PHYSICAL ACTIVITY IN OLDER ADULTS

Alex Hu

INTRODUCTION

Despite the benefits of being physically active, approximately one in four adults aged ≥50 years are inactive[1]. Providers have the ability to play a unique role in guiding and motivating these patients.

[1]CDC Morbidity and Mortality Weekly Report, 2016

RECOMMENDATIONS

- The 2018 Physical Activity Guidelines for Americans recommends all adults, including older adults, get at least 150 minutes of moderate intensity or 75 minutes of vigorous intensity aerobic physical activity weekly.
- Older adults who cannot achieve this because of chronic conditions should be as physically active as their abilities and conditions allow.[2]

[2]Piercy KL, Troiano RP, Ballard RM, et al. The Physical Activity Guidelines for Americans. JAMA. 2018;320(19):2020-2028. doi:10.1001/jama.2018.14854r

EXERCISE INTENSITY

- Exercise intensity is often expressed in metabolic equivalent of task (MET) units.[2]

Intensity	METs	Examples
Light	<3	Casual walking, stretching, light housework
Moderate	3 – 5.9	Brisk walking (2.5 – 4.0 mph), gardening, water aerobics
Vigorous	≥6	Jogging or running, carrying heavy groceries, fitness class, heavy gardening

BENEFITS OF EXERCISE IN OLDER ADULTS

- Regular physical activity has many benefits including lower mortality, risk of cardiovascular disease mortality, improved quality of life, reduced anxiety and depression, and lower risk of falls.[3]
- A study of 12,201 men aged 65-83 showed active men had a lower HR of death over the 10-13 year study period.[4]

[3]US Department of Health and Human Services. Physical Activity Guidelines for Americans, 2018.
[4]Almeida OP, Khan KM, Hankey GJ, Yeap BB, Golledge J, Flicker L. 150 minutes of vigorous physical activity per week predicts survival and successful ageing: a population-based 11-year longitudinal study of 12 201 older Australian men. *Br J Sports Med*. 2014;48(3):220-225. doi:10.1136.

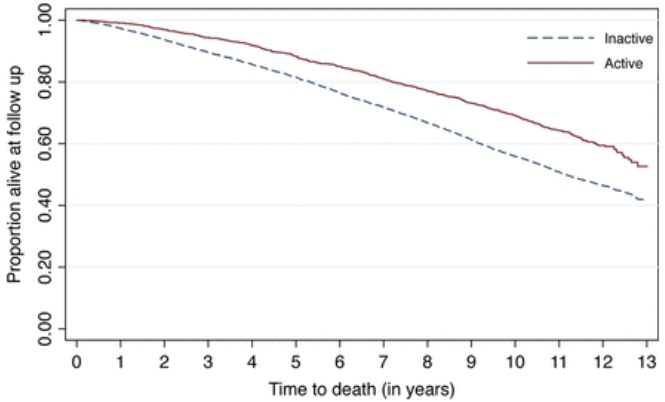


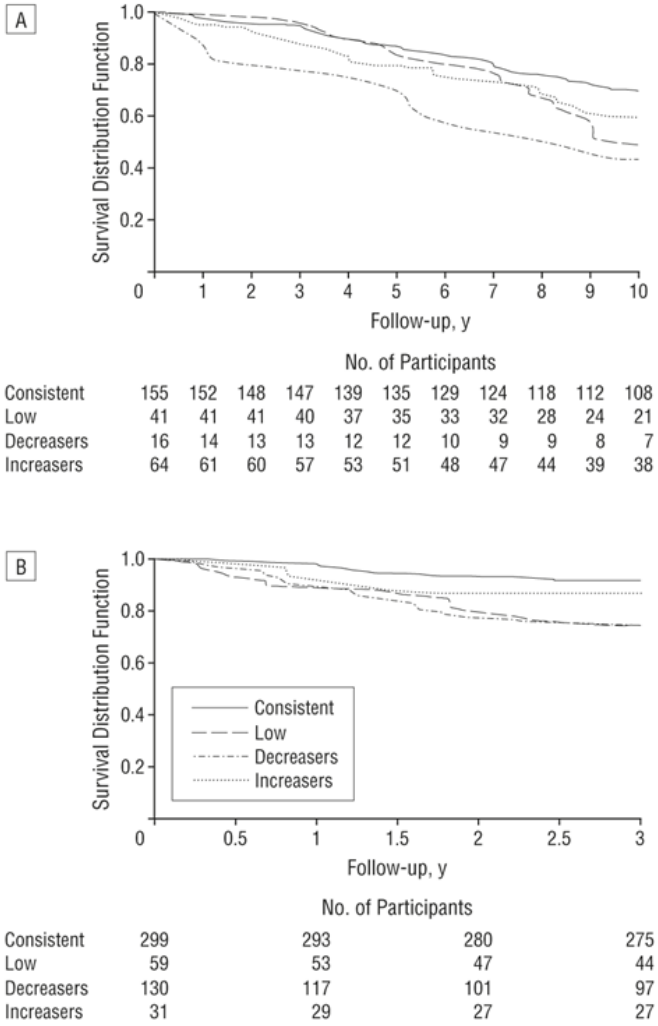
Table 2
Clinical outcomes of older men according to their level of physical activity

