

**Università degli Studi di Ferrara**

**Dipartimento di Scienze Biomediche e**

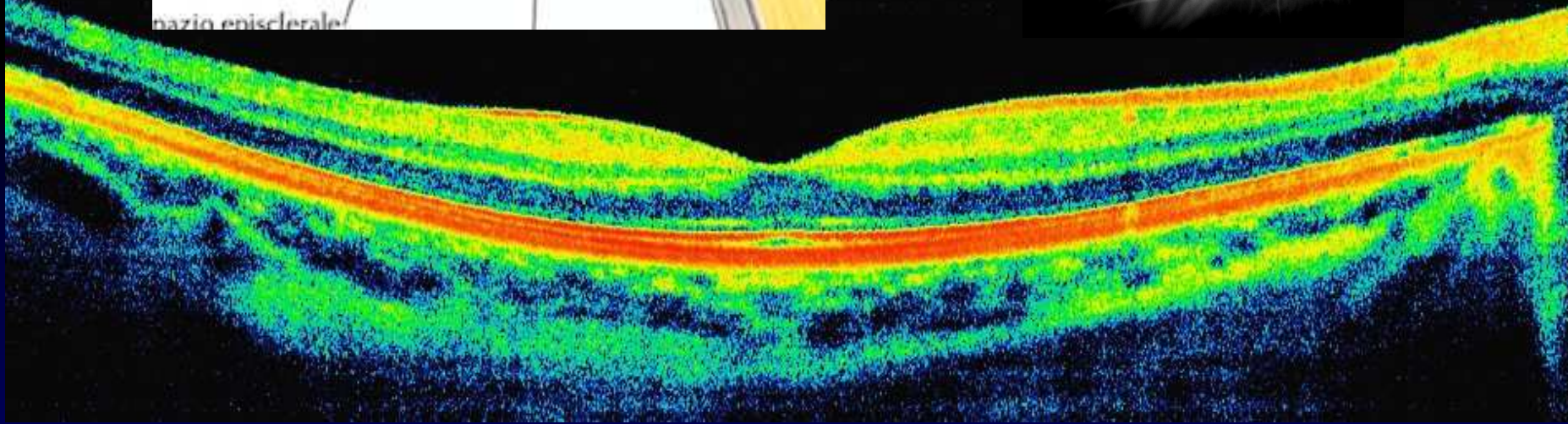
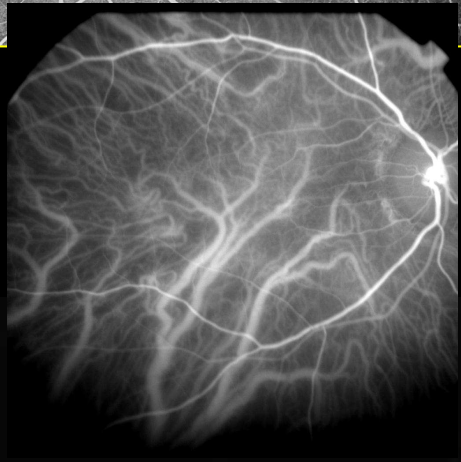
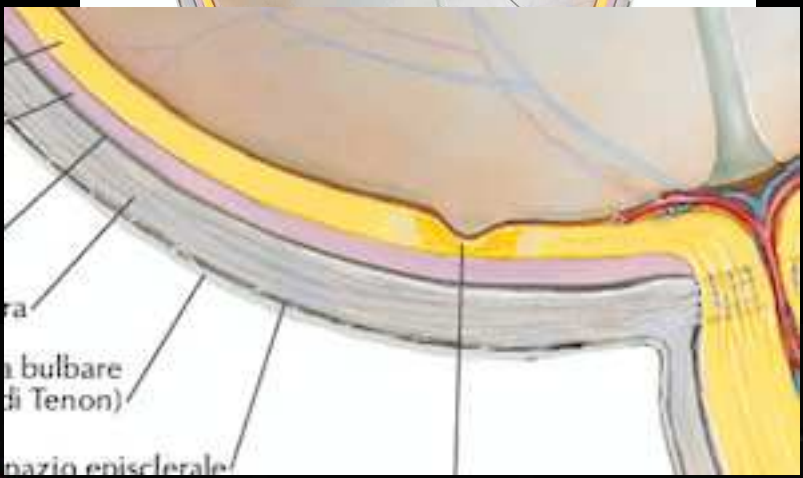
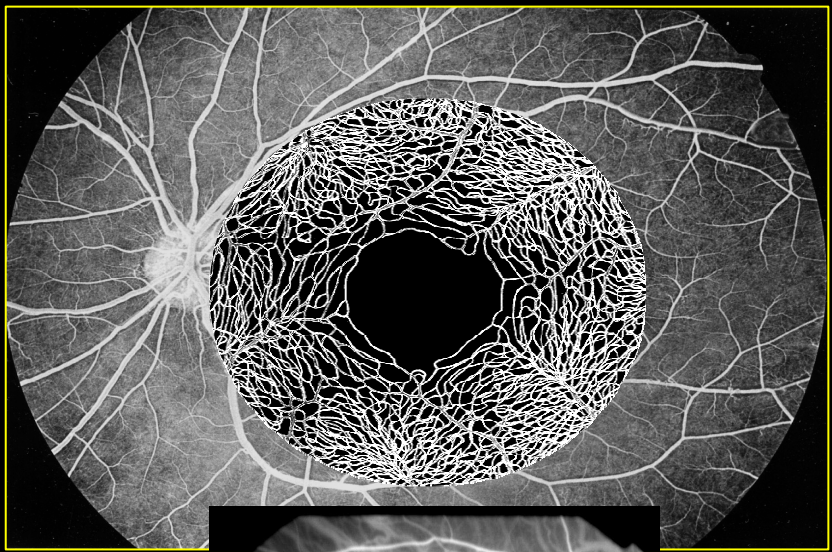
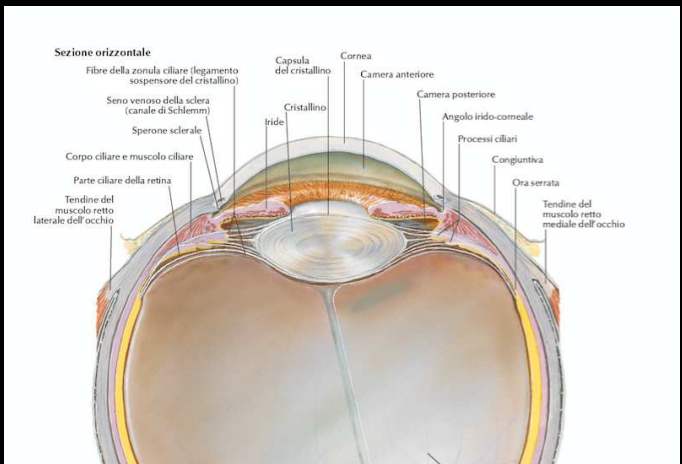
**Chirurgico Specialistiche**

**Sezione di Clinica Oculistica**

**Direttore: Prof. Paolo Perri**

**LA DEGENERAZIONE MACULARE LEGATA ALL'ETA'**

**SERGIO D'ANGELO**



## La Degenerazione Maculare Legata All'Età è la principale causa di cecità legale nei pazienti di età > 60 anni nei paesi industrializzati

3.3% of the European population 65 years or older has ARMD

The prevalence is 40% higher in women than men.

The prevalence rises steeply with age.

If this figure is applied to the entire European population aged 65 and over, this would indicate approx. 2.1 million ARMD cases amongst the initial 15 EU nations or 2.5 million with the recent addition of 10 nations.

### EUREYE study 2004

The overall prevalence of neovascular AMD and/or geographic atrophy in the US population 40 years and older is estimated to be 1.47% (95% confidence interval, 1.38%-1.55%), with 1.75 million citizens having AMD. The prevalence of AMD increased dramatically with age, with more than 15% of the white women older than 80 years having neovascular AMD and/or geographic atrophy. More than 7 million individuals had drusen measuring 125  $\mu\text{m}$  or larger and were, therefore, at substantial risk of developing AMD. Owing to the rapidly aging population, the number of persons having AMD will increase by 50% to 2.95 million in 2020.

Age-related macular degeneration was far more prevalent among white than among black persons.

### Prevalence of Age-Related Macular Degeneration in the United States

The Eye Diseases Prevalence Research Group\*

Arch Ophthalmol. 2004;122(4):564-572. doi:10.1001/arch.opht.122.4.564



Age-related macular degeneration (AMD) is a disorder of the macula characterized by one or more of the following :

Presence of at least intermediate-size drusen (63  $\mu\text{m}$  or larger in diameter)

Retinal pigment epithelium (RPE) abnormalities such as hypopigmentation or hyperpigmentation

Reticular pseudodrusen

Presence of any of the following features:

Geographic atrophy of the RPE

Choroidal neovascularization (exudative, wet)

Polypoidal choroidal vasculopathy

Retinal angiomatous proliferation

## There are a number of classifications of AMD in the literature. This Preferred Practice Pattern uses the classification of the Age-Related Eye Disease Study (AREDS)

The AREDS was a prospective multicenter randomized clinical trial conducted between 1992 and 2006 designed to assess the natural course and risk factors for age-related cataract and AMD. The effects of antioxidant vitamins and minerals on these two ocular conditions were studied.

No AMD (AREDS category 1) represented the control group  
it is characterized by no or few small drusen (<63  $\mu\text{m}$  in diameter).

Early AMD (AREDS category 2) is characterized by  
a combination of multiple small drusen, few intermediate drusen (63-124  $\mu\text{m}$  in diameter)  
or mild RPE abnormalities.

