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## **Manual of physical and psychological evaluations: LIFEAGE PROJECT**

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## 1. SOCIODEMOGRAPHIC CHARACTERISTICS

<p><b>READ CAREFULLY</b></p> <p><b>INFORMATION AND INSTRUCTIONS</b></p>
---

Dear Mr. Or Mrs:

Coming up next, you will be asked a series of questions. Please, answer each of them like a such objectivity and sincerity as possible you can. Do not leave any question unanswered. **Thank you very much for your help.**

The personal data, as well as the answers provided, are governed by Law 15/1999 of December 13 on data protection, which guarantees its confidentiality.

1. Gender:
------------

- Male
- Female

2. Age:
---------

\_\_\_\_\_ years

3. Marital Status
-------------------

- Single, never married
- Married, first and only marriage
- Remarried
- Separate/ divorced
- Widowed

4. Nationality/Residence place
--------------------------------

Indicate country and city of residence

\_\_\_\_\_

\_\_\_\_\_

5. Ethnic composition
-----------------------

- Caucasian       Asian
- Afro-American       Other \_\_\_\_\_

6. Occupational classification
--------------------------------

- Complete time worker
- Partial time worker
- Unemployed
- Own account workers
- Student
- Retired

7. Education attainment
-------------------------

- No qualifications
- Less than a higher education  
*(Elementary school)*
- High school graduate
- Higher education below degree
- Degree or equivalent

8. Living arrangement
-----------------------

- Living with spouse
- Cohabiting with partner
- No Cohabiting

9. Numbers of annual falls (since the moment to fill in this questionnaire): \_\_\_\_\_

10. Weight loss in the last year (since the moment to fill in this questionnaire): \_\_\_\_\_ Kg



11. Here is a list of medications. Please, indicate those you are consuming at this time or that you have recently consumed (last month).

- Medicines for colds, flu, throat or bronchi
- Medicines for pain
- Medicines to reduce fever
- Reconstituting like a vitamins, minerals or tonics
- Laxatives
- Antibiotics
- Tranquilizers, relaxants, sleeping pills
- Allergy medications
- Diarrhea medicine
- Medicines for rheumatism
- Heart medicines
- Blood pressure medicines
- Stomach and / or digestive disorders medicines
- Antidepressants
- Stimulants
- Pills to prevent pregnancy (only for women)
- Menopause hormones (only for women)
- Medications to lose weight
- Medications to lower cholesterol
- Diabetes medicines
- Homeopathic products
- Naturist products
- Other medications

11. a. Only in the affirmative case that you have answered that you consume any of the medications listed above, indicate exactly the medication consumed, what it is for and the daily dose.

Medicine	What is it?	Daily dose	Permanent medication	
			YES	NO



			YES	NO

12. Do you have a chronic or long-term illness or health problem? (Long term is understood if the health or illness problem has lasted or is expected to last 6 months or more).

- Yes
- No
- Do not know/ No answer

13. Next, you will be shown a list of diseases or health problems. Please answer if you have suffered or suffer from any of them.

	Have you ever been experienced?		Have you had it in the last 12 months?		Has a doctor told you he has it?	
	YES	NO	YES	NO	YES	NO
1. High tension						
2. Myocardial infarction						
3. Other heart diseases						
4. Varices on the legs						
5. Artrosis, arthritis o reumatismo						
6. Chronic back pain (cervical)						
7. Chronic back pain (lumbar)						
8. Chronic allergy (allergic asthma excluded)						
9. Asthma						
10. Chronic bronchitis, emphysema, chronic obstructive pulmonary disease (COPD)						
11. Diabetes						
12. Stomach or duodenal ulcer						



13. Urinary incontinence						
14. High cholesterol						
15. Cataracts						
16. Chronic skin problems						
17. Chronic constipation						
18. Cirrosis, liver dysfunction						
19. Chronic depression						
20. Chronic anxiety						
21. Parkinson						
22. Dementia / Alzheimer's						
23. Embolism, cerebral infarction, cerebral hemorrhage						
24. Migraine or frequent headache						
25. Hemorrhoids						
26. Cancer / Malignant tumors						
26.a. Where is it? (indicate origin)						
27. Osteoporosis						
28. Thyroid problems						
29. Prostate problems (men only)						
30. Problems of the period (only women)						
31. Injures or permanent defects caused by an accident						
32. Sleep apnea syndrome						
Other (indicate)						



## 2. MOTIVATION TEST

### 2.1. Basic psychological need satisfaction (BPNS)

The BPNS is a short 12-item instrument designed to measure the Basic psychological need satisfaction. Self-determination theory (SDT; Deci & Ryan, 1985, 2002) has become a popular framework for examining motivational issues in physical activity contexts (Frederick-Recascino, 2002). This is hardly surprising given that the approach to human development proposed within SDT accounts for the nature and function of motivation in conjunction with the psychological foundations from which motives develop (Deci & Ryan, 1985, 2002).

One integral component of the motivational approach taken by SDT is the concept of basic psychological needs (Deci & Ryan, 1985, 2002). In contrast with other theories that view psychological needs as any motivating force, including personal desires and goals (Ryan, 1995), Deci and Ryan contend that psychological needs represent essential conditions nourishing growth, integrity, and well-being (Deci & Ryan, 2002; Ryan, 1995). Consequently, the approach taken by SDT is that the effects of satisfying basic psychological needs are universal such that environments that nourish these feelings will promote well-being, whereas contexts that hinder need satisfaction will impede motivational development and promote ill-being (Deci & Ryan, 2002; Ryan, 1995; Sheldon, Williams, & Joiner, 2003). Although not without controversy, this aspect of SDT's framework offers a parsimonious explanation for a broad range of human behaviors and emotions (Deci & Ryan, 2002; Ryan, 1995) and suggests a viable route for intervention to foster psychological well-being and promote behavioral change (Sheldon et al., 2003). The psychological needs for competence, autonomy, and relatedness have been forwarded by Deci and Ryan (1985, 2002) as innate and essential for nurturing optimal development (Ryan, 1995). Competence refers to interacting effectively with one's environment while mastering challenging tasks (White, 1959). Autonomy involves feeling a sense of personal agency and volition such that one's behavior is perceived to emanate from an internal locus of causality (deCharms, 1968). Finally, relatedness refers to a sense of meaningful connection in one's social milieu (Baumeister & Leary, 1995). Although the innate and universal nature of the psychological needs contained within SDT has not gone unchallenged (Iyengar & Lepper, 1999), an emerging body of evidence highlights the complementary nature of need-satisfying experiences and points to the positive effects stemming from need satisfaction on internalization, social adjustment, and psychological health (Deci & Ryan, 2002). Given that psychological need satisfaction is a central component of SDT, it is surprising that relatively little research has examined the character or outcomes associated with perceived autonomy and relatedness compared with perceived competence in physical activity settings (Vallerand, 2001).



## 22. Questionnaire (BREQ 3)

The Behavioural Regulation In Exercise Questionnaire (BREQ) and its subsequent modifications have become the most widely used measures of the continuum of behavioural regulation in exercise psychology research. The original BREQ (Mullan, Markland & Ingledew, 1997) was developed to measure external, introjected, identified and intrinsic forms of regulation of exercise behaviour based on Deci & Ryan's (1985, 1991) continuum conception of extrinsic and intrinsic motivation, described by organismic integration theory.

In common with some other measures of the behavioural regulation continuum in different contexts, the BREQ-3 does include an integrated regulation subscale.

## 23. The satisfaction with life scale (SWLS)

The SWLS is a short 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life and relation with physical activity (Diener, Emmons, Larsen and Griffin, 1985).

The Satisfaction with Life Scale (SWLS) has been used heavily as a measure of the life satisfaction component of subjective well-being. Scores on the SWLS have been shown to correlate with measures of mental health, and be predictive of future behaviours such as suicide attempts. In the area of health psychology, the SWLS has been used to measure the subjective quality of life of people experiencing serious health concerns.

## 24. Questionnaire

**NAME:** \_\_\_\_\_

Below we offer you a series of questions with which we are measuring aspects related to the practice of Physical Exercise. We want to know your opinion about what you are asked.

We ask you to be as sincere as possible and we thank you for your participation in this research study.

Using the 1 - 5 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

<b>Why do you engage in exercise?</b>		I don't Agree at all	I agree a little bit	Neither agree nor disagree	I agree a lot	I completel y agree
		1	2	3	4	5
1	I exercise because other people say I should	1	2	3	4	5



2	I feel guilty when I don't exercise	1	2	3	4	5
3	I value the benefits of exercise	1	2	3	4	5
4	I exercise because it's fun	1	2	3	4	5
5	I exercise because it is consistent with my life goals	1	2	3	4	5
6	I can't see why I should bother exercising	1	2	3	4	5
7	I take part in exercise because my friends/family/partner say I should	1	2	3	4	5
8	I feel ashamed when I miss an exercise session	1	2	3	4	5
9	I think it is important to make the effort to exercise regularly	1	2	3	4	5
10	I consider exercise part of my identity	1	2	3	4	5
11	I don't see why I should have to exercise	1	2	3	4	5
12	I enjoy my exercise sessions	1	2	3	4	5

13	I exercise because others will not be pleased with me if I don't	1	2	3	4	5
14	I don't see the point in exercising	1	2	3	4	5
15	I consider exercise a fundamental part of who I am	1	2	3	4	5
16	I feel like a failure when I haven't exercised in a while	1	2	3	4	5
17	It's important to me to exercise regularly	1	2	3	4	5
18	I find exercise a pleasurable activity	1	2	3	4	5
19	I feel under pressure from my friends/family to exercise	1	2	3	4	5
20	I consider exercise consistent with my values	1	2	3	4	5
21	I get restless if I don't exercise regularly	1	2	3	4	5
22	I get pleasure and satisfaction from participating in exercise	1	2	3	4	5
23	I think exercising is a waste of time	1	2	3	4	5

In your exercise program ...		I don't Agree at all	I agree a little bit	Neither agree	I agree a lot	complet ly
1	The exercise program I follow is highly compatible with my choices and interests	1	2	3	4	5
2	I feel I have been making a huge progress with respect to the end result I pursue	1	2	3	4	5
3	I feel extremely comfortable when with the other exercise participants	1	2	3	4	5
4	I feel very strongly that the way I exercise fits perfectly the way I prefer to exercise	1	2	3	4	5
5	I feel that execute very effectively the exercises of my training program	1	2	3	4	5

6	I feel that I associate with the other exercise participants in a very friendly way	1	2	3	4	5
7	I feel that the way I exercise is definitely and expression of myself	1	2	3	4	5
8	I feel that exercise is an activity in which I do very well	1	2	3	4	5
9	I feel there are open channels of communication with the other exercise participants	1	2	3	4	5
10	I feel very strongly that I have the opportunity to make choices with respect to the way I exercise	1	2	3	4	5
11	I feel that I can manage with the requirements of the training program I am involved	1	2	3	4	5
12	I feel very much at ease with other exercise participants	1	2	3	4	5

THE PERCEPTION THAT I HAVE OF MY LIFE IS THAT ...		I don't Agree at all	I agree a little bit	Neither agree nor disagree	I agree a lot	completely agree
1	In most ways my life is close to my ideal	1	2	3	4	5
2	The conditions of my life are excellent	1	2	3	4	5



3	I am satisfied with my life.	1	2	3	4	5
4	So far I have gotten the important things I want in life	1	2	3	4	5
5	If I could live my life over, I would change almost nothing.	1	2	3	4	5



### 3. GLOBAL PHYSICAL ACTIVITY QUESTIONNAIRE (GPAQ)

#### 3.1. Introduction

The Global Physical Activity Questionnaire was developed by WHO for physical activity surveillance in countries (De Courten, 2002). It collects information on physical activity participation in three settings (or domains) as well as sedentary behaviour, comprising 16 questions (P1-P16). The domains are:

- Activity at work
- Travel to and from places
- Recreational activities

Prior to using GPAQ, you should review the question by question section. This section, which follows the actual questions, will guide the interviewer in asking the questions and recording responses.

