

# From traditional coloring books to virtual reality. Support for people after stroke

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**We were designing traditional relaxing coloring pages. Meeting with prof. Joanna Szczepańska-Gieracha, psychotherapist and physiotherapist, resulted in the creation of a medical solution based on VR, supporting the rehabilitation of people after strokes - says Paweł Pasternak, CEO of VR TierOne.**



**In the case of VR TierOne, we are dealing with a therapy divided into 8 sessions lasting no longer than 20 minutes.**

Photo VR TierOne

## **Puls Medycyny: How did you create a virtual reality solution that supports therapy and rehabilitation of people after stroke?**

**Paweł Pasternak:** Before the idea was born, our team had 2D and 3D graphic skills and a deep fascination with virtual reality technology. At one point, we were designing traditional relaxation coloring pages. Following the trends and knowing the excellent properties of VR, we felt that it would be great to help people get rid of stress by coloring in the virtual world. The meeting with professor Joanna Szczepańska-Gieracha, a certified psychotherapist and physiotherapist, turned out to be decisive for entering the medical field. It was her professional observations that inspired us to

create a medical solution based on VR, supporting the rehabilitation of people after stroke. Our therapy finally includes tasks based on coloring, because they perfectly support cognitive and visual-spatial functions and help to focus on therapeutic verbal communication. It can be said that the idea for VR TierOne arose from the passion, dreams and sum of experiences of people whose paths crossed at the right time.

**Apparently, no one in Europe has been able to create a device that does not require calibration and works "immediately after being brought to the room". What exactly is this solution about, how does it work?**

In fact, VR TierOne is a medical device that does not require calibration or configuration. From the beginning, our idea was to create a plug-and-play device with a simplified installation procedure, activated by pressing one button. We want to support the psyche of patients, but also make the work of medics as easy as possible. The convenience of use and ease of use of the device are as important as its effectiveness. The solution consists in temporarily "immersing" the patient in a virtual reality that carries therapeutic content. Of course, full therapeutic immersion could not exist without high-quality hardware. Therapy is the heart, but it is the equipment that allows its undisturbed reception. It enables the therapy to be carried out in an optimal, controlled manner.

**Who is the solution currently going to? And the standard question: how much does it cost?**

The VR TierOne medical device is intended for the medical services market. It was prepared for continuous operation in hospital conditions. It is designed to be safe and hygienic to use. It is supposed to go to hospitals, offices and care and treatment centers. And so it is. The purchase of the device is decided by both private institutions, such as the Dynamic Medical Center in Wrocław, the Institute of Psychogerontology in Strzegom, and state centers, such as the Ministry of Interior and Administration hospital in Głucholązy, where thousands of patients benefited from the therapy during postovoid rehabilitation. The price of the device is PLN 85,000. The solution accelerates the recovery time, and therefore the incurred cost is compensated by the reduction of expenses, effort and time needed to improve the psychophysical condition of patients. It is not a household appliance. On the other hand, our new VR TierOne GO product may be a health-promoting activity that can be implemented at home. Mobile relaxation goggles are designed for relaxation and tranquility as a prevention of stress and the resulting unfavorable psychosomatic states. VR TierOne GO can serve as a continuum of care received in a medical facility.

Our goal is to reach as many people as possible in need of psychological support. In addition to domestic distribution, we plan to distribute to international markets. In the near future, we will reveal a new product in line with the telemedicine trend, based on the assumptions of VR TierOne, which will be able to be found in every home.

**Are there other devices / methods on the market that are your competition in this area? Apparently, where there are a sufficient number of mental health specialists, no state aid is needed. So where is the niche?**

There are solutions based on VR supporting the rehabilitation of people after stroke, but their goal is to improve in the physical, mainly functional and functional, in the area of the upper limbs. The VR TierOne solution uses virtual reality to cause a positive change in functioning at the level of the rehabilitated person's psyche. With the help of a virtual message, the patient's inner strength, motivation, perseverance and sense of agency are strengthened. It can be said that the healing process takes place from the inside, and the resulting improvement in mental state is followed by an improvement in functionality on the physical level. A good mood and increased energy allow the patient to actively participate in rehabilitation.

