

REAX BOARD

In Italy, there are 11 million of people older than 65 years, that is nearly 1/3 of the entire national population. Of these, 3 million are older than 80 years and the accidental falls, which are common at that age, cause about 10.000 deaths each year. Italy is becoming older and older: in 20 years, there will be more than 15 million people older than 65 and 5 million older than 80. This percentage is very high compared to a population that remains nearly unchanged numerically. (1)

This issue can also be found in other parts of the world: in the US, for example, accidental falls are the major cause of death and are responsible for every 7th death of people older than 65 years. For the year 2020 the estimated health care costs, deriving from injuries resulting from accidental falls, amount to 44 billion dollars. This will be hardly sustainable if compared to the 20 billion of dollars spent already in the year 2000.

The destroying impact of such expenses on the public welfare is going to increase also in Italy, where the hospitalization and the disability resulting from such accidental falls represents already today an alarming burden for the national treasury.

Recent scientific literature identified, out of several reasons for accidental falls of elderly people, three fundamental deficits:

- Cognitive deficit
- Static balance
- Dynamic balance

There are many scientific studies that prove how physical activities help to preserve cognitive functions (2) (3) (4) (5) (6)

Especially the oxygenation of the neurons, caused by the blood circulation in the brain and the exchange of nutritional substances with the blood flow, improves their vitality. Moreover, muscular activity contributes to the release of chemical substances which incite the production of brain-derived neurotrophic factor (BDNF). These substances overpass the blood-brain barrier, contributing to the formation of new brain cells (neurogenesis) and the development of additional inter-neuronal synapses. (7)

Regarding the balance, scientific literature agrees that it decreases for people older than 60, creating a progressive instability and insecurity during ambulation. Scientific evidence proves that it can also be trained by elderly people. (8) (9)

The training and increase of the static and dynamic balance, the recall of old movement schemes and the promotion of autonomous displacements improve the life quality of elderly

people and become therefore an essential goal. For this, it is necessary to increase the neuromuscular control. (10)

Sensitive information going to our brain is defined as “neuro muscular control”. This information can be feedforward, when movements derive from past experiences, or it can be feedback, when movements are regulated by reactions. The mechanism of feedforward prepares the muscle to face a challenge, the feedback mechanism is determined by a reactive muscular activity. The malfunction of one of the mechanisms can cause accidental falls.

I would like to remind in this meta-analysis how acting always the same ways, following fixed and predictable schemes, is bad for our brain.

For a long time, it seemed that dendrites could only evolve in children’s brains. Instead, recent studies showed that older neurons can develop other dendrites. (11)

The solving of new and unpredictable situations, both on a mental and a physical level, represents the ideal condition to stimulate the encephalon to develop new dendritic and neuronal connections. Due to new and unexpected physical activities, nutritional substances called neurotrophins (Neura Grow Factor) (12) are secreted, which can make the nearby nerve cells more active and energetic.

The brain-derived neurotrophic factor (BDNF), the vascular endothelial growth factor (VEGF) and the neurotransmitter dopamine are necessary elements to grow and fertilize new and existing neurons and their synaptic connections. (13)

The so called “Neurobic”, a composition of the words neurons and aerobic, is the discipline studying the neuronal trainability on natural synaptic activities.

Mr. Fred Cage, from the Salk Institute in La Jolla in California, and researchers from the Sahlgrenska University Hospital in Gothenburg, Sweden, have proved in the year 1998 that the brain activity is not affected by a sudden drop in advanced age, since it is possible to develop new brain cells in the hippocampus area, which coordinates the information coming from the cerebral cortex and transforms it in memories.

CONCLUSIONS

Does the training with REAX BOARD decrease the risk of accidental falls for elderly people?

Due to the electronic control of the movements, the REAX BOARD changes continuously its position preventing the possibility for the user to find a specific balance, which instead is typical for mechanical boards and which gives a break to proprioception efforts. With REAX BOARD there is a constant feedback activity; due to the possible settings regarding the intensity and the speed of the interferences, it is suitable for all ages and physical conditions.

The presented sources in scientific literature prove that this type of activity has absolutely a training effect on a neuromuscular level, which is not limited to elderly people.

The exclusive possibility to exercise with unpredictable interferences stimulates the neuronal restoration of systems that protect the posture and the ability to react rapidly on potential accidental falls during ambulation.

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