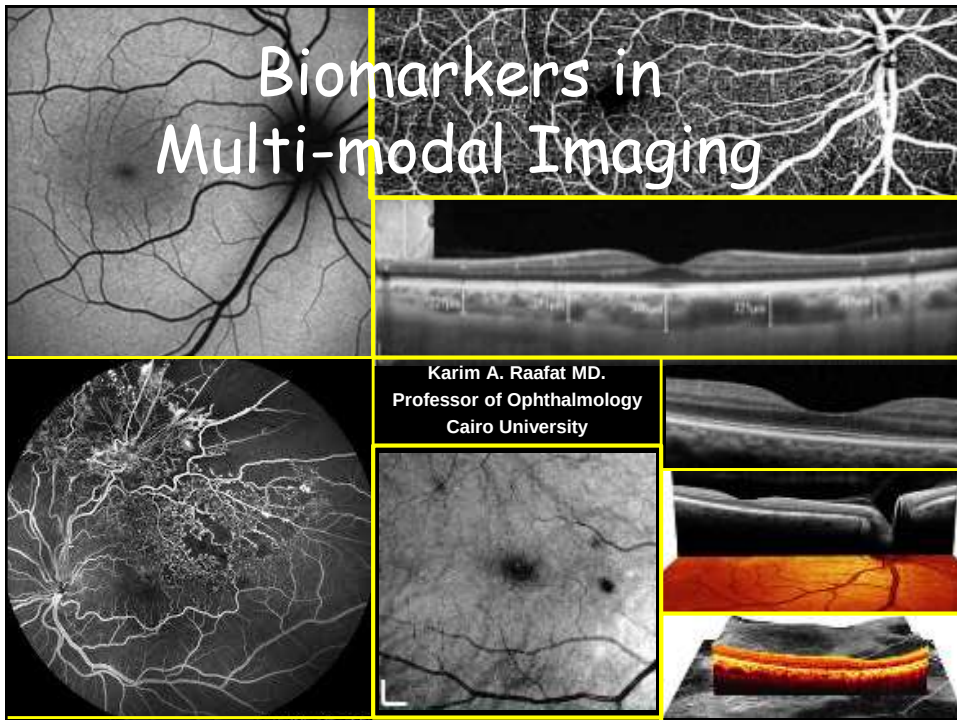




Biomarkers

"a characteristic that is objectively measured and evaluated as an indicator of Normal biological processes, Pathogenic processes presence / severity , or Pharmacologic responses to a therapeutic intervention."

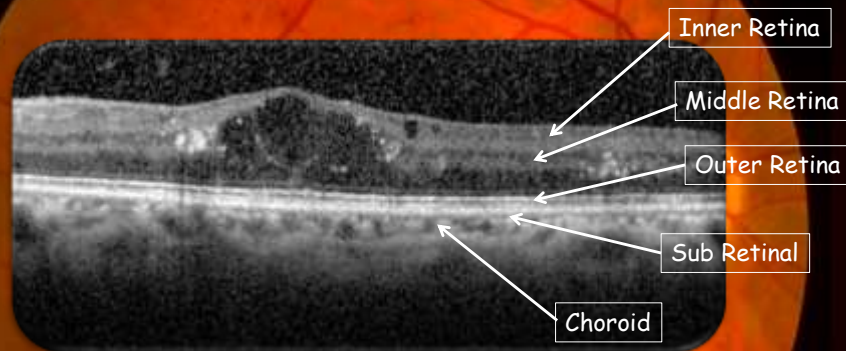
Biomarkers

Values

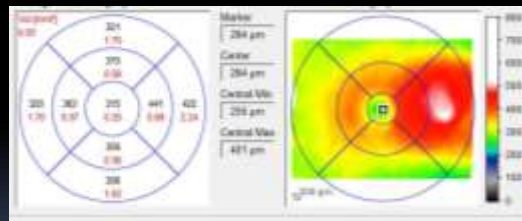
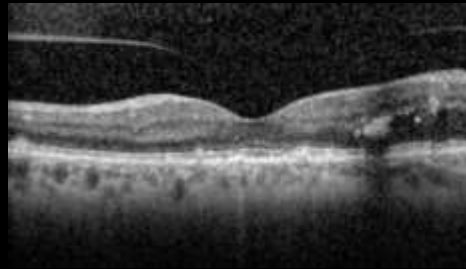
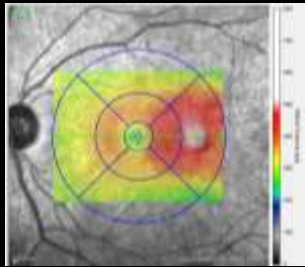
- Predictive Role of Visual Prognosis .
- Clues in anatomical / functional correlation.
- Predict and Monitor therapeutic response.
(Heterogeneous : Gain , stability , loss)