When using GPAQ, all the questions must be asked. Skips of questions do ONLY apply to the corresponding day and time variables if P1, P4, P7, P10, or P13 have been answered negatively. Skipping any other questions or removing any of the domains will restrict the results that you will be able to calculate.

METs (Metabolic Equivalent) are commonly used to express the intensity of physical activities, and are also used for the analysis of GPAQ data. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. For the analysis of GPAQ data, existing guidelines have been adopted: It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active.

Therefore, when calculating a person's overall energy expenditure using GPAQ data, 4 METs get assigned to the time spent in moderate activities, and 8 METs to the time spent in vigorous activities.

Before using the questionnaire, you should review the “**Question by question guide**” section. This section will serve as a guide for the interviewer when it comes to how to ask the questions and record their answers.

Also, in the questionnaire, there is a coding column. It is located on the left side of the questionnaire and serves as a guide for the analysis of the data obtained on the level of physical activity (FA) performed. The coding column of GPAQ is used as a reference for all the calculations. If you insert this questionnaire into another questionnaire, you should not change the coding column.

On the right side of the questionnaire you can see a numerical coding of order for the questions. This numerical order if it can be changed.

When the questionnaire is administered, it is very important to indicate to the person filling it, that all the answers must be given according to a timeframe of one week. That is, they must temporarily limit their responses, for example to the activity done



during the last week before the moment in which the questionnaire is filled out. Only in exceptional cases (such as illness) should it temporarily go back more weeks.

### 3.2. Questionnaire

Physical Activity		
<p>Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. <i>[Insert other examples if needed]</i>. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.</p>		
Question	Response	Code
<b>Work</b>		
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously? <i>[INSERT EXAMPLES] (USE SHOWCARD)</i>	<p>Yes 1</p> <p>No 2 <i>If No, go to P 4</i></p>	P1
In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days <input type="text"/>	P2
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)



How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)
Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking [for carrying light loads] for at least 10 minutes continuously? [INSERT EXAMPLES] (USE SHOWCARD)	Yes 1 No 2 If No, go to P 7	P4
In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days <input type="text"/>	P5
How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P6 (a-b)
<b>Travel to and from places</b>		
The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship. [Insert other examples if needed]		
Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	Yes 1 No 2 If No, go to P 10	P7
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days <input type="text"/>	P8
How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P9 (a-b)
<b>Physical Activity, Continued</b>		
<b>Question</b>	<b>Response</b>	<b>Code</b>
<b>Recreational activities</b>		
The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure). [Insert relevant terms].		
Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football] for at least 10 minutes continuously? [INSERT EXAMPLES] (USE SHOWCARD)	Yes 1 No 2 If No, go to P 13	P10
In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days <input type="text"/>	P11
How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P12 (a-b)
Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, volleyball] for at least 10 minutes continuously? [INSERT EXAMPLES] (USE SHOWCARD)	Yes 1 No 2 If No, go to P16	P13
In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	Number of days <input type="text"/>	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P15 (a-b)



<b>Sedentary behaviour</b>		
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping. <i>[INSERT EXAMPLES] (USE SHOWCARD)</i>		
How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P16 (a-b)

### 3.3. Administration of the GPAQ

In this section, you will find the instructions that the interviewer should follow to ensure that the questionnaire is to spend correctly.

Physical Activity		
<p>Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.</p> <p>Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment <i>[Insert other examples if needed]</i>. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.</p> <p><i>Read this opening statement out loud. It should not be omitted. The respondent will have to think first about the time he/she spends doing work (paid or unpaid work, household chores, harvesting food, fishing or hunting for food, seeking employment [insert other examples if needed]), then about the time he/she travels from place to place, and finally about the time spent in vigorous as well as moderate physical activity during leisure time.</i></p> <p><i>Remind the respondent when he/she answers the following questions that 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate. Don't forget to use the showcard which will help the respondent when answering to the questions.</i></p>		
Question	Response	Code
<b>Work</b>		
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously? <i>[INSERT EXAMPLES] (USE SHOWCARD)</i> <i>Ask the participant to think about vigorous-intensity activities at work only. Activities are regarded as vigorous intensity if they cause large increases in breathing and/or heart rate.</i>	Yes 1  No 2 <i>If No, go to P 4</i>	P1
In a typical week, on how many days do you do vigorous-intensity activities as part of your work? <i>"Typical week" means a week when the participant is engaged in his/her usual activities. Valid responses range from 1-7.</i>	Number of days <input type="text"/>	P2
How much time do you spend doing vigorous-intensity activities at work on a typical day? <i>Ask the participant to think of a typical day he/she can recall easily in which he/she engaged in vigorous-intensity activities at work. The participant should only consider those activities undertaken continuously for 10 minutes or more. Probe very high responses (over 4 hrs) to verify.</i>	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)
Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking <i>[or carrying light loads]</i> for at least 10 minutes continuously? <i>[INSERT EXAMPLES] (USE SHOWCARD)</i> <i>Ask the participant to think about moderate-intensity activities at work only. Activities are regarded as moderate intensity if they cause small increases in breathing and/or heart rate.</i>	Yes 1  No 2 <i>If No, go to P 7</i>	P4
In a typical week, on how many days do you do moderate-intensity activities as part of your work? <i>"Typical week" means a week when the participant is engaged in his/her usual activities. Valid responses range from 1-7.</i>	Number of days <input type="text"/>	P5



<p>How much time do you spend doing moderate-intensity activities at work on a typical day?</p> <p><i>Ask the participant to think of a typical day he/she can recall easily in which he/she engaged in moderate-intensity activities at work. The participant should only consider those activities undertaken continuously for 10 minutes or more. Probe very high responses (over 4 hrs) to verify.</i></p>	<p>Hours : minutes</p> <p style="text-align: center;"> <input type="text"/> : <input type="text"/>              hrs mins         </p>	<p>P6 (a-b)</p>
<b>Physical Activity, Continued</b>		
<b>Question</b>	<b>Response</b>	<b>Code</b>
<b>Travel to and from places</b>		
<p>The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship. <i>[Insert other examples if needed]</i></p> <p><i>The introductory statement to the following questions on transport-related physical activity is very important. It asks and helps the participant to now think about how they travel around getting from place-to-place. This statement should not be omitted.</i></p>		
<p>Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?</p> <p><i>Select the appropriate response.</i></p>	<p>Yes 1</p> <p>No 2 <i>If No, go to P 10</i></p>	<p>P7</p>
<p>How much time do you spend walking or bicycling for travel on a typical day?</p> <p><i>Ask the participant to think of a typical day he/she can recall easily in which he/she engaged in transport-related activities. The participant should only consider those activities undertaken continuously for 10 minutes or more. Probe very high responses (over 4 hrs) to verify.</i></p>	<p>Hours : minutes</p> <p style="text-align: center;"> <input type="text"/> : <input type="text"/>              hrs mins         </p>	<p>P9 (a-b)</p>
<b>Recreational activities</b>		
<p>The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure) <i>[Insert relevant terms]</i>.</p> <p><i>This introductory statement directs the participant to think about recreational activities. This can also be called discretionary or leisure time. It includes sports and exercise but is not limited to participation in competitions. Activities reported should be done regularly and not just occasionally. It is important to focus on only recreational activities and not to include any activities already mentioned. This statement should not be omitted.</i></p>		
<p>Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like <i>[running or football]</i> for at least 10 minutes continuously?</p> <p><i>[INSERT EXAMPLES] (USE SHOWCARD)</i></p> <p><i>Ask the participant to think about recreational vigorous-intensity activities only. Activities are regarded as vigorous intensity if they cause large increases in breathing and/or heart rate.</i></p>	<p>Yes 1</p> <p>No 2 <i>If No, go to P 13</i></p>	<p>P10</p>
<p>In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?</p> <p><i>"Typical week" means a week when the participant is engaged in his/her usual activities. Valid responses range from 1-7.</i></p>	<p>Number of days</p> <p style="text-align: center;"><input type="text"/></p>	<p>P11</p>
<p>How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?</p> <p><i>Ask the participant to think of a typical day he/she can recall easily in which he/she engaged in recreational vigorous-intensity activities. The participant should only consider those activities undertaken continuously for 10 minutes or more. Probe very high responses (over 4 hrs) to verify.</i></p>	<p>Hours : minutes</p> <p style="text-align: center;"> <input type="text"/> : <input type="text"/>              hrs mins         </p>	<p>P12 (a-b)</p>
<p>Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, <i>[cycling, swimming, volleyball]</i> for at least 10 minutes continuously?</p> <p><i>[INSERT EXAMPLES] (USE SHOWCARD)</i></p> <p><i>Ask the participant to think about recreational moderate-intensity activities only. Activities are regarded as moderate intensity if they cause small increases in breathing and/or heart rate.</i></p>	<p>Yes 1</p> <p>No 2 <i>If No, go to P16</i></p>	<p>P13</p>
<p>In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?</p> <p><i>"Typical week" means a week when the participant is engaged in his/her usual activities. Valid responses range from 1-7.</i></p>	<p>Number of days</p> <p style="text-align: center;"><input type="text"/></p>	<p>P14</p>



Physical Activity, Continued		
Question	Response	Code
<p>How much time do you spend doing moderate-intensity sports, fitness or recreational (<i>leisure</i>) activities on a typical day?</p> <p><i>Ask the participant to think of a typical day he/she can recall easily in which he/she engaged in recreational moderate-intensity activities. The participant should only consider those activities undertaken continuously for 10 minutes or more. Probe very high responses (over 4 hrs) to verify.</i></p>	<p>Hours : minutes    <input type="text"/> : <input type="text"/></p> <p>                                 hrs                    mins</p>	P15 (a-b)
<b>Sedentary behaviour</b>		
<p>The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping. [INSERT EXAMPLES] (USE SHOWCARD)</p>		
<p>How much time do you usually spend sitting or reclining on a typical day?</p> <p><i>Ask the participant to consider total time spent sitting at work, in an office, reading, watching television, using a computer, doing hand craft like knitting, resting etc. The participant should not include time spent sleeping.</i></p>	<p>Hours : minutes    <input type="text"/> : <input type="text"/></p> <p>                                 hrs                    mins</p>	P16 (a-b)

It is important to standardize the way in which the data collected are cleaned and analysed. Please use the guidelines below when cleaning and analysing your data. The cleaning and analysis guidelines use the coding column in the questionnaire as an identifier.

