

Demand on your CARE: Combating Frailty and Sarcopenia

Chapter 3

Exercise intervention for frailty and sarcopenia

Structured exercise programme

- Increase muscle oxygen content, tolerance, and flexibility
- Prevent and decrease muscle atrophy
- Increase muscle mass
- Enhance muscle strength
- Improve pace
- Improve quality of life and confidence

→ Positive effects on physical functioning, cognition, and psychological well-being

Multi-components of exercise programme

- Aerobic/endurance
- Resistance/ strength
- Balance
- Flexibility

WHO guidelines on physical activity and sedentary behaviour (2020)

For older adults, physical activity can be undertaken as part of:

- Recreation and leisure (play, games, sports or planned exercise)
- Transportation (wheeling, walking and cycling)
- Work
- Household chores
- In the context of daily occupational, educational, home or community settings

Recommendation

Older adults:

- ✓ Should undertake regular physical activity.
Strong recommendation, moderate certainty evidence
- ✓ Should do at least 150–300 minutes of moderate-intensity aerobic physical activity; or at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous intensity activity throughout the week, for substantial health benefits.
Strong recommendation, moderate certainty evidence
- ✓ May increase moderate intensity aerobic physical activity to more than 300 minutes; or do more than 150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous intensity activity throughout the week, for additional health benefits.
Conditional recommendation, moderate certainty evidence

Recommendation

- ✓ Should also do muscle strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits.
Strong recommendation, moderate certainty evidence
- ✓ Should do varied multicomponent physical activity that emphasizes functional balance and strength training at moderate or greater intensity, on 3 or more days a week, to enhance functional capacity and to prevent falls.
Strong recommendation, moderate certainty evidence

Ideal heart rate during exercise

The American Heart Association (AHA) advise:

- Your maximum heart rate is about 220 minus your age
- Target heart rate during moderate intensity activities is about 50-70% of maximum heart rate, while during vigorous physical activity it's about 70-85% of maximum

Tips for undertaking exercise properly

- **No-pain rule:** if you feel articular or muscular pain, difficulty breathing, dizziness, a rapid heartbeat, etc. during an exercise, stop immediately
- **Use an adequate area:** eliminate any obstacles that may increase a risk of falling. When doing standing up or balance exercises, you can use objects that will make it safer (chairs, bars, tables, etc.)
- **Make sure your shoes fit you well:** they should have flat soles, be anti-slip and offer good support for your heel

Tips for undertaking exercise properly

- Wear comfortable clothing
- Do not hold your breathing during the exercises. **Breathe normally**
- **Talk to your doctor if you are not sure if you should do a particular exercise,** especially if you have had hip or back surgery
- **Stop exercise and seek medical advice** immediately if you are not feeling well during exercise

Vivifrail Exercise

- Based on the idea that health in older people should be measured in terms of its **function** and **NOT as a disease**
- To maintain a level of functionality that maintains the highest degree of autonomy possible in each case
- Designed for older adults above 70, that promotes the practice of physical exercise to improve strength, gait ability and balance, while frailty and falls are prevented
- Multicomponent exercise programme: Resistance, balance, endurance & coordination training

Reference: <https://vivifrail.com/>

Vivifrail test

- To determine the most appropriate type of multicomponent physical program regarding the functional capacity and risk of falls of the older adults
- Consists of assessing functional capacity through the SPPB test and a battery of 4 measures that allow assessing the risk of falls
- For details, please refer to [vivifrail multi-component physical training prescription guide](#).

Vivifrail Exercise

- Type A: Person with disability
- Type B: Person with frailty
- Type C: Person with pre-frail
- Type D: Robust person

Type A: Person with disability



EXERCISE WHEEL

WALK
BEGIN THIS EXERCISE ONLY WHEN YOU HAVE IMPROVED YOUR MUSCLE STRENGTH.
5-10 SECONDS 5 SETS.
INCREASE THE TIME UNTIL YOU CAN WALK 1-2 MINUTES WITHOUT STOPPING.

