

**Press file**

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## **Physical activity and prevention of falls in older people**

### ***A collective expert review by Inserm***

With advancing age, every individual can be affected by sensory, motor, and cognitive defects, as well as by chronic illnesses. Past the age of 85 years, over three out of four French people state that their activities are limited.

Falls, which are frequent events for older people, are part of the risk of losing autonomy and being admitted to an institution, and prove very costly in terms of quality of life and care. In an ageing population, prevention of falls and maintaining independence in daily activities are therefore major challenges for public health.

Inserm was asked by the French Ministry of Community, Youth Affairs and Sports to prepare a collective expert report that would provide a review of the scientific knowledge regarding the contribution of physical activity to the prevention of falls in older people.

To fulfil this request, Inserm assembled a multidisciplinary group of experts in the areas of epidemiology, physical medicine and rehabilitation, gerontology and geriatrics, psychosociology, neurobiology and health economics. Following a critical analysis of the literature on this subject, and hearings with several representatives from non-profit organisations involved with physical and sporting activities, the expert group provided a review of the scientific knowledge, and formulated recommendations for action and research.

The authors of the collective expert report thus emphasise the beneficial effect of regular physical activity, centred on balance training, for all older subjects at varying risk of falling. To be tailored to the state of health and lifestyle of older people, physical exercise programmes should be better supervised and involve closer cooperation between players from the medical, non-profit and sports sectors.

## Accidental falls in older people: current situation and consequences

- **A fall is a frequent event, with many and often serious consequences for older people**

In France, according to the permanent survey on everyday accidents, **falls represented 90% of everyday accidents recorded among the over 75s by the emergency services in 2009.**

According to studies carried out in Western countries, **20-33% of people aged 65 years or older report having fallen in the previous year. Of those who had fallen, half would have fallen at least twice that year.**

**Moreover, falls are the main cause of physical trauma among the over 70s.** Trauma prevalence increases with age, and is higher in women than in men. Men most often present with head trauma, and women with hip or pelvic trauma.

Falls are also often responsible for a **loss of self-confidence**, and they are one of the most constant determinants of a **fear of falling**, and can lead to a **restriction of activity**. Autonomy and quality of life are thus affected by their occurrence.

Falls also result in the **human, hospital and medico-economic costs** associated, among other things, with hospital admissions for fractures. The high costs involved provide a measure of the size of the economic problem represented by falls, and justify preventive intervention.

- **What is the faller's profile?**

**The elderly population is a very heterogeneous group from a medical and functional point of view.** Three categories of individuals are distinguished based on their state of health: the "vigorous" (in good health, independent and autonomous), the "ill" (dependent and in poor health), and the "fragile" (in an intermediate state of health, and at risk of sliding into the "ill" category). **From the age of 65 years, 15-20% of people living at home would be fragile.** Moreover, fragility is associated with an increased risk of mortality and insults such as falls.

Sensory and motor changes associated with ageing affect balance, posture and walking. For example, maintaining one's balance requires more attention for the older person. The number of falls and fallers increases in proportion to age: **for subjects over 80 years, nearly one in two would have fallen in the previous year. The rate of falls per year for the over 65s is also higher for women than for men.** This difference is mainly observed before the age of 90 years.

Apart from age-related changes in the physiology of balance, **many medical** (sensory impairment, cognitive decline, orthostatic hypotension,<sup>1</sup> etc.), **psychological** (depression, fear of falling, lack of confidence, etc.), **behavioural** (physical inactivity) and **environmental factors contribute to the risk of falling.**

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<sup>1</sup> Orthostatic hypotension corresponds to a reduction in blood pressure when going to a standing position.

In older people, the likelihood **is increased** (in the order of 1.7- to 2-fold) by **taking psychotropic drugs**. Subjects staying in places of accommodation for dependent older people are the most affected.

Finally, the social characteristics of the faller also underpin the circumstances and often the consequences of the fall: **low income, unsuitable accommodation, a poor social network or problems in accessing social services increase the risk of falling**.

## **Physical exercise contributes to reducing the frequency and risk of falling<sup>2</sup>**

- **Physical activity in falls prevention programmes**

Since falls in older subjects often have multifactorial causes, different types of falls prevention programmes have been developed. Three different types of intervention are usually distinguished: single factor interventions (aimed at correcting a single factor), multiple interventions (offering to work with a group on two or more risk factors without individual assessment), and multifactorial interventions. Multifactorial interventions include an individual assessment of risk of falling, and then offer individualised care according to the risks detected.

Multifactorial interventions most often include physical exercise, and, depending on the case, the correction of sight problems and/or orthostatic hypotension, revision of medication, particularly reduction in psychotropic treatments, changes to the home environment, vitamin or nutritional supplementation, management of foot problems, and diagnosis and treatment of memory disorders and depression.