The strength of the solution is the high level of safety of the therapy, its planned short-term and non-stigmatizing nature. It should be noted that some patients are still reluctant to seek the help of a psychologist or psychotherapist. In the case of VR TierOne, we are dealing with a therapy divided into 8 sessions lasting no longer than 20 minutes. Therapy is enjoyable and therefore easily accepted by patients. The advantage is the ability to quickly separate from the stressful hospital environment and transfer to digitally created conditions conducive to good mental health. The weaker side of the solution, which currently makes it difficult to gain global markets, is the need to create multiple language versions of therapies. Verbal communication as an important part of the therapy must be understandable to every patient wishing to benefit from the therapy. At the moment, we have 4 language versions: Polish, German, English and Ukrainian. Acquiring an investor will support activities in this area and facilitate work on the global recognition of the VR TierOne solution.

In the classic edition, educated people are needed to ensure the psychological well-being of stroke survivors. These are missing and the number of sick people is increasing. The facility with our solution can provide the patient with professional mental support immediately, which reduces the risk of developing depressive symptoms and permanent disability.

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## **How effective is the stroke solution based on the research done?**

The effectiveness of the solution in the field of post-stroke rehabilitation has been confirmed in studies conducted in neurological rehabilitation departments. The study was registered in the global clinical trial database under the official title: Evaluation of the Effectiveness of the "VRTierOne" Virtual Therapeutic Game as a Method Supporting the Post-stroke Rehabilitation. The study was conducted on 83 adults aged 55-75 years after ischemic stroke. The research project was carried out by dr hab. Joanna Szczepańska-Gieracha and Dr. Paweł Kiper at the rehabilitation ward of neurology in the Upper Silesian Rehabilitation Center "Repty" in Tarnowskie Góry. In

the course of the research, it was established that VR TierOne is an effective method supporting neurorehabilitation. The long-term beneficial effect of VR therapy on well-being was indicated. The effectiveness of VR TierOne is 37% for reducing depression, 28% for reducing stress and 37% for reducing the level of anxiety. A scientific curiosity is the fact that a doctoral dissertation has been written assessing the effectiveness of VR TierOne as a method supporting the rehabilitation of people after stroke.

Further scientific research conducted among subsequent groups of patients allowed for the expansion of the range of VR TierOne applications. Today, we can also support other groups of patients who have suffered from a heart attack, COVID-19, COPD, we serve seniors with depression and patients treated with oncology.

**The Intelligent Development Operational Program helped to develop a technology supporting rehabilitation of stroke patients. The value of the project entitled "VR TierOne - VR game supporting therapy and rehabilitation of people after stroke" amounted to over PLN 2.2 million, and EU funding over PLN 1.3 million. Did obtaining these funds require a lot of work?**

Receiving funds is never a simple process. We turned to one of the Wrocław companies specializing in this field for help in obtaining an EU subsidy and preparation of documentation. It should be emphasized that even professional support does not release from a huge commitment to raising funds. The workload was large, and the procedure for applying for funding was multi-stage and lasted for several months. The project was assessed by entrepreneurs, foreign experts able to estimate the potential of the pioneering project. The final meeting was conducted in English. We competed for funds with companies such as Techland or CD Projekt, the tycoons of the game industry. We do not hide that we felt great satisfaction when it was the VR TierOne project that gained recognition supported by money.

**In total, three EU projects helped in the company's development. To what extent was the sum of funds from the EU funding important in the whole process - and specifically - in the creation and implementation of the "impact" project?**

EU projects, but not only, helped in the research and development of the final VR TierOne product and the company's development. We were awarded a grant by the American company Epic Games. These were significant financial injections, but own resources were also a necessary condition for success. Of course, it is worth reaching for the offered financial support, but in the process of obtaining funds, determination is required, and consistency in pursuing the goal during implementation. We are at the stage of trying to find an investor interested in the med-tech industry. It is a necessary step for the further development and internationalization of the product. With appropriate support, we are ready to fight for international markets.

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