Non-Pharmacological Intervention Society

Non Pharmacological Interventions Registry

Protocol : Vivifrail Program

Health Problem: Risk of fall

Bodily

Sheet Code
NPIS-000000026

Designation

Vivifrail Program

Category

Bodily

Main Health benefit

- Reduced risk of falling http://id.who.int/icd/release/11/mms/1093196899
- CIM11 : MB47.C

Explanation

- Improvement in functional capacity after 3 months (Casas-Herrero, 2022).
- Reduction in fall rates among a high-risk population after 1 year (Sánchez-Sánchez, 2022).

- Improvement in balance, flexibility, and functional mobility (Li, 2025).

Routine Test

- **Short Physical Performance Battery (SPPB):** (1) Balance assessment with feet placed side-by-side, in semi-tandem, and in tandem positions; (2) 4-meter walk test: measurement of the time required to walk 4 meters; (3) Chair stand test: after a pretest, measurement of the time needed to complete five chair rises; (4) 6-meter gait speed test: after two preliminary trials, measurement of walking speed over a 6-meter distance.

- **Timed Up and Go (TUG):** Measurement of the time required to stand up from a chair without using the arms, walk three meters, turn around, return, and sit down again.

Threshold

- SPPB ≤ 9: increased functional risk (higher risk of falling)
- TUG > 20 s: high risk of falling
- Gait speed over 6 m < 0.8 m/s: predictor of falls

Minimal Clinically Important Change

An increase of 1 point on the SPPB is considered clinically significant (Casas-Herrero, 2022).

Secondary benefits

- Delay in the onset of disability or loss of physical autonomy
- Reduction of fatigue
- Reduction of frailty and prevention of dependency (Gonzalez, 2023)
- Reduction of cognitive decline
- Reduction of depression
- Prevention of cardiovascular diseases
- Reduction of mortality risk
- Improvement of muscle function
- Improvement of quality of life (Izquierdo, 2021)

Direct Risks

- Falls with minor consequences
- Mild muscle and joint fatigue or soreness

Risks of interaction

None observed to date

Biological and Psychosocial Mechanisms

Biological mechanisms:

- Neuromuscular adaptations and improved postural control (coordination, sensory integration) → enhanced stability
- Muscle strengthening through progressive overload (hypertrophy, neuromuscular function) → reduction of sarcopenia
- Cardiometabolic adaptations (improved aerobic capacity and circulatory efficiency)
- Reduction of chronic inflammation (Petrella, 2021)

Psychosocial mechanisms:

- Increased self-efficacy and confidence in balance abilities through individualized progression
- Enhanced motivation and adherence via personalized goals, self-monitoring, and social support (during group sessions)

Responding population

Individuals over 70 years old who are pre-frail, frail, or experiencing loss of autonomy, with or without a high risk of falling, and with or without gait disorders.

Nonresponding population

Highly dependent individuals

Precautions should be taken in case of a recent myocardial infarction (3-6months) or unstable angina.

There are **absolute contraindications** preventing any type of exercise (to be confirmed by your physician):

- Uncontrolled atrial or ventricular arrhythmias
- Dissecting aortic aneurysm
- Severe aortic stenosis
- Acute endocarditis or pericarditis
- Uncontrolled arterial hypertension
- Acute thromboembolic disease
- Severe acute heart failure
- Severe acute respiratory failure
- Uncontrolled orthostatic hypotension
- Diabetes with acute decompensation or uncontrolled hypoglycemia
- Recent fracture within the past month (for muscle strengthening)

Participants

Individual and group
Minimum : 5
Maximum : 15

Duration

12 weeks

Sessions per week

5

Procedure

Standardized Initial Assessment: The initial evaluation includes measurement of: Functional capacity (SPPB) 6-meter gait speed Timed Up and Go (TUG) score Fall risk.
This assessment is used to determine the appropriate “Vivifrail passport” based on each older adult’s functional profile: (A) Reduced mobility, (B) Frail, (C) Pre-frail, (D) Independent.
Passport E is assigned if the individual is at risk of falling due to any of the following criteria:

- At least two falls, or one fall requiring medical attention in the year prior to testing
- TUG ≥ 20 seconds
- Gait speed < 0.8 m/s

- Presence of dementia

Assignment of the appropriate passport and individualized multimodal exercise program: Each passport comes with guidance on recommended exercise types: Strength and power Balance and gait Flexibility Endurance Vivifrail.

Passport Levels by Frailty:

- Passport A (Severe impairment): SPPB 0–3 + 6m gait speed < 0.5 m/s
- Passport B (Moderate impairment): SPPB 4–6 + 6m gait speed 0.5–0.8 m/s
- Passport C1 (Mild impairment): SPPB 7–9 + 6m gait speed 0.9–1 m/s + 10–30 min independent walking
- Passport C2 (Mild impairment): SPPB 7–9 + 6m gait speed 0.9–1 m/s + 30–45 min independent walking
- Passport D (No impairment): SPPB 10–12 + 6m gait speed > 1 m/s
- Passport E (Fall risk): Add to another passport if TUG > 20s, ≥2 falls in the previous year, fall with injury, or dementia.

Program Monitoring: SPPB should be re-evaluated every 12 weeks, change passport level if improvement exceeds 1 point.

