C11: Ocular Monitoring

(PIs: Gianmarco Vizzeri, MD[1] and Ronita L. Cromwell, PhD[2])

Giovanni Taibbi, MD[1]

[1] Department of Ophthalmology and Visual Sciences, The University of Texas Medical Branch, Galveston, TX

[2] Universities Space Research Association, Division of Space Life Sciences, Houston, TX

Disclosures

There are no conflicts of interests to disclose

Purpose

To illustrate testing procedures and outcome measures of C11 ocular monitoring

Ocular testing schedule

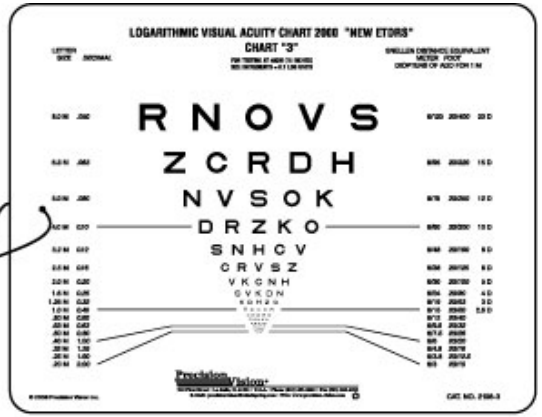
	Pre-BR		BR			Post-BR	
	-11	-5	3, 10, 17, 24, 31	38	45, 52, 59, 66	+2	+9
Visual Acuity (Distance & Near)	•	•	•	•	•	•	•
Modified Amsler Grid	•	•	•	•	•	•	•
Red Dot Test	•	•	•	•	•	•	•
Color Vision	•	•	•	•	•	•	•
Confrontational Visual Field	•	•	•	•	•	•	•
Cycloplegic Refraction	•	•	•	•	•	•	•
IOP (Handheld)	•	•	•	•	•	•	•
IOP (Goldmann)	•	•				•	•
SD-OCT	•			•		•	•
Color Fundus Photography	•			•		•	•

Visual Acuity

- Weekly

Distance
(3 m)

Near
(40 cm)



Source: precision-vision.com

Cycloplegic Refraction

- Handheld (weekly)
- Table-mounted (pre- and post-BR)
- Automated

Source: kuomed.fi/righton-retinomax-3-k-plus3

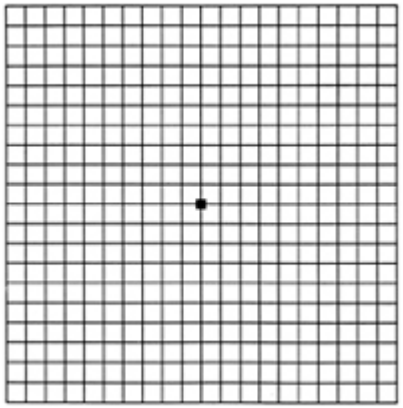
Visual Function Tests

- Modified Amsler grid
- Red dot test
- Color vision (HRR plates)
- Confrontational Visual Field

- Weekly

Visual Function Tests

- Modified Amsler grid
- Red dot test
- Color vision (HRR plates)
- Confrontational Visual Field

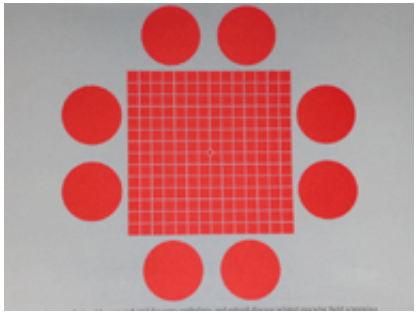


Source: en.wikipedia.org/wiki/Amsler_grid

- Weekly

Visual Function Tests

- Modified Amsler grid
- Red dot test
- Color vision (HRR plates)
- Confrontational Visual Field



Source: opticianonline.net/Articles/2005/07/22/13752/IXMUS+-+Colour+field+charts+for+macular+assessment.htm

- Weekly

Visual Function Tests

- Modified Amsler grid
- Red dot test
- Color vision (HRR plates)
- Confrontational Visual Field

Source: http://www.richmondproducts.com/shop/index.php?route=product/product&path=317_318_326&product_id=729