You should clean all domains as a combined set. While some of the calculations of results use all the domains and others use only one of the domains, it is necessary that each respondent has an overall "clean" response to all physical activity questions. To be included in the analyses, each participant must have a valid response for at least one domain and have no invalid responses for any domains. Check for the following for all the domains.

If...	Then...
Values in the hours column are 15, 30, 45, or 60	move them into the corresponding minutes variable, if the corresponding minutes variable is empty or zero (most likely a data recording error).
Maximum values: If for at least one "sub-domain" (vigorous work, moderate work, transport, vigorous recreation, or moderate recreation activity) the value of hours+minutes >16 hours	remove the case from all analyses.
If a respondent reports implausible values (eg., >7 days in any days column)	remove the case from all analyses.
If a respondent has inconsistent answers (eg., 0 days, but values >0 in the corresponding time variables)	remove the case from all analyses.
If one whole "sub-domain" (vigorous work, moderate work, transport, vigorous recreation, or moderate recreation activity) has missing values, but the other "sub-domains" are valid	include the case in the analysis, assuming no activity (0 days, 0 time) for this "sub-domain". That means that, as long as at least one "sub-domain" has valid answers, and all others are missing, this person will be included in analyses.

### 3.4. Show Cards

In many cases, it is necessary to accompany the questionnaire with an example, in order to facilitate and unify the criterion to be followed when considering, for example, the level of physical activity (FA) carried out (vigorous or moderate).

As an example, look at question P1:

Question	Response	Code
<b>Work</b>		
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously? <i>[INSERT EXAMPLES] (USE SHOWCARD)</i> <i>Ask the participant to think about vigorous-intensity activities at work only. Activities are regarded as vigorous intensity if they cause large increases in breathing and/or heart rate.</i>	Yes 1  No 2 <i>If No, go to P 4</i>	P1

In this case, it is necessary to show those cards and exemplify that it is considered vigorous physical activity (FA) by the examples contained herein. This will facilitate the unification of criteria in the answer of the subjects that carry out the questionnaire.

### Vigorous Physical Activity at Work

#### VIGOROUS Intensity Activities

#### Examples for vigorous activities at WORK

Make you breathe much harder than normal



#### Other examples for VIGOROUS activities at WORK

Forestry (cutting, chopping, carrying wood)  
Sawing hardwood



## Ploughing

Cutting crops (sugar cane)

Gardening (digging)

Grinding (with pestle)

Labouring (shovelling sand)

Loading furniture (stoves, fridge)

Instructing spinning (fitness)

Instructing sports aerobics

Sorting postal parcels (fast pace)

Cycle rickshaw driving

## **Moderate Physical Activity at Work**

### **MODERATE Intensity Activities**

#### **Examples for MODERATE activities at work**

Make you breathe somewhat harder than normal



### **Other examples for MODERATE activities at WORK**

Cleaning (vacuuming, mopping, polishing, scrubbing, sweeping, ironing)

Washing (beating and brushing carpets, wringing clothes (by hand))

Gardening

Milking cows (by hand)

Planting and harvesting crops

Digging dry soil (with spade)

Weaving

Woodwork (chiselling, sawing softwood)

Mixing cement (with shovel)

Labouring (pushing loaded wheelbarrow, operating jackhammer)

Walking with load on head



Drawing water  
Tending animals

### VIGOROUS Intensity Activities

#### Examples for VIGOROUS activities during LEISURE TIME

Make you breathe much harder than normal



#### Other examples for VIGOROUS activities during LEISURE TIME

Soccer Rugby  
Tennis

High-impact aerobics Aqua  
aerobics

Ballet dancing

Fast swimming

#### Vigorous Physical Activity during Leisure Time

#### Moderate Physical Activity during Leisure Time

### MODERATE Intensity Activities

#### Examples for MODERATE activities during LEISURE TIME

Make you breathe somewhat harder than normal



#### Other examples for MODERATE activities at WORK

Cycling Jogging Dancing  
Horse-riding Tai chi Yoga



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Erasmus+ Programme  
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**UCAM**  
UNIVERSIDAD  
CATÓLICA DE MURCIA

Pilates

Low-impact aerobics Cricket.



## 4. QUESTIONNAIRE OF MEDITERRANEAN DIET ADHERENCE

The result of the PREDIMED research study (Prevention with Mediterranean Diet), (Martinez-González, Garcia-Arellano and Toledo, 2014) whose main objective is focused on nutrition, through the study of the effect of the Mediterranean Diet in the primary prevention of chronic diseases, the choice of the adherence questionnaire has been chosen to the Mediterranean diet for our project.

### 4.1. Questionnaire

Questions	Criteria for 1 point
1. Do you use olive oil as main culinary fat?	Yes
2. How much olive oil do you consume in a given day (including oil used for frying, salads, out-of-house meals, etc.)?	≥4 tbsp
3. How many vegetable servings do you consume per day? (1 serving : 200 g [consider side dishes as half a serving])	≥2 (≥1 portion raw or as a salad)
4. How many fruit units (including natural fruit juices) do you consume per day?	≥3
5. How many servings of red meat, hamburger, or meat products (ham, sausage, etc.) do you consume per day? (1 serving: 100–150 g)	<1
6. How many servings of butter, margarine, or cream do you consume per day? (1 serving: 12 g)	<1
7. How many sweet or carbonated beverages do you drink per day?	<1
8. How much wine do you drink per week?	≥7 glasses
9. How many servings of legumes do you consume per week? (1 serving : 150 g)	≥3
10. How many servings of fish or shellfish do you consume per week? (1 serving 100–150 g of fish or 4–5 units or 200 g of shellfish)	≥3
11. How many times per week do you consume commercial sweets or pastries (not homemade), such as cakes, cookies, biscuits, or custard?	<3
12. How many servings of nuts (including peanuts) do you consume per week? (1 serving 30 g)	≥3
13. Do you preferentially consume chicken, turkey, or rabbit meat instead of veal, pork, hamburger, or sausage?	Yes
14. How many times per week do you consume vegetables, pasta, rice, or other dishes seasoned with sofrito (sauce made with tomato and onion, leek, or garlic and simmered with olive oil)?	≥2



## 5. BODY COMPOSITION AND HYDRATION STATUS

*Following the statements of the International Society for the International Society for the Advancement of Kinanthropometry (ISAK) (Esparza-Ros, Vaquero-Cristóbal and Marfell-Jones, 2019).*

### 5.1. BIOIMPEDANCE PROTOCOL

- Do not eat or drink 4 hours before.
- No strenuous exercise 12 hours before.
- Urination 30' before.
- Do not take diuretics 7 days before (except by medical prescription, in this case, register it in the formulary).
- Remove metals (watch, rings, piercing).

### 5.2. CONSIDERATIONS BEFORE TAKING AN ANTHROPOMETRIC ASSESSMENT

- Measurements should be taken in private, in a separate room or screened-off area. The measurement room should be at a comfortable temperature for the subject.
- It should be appreciated that all people have an area around their body known as “personal space” and that when this area is invaded they feel uncomfortable or threatened. This is particularly true for the front of a person, but some subjects are uncomfortable when the anthropometrist is behind them and out of view. This is why most measurements are taken from the side although a few measurements must be made directly in front of or behind the subject. In these cases, particular care must be taken to respect the subject’s personal space, with the measurer keeping as far from the subject as possible without compromising the accuracy of the landmark or measure.
- Anthropometrists should be mindful that some subjects may not feel comfortable being measured, especially by those of the opposite sex. So, subjects should be offered the opportunity of being measured by an anthropometrist of the same sex where possible.
- It is not advisable to measure too many subjects continuously, because measurer fatigue can readily contribute to measurement error.
- The subjects should be asked to present themselves in minimal clothing so measurements can be taken as quickly, reliably and efficiently as possible. A swimsuit or short sports pants are recommended for males and a bikini or sports top and short sports pants are recommended for females to facilitate ease of access to all measurement sites. Underwear only is not normally considered



appropriate.

### **5.3. GENERAL TECHNIQUE FOR MEASURING SKINFOLDS:**

- The skinfold is picked up at the marked site with the thumb and index finger of the left hand. The edge of the thumb and finger are adjacent to the skinfold mark and perpendicular to the skinfold orientation. The back of the hand should be facing the anthropometrist. The skinfold should be grasped and lifted (raised) so that a double fold of skin plus the underlying subcutaneous adipose tissue is held between the thumb tip and the tip of the index finger of the left hand using a pincer grip. The size of fold to pick up should be the minimum necessary to ensure that the two skin surfaces of the fold are parallel. Care must be taken not to incorporate underlying muscle tissue in the grasp. In order to eliminate that possibility roll the fold slightly between the finger and thumb, thereby ensuring that there is only skin and subcutaneous tissue in the skinfold raised. If difficulty is encountered, the subject should tense and relax the muscle until the anthropometrist is confident that only skin and subcutaneous tissue are included in the skinfold.
- The nearer edge of the contact faces of the caliper is applied 1 cm away from the skinfold landmark and at the same depth that the digits that hold the fold are located. If the caliper is placed deeper or shallower, incorrect values may be recorded. Constant practice is necessary to ensure the same size of skinfold is grasped at the same location for repeat measures.
- The caliper is held at 90° to the surface of the skinfold site at all times. If the caliper jaws are allowed to slip or are incorrectly aligned the value obtain may be inaccurate. The anthropometrist must make sure the hand grasping the skin remains holding the fold firmly the whole time the caliper is in contact with the skin.
- Measurement is recorded two seconds after the full pressure of the caliper is applied. It is important that the anthropometrist makes sure that the caliper trigger is fully released when the reading is taken, to enable the full caliper pressure to be exerted. In the case of large skinfolds, the needle may still be moving at the two-second point. Nevertheless, the measurement is still recorded at this time. This standardization is necessary since adipose tissue is compressible. A constant recording time enables individual test/retest comparisons to be made while controlling for skinfold compressibility.
- The sequence to measure all the skinfolds must be: 1) raise the fold; 2) apply the caliper; 3) after two seconds, take the reading; 4) remove the caliper; 5) release the fold.

### **5.4. GENERAL TECHNIQUE FOR MEASURING GIRTHS:**

- To position the tape:
  - i. Hold the case of the tape in the palm of the right hand throughout the measuring



sequence.