Clinical outcomes at the follow-up assessment	Physically inactive N=2535 n (%)	Physically active N=741 n (%)	Risk ratio*	95% CI
Depression	168 (7.6)	36 (5.4)	0.71	0.50 to 1.01
Cognitive impairment	730 (33.0)	190 (28.4)	0.86	0.75 to 0.98
Impaired IADL	1460 (57.6)	349 (47.1)	0.82	0.75 to 0.89
Impaired ADL	958 (37.8)	220 (29.7)	0.79	0.70 to 0.89
No mood, cognitive or functional impairment*	680 (26.8)	259 (34.9)	1.30	1.16 to 1.47

CONTINUED

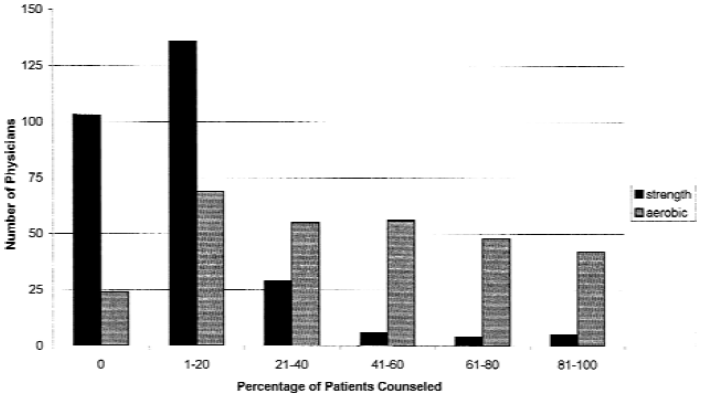
- Furthermore, studies show that any amount of physical activity can result in health benefit[5], and that it is never too late to become physically active.
- Study in JAMA IM of 1861 people aged 70-88 showed “becoming active during old age is also beneficial, even among previously sedentary people.”[6]

[5]Barengo NC, Antikainen R, Borodulin K, Harald K, Jousilahti P. Leisure-Time Physical Activity Reduces Total and Cardiovascular Mortality and Cardiovascular Disease Incidence in Older Adults. *J Am Geriatr Soc*. 2017;65(3):504-510. doi:10.1111/jgs.14694
[6]Stessman J, Hammerman-Rozenberg R, Cohen A, Ein-Mor E, Jacobs JM. Physical Activity, Function, and Longevity Among the Very Old. *Arch Intern Med*. 2009;169(16):1476–1483.



COUNSELING STATISTICS

- A study of primary care physicians showed that physicians often are unable to counsel their patients about physical activity.[8]
- Of those who counseled, 50% report spending 2 minutes or less.
- Major barriers were inadequate time (61%), knowledge (16%), and patient compliance (11%).



[8]Abramson S, Stein J, Schaufele M, Frates E, Rogan S. Personal exercise habits and counseling practices of primary care physicians: a national survey. Clin J Sport Med. 2000;10(1):40-48. doi:10.1097/00042752-200001000-00008