- Weekly

Visual Function Tests

- Modified Amsler grid
- Red dot test
- Color vision (HRR plates)
- Confrontational Visual Field

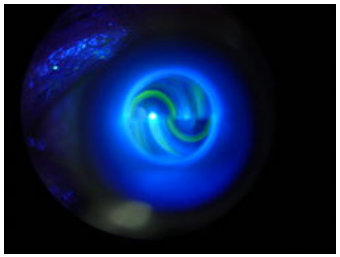
- Weekly

Tonometry

- Handheld (weekly)
  - iCare
  - Tonopen

Source: NASA

- Goldmann (pre- and post-BR)



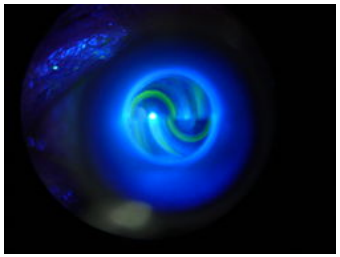
Source: en.wikipedia.org/wiki/Ocular_tonometry

Tonometry

- Handheld (weekly)
  - iCare
  - Tonopen

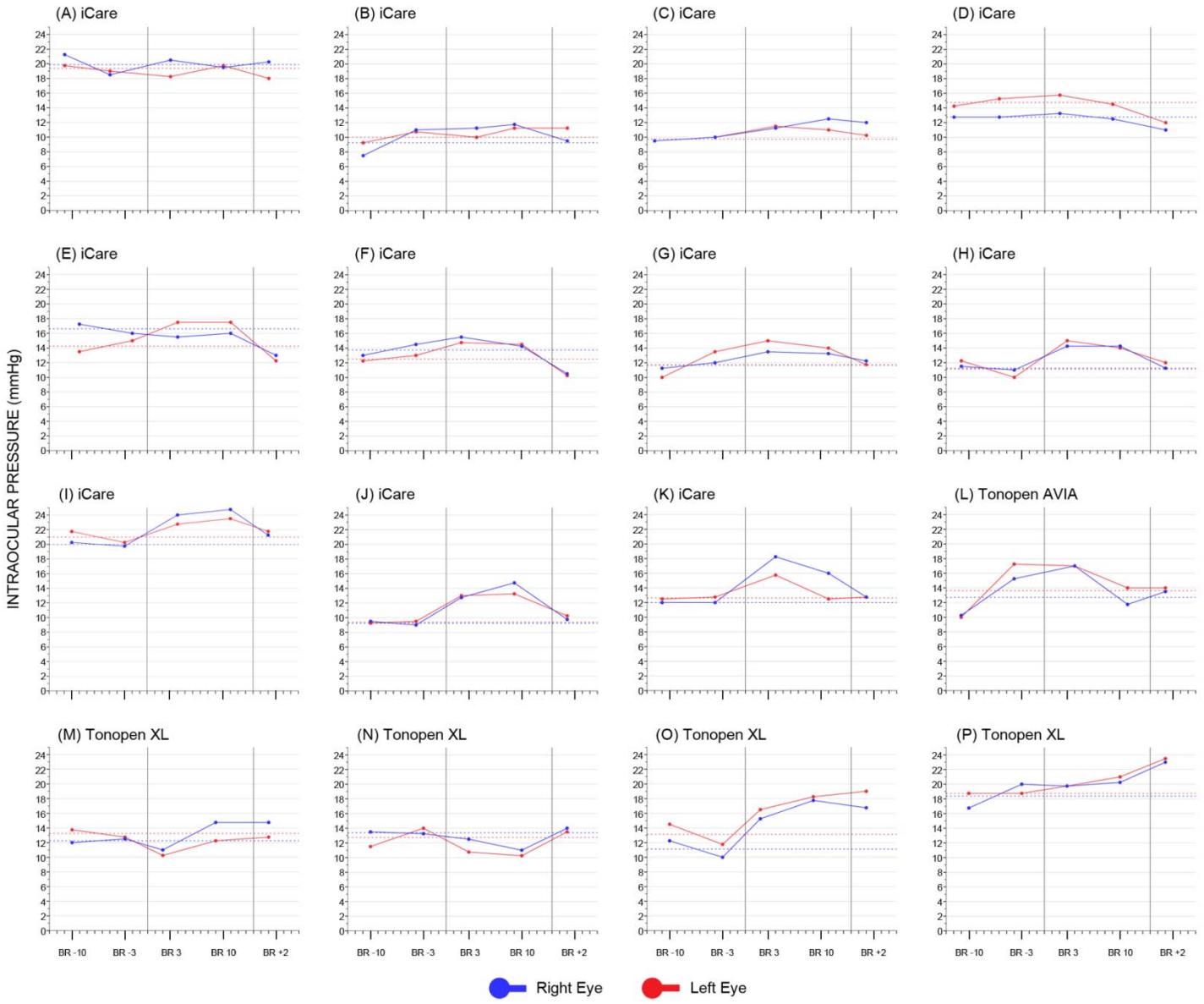
Source: NASA

- Goldmann (pre- and post-BR)

