Exploring the Development of Diabetic Macular Edema (DME)

Watch an animation that explores this mechanism of disease

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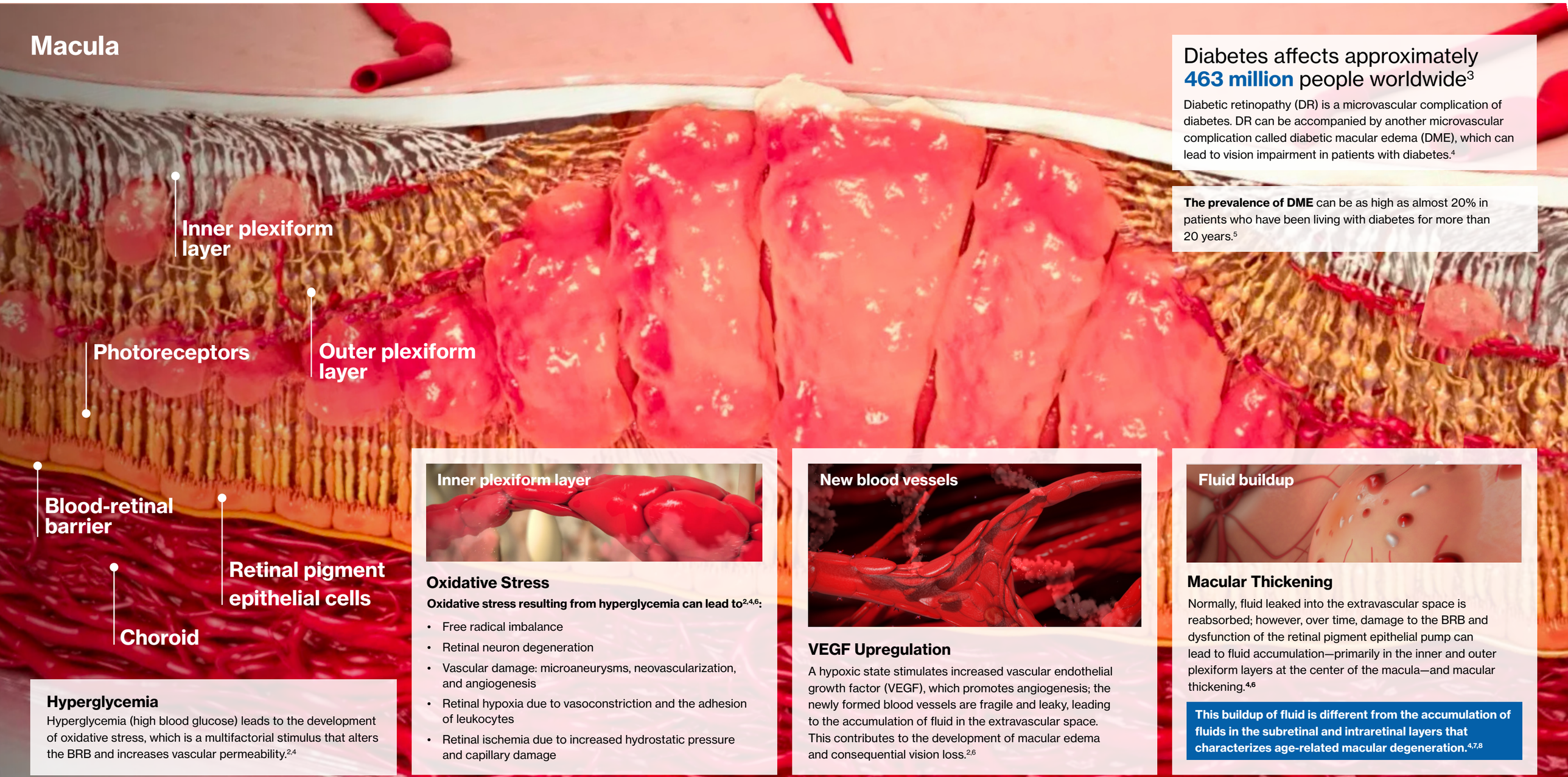
Diabetic Macular Edema (DME) Mechanism of Disease

Structural and functional changes associated with DME[1,2]:

1. Retinal thickening
2. Serous detachment
3. Exudates
4. Vitreomacular traction
5. Breakdown of the blood-retinal barrier (BRB)

Explore the development of DME

Scan the QR code to watch an animation that explores the mechanism of disease.



Diabetes affects approximately **463 million** people worldwide[3]

Diabetic retinopathy (DR) is a microvascular complication of diabetes. DR can be accompanied by another microvascular complication called diabetic macular edema (DME), which can lead to vision impairment in patients with diabetes.[4]

The prevalence of DME can be as high as almost 20% in patients who have been living with diabetes for more than 20 years.[5]

Hyperglycemia

Hyperglycemia (high blood glucose) leads to the development of oxidative stress, which is a multifactorial stimulus that alters the BRB and increases vascular permeability.[2,4]

Oxidative Stress

Oxidative stress resulting from hyperglycemia can lead to[2,4,6]:

- Free radical imbalance
- Retinal neuron degeneration
- Vascular damage: microaneurysms, neovascularization, and angiogenesis
- Retinal hypoxia due to vasoconstriction and the adhesion of leukocytes
- Retinal ischemia due to increased hydrostatic pressure and capillary damage