ROLE OF PROVIDER

MOTIVATE PATIENTS

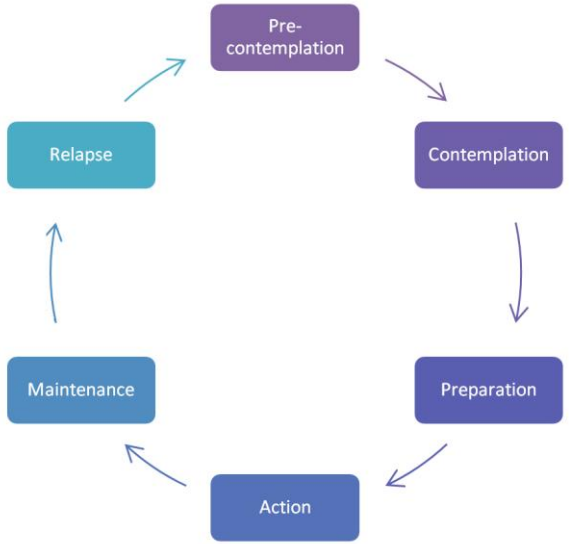
PRE-EXERCISE EVALUATION

GIVE GUIDANCE

PROVIDE RESOURCES

MOTIVATE PATIENTS

- Stages of Change model can be used to counsel patients about specific behavior changes.
- Take a few minutes out of the visit to use motivational interviewing:
  - “What do you think you would be change before our next visit?
  - “What activity would you most like to do if you start exercising?”



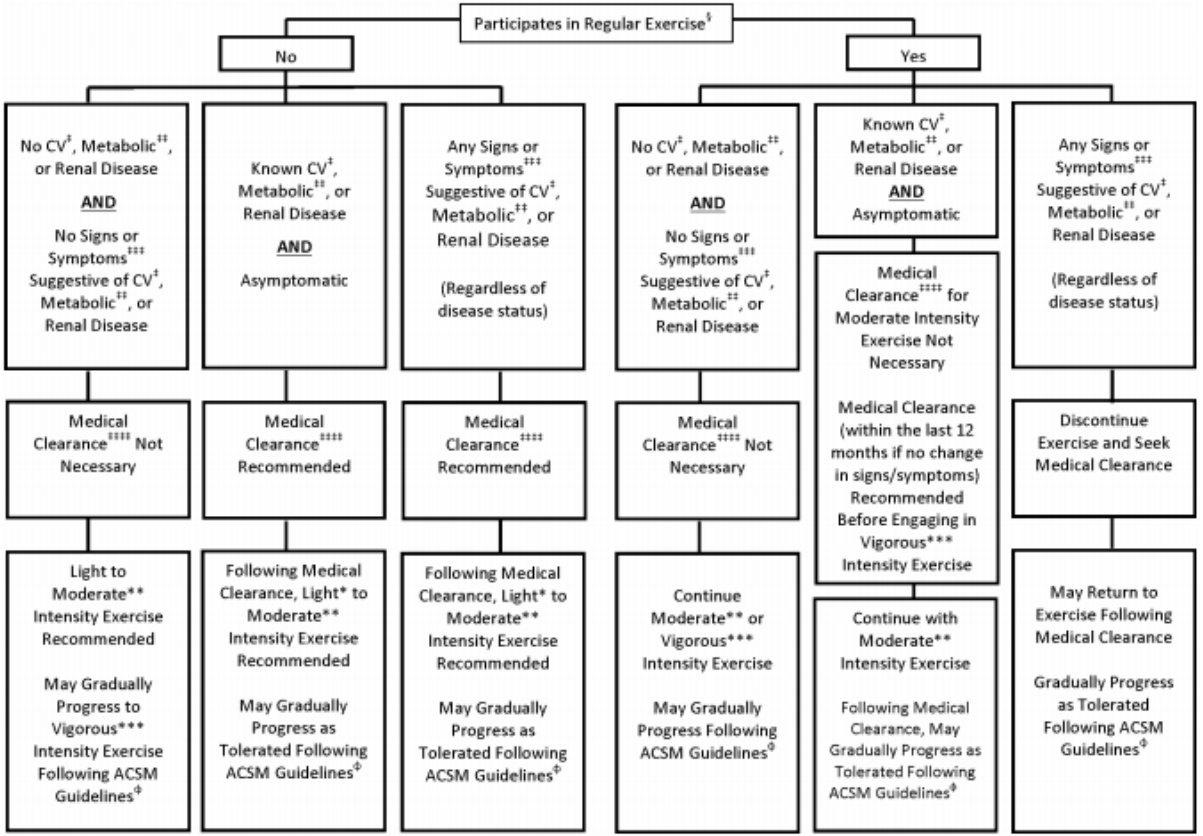
Source: Stages of Change Model

PRE-EXERCISE EVALUATION

- Because motivating people to be physically active is a significant challenge, preparticipation screening recommendations should not present unnecessary obstacles (ACSM, 2015).
- Although risk of acute cardiovascular event is transiently increased during vigorous exercise especially in sedentary individuals, the absolute risk remains extremely low.[9,10]

