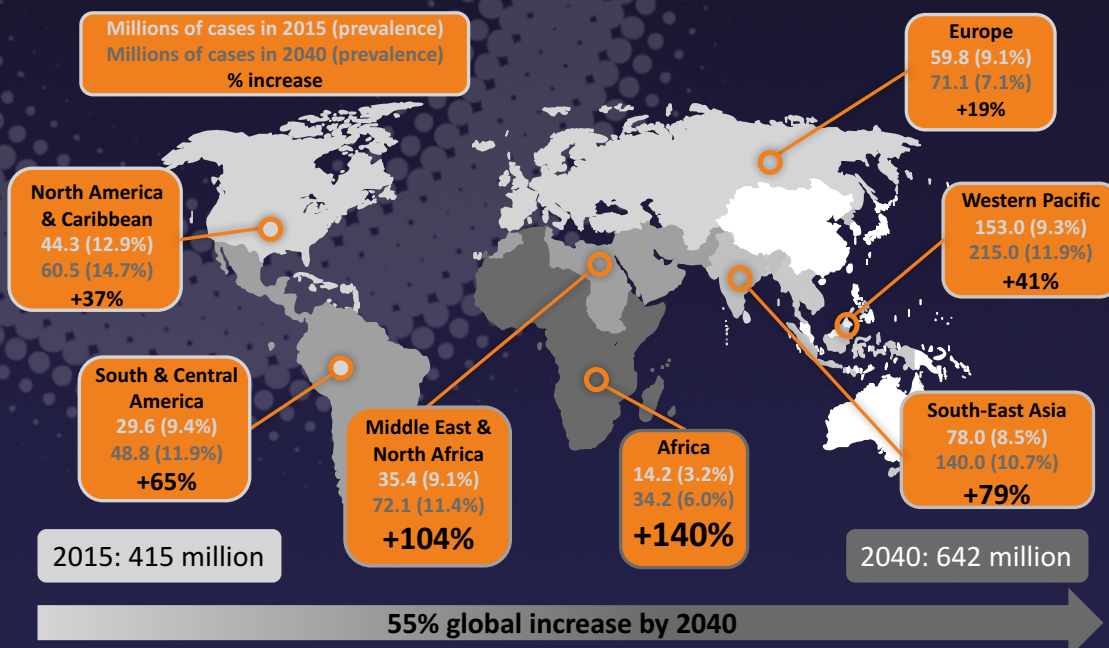
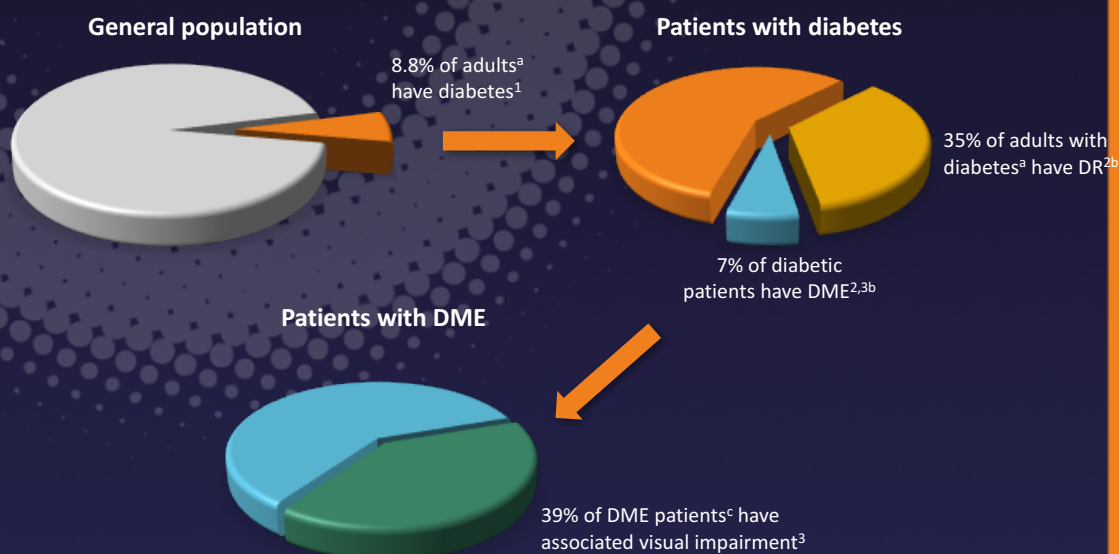