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Diabetic Macular Edema

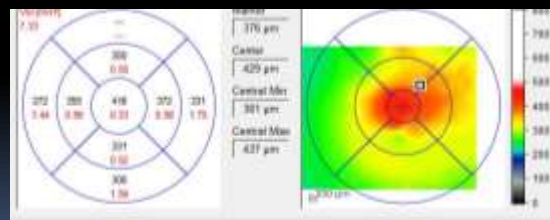
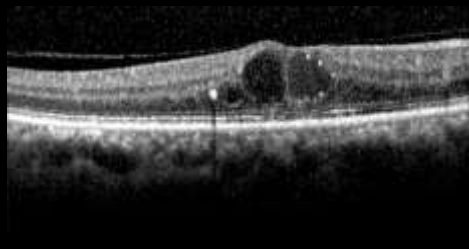
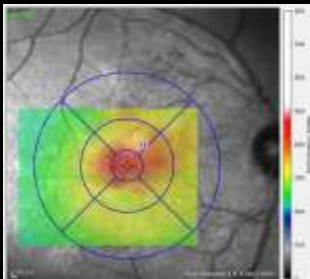


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Non center Involvement

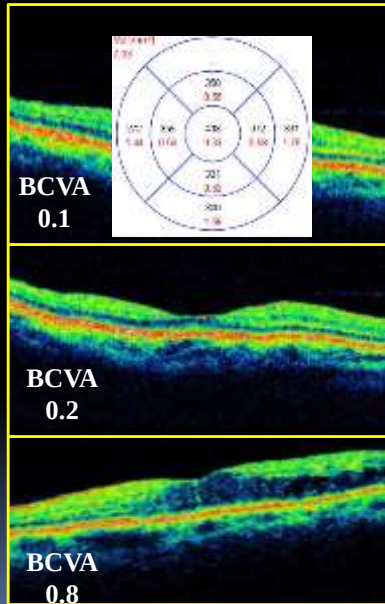
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Center Involvement

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Central Macular Thickness (CMT) !!!