Intermediate AMD (AREDS category 3) is characterized by any of the following features:

Numerous intermediate drusen

At least one large druse (125  $\mu\text{m}$  or larger in diameter)

Geographic atrophy (a sharply demarcated, usually round or oval, area of atrophy of the RPE not involving the center of the fovea)

Advanced AMD (AREDS category 4)

is characterized by one or more of the following (in the absence of other causes) in one eye:

Geographic atrophy of the RPE involving the foveal center

Neovascular maculopathy that includes the following:

- Choroidal neovascularization (CNV) defined as pathologic angiogenesis originating from the choroidal vasculature that extends through a defect in Bruch's membrane
- Serous and/or hemorrhagic detachment of the neurosensory retina or RPE
- Retinal hard exudates (a secondary phenomenon resulting from chronic intravascular leakage)
- Subretinal and sub-RPE fibrovascular proliferation
- Disciform scar (subretinal fibrosis)

# DRUSEN

25-50% nei soggetti > 50 anni  
(87% negli studi istologici)

DRUSEN DURE (drusen miliari, hard drusen)

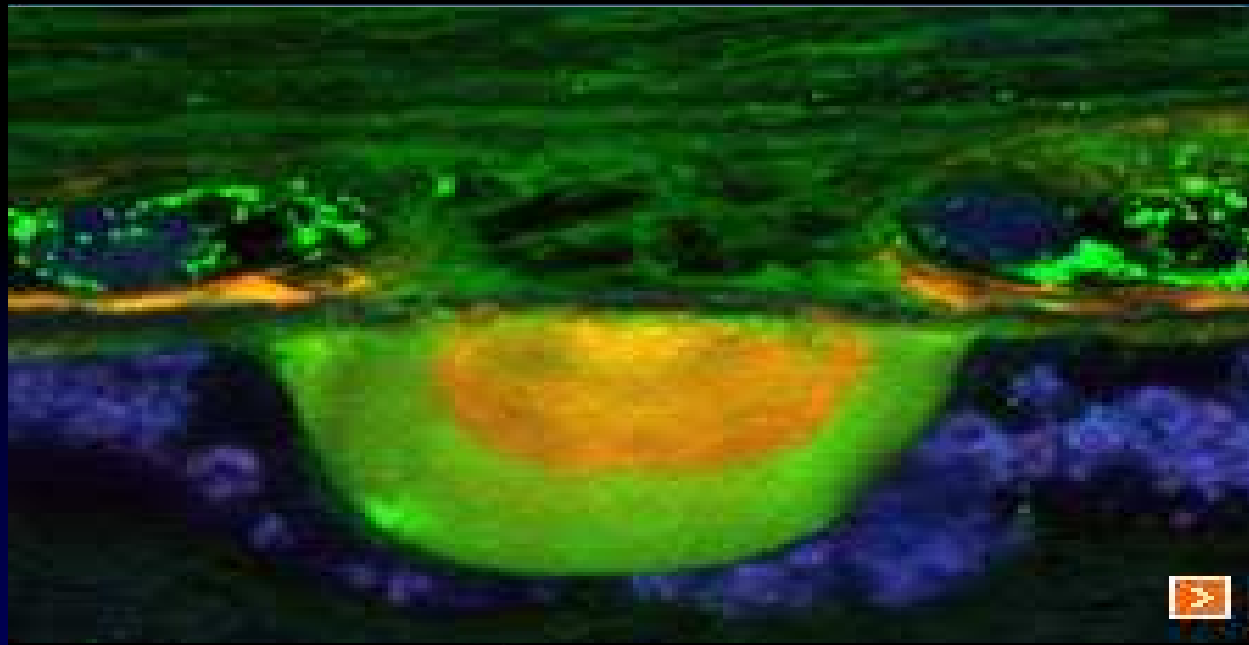
DRUSEN MOLLI (drusen molli, colloidi, sierose, soft drusen)

ALTRE DRUSEN (cuticolari, miste, calcifiche, pseudo-drusen)

Drusen piccole < 63  $\mu$

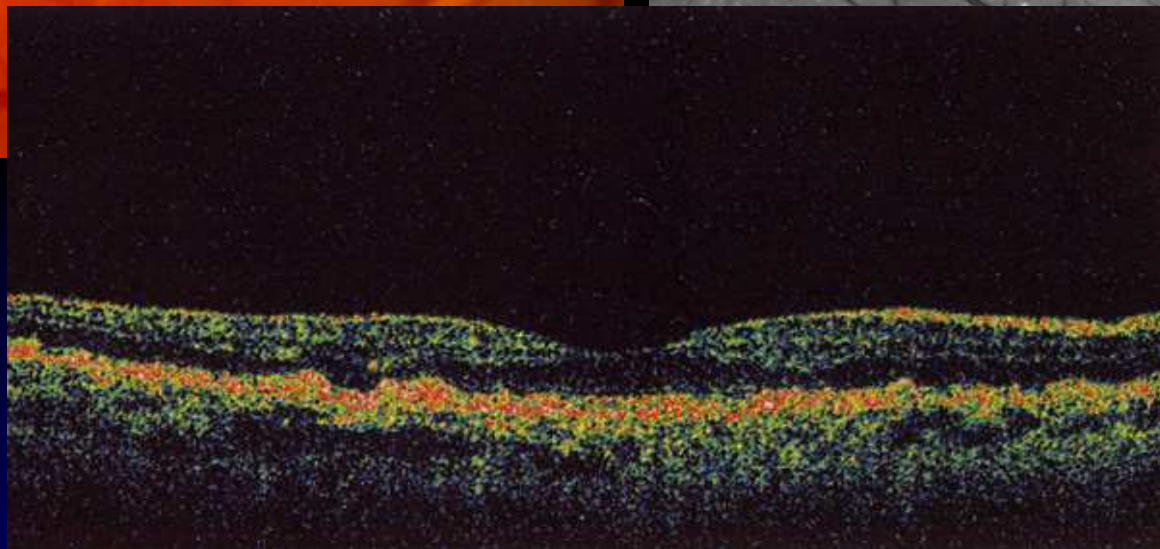
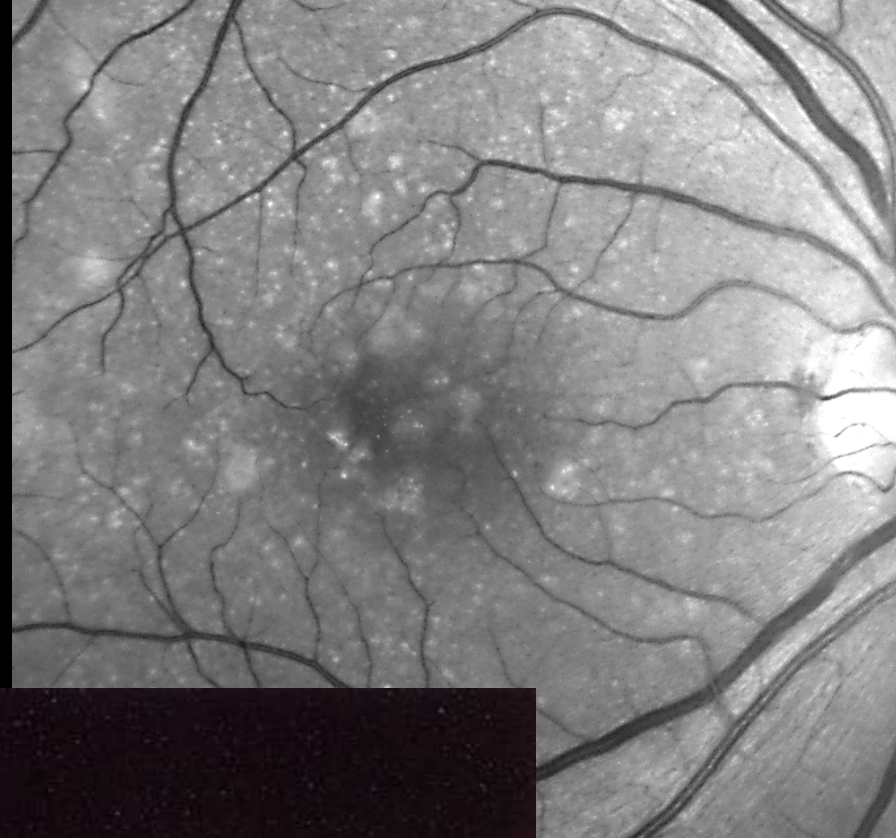
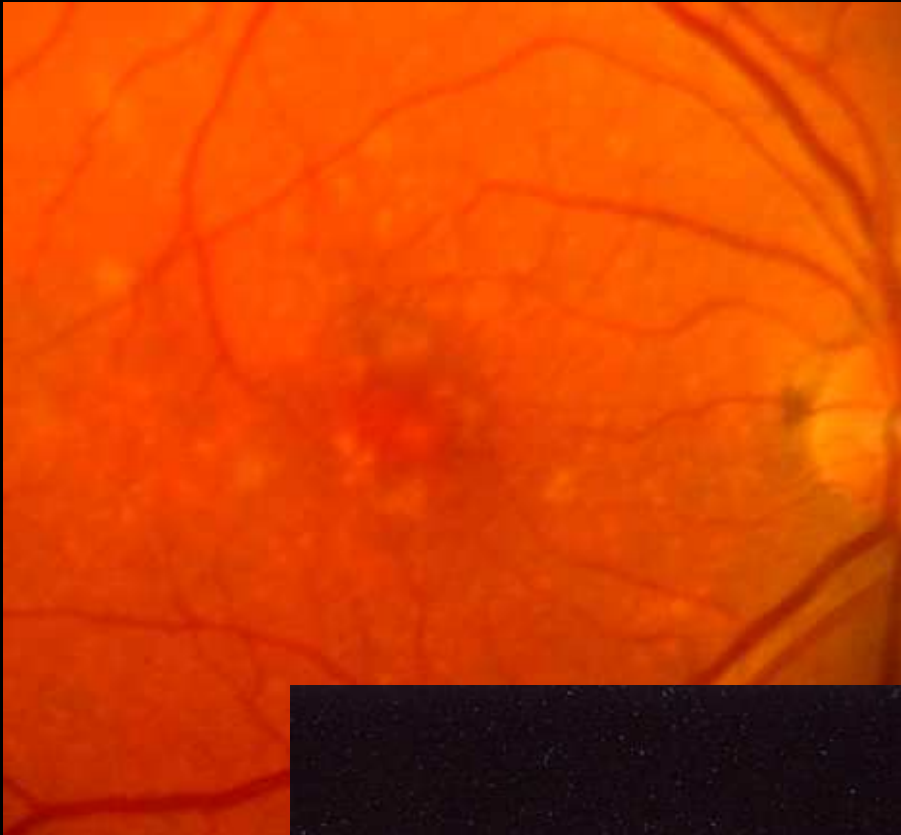
Drusen intermedie > 63 < 125  $\mu$