# Global projections for diabetes<sup>a</sup>



<sup>a</sup>Projections for adults aged 20-79 years  
 International Diabetes Federation, Diabetes Atlas 7<sup>th</sup> Edition, 2015. <http://www.idf.org/diabetesatlas> [Accessed Apr 2016]

## DME: the most prevalent cause of visual impairment in patients with diabetes



<sup>a</sup>Adults aged 20-79; <sup>b</sup>patients can have both DR and DME; <sup>c</sup>patients aged ≥12 years  
 DME, diabetic macular edema; DR, diabetic retinopathy  
 1. International Diabetes Federation, Diabetes Atlas 7<sup>th</sup> Edition, 2015. <http://www.idf.org/diabetesatlas> [Accessed Apr 2016];  
 2. Yau J, et al. Diab Care 2012;35:556-64; 3. Minassian D, et al. Br J Ophthalmol 2012;96:345-9

# Key characteristics of patients with DME



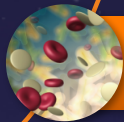
Long duration of diabetes<sup>1,2</sup>



Poor blood glucose control<sup>1-3</sup>



Hypertension<sup>1,3</sup>



High cholesterol<sup>1,2</sup>

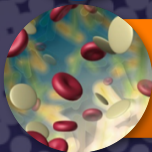
DME, diabetic macular edema

1. Ding J, Wong TY. Curr Diab Rep 2012;12:346-54; 2. Jew OM, et al. Int J Ophthalmol 2012;5:499-504;  
3. Asensio-Sánchez VM, et al. Arch Soc Esp Oftalmol 2008;83:173-6

# Risk factors for developing DME: arterial hypertension, dyslipidemia and poor glucose control



High systolic blood pressure is a risk factor for DME<sup>1</sup>  
(HR per 10 mmHg = 1.15; 95% CI, 1.04-1.26)



Increased total serum cholesterol associated  
with increased risk of hard exudates<sup>2</sup>  
(OR = 2.0; 95% CI, 1.35-2.95)<sup>a</sup>

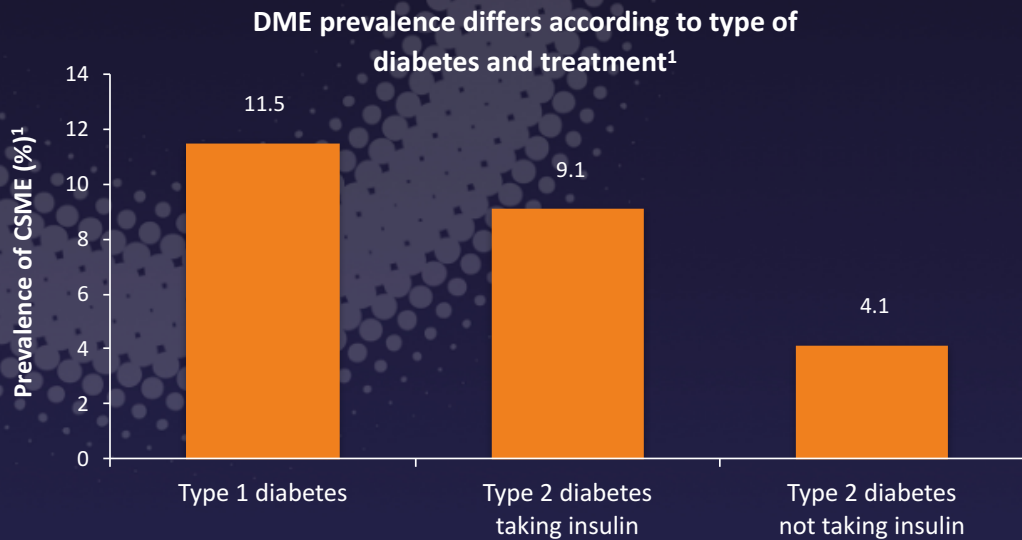


High HbA<sub>1c</sub> levels are a risk factor for DME<sup>1</sup>  
(HR per 1% = 1.17; 95% CI, 1.10-1.26)