Paradoxical improvement in VA with $\uparrow$ CMT
In 17 %

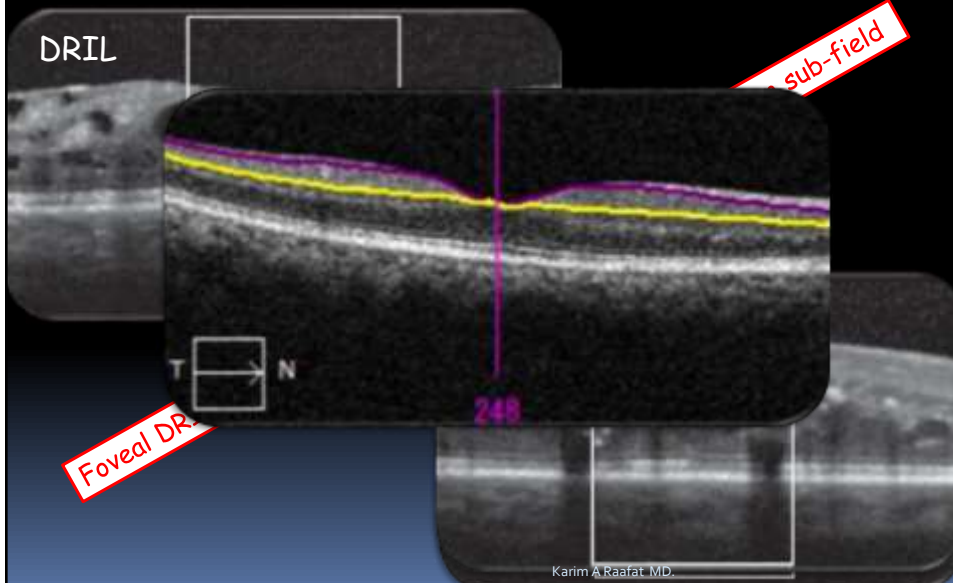
Worse VA with reduction of CMT in 26 %

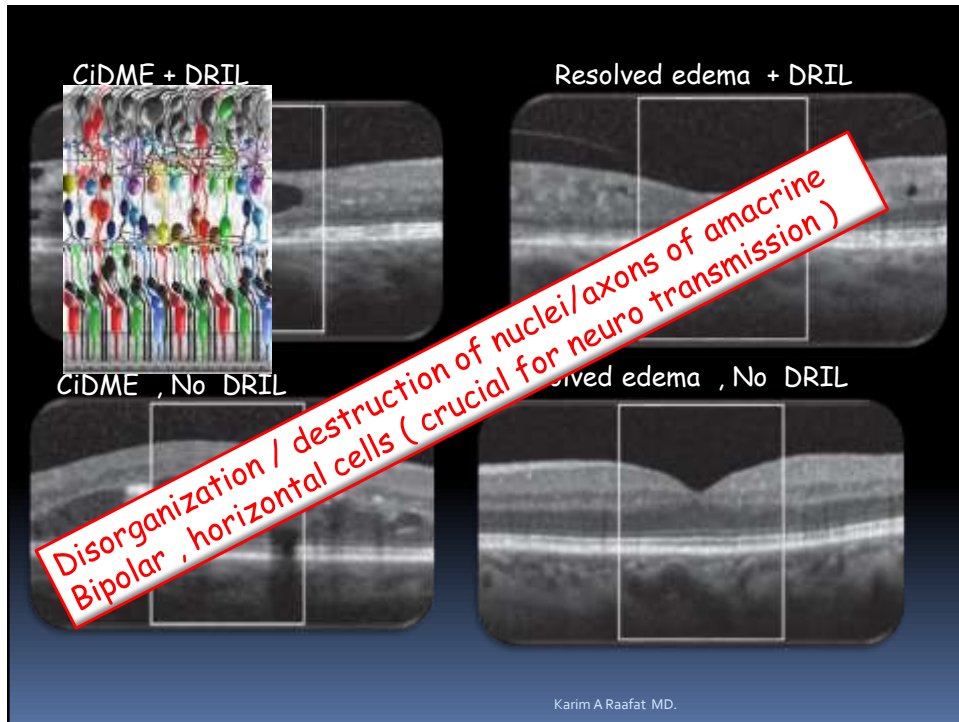
**Neural Retinal Disorganization as
a Robust Marker of Visual Acuity
in Current and Resolved Diabetic
Macular Edema**

Optometry 2013;64:2960-2970 | DOI: 10.2337/6014.0782

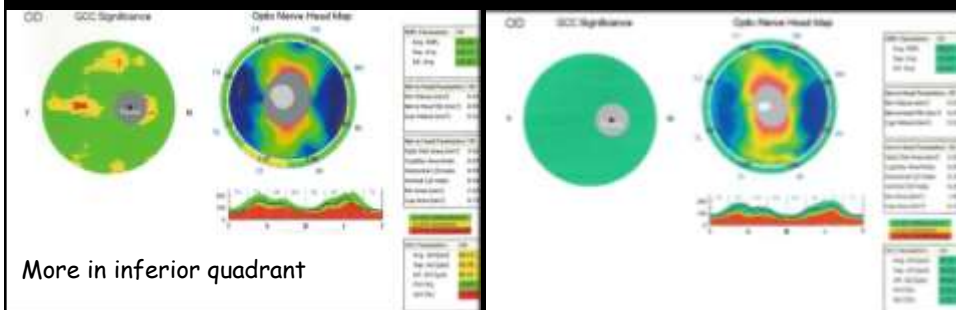
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Disorganization of Retinal Inner Layers DRIL





Retinal Neuro-degeneration in Diabetes



Type I DM (No glaucoma , No DR)