Drusen larghe  $\geq$  126  
 $\mu$



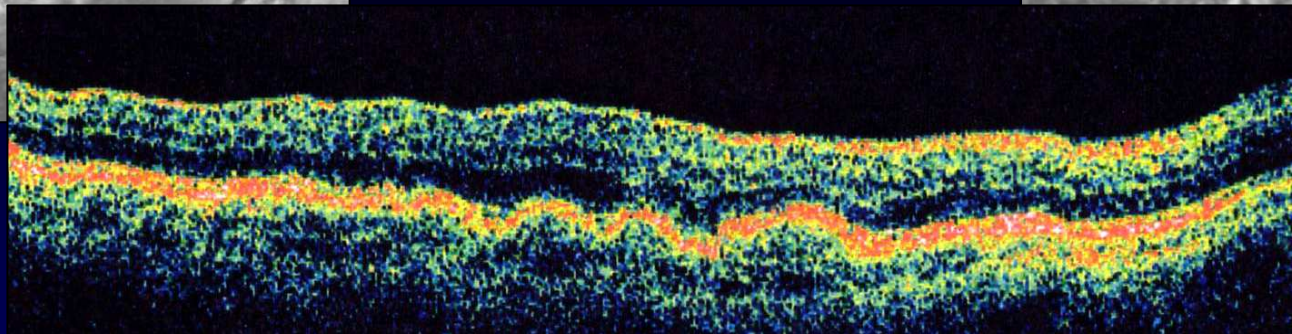
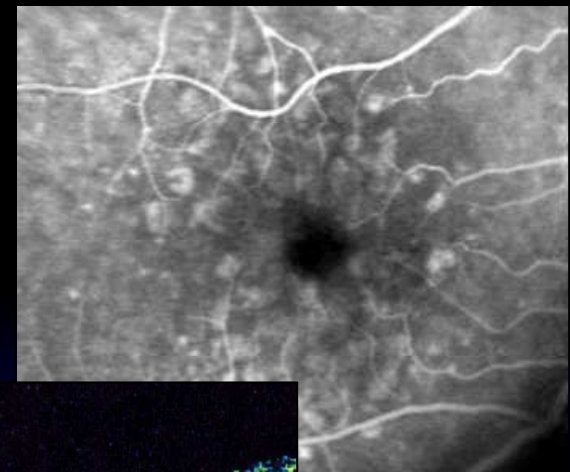
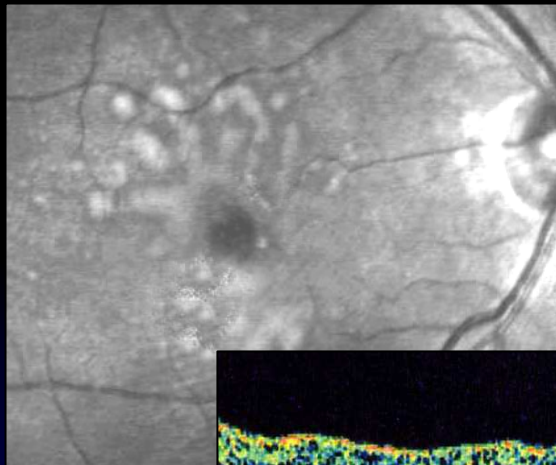
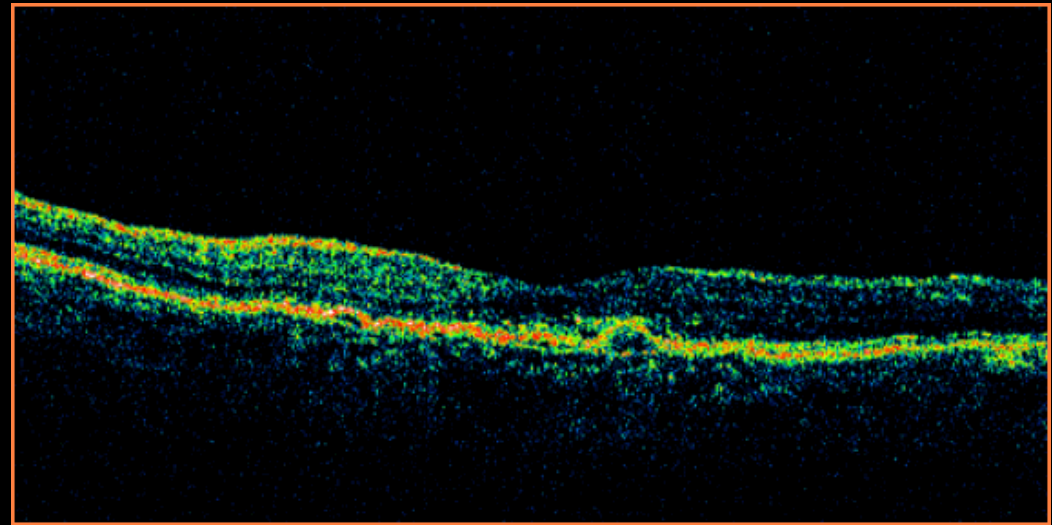
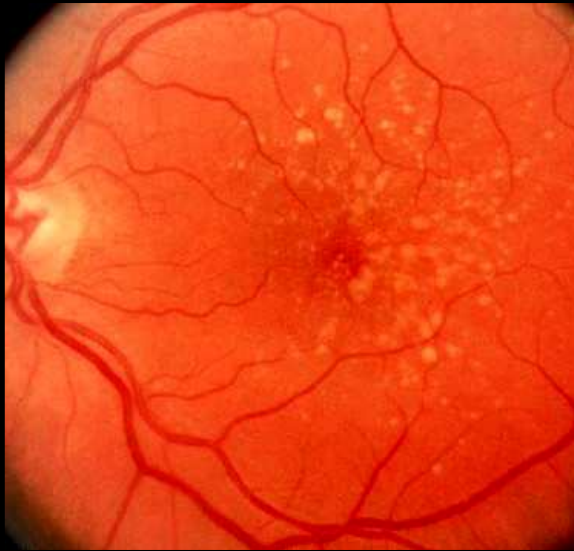
# EARLY ARMD

multiple small drusen, few intermediate drusen (63-124  $\mu\text{m}$  in diameter)  
or mild RPE abnormalities.



# INTERMEDIATE ARM D

Numerous intermediate drusen  
At least one large druse (125  $\mu\text{m}$  or larger in diameter)  
Geographic atrophy (a sharply demarcated, usually round or oval, area of atrophy of the RPE not involving the center of the fovea)

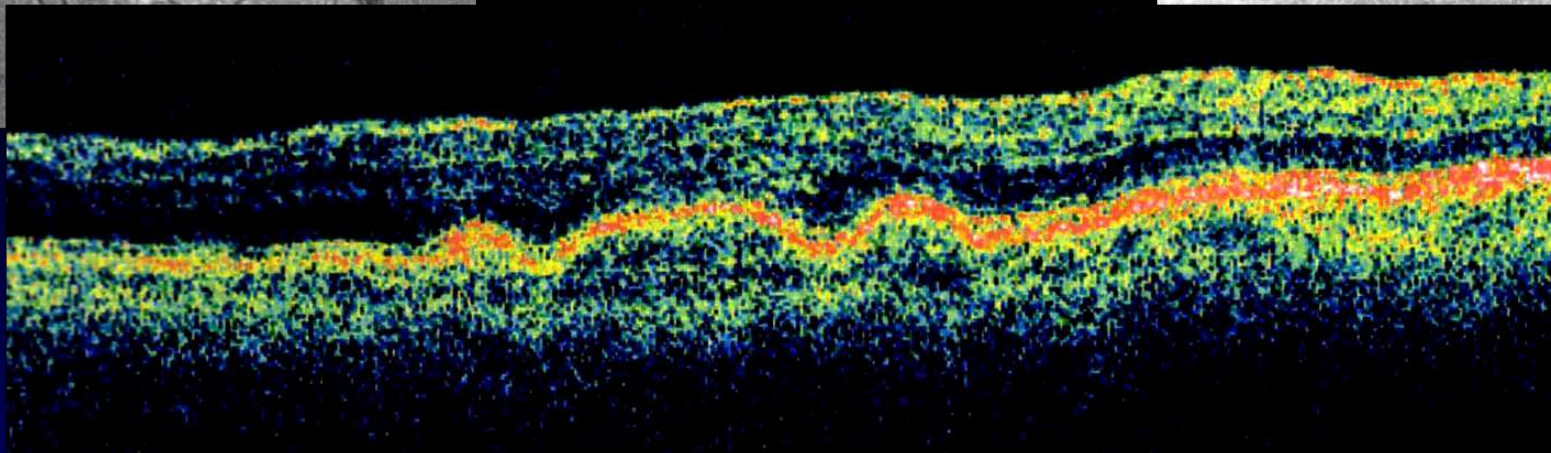
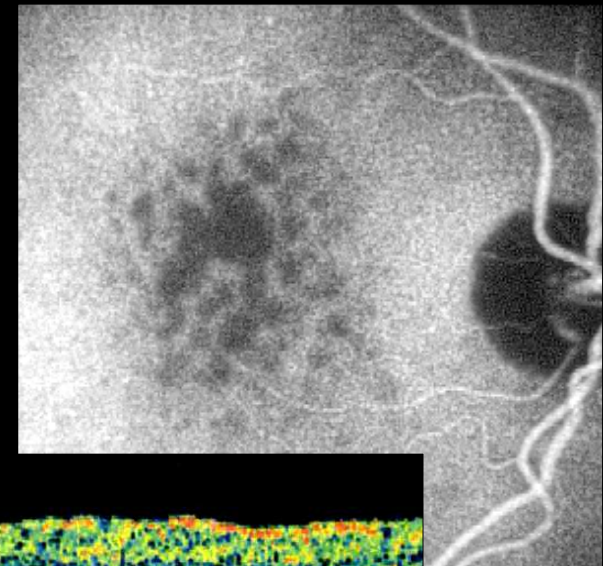
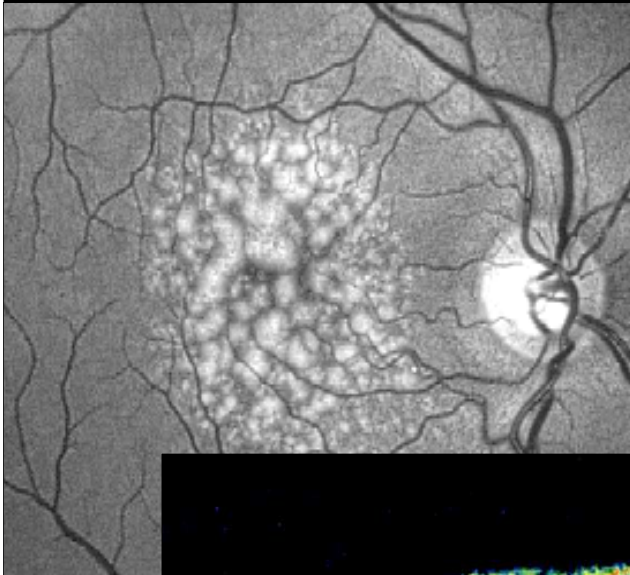


## INTERMEDIATE ARM

Numerous intermediate drusen  
At least one large druse (125  $\mu\text{m}$  or larger in diameter)  
Geographic atrophy (a sharply demarcated, usually round or oval, area of atrophy of the RPE not involving the center of the fovea)