- **Balance training: the keystone of any exercise programme for preventing falls**

**The most effective exercise programmes are those centred on balance training. Generally, those that include balance exercises lead to a significant reduction in risk of falling in the order of 25%**, whereas other types of exercise have no significant effect on preventing falls.

**Nonetheless, muscle strength training and endurance improvement** contribute to the maintenance of functional abilities, and **have effects that complement balance training** in preventing falls.

Interventions that specifically include dynamic balance exercises (obstacle course, “sit to stand” exercises, dual-task exercises, walking at different speeds and in different directions) and muscle strength training for the lower limbs improve walking speed, thereby constituting an important objective of falls prevention programmes.

- **Effective physical exercise programmes according to the target population**

*For older people living at home, programmes based on several types of physical activity exercises are effective in both reducing the rate of falls, the risk of falling, and the risk of*

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<sup>2</sup> Source: *Cochrane Review*. The rate of falls corresponds to the number of falls per person-year, whereas the risk of falling is related to the number of people who fall once or more during the period of intervention.

fractures. For fragile subjects and/or those at high risk of falling, the multifactorial approach seems most appropriate.

The Cochrane Review (2012) examined the effect of different exercise programmes on the rate of falls and risk of falling for older people living outside institutions. Results show that **programmes based on several types of exercises, practised in groups, reduce the rate of falls by 29% and the risk of falling by 15%**. The latter have also shown their efficacy when carried out individually in the person's home under the supervision (at least at the outset) of a physiotherapist or other caregivers trained in this type of exercise.

The exercise "dose" (combined frequency/duration) also seems to be an important consideration. A meta-analysis shows a clearly more marked effect on prevention of falls in trials where the minimum exercise dose was 50 hours over the total period of the intervention. Generally speaking, we know that **the benefits of exercise are quickly lost after stopping the programme, which implies that physical training should ideally be continued for as long as possible in order to maintain the effects in the long term**. However, few studies have monitored participants beyond the period of the intervention (which rarely exceeds 12 weeks), to assess the duration of the preventive effect on falls and the continuation of an activity by participants.

The efficacy of these programmes with respect to prevention of fall-related physical trauma remains to be determined, since most trials have too few participants to show an effect on the most serious events. **In general terms, however, the risk of fracture is reduced (20-40%) in subjects who take part in a physical activity and have an active lifestyle.**

In places of accommodation for older people, physical activity programmes and multifactorial interventions have not yet proved effective in preventing falls

## **Physical activity: a solution for maintaining autonomy in older people**

- **Physical activity may have a preventive effect on cognitive decline**

A full range of physical activities (water aerobics or Tai chi for example) proves effective from a physical as well as a psychological point of view in older people. The association with prevention of falls is not direct, but functional autonomy is improved.

**Older people who devote time to a physical activity have a better perception of their general health, vitality, and mental and physical condition.** Physical activity may not only prevent falls but may also improve and maintain mobility, functional ability, social life and quality of life.

- **Involvement in physical activity in older people depends on many factors.**

**Age plays a decisive role in the practice of physical activity, with a fall-off at retirement age:** in France, 71% of those in the 55-59 year age group take part in a physical activity, compared with 56% of those aged 60-65 years, and 25% of those over 75 years. Women take less exercise than men, and the discrepancy becomes more marked with age.

Moreover, **socioeconomic status plays a strong role in involvement in sports by older people:** thus 56% of people on low incomes aged between 70 and 75 years state that they do not participate in any physical activity, compared with 28% of seniors on high incomes.

## **RECOMMENDATIONS**

→ **Recommended actions** by the authors of this collective expert report include three main objectives:

### **Develop physical exercise programmes suited to the state of health of the older subject**

- **Choose balance exercises in accordance with the state of health and functional ability of subjects**

**Balance training may be provided to different populations of older people**, whatever the risk of falling. The programme must, however, be adapted, **depending on whether the people in question are robust older people, fragile older subjects, or dependent older subjects**, so as to encourage continuation of the exercises over the long term.

**For all autonomous older people living at home and even more so for those at higher risk of falling**, the expert group urges the promotion of structured programmes of physical exercise that favour static and dynamic balance training, in a group or home setting, **at least twice a week for at least six months**.

**For people living in places of accommodation for older people (EHPAD in French)**, the expert group also recommends **balance training** to prevent falls, even though its benefits have not been formally demonstrated.

- **Combine balance training with other types of exercises**

Although **muscle strength and endurance training** do not affect balance directly, they have positive effects on the efficiency of muscles needed when a person loses balance and on mobility, respectively. They **should therefore be incorporated into programmes in order to enable a rapid response when there is a risk of falling**.