Age-matched Control

Microangiopathy

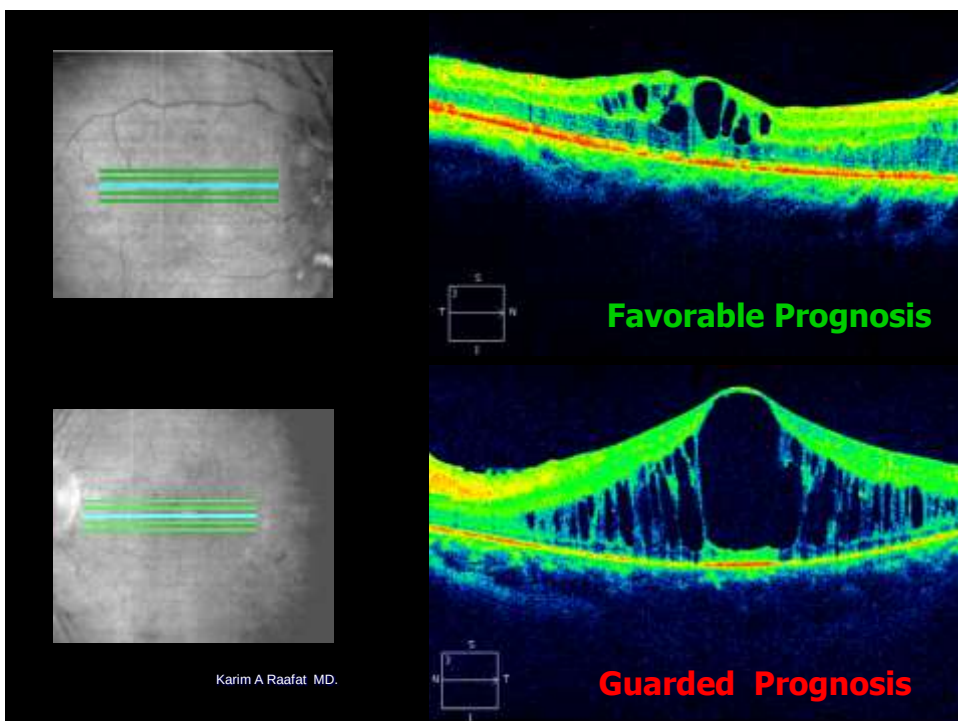
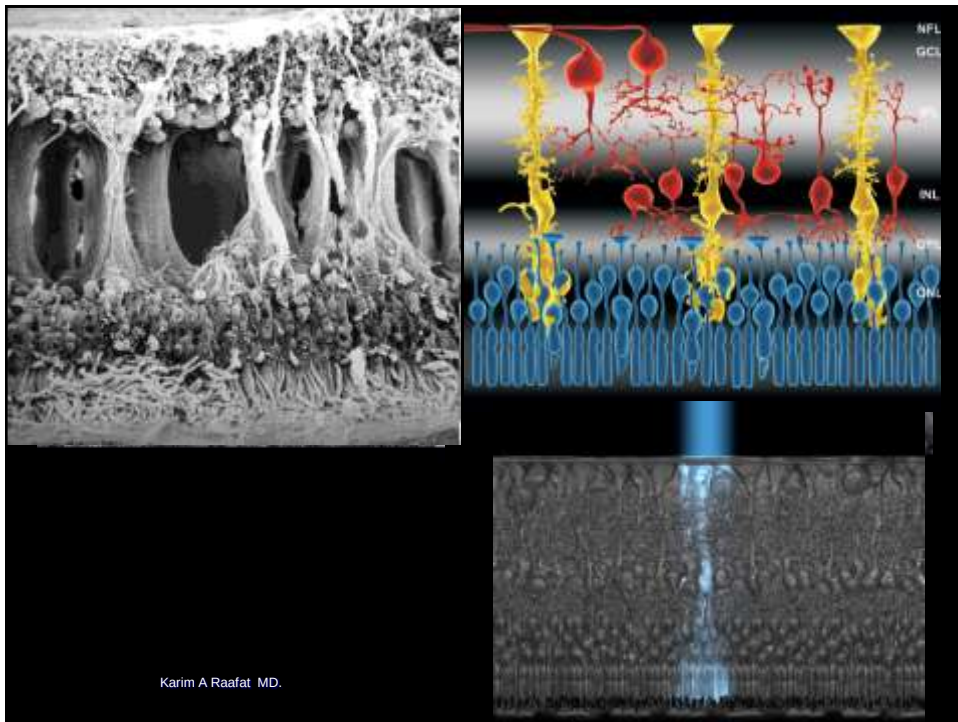
Neuropathy

Earlier

Jeon et al. , 2016

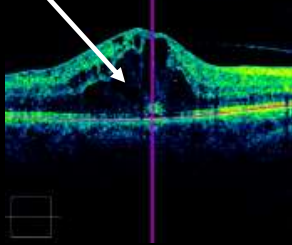
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- Oxidative stress (GED)
- Loss of neuro-protection
- Inflammation
- Glutamate excitotoxicity
- Hyperglycemia/Dyslipidemia
- Insulin deficiency.