- ii. The stub of the tape should be held between the thumb and forefinger of the left hand.
- iii. Place the tape horizontally in front of the body part to be measured and pass the stub end of the tape around the back of the limb or trunk with the left hand
- iv. Once around the girth to be measured, grasp the stub of the tape with the right hand (along with the case) and put sufficient tension on the tape to hold it in position against the body.
- v. With the big girths, the left hand is free to manipulate the tape and adjust it to the appropriate level as needed. This step is not necessary for small girths. It is recommended that the assistant monitor the horizontality of the tape on the side in which the anthropometrist cannot visualize it.
- vi. Finally, reach under the case end of the tape with the left hand to grasp the stub again and draw it under the tape so the tape is held by both hands in the cross-tape position. Once in this position, in the case of small girths, the middle fingers of both hands can be used to adjust the tape as needed.
- vii. When reading the tape, the anthropometrist's eyes should be at the same level as the tape and directly in front of the zero to avoid any error of parallax.

## **5.5. GENERAL TECHNIQUE FOR MEASURING BREADTHS**

- The caliper body lies on the dorsal surface (i.e. the back) of the hands, while the thumbs rest against the inside edge of the caliper branches, and the extended index fingers lie along the outside edges of the branches. In this position, the middle fingers are free to palpate the bony landmarks on which the caliper faces are to be placed, and the index fingers are then able to exert pressure on the lateral side of the blades to reduce the thickness of superficial soft tissue.
- The sequence to carry out the measurement should be as follows:
  - i. Place the first branch of the instrument at the relevant landmark.
  - ii. Place the second branch of the instrument at the other relevant landmark.
  - iii. Inspect each branch (fixed end first) to make sure that neither has moved away from its required position.
  - iv. Read the measurement.

## **5.6. MEASUREMENT PROTOCOL**

The order has been established looking for the ergonomics of the subject to be evaluated. In blue you can find the landmark and in green the variables that you must register.

The right side of the body is normally used for unilateral measurements irrespective of the preferred side of the subject.

Each measurement must be taken twice in the established order. A third measurement is necessary in case that the column of the database called “yes/no” put “yes”.

Measure all the variables two times in

A. *Subject sits on box*

1) **Patellare landmark**

The mid-point of the posterior superior border of the patella.

The subject sits on the edge of the box with the right knee extended and relaxed and the heel on the floor. Palpate the patella by its lateral and medial borders with the thumb and forefinger, following these borders upwards until the superior border of the patella is located. Once located, ask the subject to gently flex their knee to 90°. During this movement, palpate the point continuously, following it in its path and raising the fingers frequently to allow the skin to move to its natural position.



2) **Thigh skinfold site:**

The mid-point of a line between the patellare and the inguinal point.

The subject assumes a seated position with the torso erect to 90°. The knee of the right leg should be flexed at 90°.

Place one end of the tape on the inguinal point on the short sports pants and the other end on the patellare. Measure the distance between the two points and draw a small horizontal line at the mid-point. Then, visually project the middle of the patellare mark parallel to the long axis of the thigh and draw a short vertical line at the level of the mid-patellare-inguinal point to indicate the thigh skinfold site. Be sure to hold it so that the linear distance between the two landmarks is measured, rather than following the curvature of the thigh.



### 1) Thigh skinfold

The skinfold measurement taken parallel to the long axis of the thigh at the thigh skinfold site.

Due to the difficulty presented by the measurement of this skinfold in some subjects, three measurement methods are recommended depending on the ease of taking the measurement.



### 2) Humerus breadth

The linear distance between the lateral aspect of the lateral humeral epicondyle and the most medial aspect of the medial humeral epicondyle. The right shoulder is flexed at 90°, with the elbow also flexed to 90° and the forearm in supination.



### 3) Bi-styloid breadth

The linear distance between the lateral aspect of the radial styloid process and the medial aspect of the ulnar styloid process. Subject sited places the right forearm in a pronated position and the hand over the right knee.



### 4) Femur breadth

The linear distance between the most lateral aspect of the lateral femoral epicondyle and the most medial aspect of the medial femoral epicondyle with the subject seated with the right knee flexed to 90°.



## B. Subject standing on box

### 5) Calf skinfold site

The point on the most medial aspect of the calf at the level of the maximal girth.

The level of the maximum girth is determined by trial and error. To mark the skinfold site, draw the vertical line on the most medial aspect of the leg with the subject in the standing position.



### 6) Waist girth

The girth of the abdomen at its narrowest point between the lower costal (10th rib) border and the top of the iliac crest, perpendicular to the long axis of the trunk.

If there is no noticeable narrowing of the waist, the measurement is taken at the mid-point between the lower costal (10th rib) border and the iliac crest. The subject should breathe normally and the measurement taken at

the end of a normal expiration (end-tidal) and with the abdominal muscles relaxed.



### 7) Hips girth

The circumference of the buttocks at the level of their greatest posterior protuberance, perpendicular to the long axis of the trunk.



### 8) Thigh girth

The circumference of the thigh at the level of the thigh skinfold (mid-point between the patellare and the inguinal point), perpendicular to the thigh long axis.



### 9) Calf girth

The circumference of the leg at the level of the Medial calf skinfold site, perpendicular to its long axis.



### 10) Bimalleolar breadth

The linear distance between the lateral aspect of the lateral malleolus and the medial aspect of the medial malleolus.



### C. Subject standing on the floor

#### 11) Body mass



#### 12) Stretch stature

The perpendicular distance between the transverse planes of the vertex and the inferior aspect of the feet.

The measurement of stretch stature requires upward traction on the head when it is in the Frankfort plane. This is achieved by placing the tips of the thumbs on the orbitales, and the index fingers on the tragions. Having positioned the head in the Frankfort plane, the anthropometrist relocates the thumbs and index fingers posteriorly towards the subject's ears, and far enough along the line of the jaw of the subject to ensure that upward pressure, when applied, is transferred through the mastoid processes. The subject is then instructed to take and hold a deep breath and while keeping the head in the Frankfort plane the anthropometrist applies gentle upward traction through the mastoid processes. An assistant then places the head board firmly down on the vertex, compressing the hair as much as possible.



#### 13) Acromiale landmark

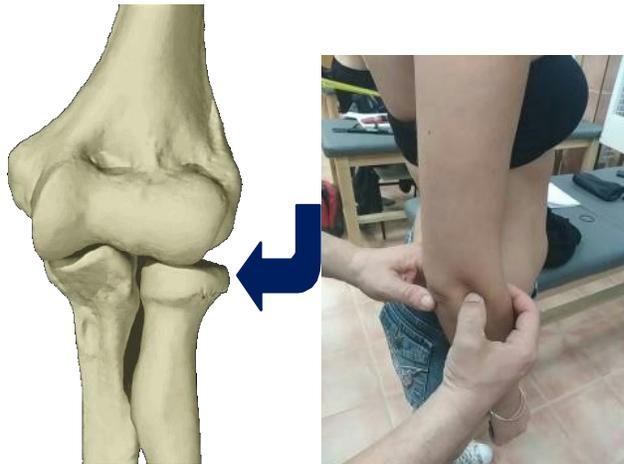
The point on the superior aspect of the most lateral part of the acromion border.

Palpate along the spine of the scapula to the corner of the acromion. This represents the start of the lateral border which usually runs anteriorly, slightly superiorly and medially. The acromion has an associated bone thickness. Palpate superiorly to the top margin of the acromion border in line with the most lateral aspect.



#### 14) Radiale landmark

The point at the proximal and lateral border of the head of the radius. With thumb located parallel to the axis of the arm, palpate downward into the lateral dimple of the right elbow. It should be possible to feel the articular space between the capitulum of the humerus and the head of the radius. Once the space is located, move the thumb distally onto the most lateral part of the proximal head of the radius.



#### 15) Mid-acromiale-radiale landmark

The mid-point of the straight line joining the acromiale and the radiale. Measure the linear distance between the acromiale and radiale landmarks with the arm relaxed and extended by the side. Be sure to hold it so that the linear distance between the two landmarks is measured, rather than following the curvature of the deltoid.



### 16) Triceps skinfold site

The point on the posterior surface of the arm, in the mid-line, at the level of the marked mid-acromiale-radiale.

Project the mid-acromiale-radiale landmark round to the posterior surface of the arm as a horizontal line. At the site of the line projected backwards from the middle acromiale-radiale, intersect a perpendicular line which divides the arm into two halves.



### 17) Triceps skinfold

The skinfold measurement taken parallel to the long axis of the arm at the triceps skinfold site.



### 18) Calf skinfold

The skinfold measurement taken vertically at the calf skinfold site.



### 19) Arm relaxed girth

The girth of the arm at the level of the mid-acromiale-radiale site, perpendicular to the long axis of the arm.



## 6. FUNTIONAL AUTONOMY TEST

Functional autonomy is assess trough the Latin American Group for Maturity (GDLAM) (Dantas & Vale, 2004; Vale, 2005). For the realization of the test battery it is necessary to have the following considerations:

Warm up:

- Joint mobility: perform 3 sets of 10-15 repetitions of the movements of the main joints that will be used during the tests (Ankles, knees, hips and shoulders).
- Vegetative activation: perform a walk of at least 5 minutes at intermediate intensity. After that, perform 2 sets of 5 repetitions of arm push-ups on the wall and 2 sets of 5 reps of a quarter squat.
- Active stretches: perform 2 series of 2 - 3 repetitions of 10 seconds duration of dynamic stretches of the main muscle groups involved.

GDLAM is composed of the following test:

### 6.1. Test 1: Walk 10m (10m W)

Purpose: the purpose of this test is to record the time that the individual takes to cover a distance of 10 meters without running.

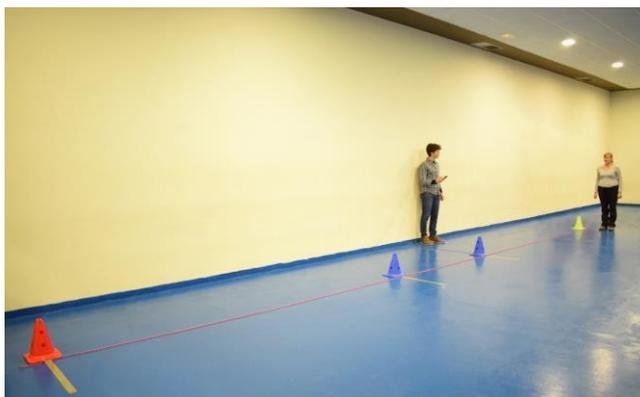
Justification: the speed of displacement is a key factor to know the autonomy of the adult, as well as its effectiveness in carrying out daily life activities.

Registered value: time spent on completing the task taken in seconds and hundredths.

Valuation protocol: average of 2 trials.

Material: chronometer and tape measure.

Description: This test consists of walking a distance in a straight line of 10 meters at the maximum possible speed without running.