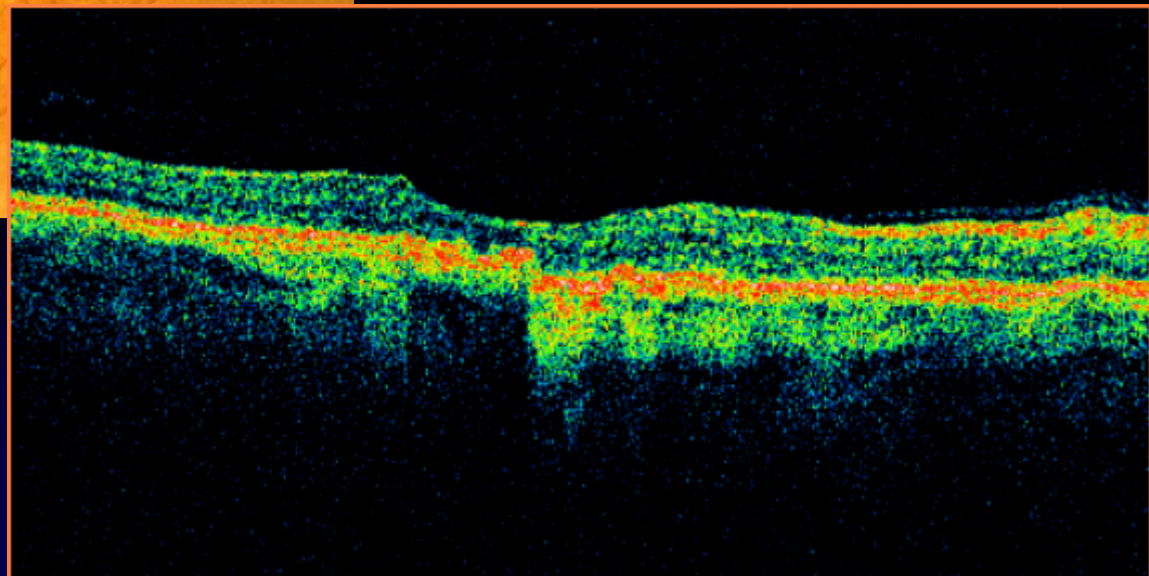
Evoluzione in numerose "large drusen" che diventano confluenti

La confluenza delle drusen evolve in distacco drusenoid  
dell'EPR (assenza di essudazione)

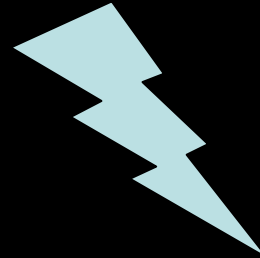
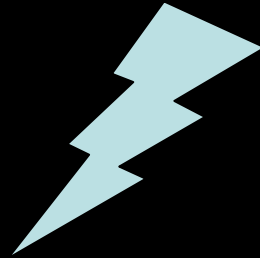


# INTERMEDIATE ARM

Numerous intermediate drusen  
At least one large druse (125  $\mu\text{m}$  or larger in diameter)  
Geographic atrophy (a sharply demarcated, usually round or oval, area of atrophy of the RPE not involving the center of the fovea)

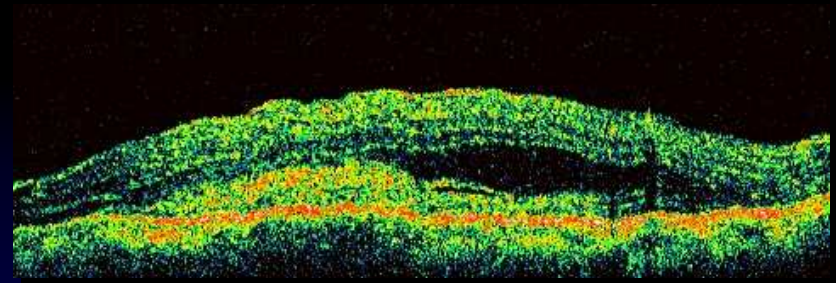
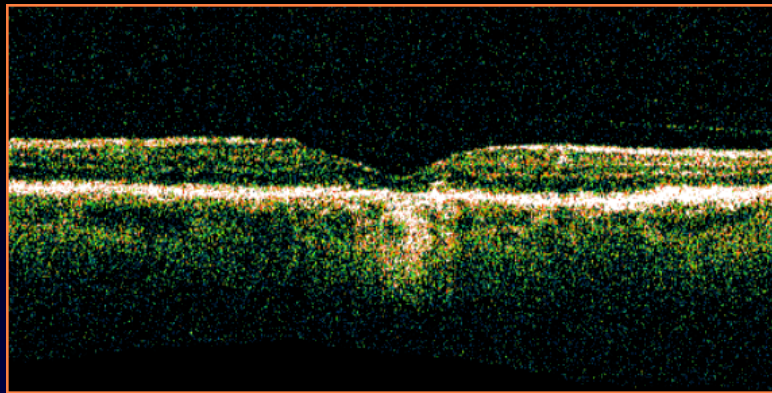


# ADVANCED ARMD



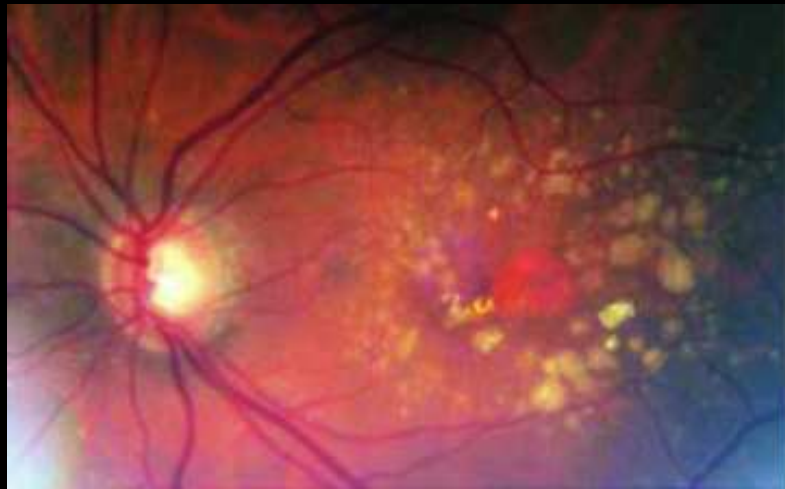
FORMA ATROFICA

FORMA ESSUDATIVA

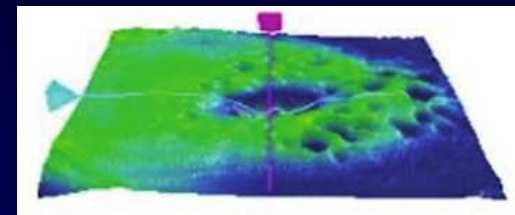
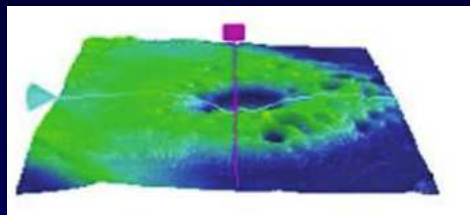
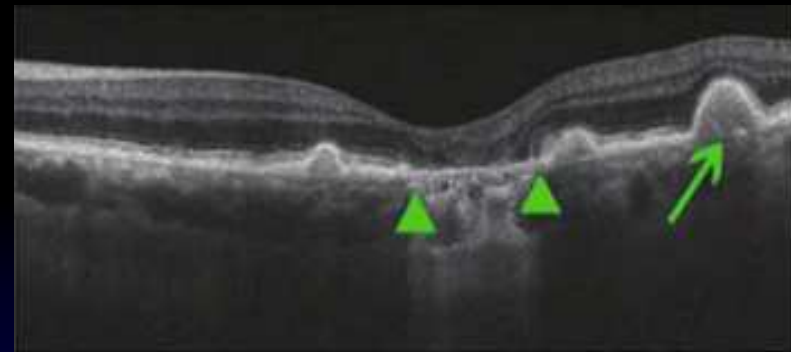
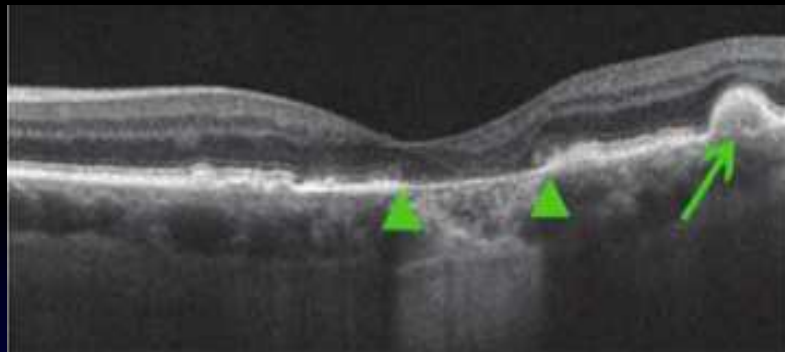
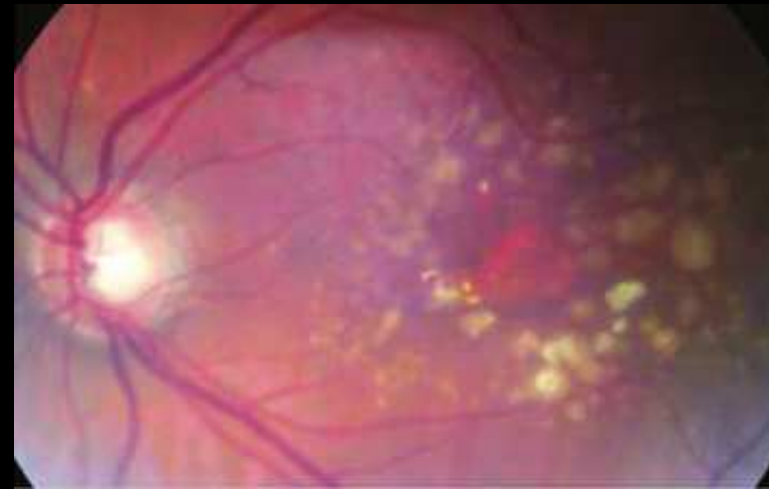