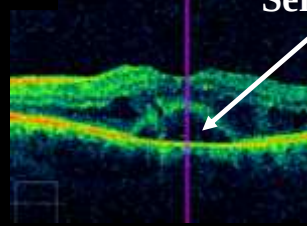


Correlation between Morphology & Functional alterations

Large ONL cysts



Serous RD

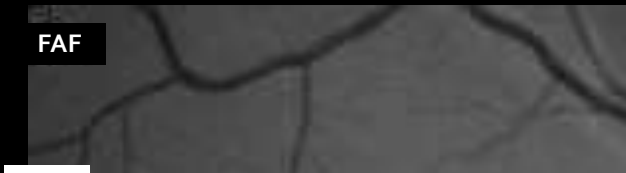


Negative impact on Visual Function

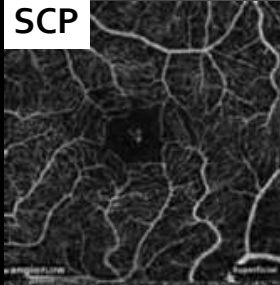
**Late ;
Should be prevented**

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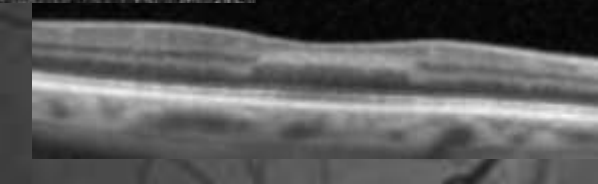
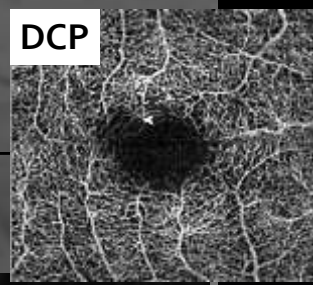
FAF