<sup>a</sup>For total cholesterol  $\geq 6.21$  mmol/L. DME, diabetic macular edema; CI, confidence interval; HbA<sub>1c</sub>, glycosylated; hemoglobin; HR, hazard ratio; OR, odds ratio

1. Klein R, et al. Ophthalmology 2009;116:497-503; 2. Chew EY, et al. Arch Ophthalmol 1996;114:1079-84

# Prevalence of visual impairment due to DME increases with type and management of diabetes

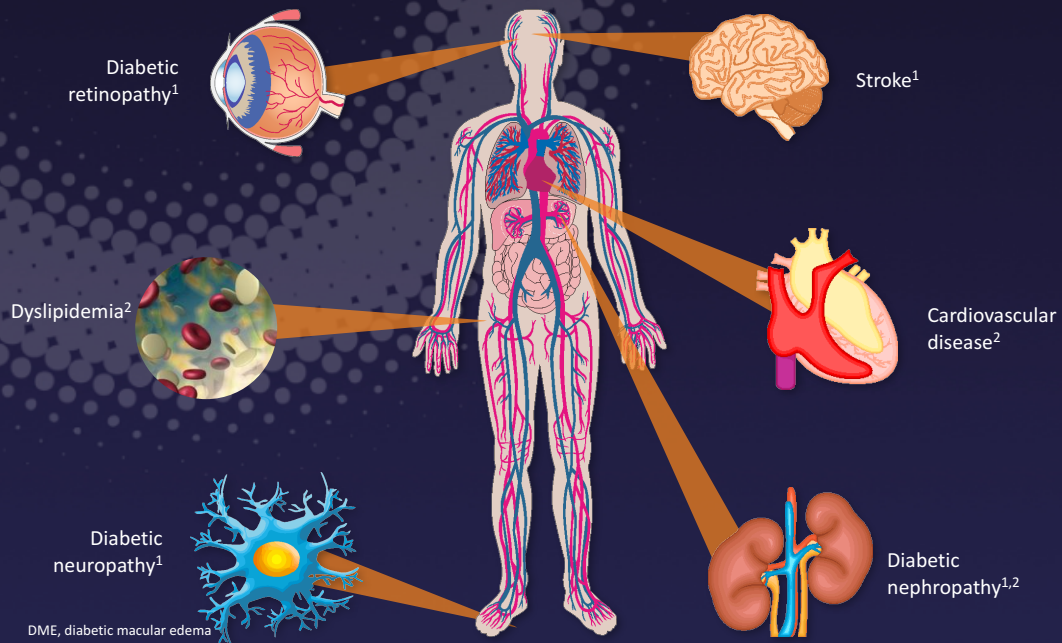


**The 25-year cumulative incidences of DME and CSME were 29% and 17%, respectively<sup>2</sup>**

CSME, clinically significant diabetic macular edema; defined as the presence of retinal thickening at or within 500  $\mu\text{m}$  of the center of the macula or hard exudates at or within 500  $\mu\text{m}$  of the center of the macula if associated with thickening of the adjacent retina or zones of retinal thickening 1 disc area in size, at least part of which was within 1 disc diameter of the center; DME, diabetic macular edema

1. Ling R, et al. Eye 2002;16:140-5; 2. Klein R, et al. Ophthalmology 2009;116:497-503

# Patients with DME have systemic co-morbidities



1. National Diabetes Fact Sheet, 2011 <http://www.cdc.gov/diabetes/pubs/pdf/nf11.pdf> [Accessed Apr 2016]; 2. Rodbard HW, et al. Endocr Pract 2007;13:4-69

# Impact of DME on vision

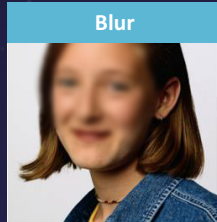
## DME impact

- Swelling of retina due to leaking of fluid from blood vessels within the macula in patients with DR<sup>1</sup>
- Thickening of basement membrane and pericyte loss → increased blood vessel permeability and leakage of plasma constituents → retinal edema<sup>1</sup>