REST
REMEMBER TO REST BETWEEN SETS.

BREATHE CORRECTLY
BREATHE NORMALLY, DO NOT HOLD YOUR BREATH DURING THE EXERCISES.

EXERCISES
IF THERE IS ANY DOUBT ABOUT HOW TO CARRY OUT THE EXERCISES, PLEASE CONSULT THE PASSPORT.



1 WALK
See legend

2 SQUEEZE A BALL
12 Repetitions
3 Sets

3 LIFT A BOTTLE
12 Repetitions
3 Sets

4 EXTEND YOUR LEGS USING A BALLESTED ANKLE BRACE
12 Repetitions
3 Sets

5 GET UP FROM A CHAIR WITH HELP
12 Repetitions
3 Sets

6 WALK WITH YOUR FEET IN LINE
15 Paces
3 Sets

7 STRETCH YOUR ARMS
3 Repetitions
3 Sets
Maintain 10 s

vivifrail

interreg | vivifrail | aptitude

The project has been 65% cofinanced by the European Regional Development Fund (ERDF) through the Interreg V-A Spain-France-Andorra programme (POCTEFA 2014-2020). POCTEFA aims to reinforce the economic and social integration of the French-Spanish-Andorran border. Its support is focused on developing economic, social and environmental cross-border activities through joint strategies favouring sustainable territorial development.

Type B: Person with frailty

B

EXERCISE WHEEL

WALK
2 MINUTES 5 SETS.
WALK AT A PACE THAT ALLOWS YOU TO KEEP A CONVERSATION CONTINUOUSLY, BUT THAT COSTS YOU A LITTLE EFFORT.
FROM WEEK 7, WALK 3 SETS OF 8 MINUTES.

REST
REMEMBER TO REST BETWEEN SETS.

BREATHE CORRECTLY
BREATHE NORMALLY, DO NOT HOLD YOUR BREATH DURING THE EXERCISES.

EXERCISES
IF THERE IS ANY DOUBT ABOUT HOW TO CARRY OUT THE EXERCISES, PLEASE CONSULT THE PASSPORT.

WALK
See legend

STRETCH YOUR ARMS
3 Repetitions
3 Sets
Maintain 10 s

LIFT A BOTTLE
12 Repetitions
3 Sets

STRETCH YOUR ARMS
3 Repetitions
3 Sets
Maintain 10 s

SQUEEZE A BALL
12 Repetitions
3 Sets

WALK ON YOUR TIP TOES AND YOUR HEELS
14 Paces
3 Sets

PRETEND TO SIT
12 Repetitions
3 Sets

viviFrail

interreg POCTEPA **viviFrail** **optitude**

The project has been 65% cofinanced by the European Regional Development Fund (ERDF) through the Interreg V-A Spain-France-Andorra programme (POCTEPA 2014-2020). POCTEPA aims to reinforce the economic and social integration of the French-Spanish-Andorran border. Its support is focused on developing economic, social and environmental cross-border activities through joint strategies favouring sustainable territorial development.

Type C: Person with pre-frail

EXERCISE WHEEL

WALK
1:10 MINUTES 3 SETS.
WALK AT A PACE THAT ALLOWS YOU TO KEEP A CONVERSATION CONTINUOUSLY, BUT THAT COSTS YOU A LITTLE EFFORT.
FROM WEEK 7, WALK 3 SETS OF 15 MINUTES.

REST
REMEMBER TO REST FOR 2 MINUTES BETWEEN SETS.

BREATHE CORRECTLY
BREATHE NORMALLY, DO NOT HOLD YOUR BREATH DURING THE EXERCISES.

EXERCISES
IF THERE IS ANY DOUBT ABOUT HOW TO CARRY OUT THE EXERCISES, PLEASE CONSULT THE PASSPORT.