SCP

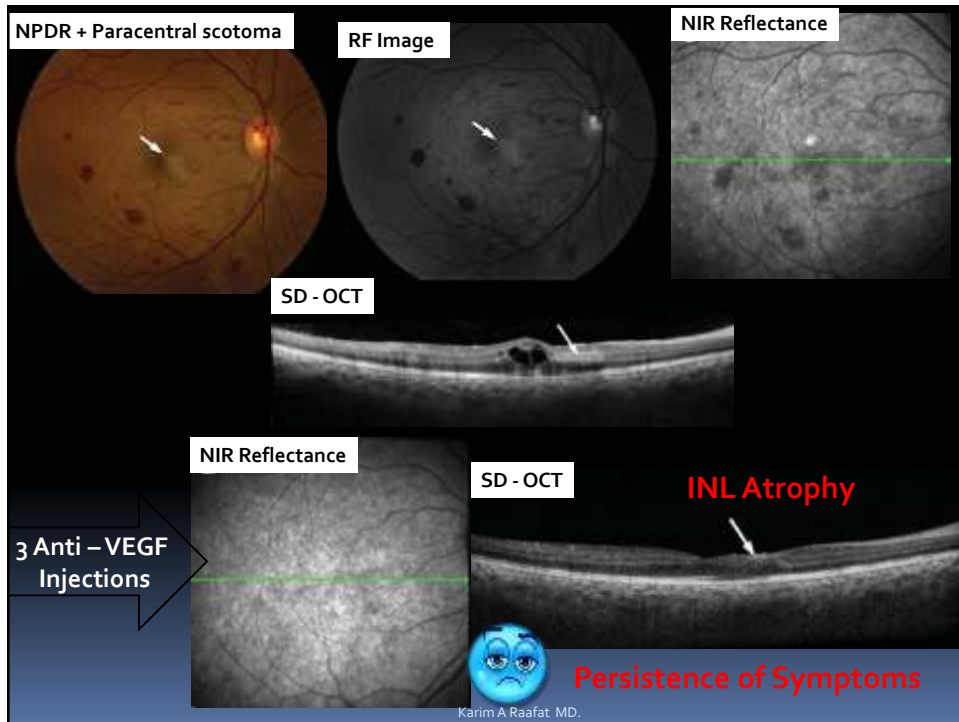


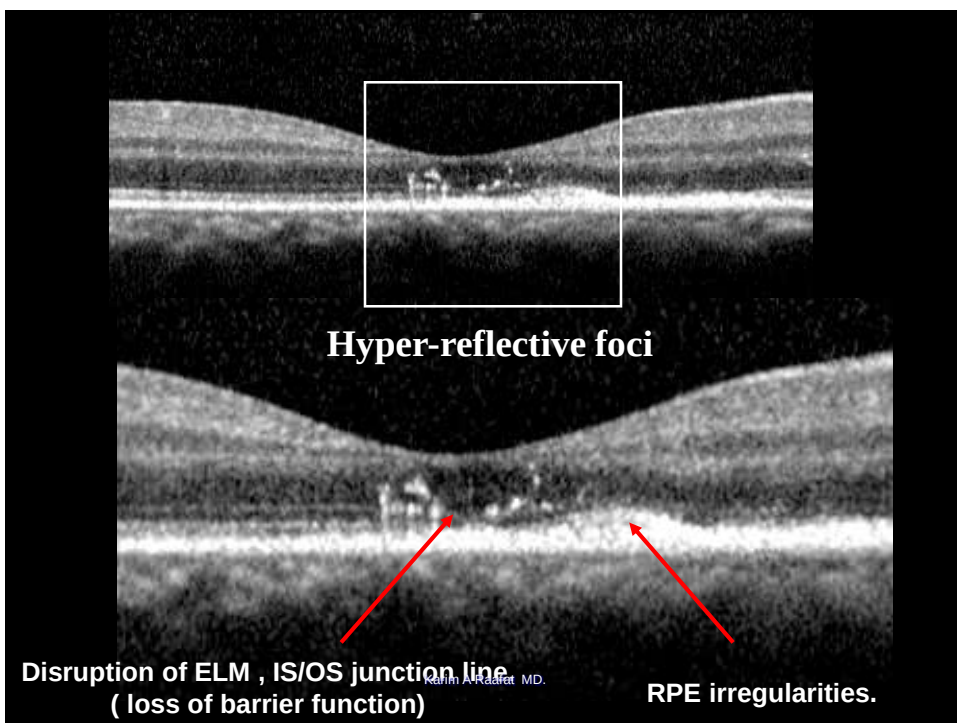
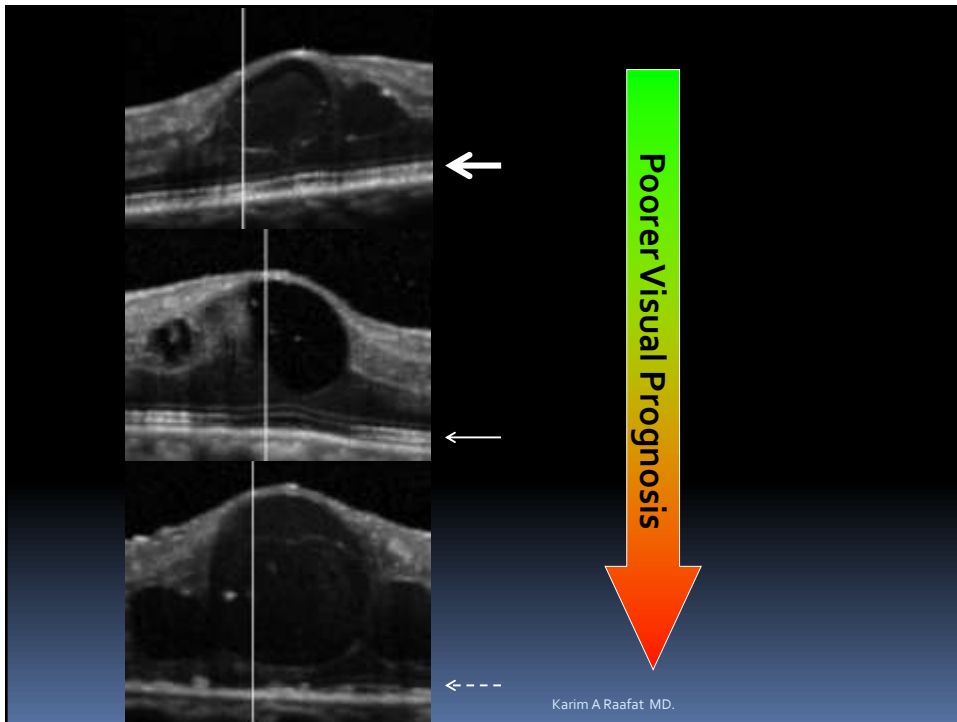
DCP