# ADVANCED ARMD FORMA ATROFICA

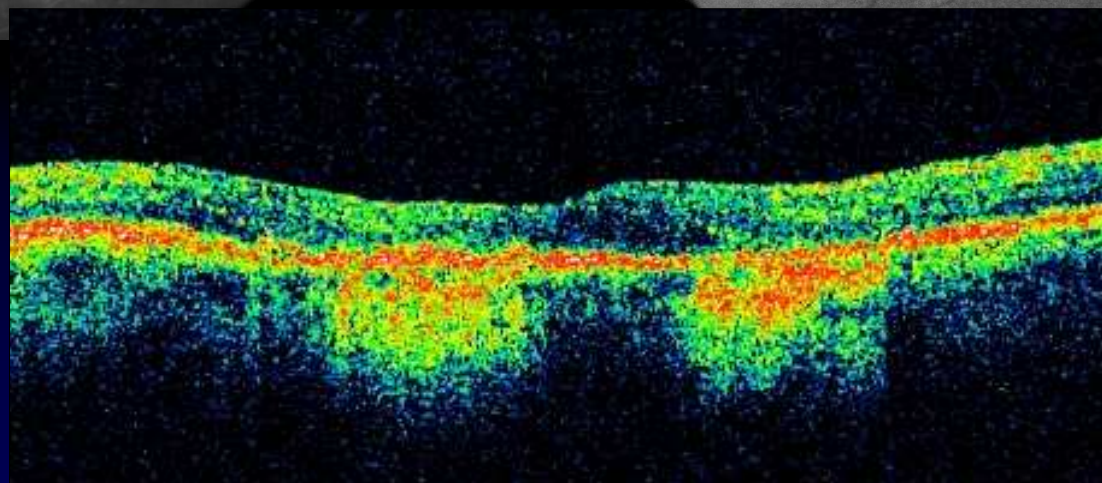
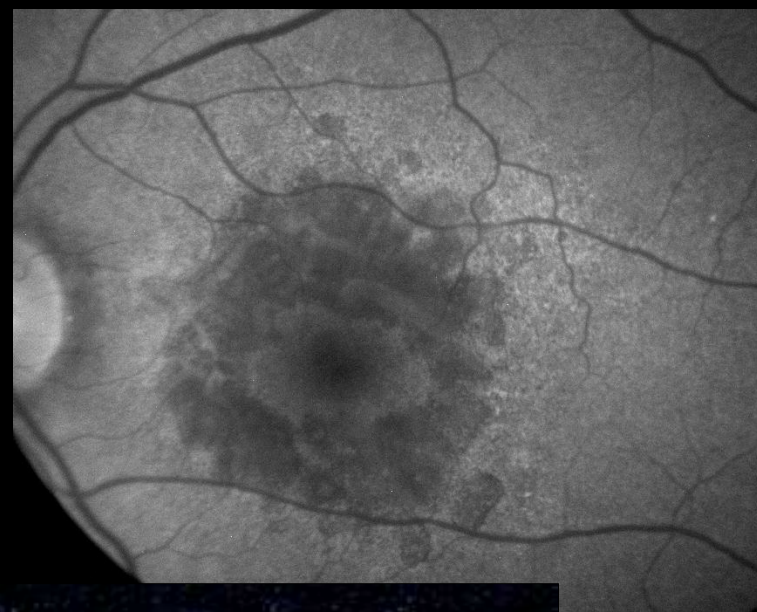
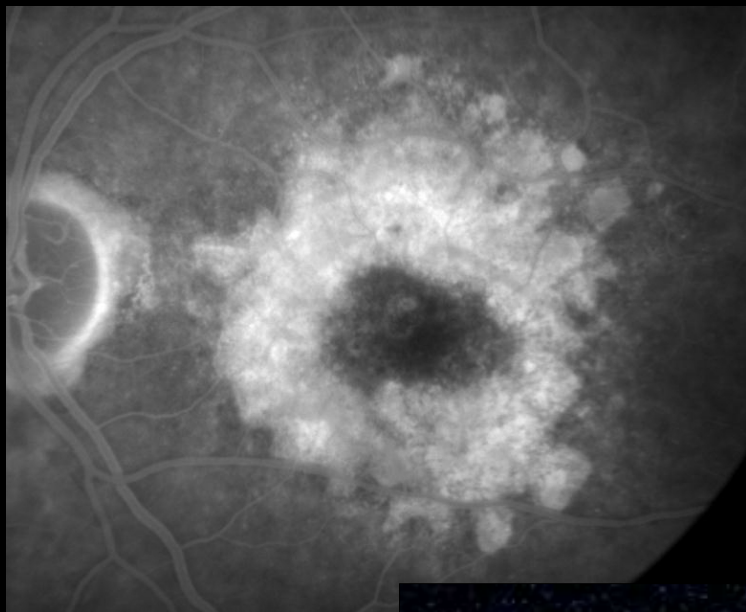
OTTOBRE 2010



OTTOBRE 2011



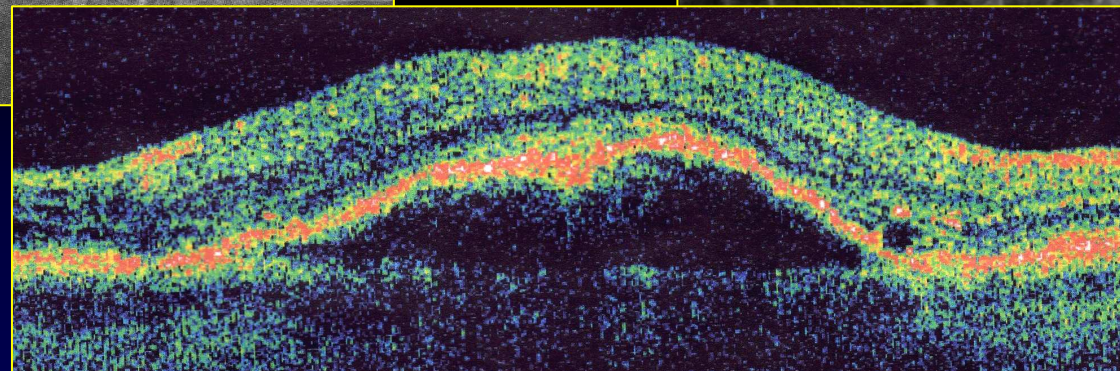
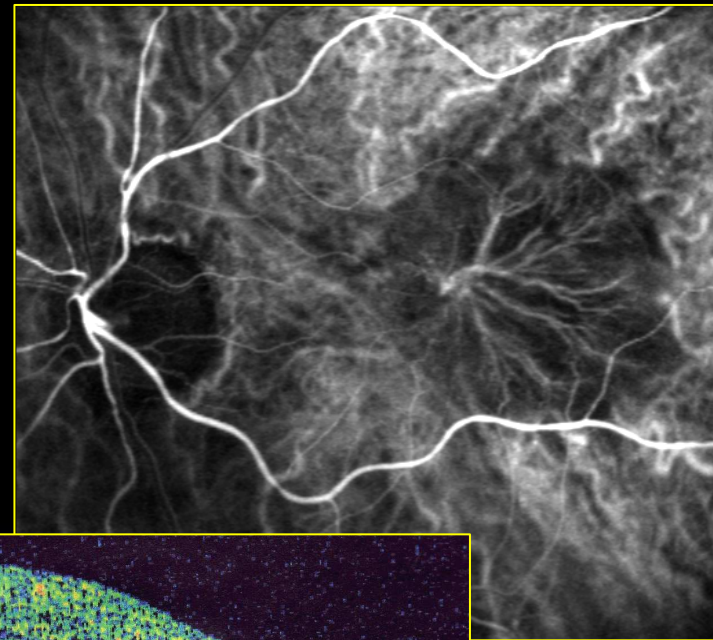
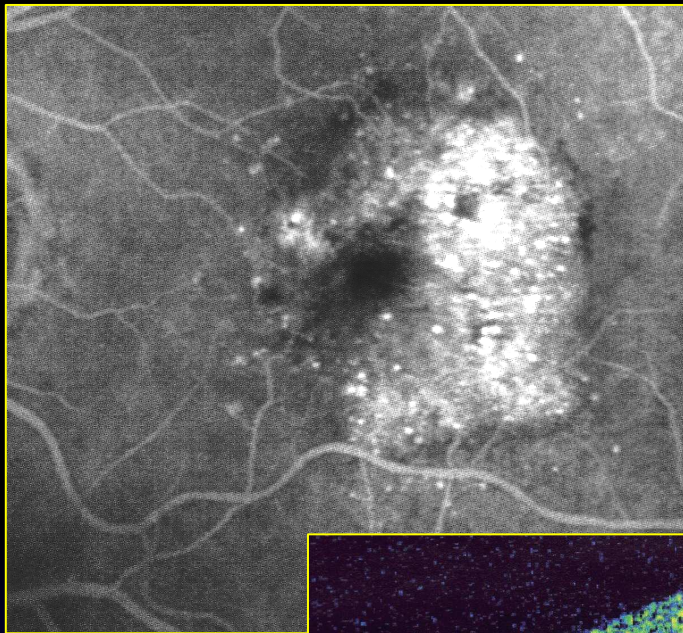
# ADVANCED ARMD FORMA ATROFICA



# ADVANCED ARMD FORMA ESSUDATIVA

## 3 TIPOLOGIE DI MEMBRANA NEOVASCOLARE SOTTORETINICA

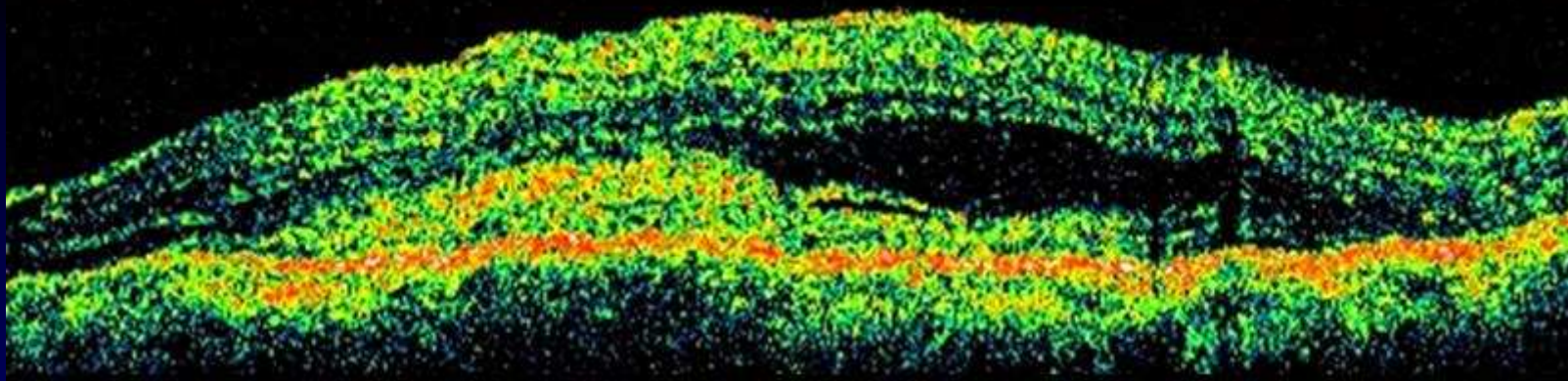
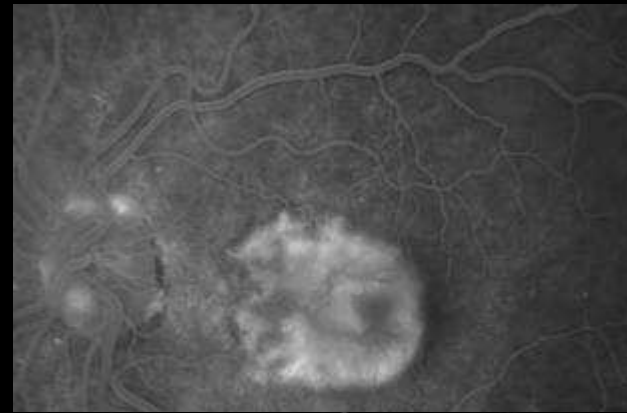
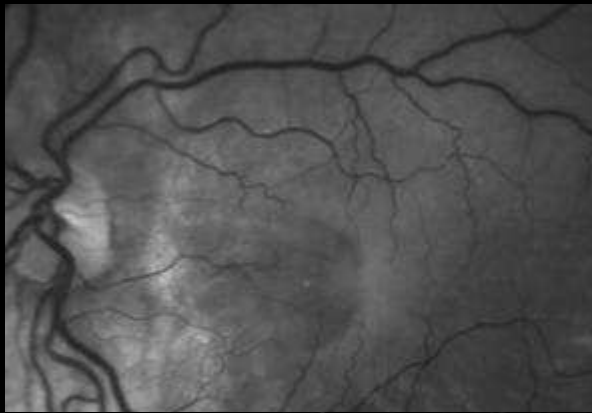
Type 1 CNV Occult CNV (between Bruch's membrane and RPE)