STRETCH YOUR LEGS
6 Repetitions
3 Sets
Maintain 10 s

WALK
See legend

TWIST A TOWEL
12 Repetitions
3 Sets

LIFT A BOTTLE
12 Repetitions
3 Sets

GET UP FROM A CHAIR
12 Repetitions
3 Sets

OBSTACLES
5 Obstacles
8 Sets


WALK IN A FIGURE OF 8 (DOING EIGHTS)
2 Repeats
3 Sets

STRETCH YOUR ARMS
3 Repetitions
3 Sets
Maintain 10 s

Interreg **Vivifrail** **aptitude**

The project has been 65% cofinanced by the European Regional Development Fund (ERDF) through the Interreg VA Spain-France-Andorra programme (POCTEFA 2014-2020). POCTEFA aims to reinforce economic and social integration of the French-Spanish-Andorran border. Its support is focused on developing economic, social and environmental cross-border activities through joint strategies favouring sustainable territorial development.

Type D: Robust person



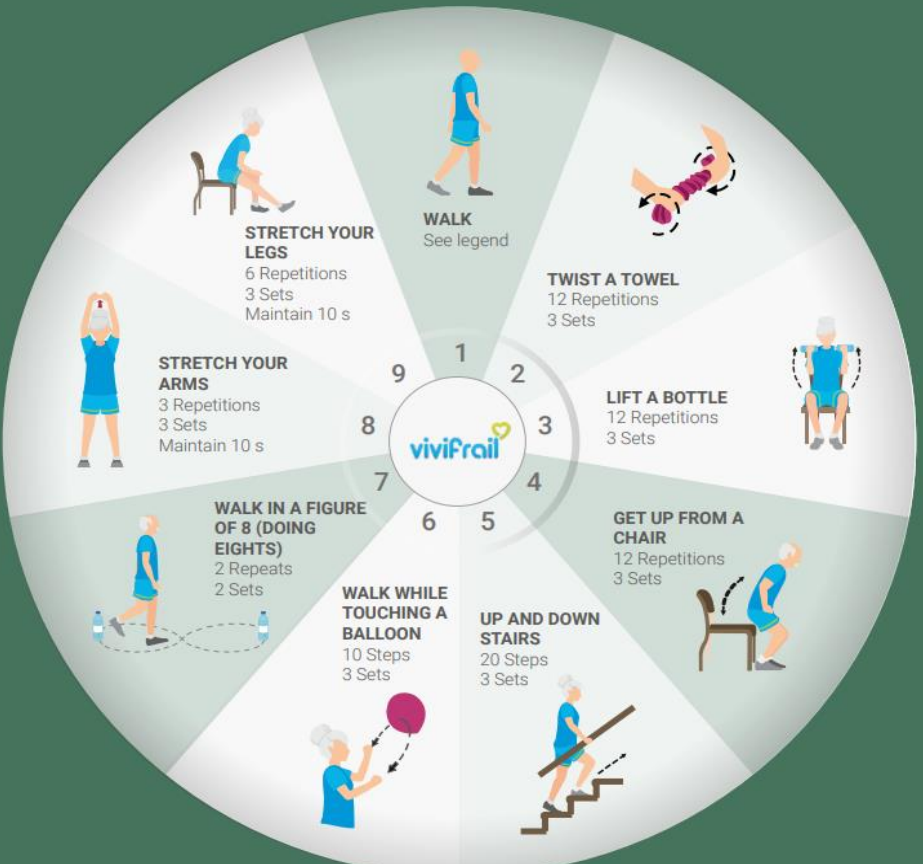
EXERCISE WHEEL

WALK
20 MINUTES 2 SETS.
WALK AT A PACE THAT ALLOWS YOU TO KEEP A CONVERSATION CONTINUOUSLY, BUT THAT COSTS YOU A LITTLE EFFORT.
FROM WEEK 7, WALK CONTINUOUSLY BETWEEN 30 & 45 MINUTES.

REST
REMEMBER TO REST FOR 2 MINUTES BETWEEN SETS.