PAMM

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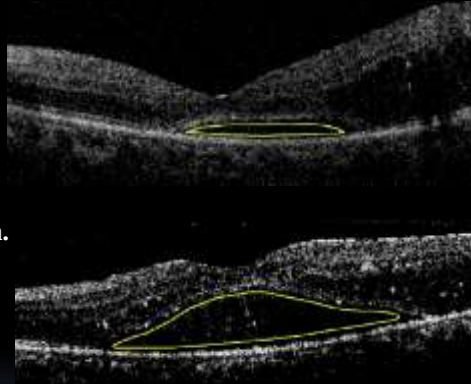




SRF Reflectivity

Correlates with VEGF level :

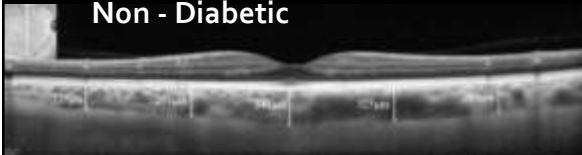
- Hyper-permeability.
- Up regulating fibrinogen and fibrin.



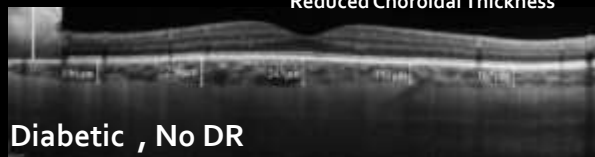
Related to DR severity and activity
..... Response to Anti-VEGF rather than laser.

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Non - Diabetic

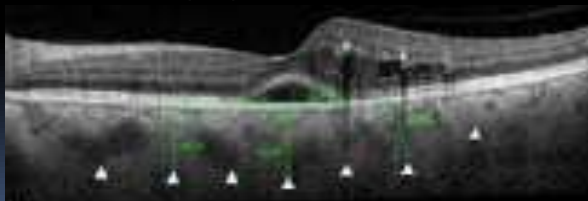


Reduced Choroidal Thickness

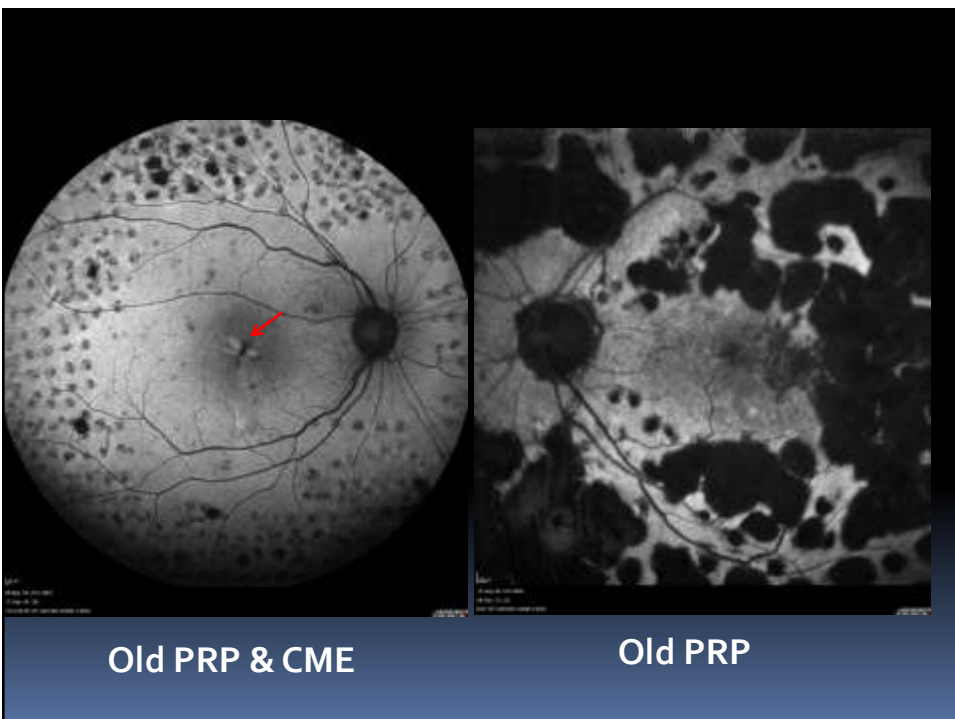
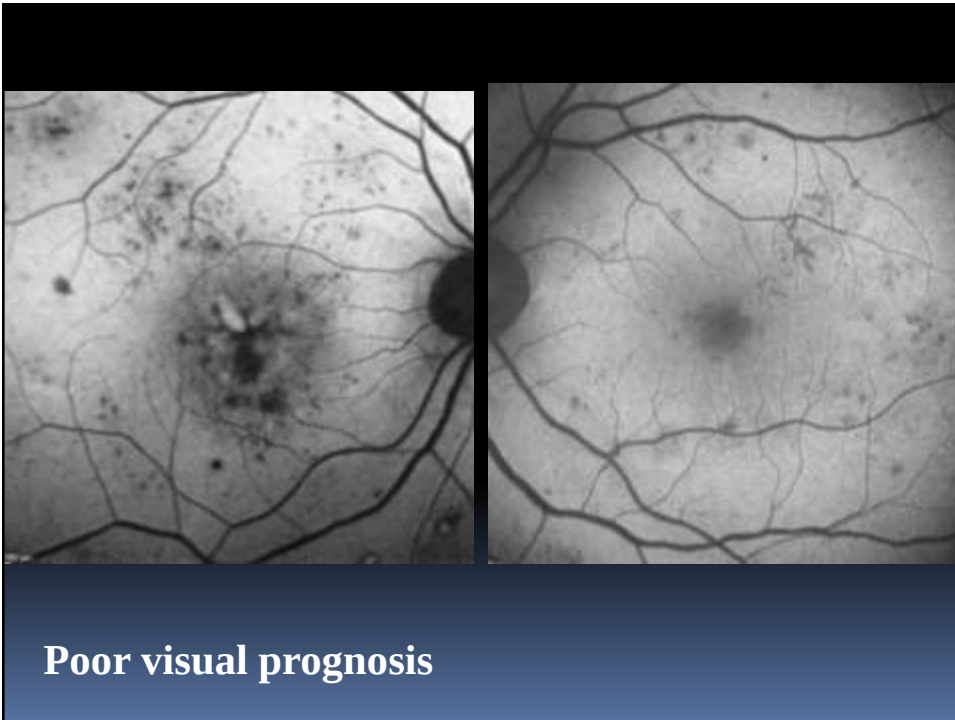


