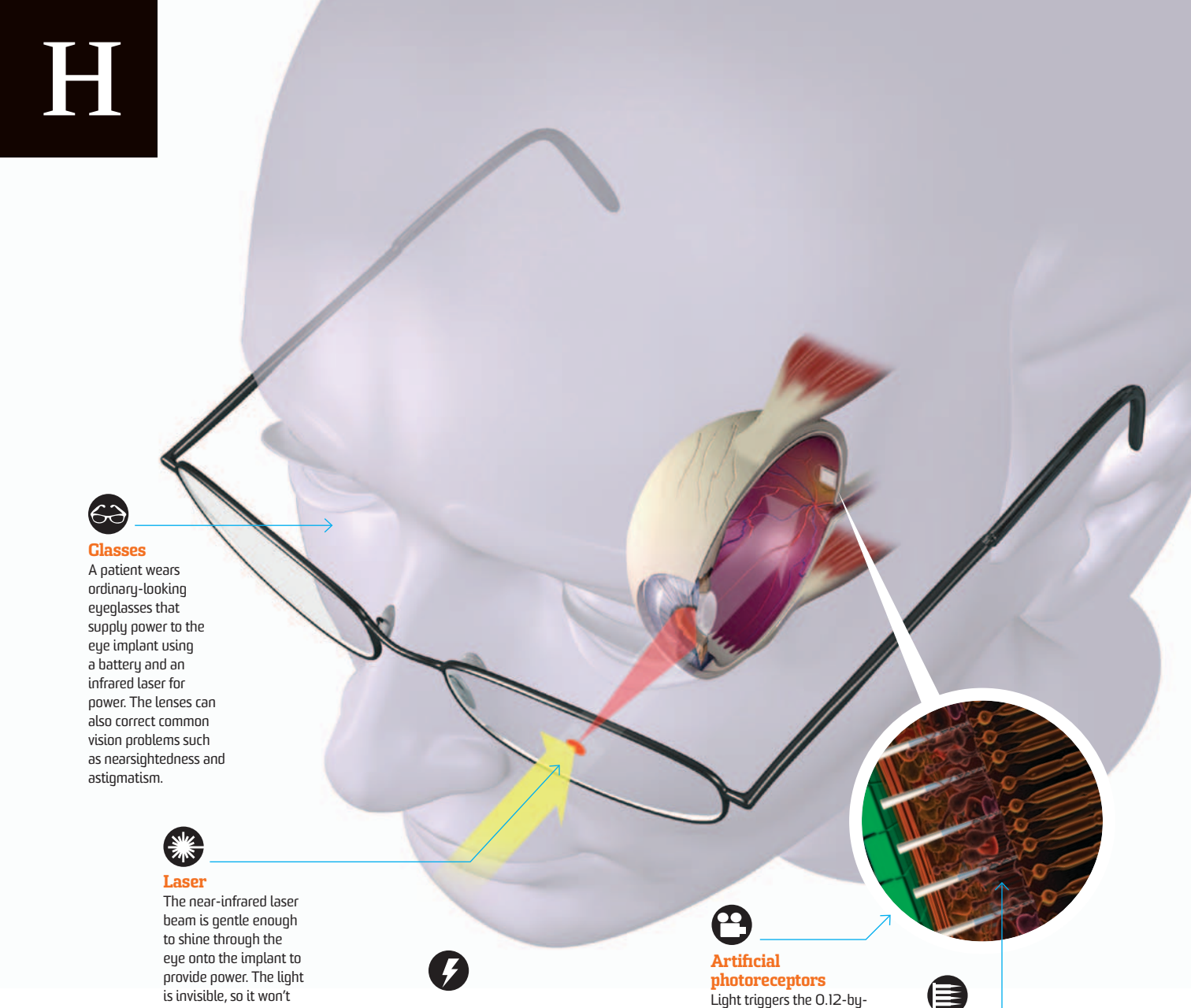

Glasses
A patient wears ordinary-looking eyeglasses that supply power to the eye implant using a battery and an infrared laser for power. The lenses can also correct common vision problems such as nearsightedness and astigmatism.

Laser
The near-infrared laser beam is gentle enough to shine through the eye onto the implant to provide power. The light is invisible, so it won't interfere with sight. A

Artificial photoreceptors
Light triggers the 0.12-by-0.16-inch implant's artificial photoreceptors. The photoreceptors pass information to an ultralow-power image processor that translates each image pixel into a series of electrical pulses that represent a particular shade of gray. The implant then transmits the signal to the electrodes.

Electrodes
Six-hundred needle electrodes penetrate the retina, wrapped in bio-compatible silicon and sapphire to prevent the formation of scar tissue. Each electrode represents one pixel, sending pulses of electricity to stimulate the eye's neurons, which transmit the image to the brain.

THE ANNOTATED MACHINE

Instant Eye

Giving sight to the blind in 30 minutes

A **new bionic eye** implant could allow blind people to recognize faces, watch TV, and even read. The Bio-Retina is one of several recent attempts to help patients with age-related macular degeneration, which affects about 1.5 million people in the U.S. A similar device, Second Sight's Argus II implant—available in Europe since last year—includes an electrode array in the eye as well as an antenna mounted on a ring around the eyeball to receive power and images from an external apparatus. The prosthesis requires a four-hour operation under full anesthesia—potentially risky for seniors—and produces a 60-pixel black-and-white image. Nano Retina's implant doesn't need an antenna, so an ophthalmologist can insert it in the eye under local anesthesia. The Bio-Retina will be powered wirelessly from an infrared light source and will generate a 576-pixel grayscale image. Clinical trials could begin as soon as next year.

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