## 6.2. Test 2: Rising from a sitting position five times

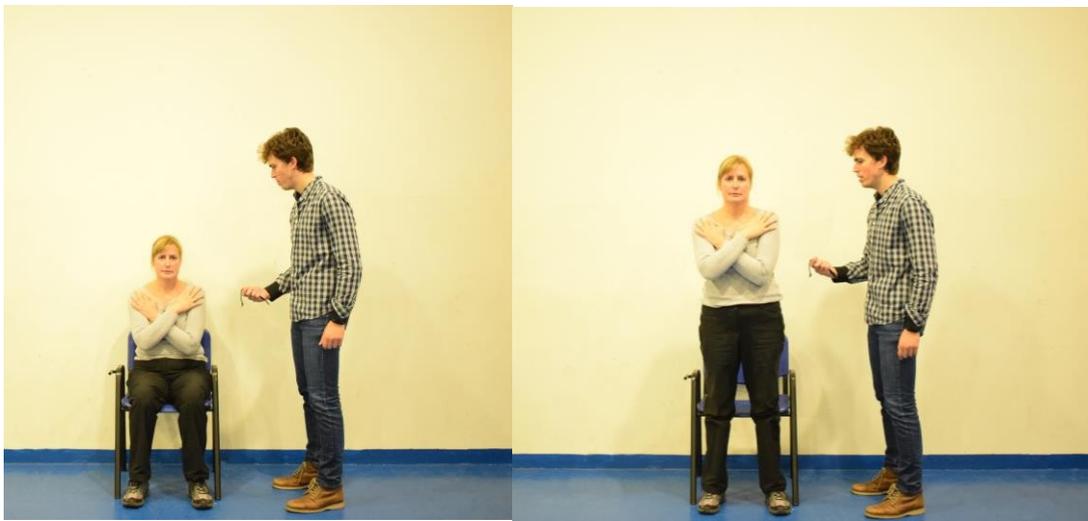
**Purpose:** The test aims to assess the functional capacity of the lower limbs  
**Justification:** muscle strength is a key variable for the successful development of activities of daily life. The manifestation of explosive force correlates with the risk of falling in the elderly. The strength muscles deficits of the lower body are related to the fragility and dependence of the subject to stand on their own in the performance of daily tasks.

**Registered value:** time spent on completing the task taken in seconds and hundredths.

**Valuation protocol:** average of 2 trials.

**Material:** Chair 50 cm high and chronometer.

**Description:** This test consists of the individual rising and sitting five consecutive times, starting from a sitting position on a chair, without arm support and the seat 50 cm from the floor.



## 6.3. Test 3: Rising from a ventral decubitus position

**Purpose:** This test assesses the individual's ability to rise from the floor. **Justification:** falls can occur frequently in the elderly. Having the ability and strength necessary to be able to get up from the ground, is a variable that indicates the capacity of independence and autonomy of the older adult

**Registered value:** time spent on completing the task taken in seconds and hundredths.

**Valuation protocol:** average of 2 trials.

**Material:** stopwatch

Description: This test involves rising to a standing position as fast as possible at the command “now”, starting from the initial ventral decubitus position, with arms alongside the body.

Recommendation: this test can be dangerous for older adults with reduced mobility or reduced strength. It is advised that the assessor be placed in front of the subject to help him in case of accident.



#### 6.4. Test 4: Rising from a chair and walking around the house

Purpose: The aim is to assess the elderly individual’s agility and balance in daily situations.

Justification: the displacement, as well as sitting and getting up from a chair, is everyday actions that the older adult performs daily in their home. This test emulates movements similar to the tasks of daily life indicating the functional capacity of the elderly as well as their autonomy to live alone or without the help of another person.

Registered value: time spent on completing the task taken in seconds and hundredths.

Valuation protocol: average of 2 trials.

Material: chronometer and chair 50 cm high.

Description: With a chair fixed to the floor, two cones are placed diagonally to the chair, four meters behind and three meters to the right and left. The subject is sitting on a chair, feet off the floor, and at the command “now”, must rise, move to the right, circle the cone, return to the chair, sit down and lift both feet off the floor. The same procedure is then performed to the left without hesitation. Immediately thereafter they follow a new course, to the right and to the left, and thus circle each cone twice, in the shortest time possible.



### 6.5. Test 5: Putting on and removing a t-shirt

Purpose: This test aims to assess upper limb agility and coordination.

Justification: the capacity of an adult to dress helps to identify the level of independence to perform the tasks of daily life. The lack of agility and joint mobility of the upper limbs may imply a reduction in functional autonomy level in the elderly.  
Registered value: time invested in completing the task in seconds and hundredths.  
Valuation protocol: average of 2 trials.

Material: chronometer and T-shirt size "L" (Europe)

Description: At the command "now", they should put on the t-shirt and immediately remove it, returning to the original position.





## 6.6. Test evaluation:

To calculate the autonomy index of the adult and the elderly, the following equation is used:

All the tests should be performed twice consecutively, with a minimum interval of five minutes between attempts, considering the lowest time recorded in seconds.

Using these data and the formula below, the GDLAM autonomy index (GI) 6 was calculated, in which the lower the GI, the better the result.

$$GI = \frac{(10mW + RSP + RVDP + PRTS) \times 2 + RCWH}{4}$$

Clasif/test	10m W (s)	RSP(s)	RVDP(s)	PRTS (s)	RCWH (s)	GI (s)
Weak	>7,09	>11,19	>4,40	>13,14	>43,00	>27,42
Regular	7,08- 6,34	11,18-9,55	4,39-3,30	13,13-11,62	43,00- 38,69	27,42- 24,98
Good	6,33-5,71	9,54-7,89	3,28-2,63	11,60-10,14	38,67-34,78	24,97-22,66
Very good	<5,71	<7,89	<2,63	<10,14	<34,78	<22,66



## 7. STATIC AND DYNAMIC BALANCE TEST

### 7.1. Static Balance

To ensure that testing conditions are the same for all subjects, the test is preferably performed on a smooth, hard floor with the subjects barefooted.

#### **Side-by-side Stand**

With their eyes open, the subjects are instructed to start in a position with feet together side-by-side.

- The subjects are instructed to keep the balance without using any assistive device, and keeping their arms by their sides.
- The test will be timed in seconds as soon as the participant report being stable and the researcher remove her hand from helping the participant gain a stable position.
- The tests are over after 10s has elapsed, when the foot shifts, or when lose your position, or raise your arms, whichever occurs first.
- To prevent falls or injuries, the examiner stands close to the subjects throughout the trial. Ideally, the test is performed by two examiners, one acting as time keeper and the other as an assistant to prevent falls or injuries caused by loss of balance.
- Subjects are given two trials unless they are able to complete 10 s on the first. The examiner records the better of the two trial times.

#### **SEMITANDEM STAND**

With their eyes open, the subjects are instructed to start in semi-tandem stand, in which the heel of one foot will be placed to the side of the first toe of the other foot, with the participant choosing which foot to place forward.

- The subjects are instructed to keep the balance without using any assistive device, and keeping their arms by their sides.
- The test will be timed in seconds as soon as the participant report being stable and the researcher remove her hand from helping the participant gain a stable position.
- The tests are over after **10s** has elapsed, when the foot shifts, or when lose your position, or raise your arms, whichever occurs first.
- To prevent falls or injuries, the examiner stands close to the subjects



throughout the trial. Ideally, the test is performed by two examiners, one acting as time keeper and the other as an assistant to prevent falls or injuries caused by loss of balance.

- Subjects are given two trials unless they are able to complete 10 s on the first. The examiner records the better of the two trial times.

**\*Those able to maintain the semi-tandem position for 10 seconds will be further evaluated with the feet in full tandem position, with the heel of one foot directly in front of the toes of the other foot.**

### **TANDEM STAND**

With their eyes open, the subjects are instructed to start in a position with (one foot in front of the other).

- The subjects are instructed to keep the balance without using any assistive device, and keeping their arms by their sides.
- The test will be timed in seconds as soon as the participant report being stable and the researcher remove her hand from helping the participant gain a stable position.
- The tests are over after 10s has elapsed, when the foot shifts, or when lose your position, or raise your arms, whichever occurs first.
- To prevent falls or injuries, the examiner stands close to the subjects throughout the trial. Ideally, the test is performed by two examiners, one acting as time keeper and the other as an assistant to prevent falls or injuries caused by loss of balance.
- Subjects are given two trials unless they are able to complete 10 s on the first. The examiner records the better of the two trial times.

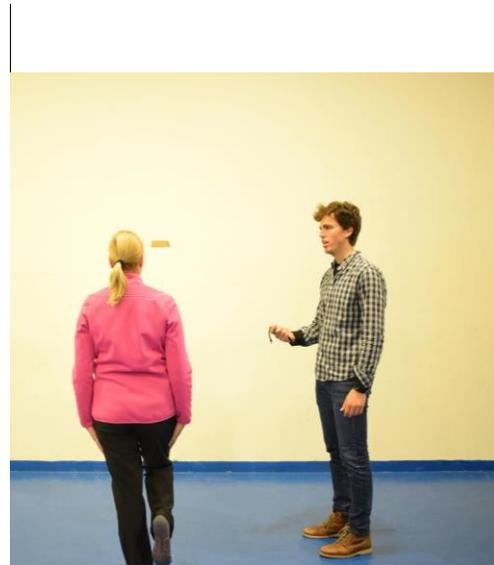
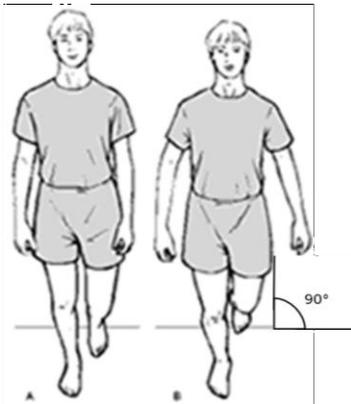
### **ONE LEG STAND TEST**

The examiner first asks the subjects to decide on which leg they would like to stand, it have to be the dominant leg. The subjects are then asked to stand initially in a relaxed stance with their weight evenly distributed between both. With their eyes open, the subjects are instructed to stand on the leg they have selected, without using any assistive device, and keeping their arms by their sides. The One- Leg Stand test will be timed in seconds from the time one foot is lifted from the

floor and the test is over after **60 s** has elapsed, when the stance foot shifts, or when the lifted foot is replaced on the floor, whichever occurs first.

To prevent falls or injuries, the examiner stands close to the subjects throughout the trial. Ideally, the test is performed by two examiners, one acting as time keeper and the other as an assistant to prevent falls or injuries caused by loss of balance.

Subjects are given two trials unless they are able to complete **60 s** on the first. The examiner records the better of the two trial times.