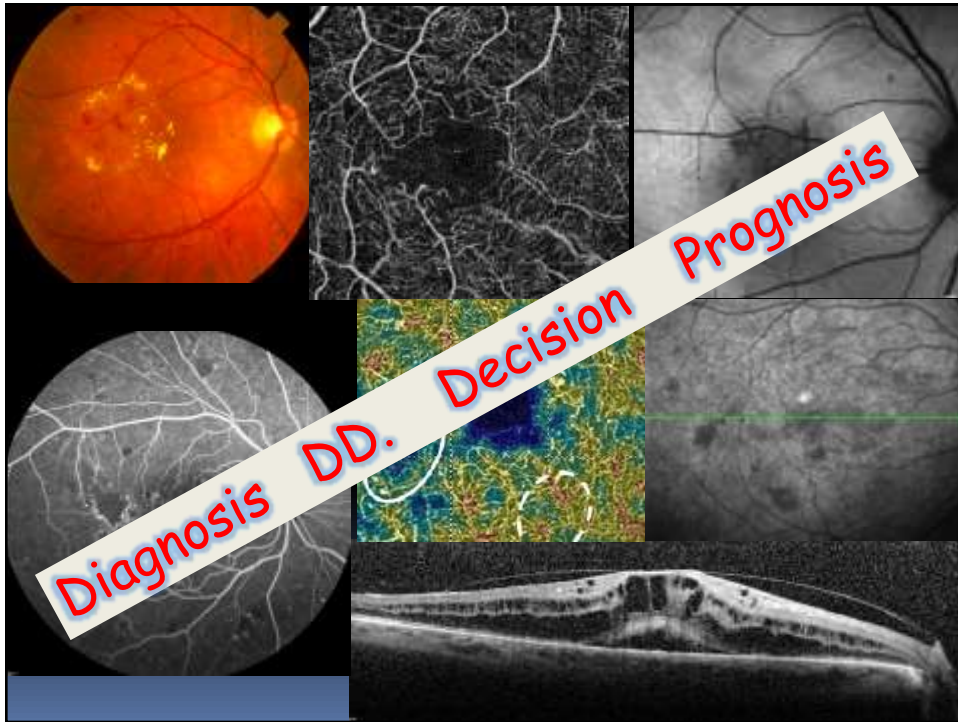
Diabetic , No DR

Diabetic Choroidopathy



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