[9]Albert CM, Mittleman MA, Chae CU, Lee IM, Hennekens CH, Manson JE. Triggering of sudden death from cardiac causes by vigorous exertion. N Engl J Med. 2000;343(19):1355-1361. doi:10.1056/NEJM200011093431902
[10]Whang W, Manson JE, Hu FB, et al. Physical exertion, exercise, and sudden cardiac death in women. JAMA. 2006;295(12):1399-1403. doi:10.1001/jama.295.12.1399

EVALUATION ALGORITHM



[11]Riebe D, Franklin BA, Thompson PD, et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening [published correction appears in Med Sci Sports Exerc. 2016 Mar;48(3):579]. Med Sci Sports Exerc. 2015;47(11):2473-2479. doi:10.1249/MSS.0000000000000664

RISK FACTOR ASSESSMENT

- Most recent ACSM guidelines removed CVD risk factor assessment from the algorithm because (1) Evidence shows the ability to predict SCD and AMI from CVD risk factors is low, and (2) Suggests that risk factor-based screening may be overly conservative.
- Identifying and controlling CVD risk factors continue to be important objectives for overall health.

WHAT IS MEDICAL CLEARANCE?

Condition	Possible Evaluation for Asymptomatic Individuals
Cardiac Disease	EKG, Exercise stress test (ACC, 2002)[12]
Diabetes	EKG[13]
Hypertension	"Exercise testing is not recommended for most patients who start exercise program"[14]
Pulmonary Disease	Consider clinical tests (6 minute walk, shuttle walk), spirometry[15]

[12]Elsawy B, Higgins KE. Physical activity guidelines for older adults. Am Fam Physician. 2010;81(1):55-59.
[13]UpToDate. Effects of exercise in adults with diabetes mellitus. Updated Sep 20, 2019.
[14]UpToDate. Exercise in the treatment and prevention of hypertension. Updated May 13, 2020.
[15]UpToDate. Pulmonary Rehabilitation.Updated June 10, 2020.

GIVE GUIDANCE

- AEROBIC EXERCISE
- MUSCLE STRENGTHENING
- FLEXIBILITY
- BALANCE

PHYSICAL ACTIVITY COMPONENTS

Component	Examples
Aerobic exercise	Brisk walking, jogging, swimming, water aerobics, tennis, golf without use of a cart, exercise classes
Muscle strengthening	Resistance bands, weight machines, handheld weights, heavy gardening, carrying groceries
Flexibility	Stretching exercises performed twice a week for >10 minutes, ideally after other activities
Balance	Balance exercises and participation on classes. Tai chi may be more effective at reducing serious falls versus multimodal or stretching exercises

FLEXIBILITY EXERCISES

Source: UpToDate: Physical Activity and Exercise in Older Adults. Updated May 28, 2019.

BALANCE EXERCISES

Source: UpToDate: Physical Activity and Exercise in Older Adults. Updated May 28, 2019.

EXERCISE PRESCRIPTION

- A verbal or written recommendation for physical activity that should include the modality, frequency and intensity, and short and long term goals to help maintain motivation.

FITT MNEMONIC

- **F** – Frequency
- **I** – Intensity
- **T** – Time
- **T** – Type

F	Three days a week
I	Moderate
T	20 to 30 minutes
T	Brisk walking

EXAMPLE PRESCRIPTION

Initial condition stage prescription for an older adult with diabetes who performs less than 150 minutes of moderate intensity physical activity per week

[18]Lee PG, Jackson EA, Richardson CR. Exercise Prescriptions in Older Adults. Am Fam Physician. 2017;95(7):425-432.

Sample Exercise Prescription

Weeks 1 and 2*

Aerobic activities

For 3 days per week (frequency), walk briskly (activity, intensity) for 20 minutes (duration) each day at the local park after dinner (setting).

Flexibility training

For 3 days per week (frequency), stretch calf and thigh muscles (activity, muscle groups) for 5 minutes each day at home (setting) after walking (aerobic activity).

Resistance training

For 2 days per week (frequency), lift 5-lb dumbbells, front arm and side arm raises (activity, muscle groups) for 2 sets of 5 repetitions each day at home (setting).

Weeks 3 and 4 (increase duration of aerobic activity and add more resistance training)

Aerobic activities

For 3 days per week (frequency), walk briskly (activity, intensity) for 30 minutes (duration) each day at the local park after dinner (setting).

Flexibility training

For 3 days per week (frequency), stretch calf and thigh muscles (activity, muscle groups) for 5 minutes each day at home (setting) after walking (aerobic activity).