# ADVANCED ARMD FORMA ESSUDATIVA

## 3 TIPOLOGIE DI MEMBRANA NEOVASCOLARE SOTTORETINICA

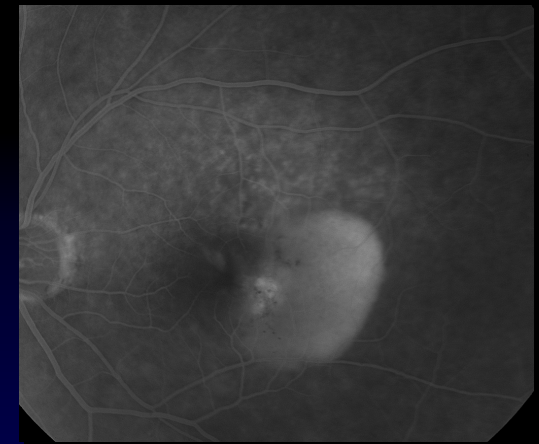
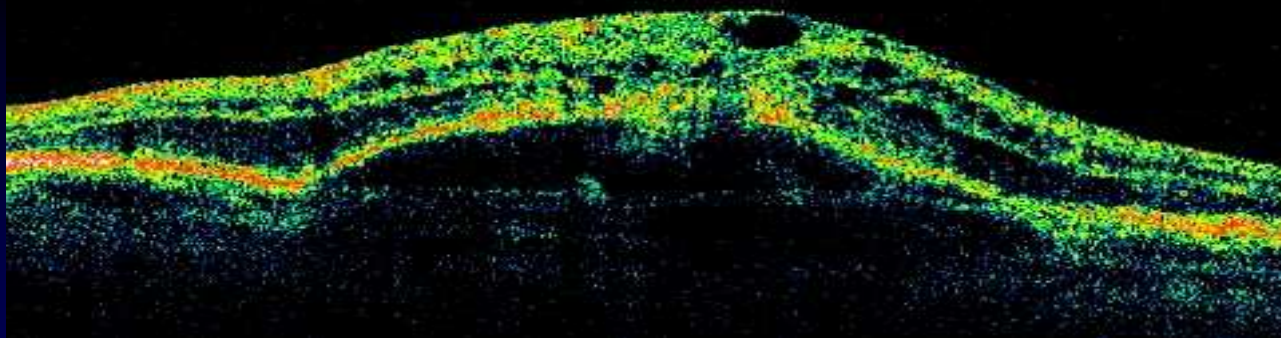
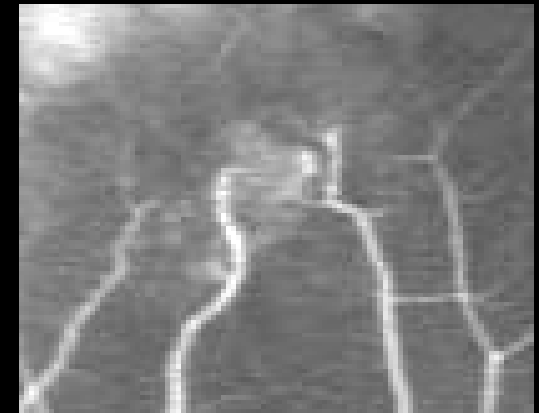
Type 2 Classic CNV is believed to correspond histologically to CNV which is located in the subretinal space,



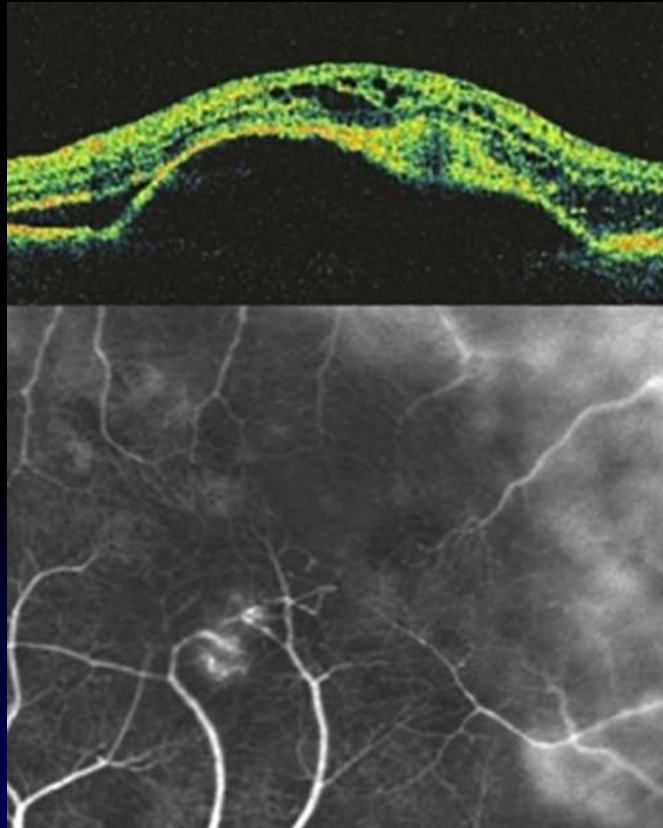
# ADVANCED ARMD FORMA ESSUDATIVA

## 3 TIPOLOGIE DI MEMBRANA NEOVASCOLARE SOTTORETINICA

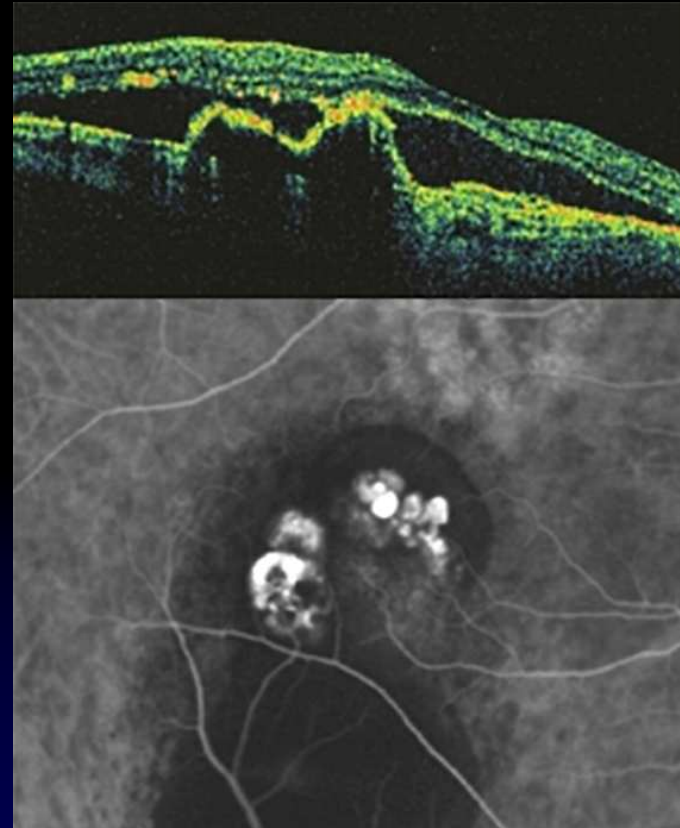
"Type 3 neovascularization" Retinal Angiomatous Proliferation (RAP)  
to emphasize the intraretinal location of the vascular complex.



Polypoidal choroidal vasculopathy was first described as a peculiar hemorrhagic disorder of the macula, characterized by recurrent sub-retinal and sub-retinal pigment epithelium bleeding. The use of indocyanine green angiography and subsequently of optical coherent tomography has widened our ability to study and understand the pathophysiology of this disorder. The primary abnormality involves the choroidal circulation, and the characteristic lesion is an inner choroidal vascular network of vessels ending in an aneurysmal bulge or outward projection, visible clinically as a reddish orange, spheroid, polyp-like structure.



