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INFORMATION/EDUCATION PAGE

What do I Need to Know About Exergames to Improve Recovery at Home After My Stroke?

This information/education page is intended to help stroke survivors and their caregivers to better understand the beneficial effect of exergames to improve recovery after stroke. It describes what exercise-based games are and how they can help you in your recovery after a stroke.

What is a stroke?

Stroke is a leading cause of disability worldwide with survivors often living the rest of their lives with trouble moving their arm and hand. Stroke is an injury to the brain caused by loss of blood supply. This loss of blood flow can be due to a burst of a blood vessel (hemorrhagic stroke) or a clot blocking blood flow in a blood vessel (ischemic stroke). Because blood carries oxygen and other nutrients throughout the body, a lack of blood flow due to a stroke prevents oxygen and other nutrients from reaching brain cells resulting in their death.[1]

How does a stroke affect your day-to-day life?

Stroke can affect the movement of your arms and legs, your speech,[2] thinking skills, and emotions.[3] These changes can make it difficult to complete activities of daily living for your personal care or for independent living such as cooking and shopping. Most often, stroke affects only one side of your body. You may find that your arm and hand may feel weak, floppy, or tight. You may have difficulty in sensing specific textures of surfaces or various objects through touch. You may also have difficulty in planning and moving arms and hands together which could make movements feel slow or clumsy.[2] It can also be difficult for your to lift your foot to clear the ground when you are walking.[4]

What are exergames and how is it going to help me after my stroke?

- Exergames are also known as exercise-based games. “Exergaming is the combination of exercise and video games”.[5] Exergames provide a fun, engaging and interactive environment to actively move your body and think at the same time. Thus, exergames can be a means to practice physical activity or rehabilitation in a video-game environment from your home.[6]
- Exergames can improve your brain’s ability to recover through a process called neuroplasticity. “Neuro" refers to the nerve cells in the brain, and "plasticity" means moldable. Neuroplasticity is the brain’s ability to build new connections based on practice of skills. If a portion of the brain is damaged due to a stroke, the healthy surrounding brain tissue take over some of the functions of the damaged area. By practicing tasks over and over again, the brain has the ability to reorganize and make new connections between the brain cells that survived after the stroke.[7]
- Exergames can help you as you work to improve your ability to use your arms and hands to perform different actions like reaching, grasping larger objects, gripping heavier objects, and

pinching smaller objects.[8] Exergaming can also help you as you work to improve your balance, your walking ability, and your ability to do daily tasks independently. You may also find that your thinking abilities may improve after exercising while playing games. Exergames can also be helpful in improving your fitness. You may experience those benefits soon after you play exergames and these can last up to several weeks.[8]

- You can use exergaming in addition to receiving physiotherapy or occupational therapy.[9]
- If you have difficulty joining a community or group fitness class, you can play exergames in your home. Your family and friends can join the games at home too and make exergames a social way of improving your movements and fitness.
- Exergames can be a useful distraction from physical and mental effort during your rehabilitation and recovery. Because exergames are fun, they can push you to get a lot more exercise and help distract you from feeling tired. Exergames may save you time as you will not need to commute to another location or worry about the weather.

What should I know before I start any exergame?

- Before you start any exergames, you should discuss with your care provider to identify your specific needs and obtain clearance to engage in physical activity. Your care provider should guide you to choose exergames that you can perform individually with little professional help.
- Be realistic about what your goals are and what you expect exergaming to do for you with regards to improving your movements and physical fitness. Depending upon the type of exergames, they can provide low-intensity to vigorous levels of physical activity.[10] Please discuss with your care provider to choose the safest and most effective exergame intensity for you.
- It may be helpful to choose exergame interventions that have training tasks that prioritize natural movements closely related to everyday life activities such as bending, reaching, and stepping as is done when getting dressed, managing home tasks, or shopping.
- Ask your care provider if their clinic subscribes to a Remote Therapeutic Monitoring exergame service, which is designed specifically for people with disabilities. Such services make exergaming accessible on devices you already own, such as your tablet or cell phone. This can enable your provider to monitor your progress. Alternatively, you can try exergame systems such as an Xbox, Playstation or Nintendo that are commercially available.
- Setting up the exergame system at home for the first time can feel a bit overwhelming if you are not used to it. Ask your family to help you in setting up the exergaming system or your care provider for exergame options that are easy to set up.

Choose a place to play safely.

How much should I practice exergames?

- To improve and maintain function after stroke, a lot more exercise is needed than usual rehabilitation.[11] High to very high doses of practice are usually recommended to improve mobility and brain functions months to years after stroke. It is important that you practice physical activity at the right dose, as prescribed by your health care provider in order to improve your recovery.[12] This will help improve your circulation, your movements, and your brain recovery even years after your stroke.[13]
- It is recommended to do physical activity or exercise after stroke for 20 to 60 min at least 3-5 days per week to improve physical function, blood pressure, and quality of life.[14] To complement these, you can do exergames 2-3 days per week.[14,15]

What precautions should I take during exergames?

When using exergames, it is important for you to make sure that you are safe. Here are some precautions you may need:

- How to avoid falls: Falls are common after a stroke. Falls after stroke may occur because of muscle weakness, loss of sensation in your legs, reduced balance, poor vision or hearing loss. If you are taking medications that make you drowsy or dizzy, you might be at risk of falling. Therefore, exercise-based gaming must be played in a safe space. If you have any risk of falls, your family or your caregivers can assist you when you are exergaming to prevent falls.[16] You should also remove any loose rugs to avoid your feet getting caught which could cause a fall.
- How to pace yourself: After your stroke, you may feel tired more easily and more often than before. It is important that you pace yourself when you are gaming so as to manage your energy to get through the rest of the day. Some people feel less fatigued when they do 3 10-minute bouts of exercise instead of 30 minutes straight.[14] If you are tired, take a rest. If you have a physiotherapist or an occupational therapist, ask them for further advice and support.
- How to avoid pain and strains: Warm up your body before playing exercise-based games. Avoid jerky movements. If pain persists, notify your care provider and if the pain still persists, see your doctor.
- How to avoid collisions: Headsets used during virtual reality exergames can decrease awareness of objects around you as you cannot see where you are stepping, punching, or kicking. If you are concerned about collisions with objects around you, make sure you have sufficient space around you to allow free movement of your body, arms and legs. You may also choose to have protected railings, sit while playing or ask someone to alert you if you are at risk of colliding with objects.

Authorship

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Disclaimer

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