Resistance training

For 2 days per week (frequency), lift 5-lb dumbbells, front arm and side arm raises, and perform wall push-ups (activity, muscle groups) for 2 sets of 10 repetitions each day at home (setting).

ADVANCING AEROBIC EXERCISE

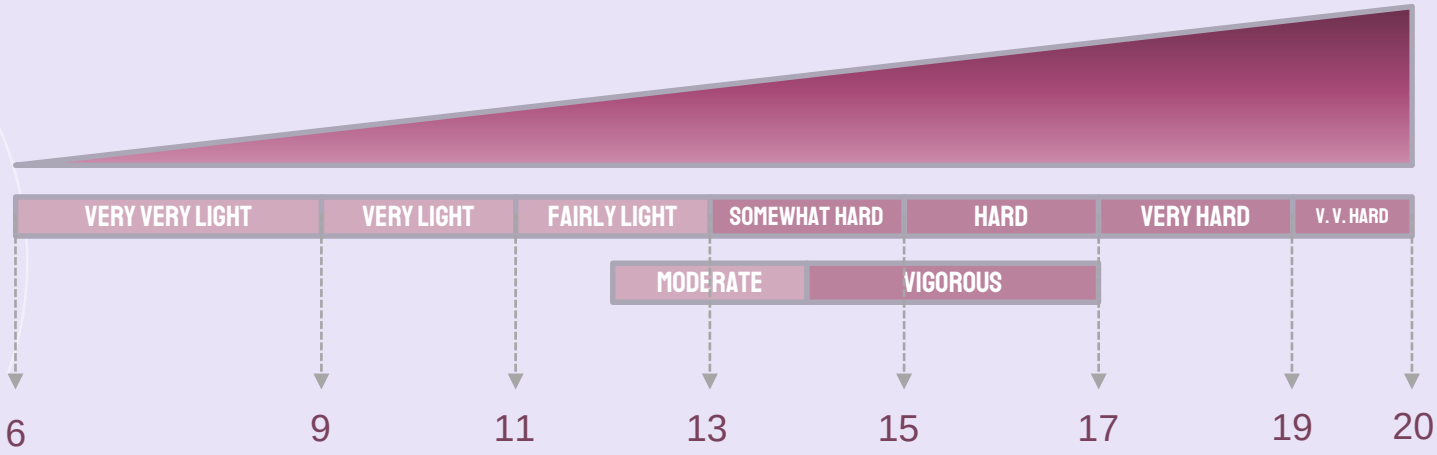
- Patients should advance their exercise and increase their intensity for optimal cardiovascular benefit.[19]

INITIAL CONDITIONING	IMPROVEMENT	MAINTENANCE
• 40% progressing to 70% of maximum heart rate • 3 days per week, sessions lasting 12-20 minutes • Occurs over 3-4 weeks	• 60% progressing to 85% of maximum heart rate • 3 to 5 days, sessions 30-45 minutes • Occurs 4-5 months	• 50% progressing to 85% of maximum heart rate • 3 to 5 days, sessions 30-45 minutes • After 6 months

[19]UpToDate. Exercise prescription and guidance for adults. Updated Mar 19, 2020.

RATING OF PERCEIVED EXERTION

- Individual's perception of how hard they are working. In a young adult, you can add a 0 to the rating to estimate the corresponding heart rate when performing that activity.[20]



[20]CDC. Perceived Exertion (Borg Rating of Perceived Exertion Scale). Reviewed April 10, 2020.

IMPORTANT GUIDELINES

- In general, increase exercise intensity gradually.
- Emphasize perceived exertion and prescribed training heart rates.
- Educate patients about recognizing symptoms.
- Encourage patients to listen to their body.
- Try to reduce inertia.
    - Workday walking routine
    - Integrating into everyday activities
    - Finding a partner
    - Fitness professional

SPECIAL POPULATIONS

Population	Recommendations
Arthritis	Aerobic activities that minimize joint stress (e.g. swimming, water aerobics, stationary cycling).[21]
Osteoporosis	Resistance exercises and impact loading activities. Strengthening programs should be gradual.[22]
Cognitive Impairment	Similar to standard recommendations. Involve caregiver.
High risk for falls	Balance exercises, fall prevention programs.[23]

[21]Lee PG, Jackson EA, Richardson CR. Exercise Prescriptions in Older Adults. Am Fam Physician. 2017;95(7):425-432.
[22]Bolam KA, van Uffelen JG, Taaffe DR. The effect of physical exercise on bone density in middle-aged and older men: a systematic review. Osteoporos Int. 2013;24(11):2749–2762
[23]Chodzko-Zajko WJ, Proctor DN, Fiatarone Singh MA, et al. American College of Sports Medicine position stand. Exercise and physical activity for older adults. Med Sci Sports Exerc. 2009;41(7):1510–1530.