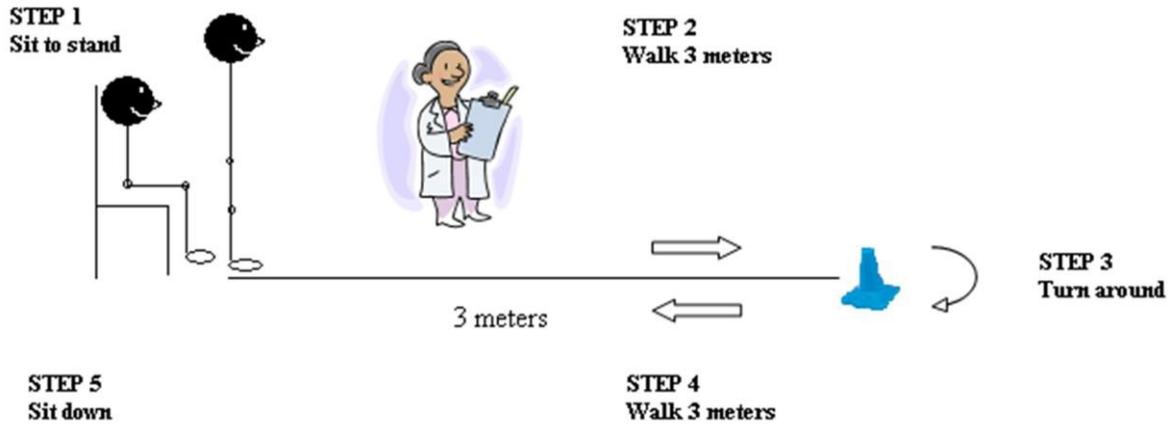


## 7.2 Time Up and Go Test

The timed "Up & Go" measures, in seconds, the time taken by an individual to stand up from a standard arm chair (approximate seat height of 46 cm), walk to distance of 3 meters, turn, walk back to the chair, and sit down again. The subject wears his regular footwear and uses his customary walking aid (none, cane, or walker). No physical assistance is given. He starts with his back against the chair, his arms resting on the chair's arms, and his walking aid at hand. He is instructed that, on the



word .go, "he is to get up and walk at a comfortable and safe pace to a line on the floor 3 meters away, turn, return to the chair, and sit down again. The subject walks through the eleven test before being timed in order to become familiar with the test Either a wrist-watch with a second hand or a stop-watch can be used to time the performance.



## 8. MAXIMUM ISOMETRIC STRENGTH TEST

### 8.1. Biceps Flexion Strength test

Description: 2 maximum voluntary contractions will be performed for 5 seconds, selecting the attempt with the highest peak force signal generated in Newton.

Position: In standing with the trunk erect, elbows attached to the trunk and semiflexion ( $10^{\circ}$ - $15^{\circ}$ ) of the joint of the knees, located on the platform where the chain is attached.

Once at a 90 degree angle in the elbow joint, the steel bar will be grasped with the hands, joined to the force sensor held by a steel chain to the platform, whose chain links will allow to vary the angle of the joint, and the maximum contraction will be carried out.



## 8.2 Leg Extension Strength Test

Description: 2 maximum voluntary contractions will be performed for 5 seconds, selecting the attempt with the highest peak force signal generated in Newton.

Position: With the trunk upright and their arms across their chest, they will be placed on the chair or measuring surface.

Once the knee joint is at 90 degrees, we will place the ankle, attached to the same force sensor held this with a steel chain to a stable and rigid surface, the links of the chain will vary the angle of the joint.



## 9. FUNCTIONAL FITNESS TEST BATTERY:

Functional fitness is measure by Senior Fitness Test (Jone and Rikli, 2002; Rikli and Jones, 1999; Rikli and Jones, 2012).

### 9.1. Chair Sit & Reach

Purpose: To assess lower body flexibility.

Justication: Lower body flexibility is important for good posture, for normal gait patterns and for various mobility task, such as getting in and out of a bathtub or car.



Value data: Centimetres between extended fingers and tip of toe of right leg  
Material: Folding chair or straight-back (47 cm high approximately) and 45 cm ruler.  
Scoring protocol: Best of 2 trails.

Description: Subject sit on the front edge of the chair. The crease between the buttocks and the top of the leg will be even with the edge of the chair seat. One leg will be bent and the foot flat on the floor; and the other leg will be extended straight in front of the hip, with the heel on the floor and foot flexed (90° approximately). The hand will be one on the other with the tip of the middle fingers even. In this position, the subjects bends forwards at the hip joint (spine should remain as straight as possible, with head in line with spine, not trucked). The subjects will try to touch the toe. The reach must be held for 2 seconds. The move is done slowly. The straight leg does not have to bend. To avoid bouncing or rapid, forceful movements, and to never stretch to the point of pain; participant should be reminded to exhale as they bend forward.

Risk zone: Men: minus 10.6 cm; Woman: minus 5.08 cm.



## 92. Back Scratch

Purpose: To assess upper body (shoulder) flexibility.

Justification: Upper body flexibility is important in tasks such as combing one hair, putting on overhead garments and reaching for a seat belt.

Value data: centimetres + / - between fingers (-) or overlap (+). Right arm up – left arm down.

Material: 45 cm ruler

Scoring protocol: Best of 2 trails.



Description: In a standing position, subject places one hand behind the same-side shoulder, palm toward back and fingers extended, reaching down the middle of the back as far as possible. Subject place the other hand behind the back, palm out and try to reach up as much as possible, trying to touch the other hand or overlap. Participant do not have to move or grab his or her fingers together and pull. Tester will measure the distance (-) or the overlap (+) between middle finder.

Risk zone: Less than 8 unassisted stands for men and women.



### 9.3. 6-Minute Walk

Purpose: To assess aerobic endurance.

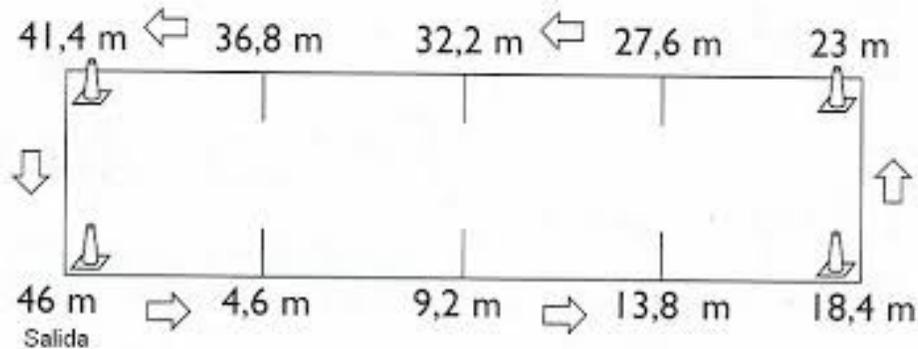
Justication: Aerobic endurance is important for walking distances, stair climbing,

shopping, sightseeing while on vacation, etc.

Value data: Total of number of meter walked in 6 minutes.

Material: Stopwatch, 4 cones, long measure tape, popsicle sticks, chalk, masking tape (or some other type of marker) and chairs (placed along the walkway, for safety).

Scoring protocol: Test is performance one trial.



Description: The walking area can be indoor or outdoor; should be well lit, with a nonslippery, level surface. Participant have to walk around for about a minute to cool down. Subject have to walk around the walkway of 46 meters during 6 minutes as fast as possible (not run). Subject have to walk outside the cones. Participant can stop and/or sit on a chair if they need it, and then return to walk. Each time that the subject completes a lap a popsicle stick (or something similar) can be given to the participant in order to account the round around the walk place. Two or more subject have performance the test at the same time, with starting time staggered (10 second) because the participant cannot walk in clusters or pairs. Tester have to inform when 3, 2 and 1 min are left; and have to encourage phrases such as "you are doing well" and "keep up the good work" every 30 second intervals. When the subject finish has to inform to the examiner their score.

Risk zone: Less than 320 meters for men and woman.

## 10. EVALUATION OF FRAGILITY SYNDROME

Frailty is considered highly prevalent in old age and to confer high risk for falls, disability, hospitalization, and mortality. There is a growing consensus that markers of frailty include age-associated declines in lean body mass, strength, endurance, balance, walking performance, and low activity, and that multiple components must be present clinically to constitute frailty. Many of these factors are related and can be unified, theoretically, into a cycle of frailty associated with declining energetics and reserve. Fried Frailty Phenotype (Fried, 2001) indicate the follow criteria to define fragility: Weight loss, Exhaustion, Physical Activity, Walk Time and Grip Strength.

### 10.1. Weight Loss

It is defined as the involuntary weight reduction equivalent to > 10 pounds / 4.54 kg during the year previous to the start, or during the follow-up done in the experimentation phase, or > 5% of the body weight of the previous year (measured directly through the weight).

Protocol to follow for the standardization of your measure:

*“In the last year, have you lost more than 10 pounds unintentionally (i.e., not due to dieting or exercise)?”*. If yes, then frail for weight loss criterion. At follow-up, weight loss was calculated as:

***(Weight in previous year – current measured weight)/(weight in previous year)***  
**= K.**

If  $K \geq 0.05$  and the subject does not report that he/she was trying to lose weight (i.e., unintentional weight loss of at least 5% of previous year's body weight), then **FRAIL** for weight loss=Yes.

### 10.2. Exhaustion

This factor will obtain its valuation through a self-report of exhaustion. That self-report of exhaustion will be identified with the two questions of the CESD-R scale (Scale of the Center for Depression Epidemiological Studies reviewed).

Protocol to follow for the standardization of your measure:

Using the CES–D Depression Scale, the following two statements are read:

- (a) I felt that everything I did was an effort;
- (b) I could not get going.

The question is asked “How often in the last week did you feel this way?” 0=rarely or none of the time (<1 day)

1= some or a little of the time (1–2 days)

2= a moderate amount of the time (3–4 days) or



3= most of the time.

Subjects answering “0” or “1” to either of these questions are categorized as **NO FRAIL**.

Subjects answering “2” or “3” to either of these questions are categorized as **FRAIL** by the exhaustion criterion.

This scale is a self-report measure of depression. Questions measure 8 different subscales, including:

- *Sadness (Dysphoria):* (Q. 2, 4, 6)
- *Loss of Interest (Anhedonia):* (Q. 8, 10)
- *Appetite:* (Q. 1, 18)
- *Sleep:* (Q. 5, 11, 19)
- *Thinking / concentration:* (Q. 3, 20)
- *Guilt (Worthlessness):* (Q. 9, 17)
- *Tired (Fatigue):* (Q. 7, 16)
- *Movement (Agitation):* (Q. 12, 13)
- *Suicidal Ideation:* (Q. 14, 15)

**Total Items:** 20

In the case that concerns us, in relation to the affirmations to consider to measure or not the existence of fragility, questions 7 and 16 should be looked at .

### **10.3. Calculating the overall CESD-style symptom score**

The response values for each question are:

- Not at all or less than one day = 0
- 1-2 days = 1
- 3-4 days = 2
- 5-7 days = 3
- Nearly every day for 2 weeks = 4

The Total CESD-R Score is calculated as a sum of responses to all 20 questions. In order to make the revised CESD-R have the same range as the original version i.e., the ‘CESD style score’), the values for the top two responses are given the same value:

- Not at all or less than one day = 0
- 1-2 days = 1
- 3-4 days = 2
- 5-7 days = 3
- Nearly every day for 2 weeks = 3



As in the original CESD the range of possible scores is between 0 (for those who say 'not at all or less than one day to all 20 questions' and 60 (for those who say '5-7 days' or 'nearly every day for 2 weeks' for all 20 questions).