Normal



DME



DME with proliferative DR

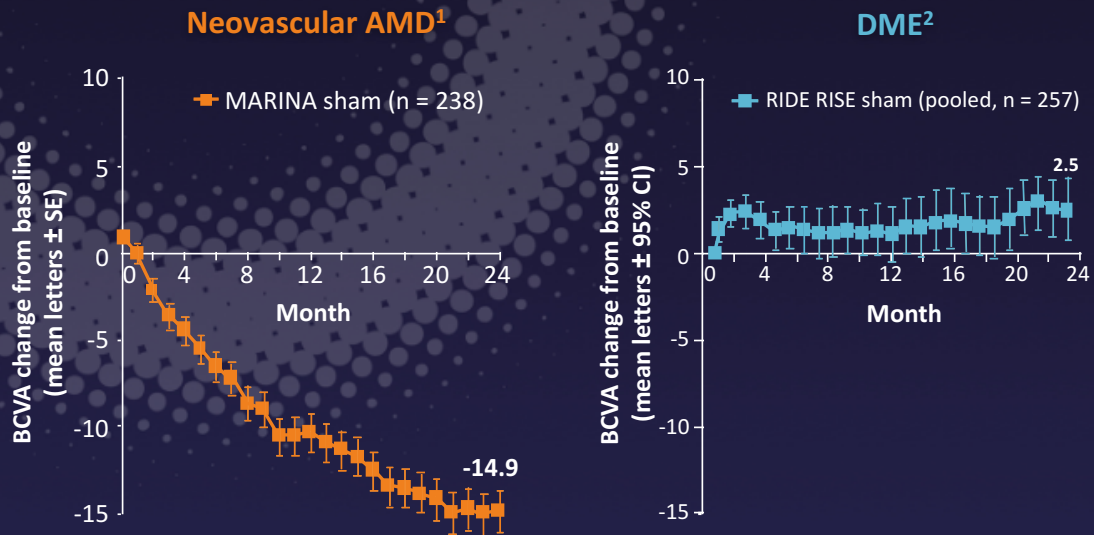
Blur + scotomas



DME, diabetic macular edema; DR, diabetic retinopathy

Kumar B, et al. J Postgrad Med 2012;58:132-9

# Impact of DME: gradual loss of vision



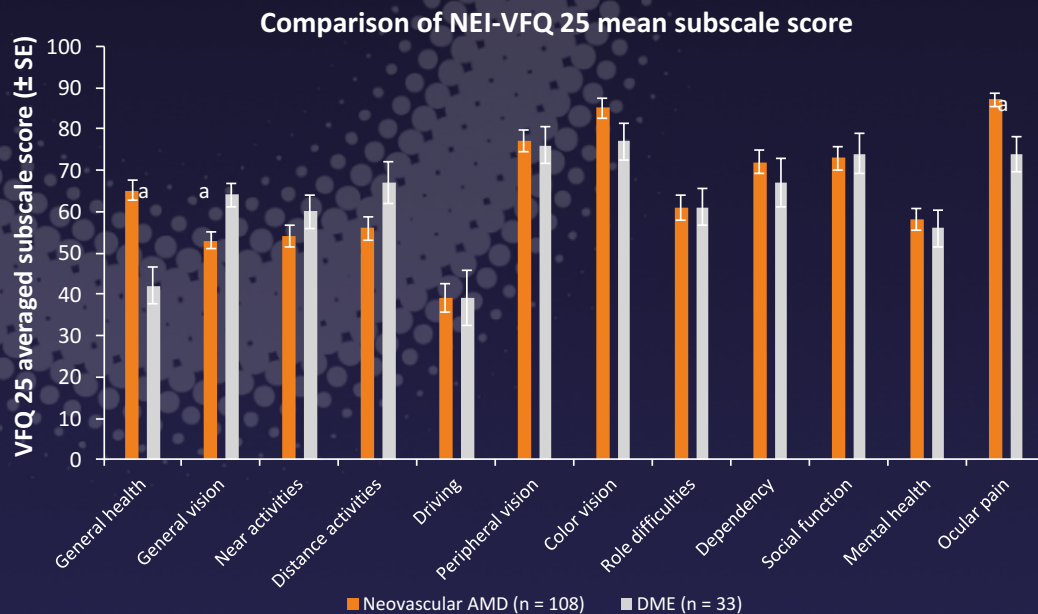
Compared with AMD, DME vision loss is gradual