RESOURCES

- NIH - National Institute on Aging

4 Types of Exercise

Learn about endurance, strength, balance, and flexibility.

How to Get Started with Exercise

Being physically active is one of the best things you can do for your health. Get started!

Real-Life Benefits of Exercise

Staying active can help your physical and emotional health and mobility.

Staying Motivated to Exercise

Find ways to stay motivated and fit exercise into your life.

Have Fun and Be Active

Find fun, simple ideas to keep you active throughout the year.

Finding the Right Fitness Clothes

Choosing the right clothing and shoes is important for staying safe and comfortable.

CONCLUSIONS

- There are many benefits to physical activity in older adults. A little is better than none, and it is never too late to start.
- Providers can help by motivating patients, conducting pre-exercise evaluations, give guidance, and provide resources.
- Exercise prescriptions use the FITT mnemonic. Advancing exercise can be done while monitoring heart rate and RPE.


THANKS!
ANY QUESTIONS?

CONTINUED

- Another trial found that moderate intensity physical activity reduced major mobility disability (MDD), and that there were positive effects of physical activity even in frail individuals.[7]

[7]Slomski A. Benefits of Moderate Physical Activity Despite Frailty. JAMA. 2018;319(12):1190. doi:10.1001/jama.2018.2789

START LOW

- Ultimately, decisions should be individualized. Typically, start with light to moderate intensity exercise in sedentary patients and increase while paying attention to any symptoms. This also helps reduce initial inertia.
- Research has primarily focused on vigorous and near-maximal intensity physical activity. It is thought the risks from light and moderate intensity exercise is substantially lower.[16]

[16]Riebe D, Franklin BA, Thompson PD, et al. Updating ACSM's Recommendations for Exercise Preparticipation Health Screening [published correction appears in Med Sci Sports Exerc. 2016 Mar;48(3):579]. Med Sci Sports Exerc. 2015;47(11):2473-2479. doi:10.1249/MSS.0000000000000664

TAI CHI

- 2019 study compared patients receiving tai chi to those receiving multimodal exercise intervention and stretching exercises.
- Participants were 70 years or older, and had either fallen in the last 12 months or had impaired mobility.
- Primary outcome was moderate and serious injurious falls during 12 months.

CONTINUED

Table 3. Number of Injurious Falls and Intervention Group During 12 Months Using Stretching Exercise as a Reference Group[a]

Outcome	Unadjusted IRR (95% CI)	*P* Value	Adjusted IRR (95% CI)[b]	*P* Value
Primary				
Moderate injurious falls				
TJQMBB vs stretching exercise	0.51 (0.35-0.74)	<.001	0.53 (0.36-0.76)	.001
Multimodal exercise vs stretching exercise	0.62 (0.42-0.89)	.01	0.65 (0.45-0.94)	.02
Serious injurious falls				
TJQMBB vs stretching exercise	0.25 (0.13-0.48)	<.001	0.25 (0.13-0.46)	<.001
Multimodal vs stretching exercise	0.56 (0.33-0.94)	.03	0.53 (0.32-0.88)	.02
Secondary				
Emergency department visits				
TJQMBB vs stretching exercise	0.26 (0.12-0.52)	<.001	0.26 (0.14-0.51)	<.001
Multimodal vs stretching exercise	0.55 (0.31-0.97)	.04	0.52 (0.30-0.91)	.02
Hospitalizations				
TJQMBB vs stretching exercise	0.27 (0.10-0.73)	.01	0.26 (0.10-1.71)	.008
Multimodal vs stretching exercise	0.60 (0.28-1.29)	.19	0.58 (0.27-1.24)	.16

[17]Li F, Harmer P, Eckstrom E, Fitzgerald K, Chou LS, Liu Y. Effectiveness of Tai Ji Quan vs Multimodal and Stretching Exercise Interventions for Reducing Injurious Falls in Older Adults at High Risk of Falling: Follow-up Analysis of a Randomized Clinical Trial [published correction appears in JAMA Netw Open. 2019 Mar 1;2(3):e192314]. JAMA Netw Open. 2019;2(2):e188280. Published 2019 Feb 1. doi:10.1001/jamanetworkopen.2018.8280