary

- Walking may improve some outcomes but we need more studies
 - Limited evidence about Nordic walking
- There is some evidence to support impact exercise in people with low bone mass
- Canada's 24-Hour Movement guidelines recommend regular physical activity
 - Walking and impact exercises may have additional health benefits
- New exercise guidelines for osteoporosis (coming soon) will include discussions for impact and walking as well as other types of exercise
 - Balance, functional strength and balance training

Acknowledgements

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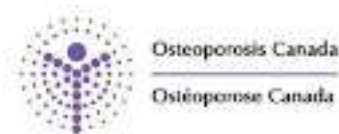
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Thank you!

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