BREATHE CORRECTLY
BREATHE NORMALLY, DO NOT HOLD YOUR BREATH DURING THE EXERCISES.

EXERCISES
IF THERE IS ANY DOUBT ABOUT HOW TO CARRY OUT THE EXERCISES, PLEASE CONSULT THE PASSPORT.



1 WALK
See legend

2 TWIST A TOWEL
12 Repetitions
3 Sets

3 LIFT A BOTTLE
12 Repetitions
3 Sets

4 GET UP FROM A CHAIR
12 Repetitions
3 Sets

5 UP AND DOWN STAIRS
20 Steps
3 Sets

6 WALK WHILE TOUCHING A BALLOON
10 Steps
3 Sets

7 WALK IN A FIGURE OF 8 (DOING EIGHTS)
2 Repeats
2 Sets

8 STRETCH YOUR ARMS
3 Repetitions
3 Sets
Maintain 10 s

9 STRETCH YOUR LEGS
6 Repetitions
3 Sets
Maintain 10 s

vivifrail

The project has been 65% cofinanced by the European Regional Development Fund (ERDF) through the Interreg V-A Spain-France-Andorra programme (POCTEFA 2014-2020). POCTEFA aims to reinforce economic and social integration of the French-Spanish-Andorran border. Its support is focused on developing economic, social and environmental cross-border activities through joint strategies favouring sustainable territorial development.

Multicomponent physical exercise program to prevent frailty and the risk of falls. © Mikel Izquierdo

Vivifrail exercise free download mobile App

- iPhone:

- <https://apps.apple.com/tw/app/vivifrail/id1463377040>

- Android:

- https://play.google.com/store/apps/details?id=com.mikelizquierdo.vivifrail&hl=zh_HK&gl=US

References

American Heart Association. (2021). *Target heart rates chart*. www.heart.org. <https://www.heart.org/en/healthy-living/fitness/fitness-basics/target-heart-rates>

Casas-Herrero, A., Anton-Rodrigo, I., Zambom-Ferraresi, F., Sáez de Asteasu, M. L., Martinez-Velilla, N., Elexpuru-Estomba, J., Marin-Epelde, I., Ramon-Espinoza, F., Petidier-Torregrosa, R., Sanchez-Sanchez, J. L., Ibañez, B., & Izquierdo, M. (2019). Effect of a multicomponent exercise programme (VIVIFRAIL) on functional capacity in frail community elders with cognitive decline: Study protocol for a randomized multicentre control trial. *Trials*, 20(1). <https://doi.org/10.1186/s13063-019-3426-0>

The Government of the Hong Kong Special Administrative Region. (2020). *"Create your own exercise programme" - for both elders & caregivers*. Elderly Health Service. https://www.elderly.gov.hk/english/healthy_ageing/exe_leisure_travel/create_your_own_exercise_program.html

References

- Izquierdo, M., Zambom-Ferraresi, F., Sáez de Asteasu, M. L., Martínez-Velilla, N., Ramirez-Vélez, R., García-Hermoso, A., Casas-Herrero, A., Sinclair, A., & Rodríguez-Mañas, L. (2021, March 6). VIVIFRAIL: A multi-component physical training program to prevent weakness and falls in people over 70 years [web log]. Retrieved January 26, 2022, from <https://blogs.bmj.com/bjbm/2021/03/06/vivifrail-a-multi-component-physical-training-program-to-prevent-weakness-and-falls-in-people-over-70-years/>
- Theou, O., Stathokostas, L., Roland, K. P., Jakobi, J. M., Patterson, C., Vandervoort, A. A., & Jones, G. R. (2011). The effectiveness of exercise interventions for the management of frailty: A systematic review. *Journal of Aging Research, 2011*, 1-19. <https://doi.org/10.4061/2011/569194>
- World Health Organization Team. (2020). *WHO guidelines on physical activity and sedentary behaviour*. World Health Organization.