#### Determining categories

The determination of possible depressive symptom category is based upon an algorithm with the following logic:

- **Meets criteria for Major depressive episode:** Anhedonia or dysphoria nearly every day for the past two weeks, plus symptoms in an additional 4 DSM symptom groups noted as occurring nearly every day for the past two weeks;
- **Probable major depressive episode:** Anhedonia or dysphoria nearly every day for the past two weeks, plus symptoms in an additional 3 DSM symptom groups reported as occurring either nearly every day for the past two weeks, or 5-7 days in the past week;
- **Possible major depressive episode:** Anhedonia or dysphoria nearly every day for the past two weeks, plus symptoms in an additional 2 other DSM symptom groups reported as occurring either nearly every day for the past two weeks, or 5-7 days in the past week;
- **Subthreshold depression symptoms:** People who have a CESD-style score of at least 16 but do not meet above criteria;
- **No clinical significance:** People who have a total CESD-style score less than 16 across all 20 questions.



### 10.3.1. Questionnaire

Below is a list of the ways you might have felt or behaved. Please check the boxes to tell me how often you have felt this way in the past week or so.	LAST WEEK				Nearly every day for 2 weeks
	Not at all <i>or</i> Less than 1 day	1-2 days	3-4 days	5-7 days	
My appetite was poor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could not shake off the blues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had trouble keeping my mind on what I was doing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt depressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My sleep was restless.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt sad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could not get going.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nothing made me happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt like a bad person.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I lost interest in my usual activities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I slept much more than usual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt like I was moving too slowly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt fidgety.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wished I were dead.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wanted to hurt myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I was tired all the time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I did not like myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I lost a lot of weight without trying to.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had a lot of trouble getting to sleep.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I could not focus on the important things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## 10.4. Physical Activity

It will be a measure to be taken at the beginning of the experimental phase. It will be based on the Global Physical Activity Questionnaire.

The Global Physical Activity Questionnaire was developed by WHO for physical activity surveillance in countries. It collects information on physical activity participation in three settings (or domains) as well as sedentary behaviour, comprising 16 questions (P1-P16). The domains are:

- Activity at work
- Travel to and from places
- Recreational activities

### **Protocol to follow for the standardization of your measure:**

Prior to using GPAQ, you should review the question by question section. This section, which follows the actual questions, will guide the interviewer in asking the questions and recording responses.

When using GPAQ, all the questions must be asked. Skips of questions do ONLY apply to the corresponding day and time variables if P1, P4, P7, P10, or P13 have been answered negatively. Skipping any other questions or removing any of the domains will restrict the results that you will be able to calculate.

METs (Metabolic Equivalents) are commonly used to express the intensity of physical activities, and are also used for the analysis of GPAQ data. MET is the ratio of a person's working metabolic rate relative to the resting metabolic rate. One MET is defined as the energy cost of sitting quietly, and is equivalent to a caloric consumption of 1 kcal/kg/hour. For the analysis of GPAQ data, existing guidelines have been adopted: It is estimated that, compared to sitting quietly, a person's caloric consumption is four times as high when being moderately active, and eight times as high when being vigorously active.

Therefore, when calculating a person's overall energy expenditure using GPAQ data, 4 METs get assigned to the time spent in moderate activities, and 8 METs to the time spent in vigorous activities.

The metabolic equivalent (MET)-minutes per week for each domain was calculated as MET level x minutes of activity per week. The total METs score was in equation: Total PA = [(vigorous work × 8) + (moderate work × 4) + (transport × 4) + (vigorous recreation × 8) + (moderate recreation × 4)] then categorized into two levels as follows:

The METs score more than or equal to 600 means moderate to high physical activity and METs score of less than 600 means low physical activity.

Before using the questionnaire, you should review the “**Question by question guide**” section. This section will serve as a guide for the interviewer when it comes to how to ask the questions and record their answers.



Also, in the questionnaire, there is a coding column. It is located on the left side of the questionnaire and serves as a guide for the analysis of the data obtained on the level of physical activity (FA) performed. The coding column of GPAQ is used as a reference for all the calculations. If you insert this questionnaire into another questionnaire, you should not change the coding column.

On the right side of the questionnaire you can see a numerical coding of order for the questions. This numerical order if it can be changed.

When the questionnaire is administered, it is very important to indicate to the person filling it, that all the answers must be given according to a timeframe of one week. That is, they must temporarily limit their responses, for example to the activity done during the last week before the moment in which the questionnaire is filled out. Only in exceptional cases (such as illness) should it temporarily go back more weeks.

*Men:* Those with METs of physical activity per week <600 are **FRAIL**.

*Women:* Those with METs per week <600 are **FRAIL**.



### 10.4.1. Questionnaire. Instructions

Physical Activity		
<p>Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.</p> <p>Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. <i>[Insert other examples if needed]</i>. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate. 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.</p>		
Question	Response	Code
<b>Work</b>		
<p>Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously?</p> <p><i>[INSERT EXAMPLES] (USE SHOWCARD)</i></p>	<p>Yes 1</p> <p>No 2 <i>If No, go to P 4</i></p>	P1
In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days <input type="text"/>	P2
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P3 (a-b)
<p>Does your work involve moderate-intensity activity, that causes small increases in breathing or heart rate such as brisk walking <i>[or carrying light loads]</i> for at least 10 minutes continuously?</p> <p><i>[INSERT EXAMPLES] (USE SHOWCARD)</i></p>	<p>Yes 1</p> <p>No 2 <i>If No, go to P 7</i></p>	P4
In a typical week, on how many days do you do moderate-intensity activities as part of your work?	Number of days <input type="text"/>	P5
How much time do you spend doing moderate-intensity activities at work on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P6 (a-b)
<b>Travel to and from places</b>		
<p>The next questions exclude the physical activities at work that you have already mentioned.</p> <p>Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship. <i>[Insert other examples if needed]</i></p>		
Do you walk or use a bicycle ( <i>pedal cycle</i> ) for at least 10 minutes continuously to get to and from places?	<p>Yes 1</p> <p>No 2 <i>If No, go to P 10</i></p>	P7
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days <input type="text"/>	P8
How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes <input type="text"/> : <input type="text"/> hrs mins	P9 (a-b)



Physical Activity, Continued		
Question	Response	Code
<b>Recreational activities</b>		
The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure), [Insert relevant terms].		
Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football] for at least 10 minutes continuously? [INSERT EXAMPLES] (USE SHOWCARD)	Yes 1 No 2 If No, go to P 13	P10
In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days _____	P11
How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day?	Hours : minutes ____ : ____ hrs mins	P12 (a-b)
Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, volleyball] for at least 10 minutes continuously? [INSERT EXAMPLES] (USE SHOWCARD)	Yes 1 No 2 If No, go to P16	P13
In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	Number of days _____	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours : minutes ____ : ____ hrs mins	P15 (a-b)

## 10.5. Walk Time

Based on the time it takes to travel 32.8084 feet away (10 m), adjusted all according to gender and standing height.

Protocol to follow for the standardization of your measure:

Stratified by gender and height (gender-specific cutoff a medium height).

**Men**                      **Cutoff for Time to Walk 32.81 feet criterion for frailty**

Height  $\leq 173$  cm                       $\geq 15.31$  seconds

Height  $\geq 173$  cm                       $\geq 13$  seconds

**Women**

Height  $\leq 159$  cm                       $\geq 15.31$  seconds

Height  $\geq 159$  cm                       $\geq 13$  seconds



## 10.6. Grip Strength

Calculated through the grip force measured with a dynamometer, adjusted according to gender and body mass index (BMI) (kg / m<sup>2</sup>).

Protocol to follow for the standardization of your measure:

Stratified by gender and body mass index (BMI) quartiles:

Cutoff for grip strength (Kg) criterion for frailty

<i>Men</i>		<i>Women</i>	
BMI $\leq 24$	$\leq 29$	BMI $\leq 23$	$\leq 17$
BMI 24.1–26	$\leq 30$	BMI 23.1–26	$\leq 17.3$
BMI 26.1–28	$\leq 30$	BMI 26.1–29	$\leq 18$
BMI $> 28$	$\leq 32$	BMI $> 29$	$\leq 21$

Once the scores for each of the criteria have been obtained, the total fragility score must be calculated by assigning a value of 1 to each of the above criteria, which results in a range of values from 0 to 5. The participants will be classified as:

Subjects who score below these values will be considered as **FRAIL** in the classification for this factor.

- FRAIL, if at least they present three of the five components of fragility.
- PRE-FRAIL, if they have one or two components.
- NOT FRAIL, if they do not present any of these components.

## 10.7. Reasons for exclusion of a subject in the final sample

We excluded those with a history of Parkinson's disease, stroke or Mini-Mental scores  $< 18$ , and those who were taking Sinemet, Aricept, or antidepressants, as these conditions could potentially present with frailty characteristics as a consequence of a single disease.



## 11. COGNITIVE STATUS: MINI MENTAL STATE EXAMINATION (MMSE)

Cognitive status is assessed with Mini Mental State Examination (MMSE) (Folstein, Folstein, and McHugh, 1975).

### Mini-Mental State Examination (MMSE)

Patient's Name: \_\_\_\_\_ Date: \_\_\_\_\_

***Instructions:*** Ask the questions in the order listed. Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now: State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks the patient to name all three of them. The patient's response is used for scoring. The examiner repeats them until patient learns all of them, if possible. Number of trials: _____
5		"I would like you to count backward from 100 by sevens." (93, 86, 79, 72, 65, ...) Stop after five answers. Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those were?"
2		Show the patient two simple objects, such as a wristwatch and a pencil, and ask the patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your eyes.")
1		"Make up and write a sentence about anything." (This sentence must contain a noun and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of paper and asks him/her to draw the symbol below. All 10 angles must be present and two must intersect.)
30		TOTAL

(Adapted from Rovner & Folstein, 1987)



## 12. PERCEPTION OF HEALTH (SF-36)

The perception of health is measure by Short Form 36 Healty Survey (SF-36). (Vilagut, Ferrer and Rajmil, 2005).

### APPENDIX A: SF-36 HEALTH SURVEY

SF-36 HEALTH SURVEY-PAGE ONE.

### SF-36 HEALTH SURVEY

**INSTRUCTIONS:** This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities.

Answer every question by marking the answer as indicated. If you are unsure about how to answer a question, please give the best answer you can.

1. In general, would you say your health is: (circle one)
- |                |   |
|----------------|---|
| Excellent..... | 1 |
| Very good..... | 2 |
| Good.....      | 3 |
| Fair.....      | 4 |
| Poor.....      | 5 |

2. Compared to one year ago, how would you rate your health in general now? (circle one)
- |                                       |   |
|---------------------------------------|---|
| Much better now than one year ago     | 1 |
| Somewhat better now than one year ago | 2 |
| About the same as one year ago        | 3 |
| Somewhat worse now than one year ago  | 4 |
| Much worse now than one year ago      | 5 |



SF-36 HEALTH SURVEY-PAGE TWO.