The expert group also encourages **putting in place specific exercises to teach older people how to get up from the floor**.

### **Encourage the implementation of physical activity programmes**

- **Encourage regular physical activity**

The expert group advises the **implementation of interventions aimed at increasing the confidence of older people in their own abilities, while modifying their views on physical activity**. Introductory workshops may, for example, help to make sedentary people (one out of two people over 80 years) more aware of physical exercise. It is therefore important to provide personalised advice for the latter, taking their culture into consideration and not disrupting their habits too much.

- **Improve training for caregivers involved in the area of physical activity and rehabilitation**

For each of these types of caregivers (sports trainers, professionals working in adapted physical activity, allied health professionals and rehabilitators), it would be useful to **insist**

**that they be trained in the knowledge of tests for assessing motor and postural abilities, and in the preparation of specific programmes** (prevention of falls, improvement of general physical condition, reduction in cardiometabolic risks, etc.), **appropriate for the different types of elderly populations.**

- **Favour networks that include players from the medical, non-profit and sports sectors.**

So that all medical issues that could benefit from a physical and sports activity can be picked up, **coordination needs to be encouraged between supervisory bodies responsible for health (Regional Health Agencies), and sport (Regional Directorates for Youth, Sport and Social Cohesion [DRJSCS]), local governments and non-profit organisations.**

The expert group recommends that **sports educators and leaders from the non-profit sector who provide physical activity programmes be associated with the medical and allied health aspects of care.**

- **Prepare terms of reference aimed at guiding the preparation and implementation of tailored physical exercise programmes**

The expert group calls for the **writing of terms of reference which would be a reference document for obtaining designation**, recognised by the Regional Health Agencies, for **programmes and training aimed at older people at risk of falling**, supervised by physical activity and rehabilitation professionals.

### **Educate people about falls, and identify and care for older people at risk**

- **Make older people and those close to them aware of the risk of falling, and of the consequences and prevention of falls.**

The expert group recommends that the **attention of the elderly population at risk of falling be drawn to the consequences of falls and their potentially avoidable nature.** It recommends more particularly that **older people and those close to them be informed about the risk factors** (history of falling in the previous year, poor eyesight, problems with balance and walking, use of psychotropic drugs, hazards in the home, etc.), and the means of correcting some of them.

In order to be effective, **prevention messages need to emphasise the benefits of good balance on mobility, autonomy, well-being and quality of life, and not just deal with the prevention and consequences of falls.**

- **Make health professionals aware of the assessment of risk of falling and the detection of fragility.**

**An annual assessment of the risk of falling is recommended for all older people.** This task is primarily the responsibility of the general practitioner, but may also be carried out by other health professionals involved in caring for the older person. The French National

Authority for Health has issued proposals for tools to be used in detection by general practitioners and allied health professionals.<sup>3</sup>

The patient interview should initially be based on the core question, “Have you fallen in the last year?” and if yes, “How many times?” **Knowledge of previous falls is an excellent predictor of further falls, and should lead to a search for risk factors for falling and their management.**

- **Take action on excessive use of psychotropic drugs by older people**

The expert group proposes **that prescriptions for psychotropic drugs be regularly reviewed.** Physicians and pharmacists should also inform older people of the risk of falling associated with taking such drugs.

The risk of falling should also be assessed prior to any first prescription of psychotropic drugs. For a better benefit/risk assessment, the expert group finally recommends that falls be listed among the adverse effects for purposes of pharmacovigilance monitoring.

- **Provide post-fall care for patients admitted to emergency departments**

Emergency department services should rely on mobile geriatric units to refer the fall patient to the appropriate service, or, if the patient is returning home immediately, to initiate management and put in place an appropriate care pathway and an individualised falls prevention plan.

→ The authors of the present expert report have also formulated several **recommendations for research:**

- **Carry out studies making it possible to specify optimum programmes in terms of efficacy and acceptability, especially for the oldest, least mobile and most fragile people;**
- **Perform cost-effectiveness analyses of prevention programmes; analyse the incidence and consequences of falls in France;**
- **Elucidate the basic mechanisms underlying risk factors for falls;**
- **Assess the psychological and behavioural aspects of risk of falling associated with the fear of falling;**
- **Better define the facilitators and impediments to participation in physical activity by older people**

## **Expert group**

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<sup>3</sup> [http://www.has-sante.fr/portail/upload/docs/application/pdf/2013-06/fiche\\_parours\\_fragilite\\_vf.pdf](http://www.has-sante.fr/portail/upload/docs/application/pdf/2013-06/fiche_parours_fragilite_vf.pdf)

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