AMD, age-related macular degeneration; DME, diabetic macular edema

1. Rosenfeld PJ, et al. N Engl J Med 2006;355:1419-31; 2. Nguyen QD, et al. Ophthalmology 2012;119:789-801



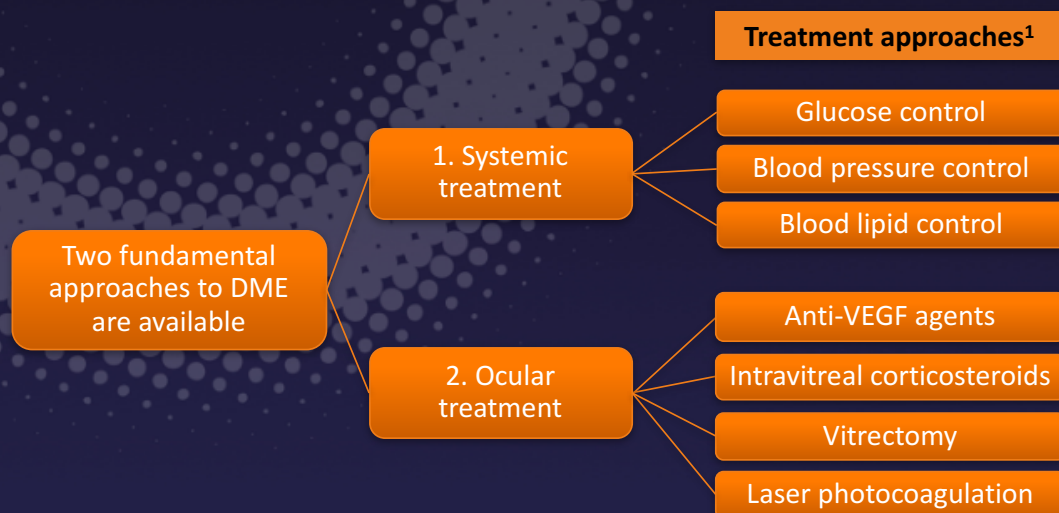
## Impact of DME: effects on patient quality of life are similar to neovascular AMD



<sup>a</sup>t-test comparison with DME treatment group is statistically significant (p < 0.05); AMD, age-related macular degeneration; DME, diabetic macular edema; NEI-VFQ, National Eye Institute Visual Function Questionnaire

Hariprasad SM, et al. Br J Ophthalmol 2008;92:89-92

## Treatment of DME requires a multifactorial and multidisciplinary approach



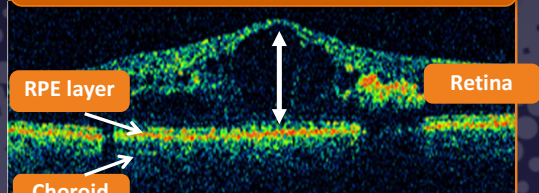
DME, diabetic macular edema; VEGF, vascular endothelial growth factor

1. Yam JCS, Kwok AKH. Hong Kong Med J 2007;13:46-60



# DME retinal pathology

## Structural changes in DME<sup>1,2</sup>



- Retinal swelling (thickening)
- Cystoid macular edema
- Serous retinal detachment
- Vitreomacular traction
- Hard exudates

## Pathogenesis of DME is complex and multifactorial

- Primarily associated with breakdown of the inner BRB<sup>1</sup>
  - Other factors associated with the progression of DME include<sup>1</sup>:
    - altered blood flow
    - retinal ischemia
    - inflammation
- hypoxia

BRB, blood-retinal barrier; DME, diabetic macular edema; OCT, optical coherence tomography; RPE, retinal pigment epithelium

1. Bhagat N, et al. Surv Ophthalmol 2009;54:1-32; 2. Lang G. In: Developments in Ophthalmology. Basel: Karger, 2007. p. 31-47  
Image from Vujosevic et al. Invest Ophthalmol Vis Sci 2011;52:442-448. Copyright ARVO