VEGF Upregulation

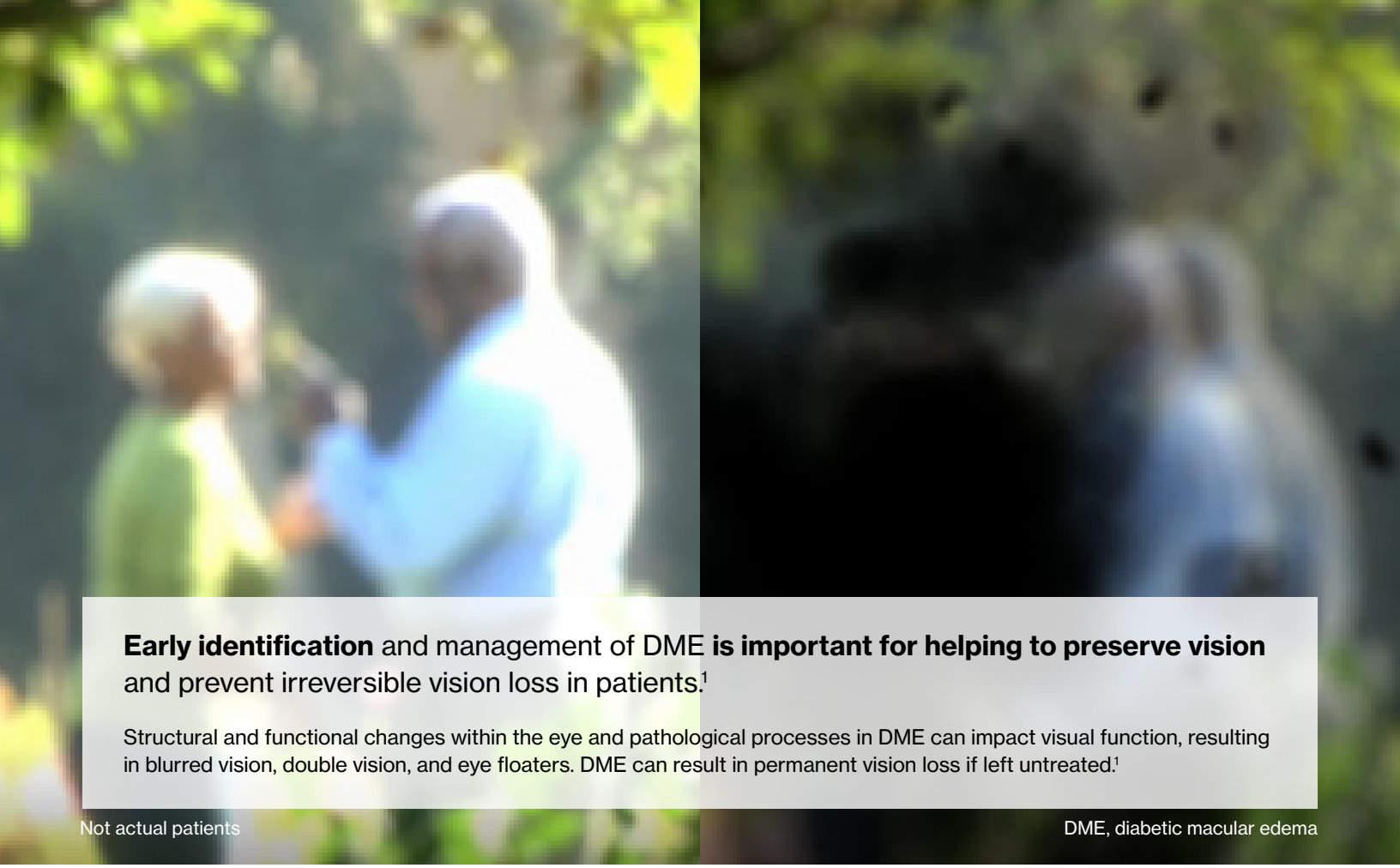
A hypoxic state stimulates increased vascular endothelial growth factor (VEGF), which promotes angiogenesis; the newly formed blood vessels are fragile and leaky, leading to the accumulation of fluid in the extravascular space. This contributes to the development of macular edema and consequential vision loss.[2,6]

Macular Thickening

Normally, fluid leaked into the extravascular space is reabsorbed; however, over time, damage to the BRB and dysfunction of the retinal pigment epithelial pump can lead to fluid accumulation—primarily in the inner and outer plexiform layers at the center of the macula—and macular thickening.[4,6]

This buildup of fluid is different from the accumulation of fluids in the subretinal and intraretinal layers that characterizes age-related macular degeneration.[4,7,8]

BRB, blood-retinal barrier; DME, diabetic macular edema; DR, diabetic retinopathy; VEGF, vascular endothelial growth factor



Early identification and management of DME **is important for helping to preserve vision** and prevent irreversible vision loss in patients.[1]

Structural and functional changes within the eye and pathological processes in DME can impact visual function, resulting in blurred vision, double vision, and eye floaters. DME can result in permanent vision loss if left untreated.[1]

Not actual patients

DME, diabetic macular edema

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Novartis Pharmaceuticals Corporation
East Hanover, New Jersey 07936-1080

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