Session Duration by Passport:

- Passport A: 20 minutes
- Passport B: 30 minutes
- Passports C1 & C2: 30–50 minutes
- Passport D: 50–70 minutes
- Passport E: Add 10–15 minutes to the session of another passport

Components

Muscle Strengthening (3 times per week):

- Passport A: Arm and leg flexion/extension in a seated position, with very light or no resistance
- Passport B: Exercises using elastic bands or light weights
- Passport C1: Dumbbells or resistance bands
- Passport C2: Progressive resistance training or elastic bands
- Passport D: Free weights

Cardiovascular Endurance (daily):

- Passport A: Assisted walking – 5–45 sec × 5–15 repetitions, 10–20 sec rest
- Passport B: Interval walking – 20–70 sec × 5–15 repetitions, 20 sec rest
- Passport C1: Continuous walking – 3–12 min, progressing up to 20 min per day

- Passport C2: Continuous walking – up to 30–40 min per day
- Passport D: Walking – 30 to 70 min per day

Balance (5 times per week):

- Passport A: Seated position, assisted single-leg stance; varied surfaces, eyes closed if supervised
- Passport B: Unassisted single-leg stance, straight-line walking, stepping over light obstacles
- Passport C1: Dynamic balance – lateral steps, zigzag walking, obstacle course
- Passport C2: Dynamic balance with dual tasking, quick obstacle crossing, functional mobility drills
- Passport D: Complex balance challenges – eyes closed, unstable surfaces, rapid directional changes

Flexibility (daily):

- Passport A: Passive seated stretching
- Passport B: Stretching after sessions, daily
- Passport C1: Active stretching (seated or standing) after sessions, daily
- Passport C2: Active standing stretches after each session, daily
- Passport D: Global active standing stretches (all major muscle groups, daily)

For detailed exercises and programming by passport, refer to the practical guide.

Equipment

Mats, chairs, elastic resistance bands of varying strengths, light dumbbells (1–4 kg), cones/obstacles

Location

- At home, in multiprofessional health centers, health and exercise facilities, day hospitals, retirement homes, nursing homes (EHPAD), or physiotherapy practices.

- In institutional settings, it is recommended to communicate to the entire healthcare team about the intervention so that it becomes a multidisciplinary decision integrated into the overall care plan.

Best implementation practices

- Group practice is encouraged to enhance motivation.
- A 5–10 minute warm-up phase should be performed at the beginning of each session to prevent injuries (including joint mobility, breathing exercises, and gentle cardiovascular activation).
- A 5–10 minute cool-down phase should be included at the end of each session to refocus on body sensations and promote recovery (passive stretching, breathing exercises, relaxation, etc.).
- Progression should occur only after successfully completing at least 2 sets of 10 repetitions before increasing load, duration, or exercise complexity.
- Sessions should take place in a safe environment (non-slip floor, good lighting, presence of a table, chair, or stable support, and absence of obstacles).
- Participants should be encouraged to drink water before feeling thirsty — before, during, and after sessions.
- The use of corrective eyewear and hearing aids is recommended, when applicable, to maximize comprehension of instructions and ensure safety.
- Participants should wear appropriate clothing and footwear: comfortable, flexible clothing and closed shoes with good ground grip. They should also be encouraged to walk for 30 minutes, in bouts of at least 10 minutes, twice per week, in addition to exercise sessions.
- Allow one day of recovery between sessions targeting the same muscle groups.
- A general framework for these recommendations has been issued by the Haute Autorité de Santé (HAS, 2024, France): https://www.has-sante.fr/upload/docs/application/pdf/2024-04/synthese_aps_personnes_agees_a_risque_de_chute.pdf

Best practices for sustainability

- Support continued engagement in exercise and independent walking.
- Organize group sessions to help maintain motivation and preserve functional gains (Montero-Odasso, 2022).
- Encourage participation in other physical activities such as gardening, household chores, walking, dancing, or cultural outings.
- The World Health Organization (WHO) has published two influential reports on fall prevention (WHO, 2007; WHO, 2021).
- Ensure good adherence and safety practices through a quarterly follow-up phone call (5–10 minutes).
- When possible, organize a “booster” home visit to verify correct exercise performance and sustain motivation.
- Provide additional educational materials on fall prevention, such as those available in France from: Assurance Maladie: Bouger en toute sérénité (2022) Ministry of Health and

CNSA: Prévention des risques de chutes chez les personnes âgées

Precautions

- Ensure that exercise is performed without pain, particularly in cases of osteoarthritis, musculoskeletal or joint disorders, osteoporosis, or other painful conditions.
- Make sure the participant knows how to call for help in case of an emergency (keep a phone within reach, have a first-aid kit available, etc.).
- Adjust exercise intensity and weekly load using tracking tools such as exercise logs, perceived exertion scales, or the Borg scale.
- Provide guidance on correct exercise execution and regularly verify that movements are performed safely and properly.
- Monitor for any signs or symptoms of exercise intolerance on a regular basis.
- Advise the participant to contact their physician if they experience chest pain, shortness of breath, dizziness, persistent muscle pain, or a severe fall.
- Consider recommending the use of hip protectors in cases of recurrent falls.
- If Passport E is assigned, it is recommended to implement additional measures, including: Nutritional assessment and management - Optimization of medical treatments - Environmental modifications to reduce fall risks - Strengthening of the physical activity program

Regulatory specification

- Program developed as part of an Erasmus+ project supported by the European Commission.
- Recommended for frailty prevention (WHO, 2017; HAS, 2024).
- In France, the Vivifrail program is endorsed by the Regional Health Agency of Nouvelle-Aquitaine (ARS, 2023) and by the Haute Autorité de Santé (HAS, 2019; HAS, 2024).

Main Initiator

Prof. Mikel Izquierdo, Public University of Navarre (Spain)

Qualification required

- Certified Adapted Physical Activity (APA) Instructor
- Physiotherapist

- In-person or online training in the Vivifrail program is recommended

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