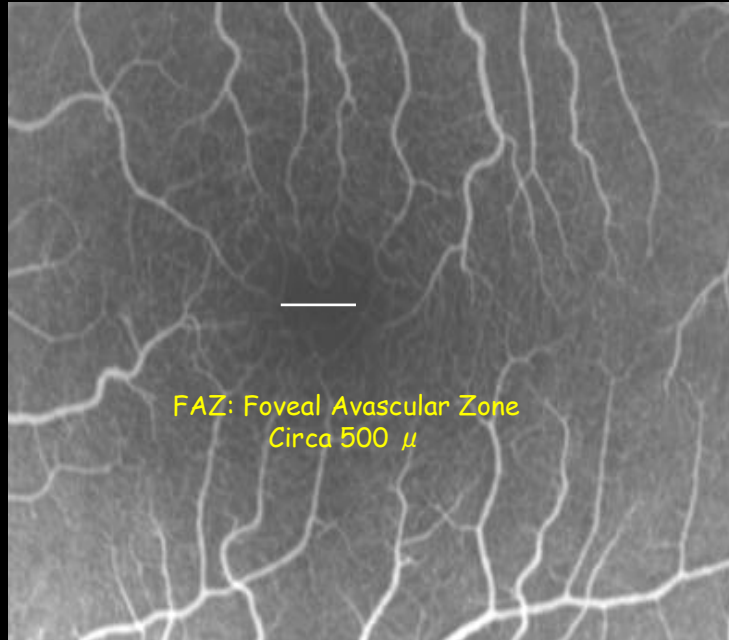
R.A.P.  
D



Polypoidal choroidal vasculopathy

# Fotocoagulazione laser

1979-1994  
MACULAR PHOTOCOAGULATION STUDY GROUP (MPS)

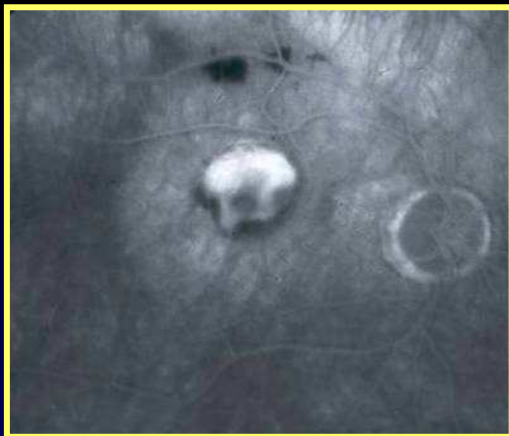


Extrafoveale: 200-2,500 μ

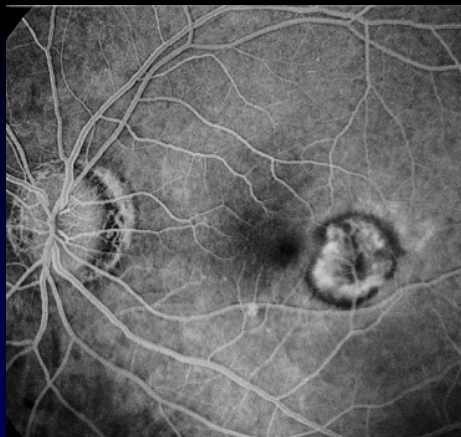
Iuxtafoveale: 0-200 μ

Subfoveale: coinvolge il centro

Subfoveale



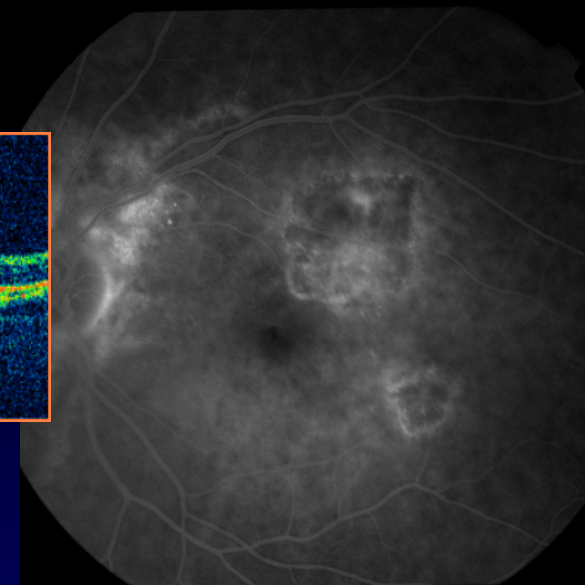
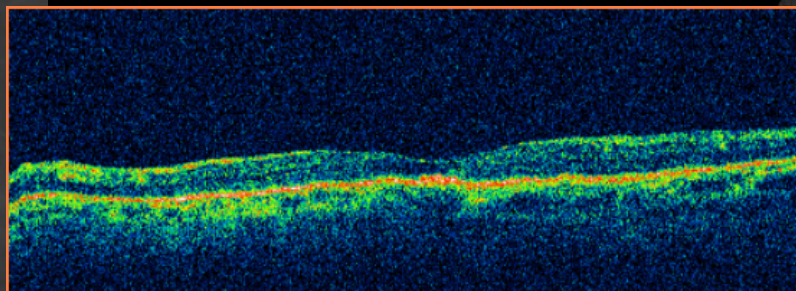
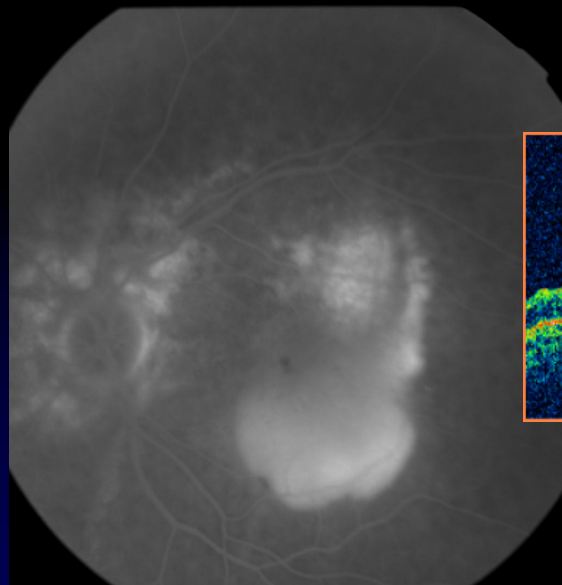
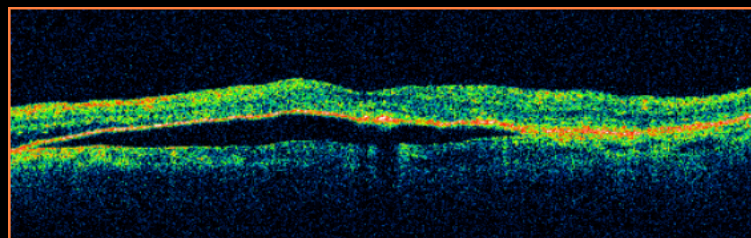
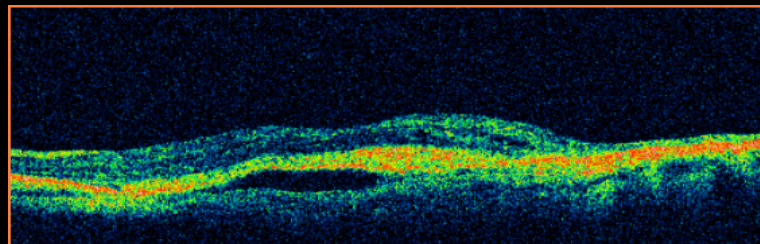
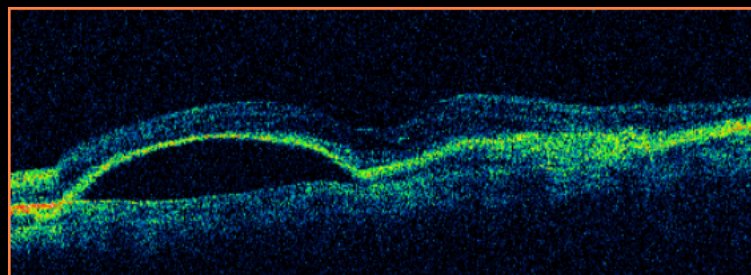
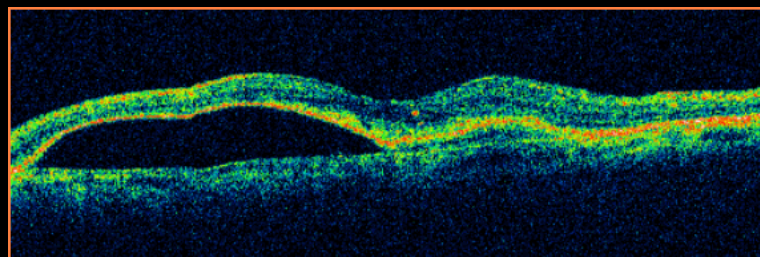
Extrafoveale



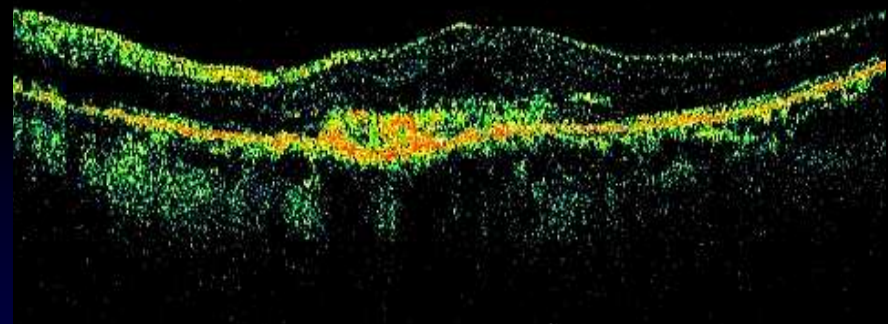
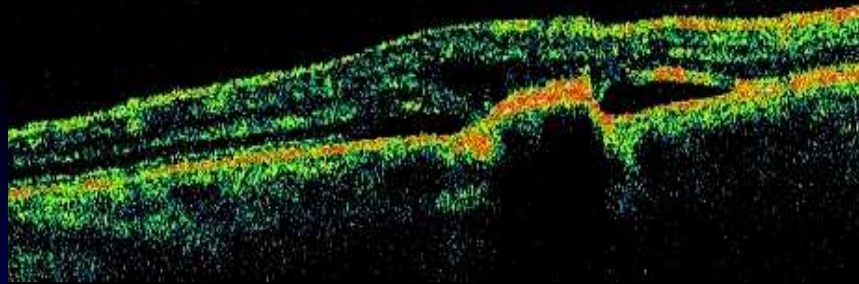
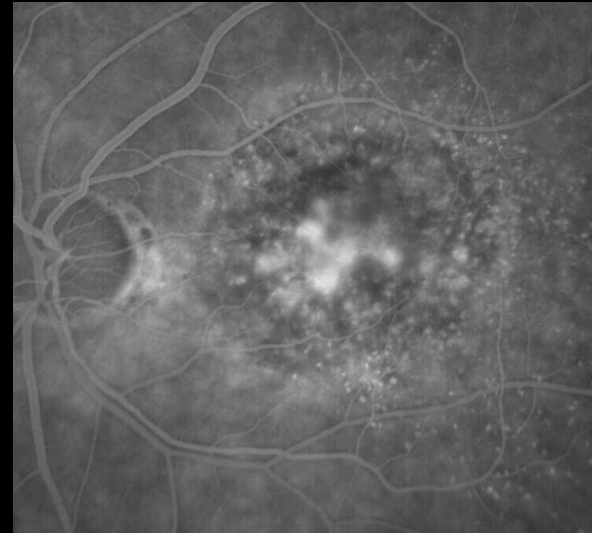
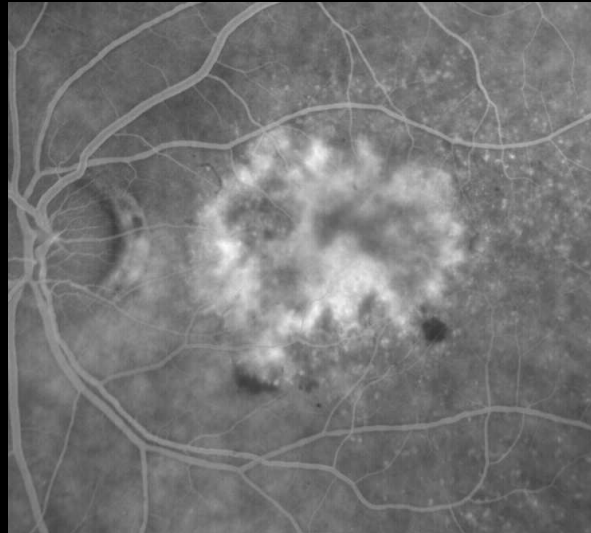
Iuxtafoveale