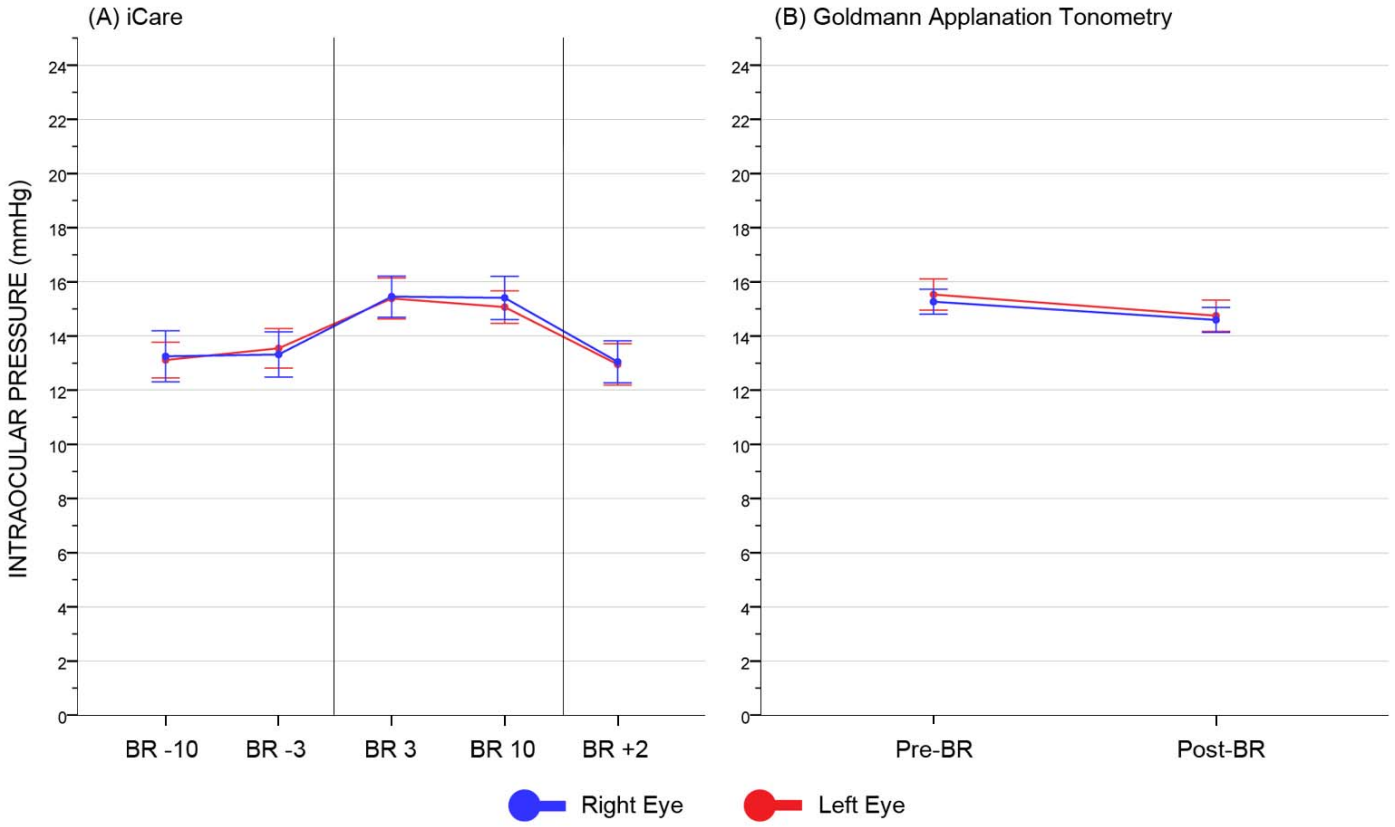


Source: en.wikipedia.org/wiki/Ocular_tonometry