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

(circle one number on each line)

<u>ACTIVITIES</u>	Yes, Limited A Lot	Yes, Limited A Little	No, Not Limited At All
a. <b>Vigorous activities</b> , such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. <b>Moderate activities</b> , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing <b>several</b> flights of stairs	1	2	3
e. Climbing <b>one</b> flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking <b>more than a mile</b>	1	2	3
h. Walking <b>several blocks</b>	1	2	3
i. Walking <b>one block</b>	1	2	3
j. Bathing or dressing yourself	1	2	3

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

(circle one number on each line)

	YES	NO
a. Cut down on the <b>amount of time</b> you spent on work or other activities	1	2
b. <b>Accomplished less</b> than you would like	1	2
c. Were limited in the <b>kind</b> of work or other activities	1	2
d. Had <b>difficulty</b> performing the work or other activities (for example, it took extra effort)	1	2



5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

(circle one number on each line)

	YES	NO
a. Cut down the <b>amount of time</b> you spent on work or other activities	1	2
b. <b>Accomplished less</b> than you would like	1	2
c. Didn't do work or other activities as <b>carefully</b> as usual	1	2

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

(circle one)

Not at all	1
Slightly	2
Moderately	3
Quite a bit	4
Extremely	5

7. How much bodily pain have you had during the past 4 weeks?

(circle one)

None	1
Very mild	2
Mild	3
Moderate	4
Severe	5
Very severe	6



SF-36 HEALTH SURVEY-PAGE FOUR.

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

(circle one)

- |              |   |
|--------------|---|
| Not at all   | 1 |
| A little bit | 2 |
| Moderately   | 3 |
| Quite a bit  | 4 |
| Extremely    | 5 |

9. These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks -

(circle one number on each line)

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of pep?	1	2	3	4	5	6
b. Have you been a very nervous person?	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
d. Have you felt calm and peaceful?	1	2	3	4	5	6
e. Did you have a lot of energy?	1	2	3	4	5	6
f. Have you felt downhearted and blue?	1	2	3	4	5	6
g. Did you feel worn out?	1	2	3	4	5	6
h. Have you been a happy person?	1	2	3	4	5	6
i. Did you feel tired?	1	2	3	4	5	6



SF-36 HEALTH SURVEY-PAGE FIVE.

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

(circle one)

- All of the time 1
- Most of the time 2
- Some of the time 3
- A little of the time 4
- None of the time 5

11. How TRUE or FALSE is each of the following statements for you?

(circle one number on each line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people	1	2	3	4	5
b. I am as healthy as anybody I know	1	2	3	4	5
c. I expect my health to get worse	1	2	3	4	5
d. My health is excellent	1	2	3	4	5



## 13. LAWTON & BRODY TEST

Lawton & Brody test measure the capacity to performance daily activities (Lesinski, Hortobágyi, Muehlbauer, etc. 2015).

### 13.1. Key concepts

**Capacity:** Set of resources and capacities that the older adult has, to carry out certain tasks.

**Dependency:** a person with a physical or functional limitation that avoid or impedes the optimal performance of the activities and tasks of the older adult's life.

**Maximum dependency:** When the elderly adult presents a high degree of disability or dysfunctionality and needs the help of third parties to survive.

**Total independence:** this is when the elderly can take care of themselves, assume their responsibilities and satisfy their needs without resorting to other people.

### APPLICATION RULES

The instrument is most useful for identifying how a person is functioning at the present time, and to identify improvement or deterioration over time. There are eight domains of function measured with the Lawton IADL scale. Women are scored on all 8 areas of function; historically, for men, the areas of food preparation, housekeeping, laundering are excluded.

Clients are scored according to their highest level of functioning in that category. A summary score ranges from 0 (low function, dependent) to 8 (high function, independent) for women, and 0 through 5 for men

### UTILITY

The Lawton IADL is an easy to administer assessment instrument that provides self-report information about functional skills necessary to live in the community. Administration time is 10-15 minutes. Specific deficits identified can assist nurses and other disciplines in planning for safe discharge.

A great advantage of this scale is that it allows you to study and analyse not only your overall score but also each of the items.

It has proved useful as an objective and brief assessment method that allows the implementation and evaluation of a therapeutic plan both at the level of daily patient care and at the teaching and research levels.

It detects the first signs of deterioration in the elderly.

It is considered a more appropriate scale for women (many of the activities measured by the scale have traditionally been carried out by women) but its application is also recommended for men although they don't have yet to identify those instrumental activities carried out by them according to social patterns.



### 13.2. Questionnaire

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Patient ID # \_\_\_\_\_

LAWTON - BRODY INSTRUMENTAL ACTIVITIES OF DAILY LIVING SCALE (I.A.D.L.)			
<b>Scoring:</b> For each category, circle the item description that most closely resembles the client's highest functional level (either 0 or 1).			
<b>A. Ability to Use Telephone</b>		<b>E. Laundry</b>	
1. Operates telephone on own initiative-looks up and dials numbers, etc.	1	1. Does personal laundry completely	1
2. Dials a few well-known numbers	1	2. Launders small items-rinses stockings, etc.	1
3. Answers telephone but does not dial	1	3. All laundry must be done by others	0
4. Does not use telephone at all	0		
<b>B. Shopping</b>		<b>F. Mode of Transportation</b>	
1. Takes care of all shopping needs independently	1	1. Travels independently on public transportation or drives own car	1
2. Shops independently for small purchases	0	2. Arranges own travel via taxi, but does not otherwise use public transportation	1
3. Needs to be accompanied on any shopping trip	0	3. Travels on public transportation when accompanied by another	1
4. Completely unable to shop	0	4. Travel limited to taxi or automobile with assistance of another	0
		5. Does not travel at all	0
<b>C. Food Preparation</b>		<b>G. Responsibility for Own Medications</b>	
1. Plans, prepares and serves adequate meals independently	1	1. Is responsible for taking medication in correct dosages at correct time	1
2. Prepares adequate meals if supplied with ingredients	0	2. Takes responsibility if medication is prepared in advance in separate dosage	0
3. Heats, serves and prepares meals, or prepares meals, or prepares meals but does not maintain adequate diet	0	3. Is not capable of dispensing own medication	0
4. Needs to have meals prepared and served	0		
<b>D. Housekeeping</b>		<b>H. Ability to Handle Finances</b>	
1. Maintains house alone or with occasional assistance (e.g. "heavy work domestic help")	1	1. Manages financial matters independently (budgets, writes checks, pays rent, bills, goes to bank), collects and keeps track of income	1
2. Performs light daily tasks such as dish washing, bed making	1	2. Manages day-to-day purchases, but needs help with banking, major purchases, etc.	1
3. Performs light daily tasks but cannot maintain acceptable level of cleanliness	1	3. Incapable of handling money	0
4. Needs help with all home maintenance tasks	1		
5. Does not participate in any housekeeping tasks	0		
<b>Score</b>		<b>Score</b>	
		<b>Total score</b> _____	
A summary score ranges from 0 (low function, dependent) to 8 (high function, independent) for women and 0 through 5 for men to avoid potential gender bias.			

Source: *try this*: Best Practices in Nursing Care to Older Adults, The Hartford Institute for Geriatric Nursing, New York University, College of Nursing, [www.hartfordign.org](http://www.hartfordign.org).

## 14. WORKSHEET

### ORDER IN WHICH THE TESTS ARE CARRIED OUT

### BODY COMPOSITION VALUATIONS WILL BE NOTED ON THE EXCEL SHEET PROVIDED

Name and surname: ..... Date : ..... / ..... / .....

Participant code: ..... Partner: .....

- 1 Sociodemographic questionnaire (S\_Demo).....
- 2 Motivation tests:
  - Basic Physiological Needs in Exercise Scale (BPNES).....
  - Behavioural Regulation in Exercise Questionnaire (BREQ3).....
  - Satisfaction With life Questionnaire (SWL).....
- 3 Global Physical Activity Questionnaire (GPAQ).....
- 4 Body composition and hydration status (BodyC):
  - Body mass.....   - Bioimpedance.....
  - Height.....   - Breadths (Bd).....
  - Skinfolds (SF).....   - Girths (GR).....
- 5 Balance test (BLCT): ..... 
  - 5a - Time Up and Go Test (TUGT) (Blue and green rope)
 




TUGT\_01: .....

TUGT\_02: .....
  - 5b - Side by Side Stand Test (SBS)
 



SBS\_01: .....

SBS\_02: .....
  - 5c - Semi Tandem Test (SMT)
 



SMT\_01: .....

SMT\_02: .....
  - 5d - Tandem Balance Test (TBT)
 



TBT\_01: .....

TBT\_02: .....
  - 5e - One-Leg Stand Test (OLST)
 



OLST\_01: .....

OLST\_02: .....
- 6 Mini Mental State Examination (MMSE).....
- 7 Center for Epidemiologic Studies Depression Scale Revised (CESD\_R).....
- 8 Biceps Flexion Maximun Isometric Strength (BMIS)..... 



BMIS\_01: .....

BMIS\_02: .....
- 9 Latin-American Development to the Maturity Group Protocol (GDLAM)..... 
  - 9a - Walking 4 m / 6 m / 10 m (W4m / W6m / W10m) (Green and yellow rope)
 



W4m\_01: ..... W4m\_02: .....

W6m\_01: ..... W6m\_02: .....

W10m\_01: ..... W10m\_02: .....
  - 9b - Rising from the Sitting Position (RSP)
 




RSP\_01: .....

RSP\_02: .....
  - 9c - Rising from a Ventral Decubitus Position (RVDP)
 




RVDP\_01: .....

RVDP\_02: .....
  - 9d - Sitting and Rising from a chair and Walking around the House (SRWH) (Red rope)
 



SRWH\_01: .....

SRWH\_02: .....
  - 9e - Putting On and Taking Off a T-Shirt (PTTs)
 




PTTs\_01: .....

PTTs\_02: .....



10 Perception of Health. Short -Form Health Survey (SF\_36).....

11 Adherence to the Mediterranean Diet Questionnaire (MD) .....

12 Senior Fitness Test (SFT) .....

12a - Right Chair Sit and Reach (RCSnR)



RCSnR\_01: .....

RCSnR\_02: .....

12a - Left Chair Sit and Reach (LCSnR)



LCSnR\_01: .....

LCSnR\_02: .....

12b - Right Back Scratch (RBckS)



RBckS\_01: .....

RBckS\_02: .....

12b - Left Back Scratch (LBckS)



LBckS\_01: .....

LBckS\_02: .....

13 Handgrip Strength Test (HST).....



HST\_Right01: .....

HST\_Left01: .....

HST\_Right02: .....



HST\_Left02: .....

HST\_Right03: .....

HST\_Left03: .....

14 Leg Extension Maximun Isometric Strength Test (LMIS).....



LMIS\_01: .....

LMIS\_02: .....

15 6 Minutes Walking Test (6min).....



6min\_01: .....

16 Lawton and Brody Instrumental Activities of Daily Living Scale (IADL) .....



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