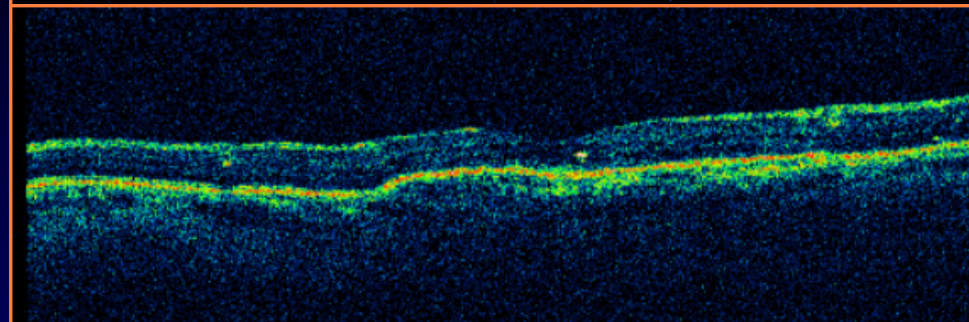
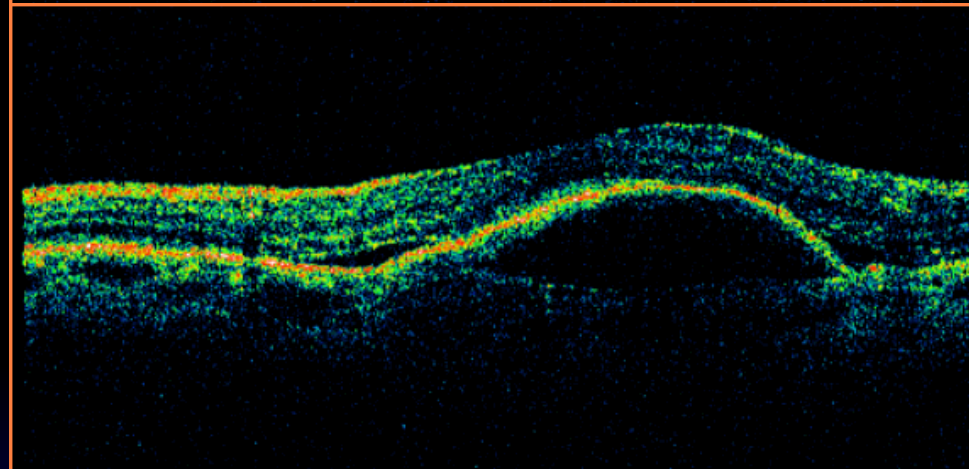
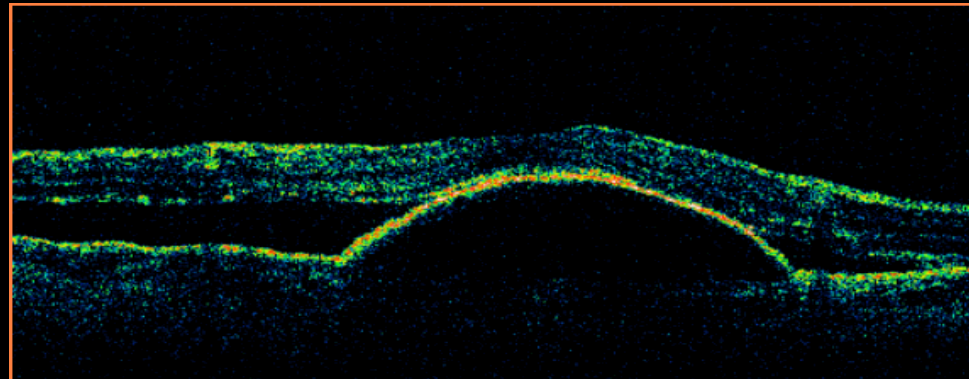
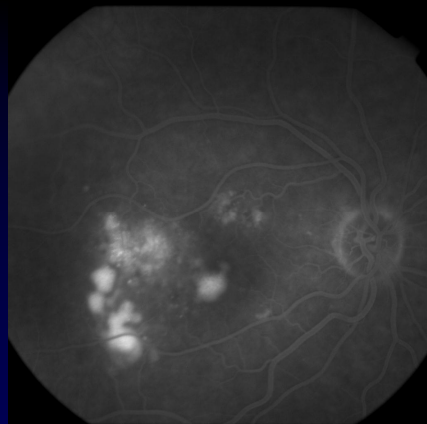
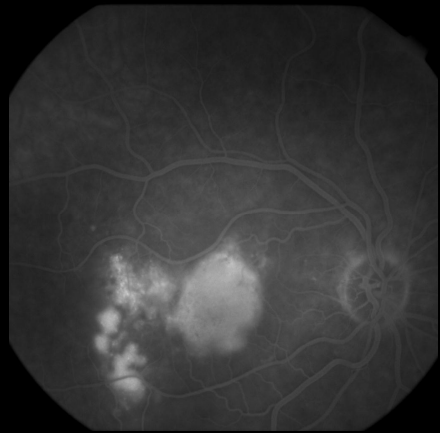
# Fotocoagulazione laser (CNV EXTRAFOVEALI E, TALVOLTA, IUXTAFOVEALI)



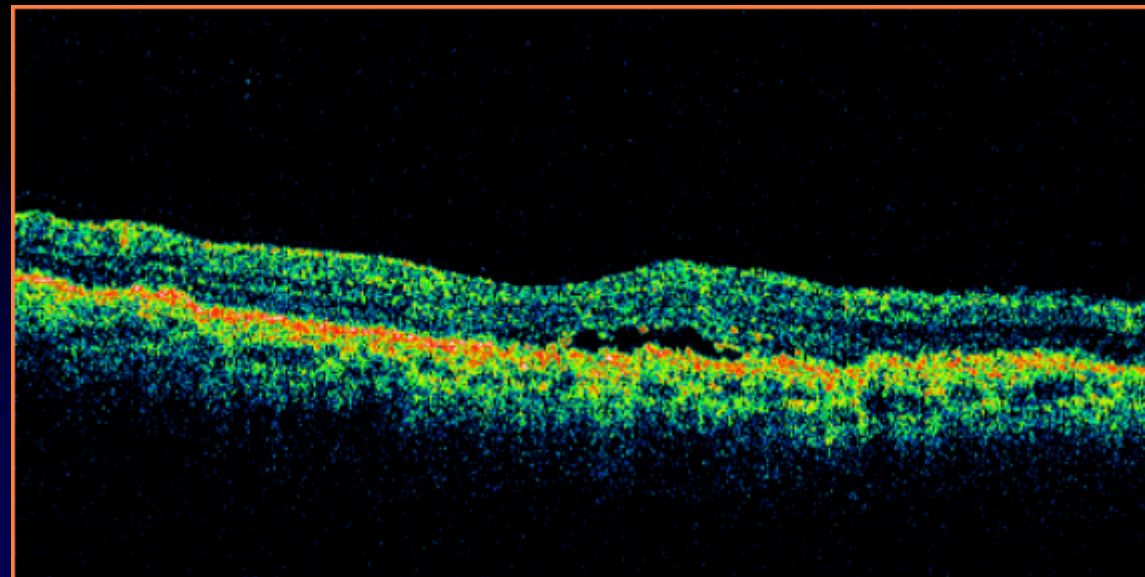
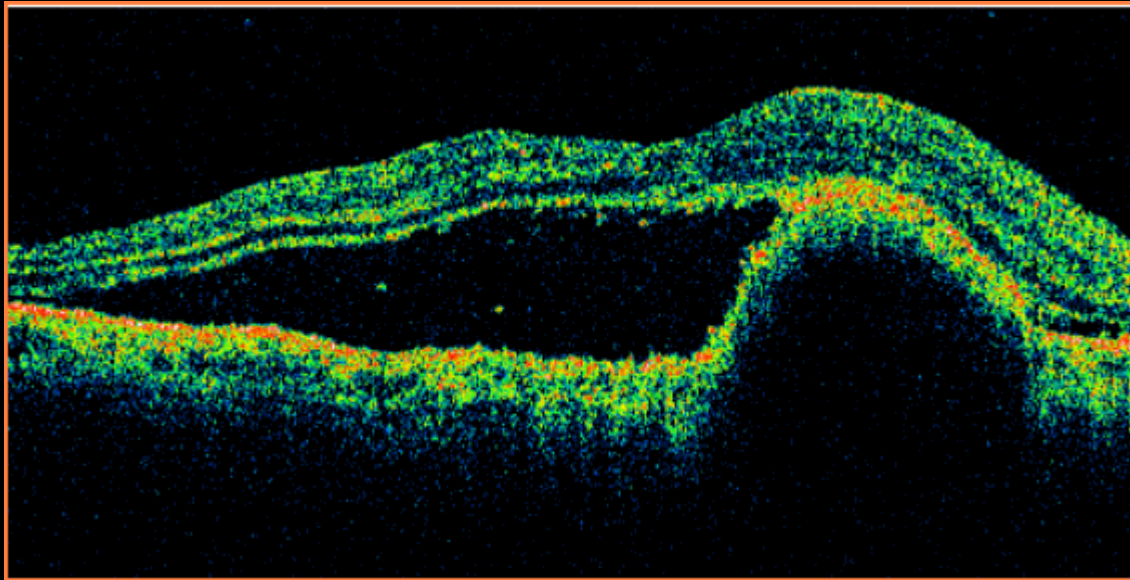
# TERAPIA FOTODINAMICA (CONSERVATIVA - CNV SUBFOVEALI)



# FOLLOW-UP NEOVASCULARIZZAZIONE COROIDEALE TRATTATE ANTIANGIOGENICI



FOLLOW-UP NEOVASCULARIZZAZIONE COROIDEALE TRATTATE  
ANTIANGIOGENICI



Grazie per l'attenzione

