

# Innovative Home Treatment for Dry AMD Retinal Disease

PBM Medical Technologies offers a treatment for dry Age-related Macular Degeneration (AMD), through a simple-to-operate, self-administered, home-based phototherapy device aiming at preventing vision deterioration and thereby improving patient quality-of-life



Phototherapy glasses by PBM Medical Technologies Credit: Courtesy of PBM Medical

One of the most common chronic eye diseases causing blindness in adults, is called Age-related Macular Degeneration (AMD) and affects approximately 19.8 million (12.6%) of adults Americans.

The disease is classified into two main categories. Eighty percent of those affected are in the stage called "dry" AMD—a condition, in which areas in the macula (the central area of the retina responsible for visual acuity and color vision), including the vision cells, are damaged and depleted. As the disease progresses, deposits composed of proteins and lipids called "drusen" begin to appear. These deposits create a "toxic" environment for vision cells, a process that causes gradual vision loss developing from a central black stain that progressively becomes larger. In the more advanced stage of the disease, capillary blood vessels begin to develop, creating swelling that distorts the macula and increases vision cell mortality. This stage of the disease is called "wet" AMD.



Shlomo Lev, Founder and Chief Technologist

"This is a chronic disease, one of the most common causes of blindness, currently affecting about 200 million people worldwide. The disease, and the subsequent vision loss, can happen to anyone without early warning," says Shlomo Lev, founder and Chief Technology Officer of PBM Medical Technologies, a chemist by training with a background in research and development. Following his personal story, Lev decided to find a solution for a disease for which no effective treatment is available today.

"Our mission is to provide accessible and non-invasive treatments that significantly improve treatment outcomes for dry AMD," explains Ronen Berger, the CEO of the company. "This is an innovative and effective method provided as home treatment using SightRetain®, our phototherapy glasses, a breakthrough alternative to the expensive treatments currently available only at medical centers."



Ronen Berger, CEO of the company

## From personal problem to startup

About four years ago, Shlomo, the company founder, was diagnosed with wet AMD and started medical procedures involving intraocular injections requiring exhausting and time-consuming monthly hospital visits.

Sitting in the waiting room, he met dry AMD patients who told him about an innovative medical procedure available abroad that reduces dry AMD symptoms using a FDA approved phototherapy technology called photobiomodulation (PBM). The medical procedure relies on a desktop device operated by medical staff. This requires the patient to visit the hospital every other day for a 4.5 minute treatment for four months, and then after a three-month break and the cycle repeated for life.

Coming to the hospital every other day for just 4.5 minutes over many months, he thought, was impractical. Why not transferring the phototherapy treatment that has proven effective in several medical studies from the clinic to the patients' home, for their benefit and convenience. Thus, the idea of developing the device was born.

Shlomo partnered with two doctors, one a phototherapy expert and the other an ophthalmologist, and together they began moving the idea towards implementation with support from the Innovation Authority, as part of the "Tnufa" program. After three years of development, the company reached an initial prototype (MVP), which looks like VR glasses designed for computer gaming.

Based on years of acquaintance with Ronen Berger, who came from a business development background and now serves as the CEO of the company, the two joined forces to expand and strengthen PBM Medical Technologies by establishing an advisory board of experts, including world-leading medical professionals, among them Prof. Michael Belkin and Dr. Barak Azmon.

## The science behind the product

The solution offered by PBM Medical Technologies is the SightRetain® glasses. The implementation of the solution is based on developing and miniaturizing electro-optical components that emit light at three dedicated wavelengths, at specific time intervals and intensities. The wavelengths that are aimed at the eye and absorbed by retinal cells, activates an enzyme called cytochrome c oxidase (CcO) found in mitochondrial organelles present in every cell in the human body, including vision cells. This triggers a chain of biochemical actions that ultimately produce ATP molecules, which serve as "fuel" for retinal cells. Additionally, a decrease in oxidative stress and reduction in retinal deposit volumes have been observed. The overall result is that vision cells are awakened to renewed activity.

Studies show that after few months of treatment, visual acuity improves by an average of about 7 letters, equivalent to about one and a half lines on the Snellen chart familiar to anyone who has been examined by an optometrist or ophthalmologist. This electro-optical technology and treatment method are currently included in an international patent application under "PCT procedure."

## The future lies in home medicine

The company's advisor, Prof. (Emeritus) Michael Belkin, former head of the ophthalmology department at Tel Aviv University, strongly believes in the product the company is developing. "This is a very common disease that currently has no cure, and the current recommendation is to take antioxidant supplements." However, he cautions, "The mere fact of getting to a medical center for treatment and the long waiting times are burdensome for both the medical system and the patients, which is the main reason why SightRetain® phototherapy glasses are the optimal solution for AMD, with an emphasis on the target population of the elderly, which is growing due to increased life expectancy."

## What stage is the company at?

Lev: "The company has a working prototype. To date, the company's activities have been supported by two rounds of financing from the Innovation Authority. We are currently working to raise funds for the clinical trial, a process that requires much larger amounts than before. For this purpose, we are looking for strategic investors, angels or venture capital funds. Berger: "The main funding for the next stage is intended for regulatory processes and continued development and technological improvements, including the clinical trial and FDA approval. To this end, we are considering raising \$3-5 million."

## How do you see the future?

Lev: "After reading many articles and research reports in the field, we understand that phototherapy glasses constitute a technological platform that will serve as a growth engine for the company in the future. Phototherapy glasses will be able to treat additional eye and retinal diseases. This is done through adjustments of the treatment protocol and product changes depending on the type of disease. Market trends indicate that myopia will become a common disease among children. Our technology makes it possible to treat the phenomenon while creating phototherapy glasses with augmented reality technology, thus allowing children to sit in the classroom and continue learning while receiving treatment at the same time. We hope to fulfill the company's vision as a global leader in phototherapy treatment in the field of ophthalmology."

### PBM Medical Technologies Ltd

Year established: 2021.

Founders: Shlomo Lev, Prof. David Enk, Dr. Or Shmueli.

Field of activity: The company is a pioneer in innovative home treatment solutions for dry AMD retinal disease.

Leading motto: SightRetain® Our vision - your eyesight.

In collaboration with PBM Medical Technologies