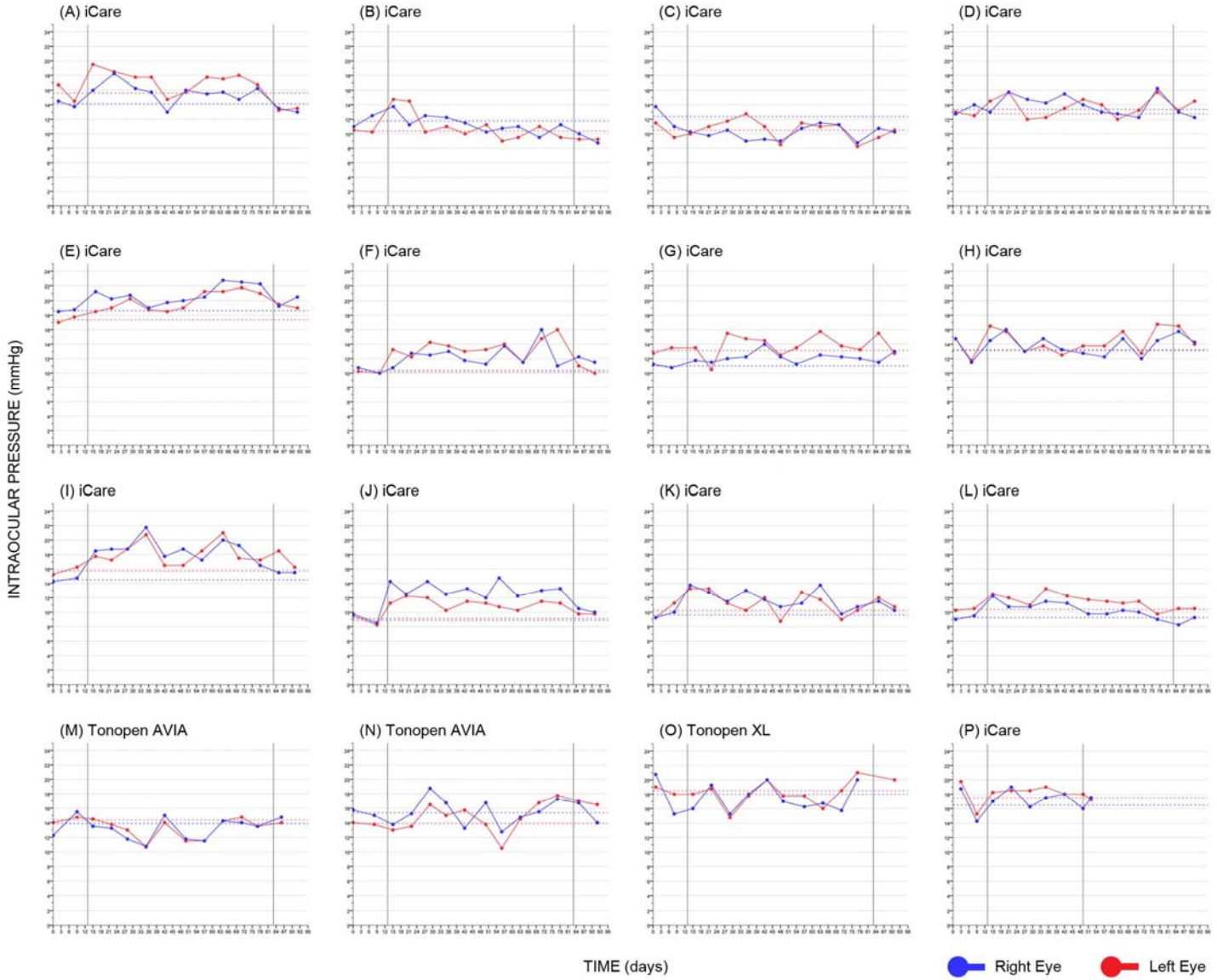
Intraocular Pressure 14-d BR



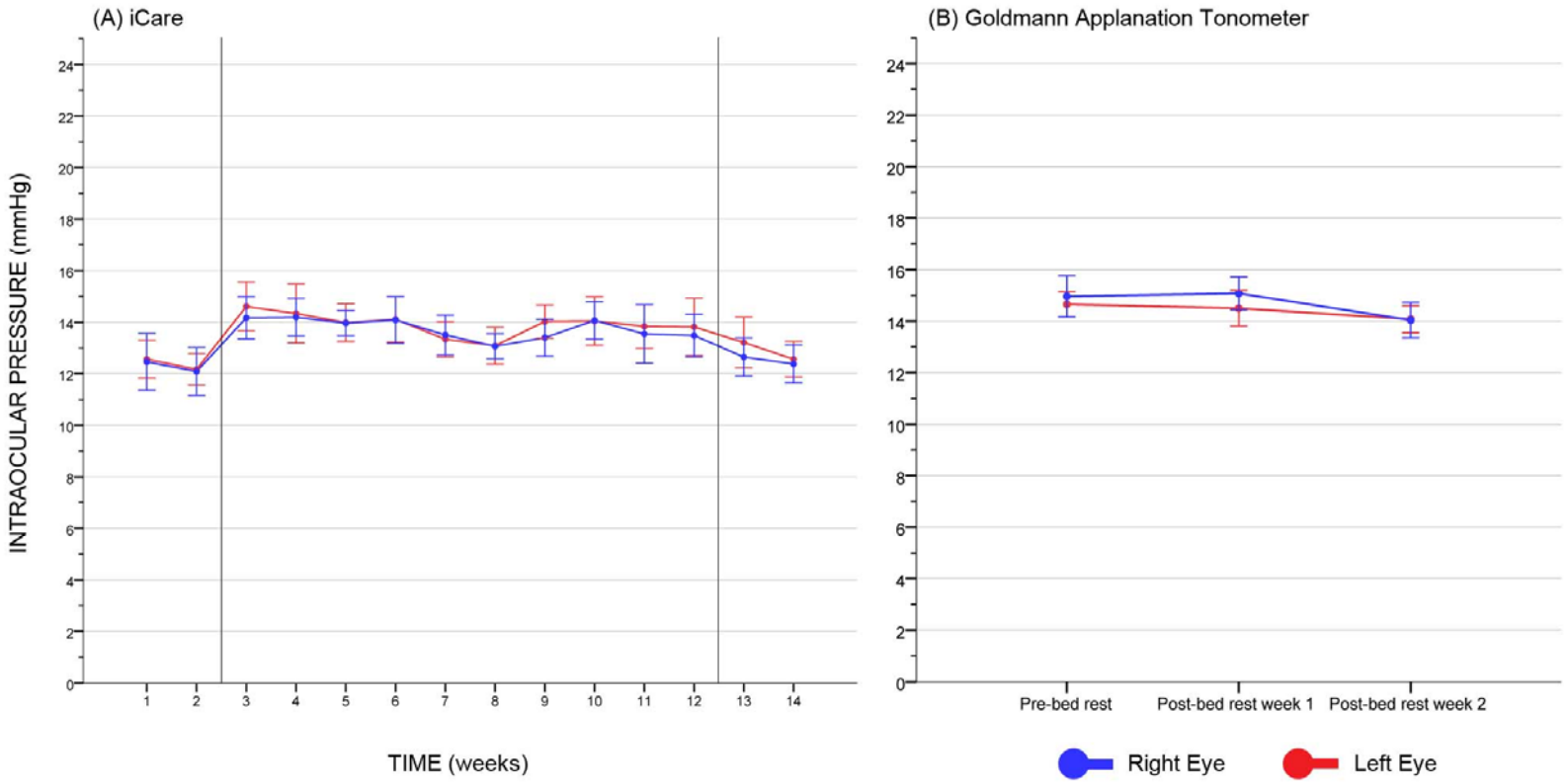
Intraocular Pressure 14-d BR



Intraocular Pressure 70-d BR



Intraocular Pressure 70-d BR



Color Fundus Photography

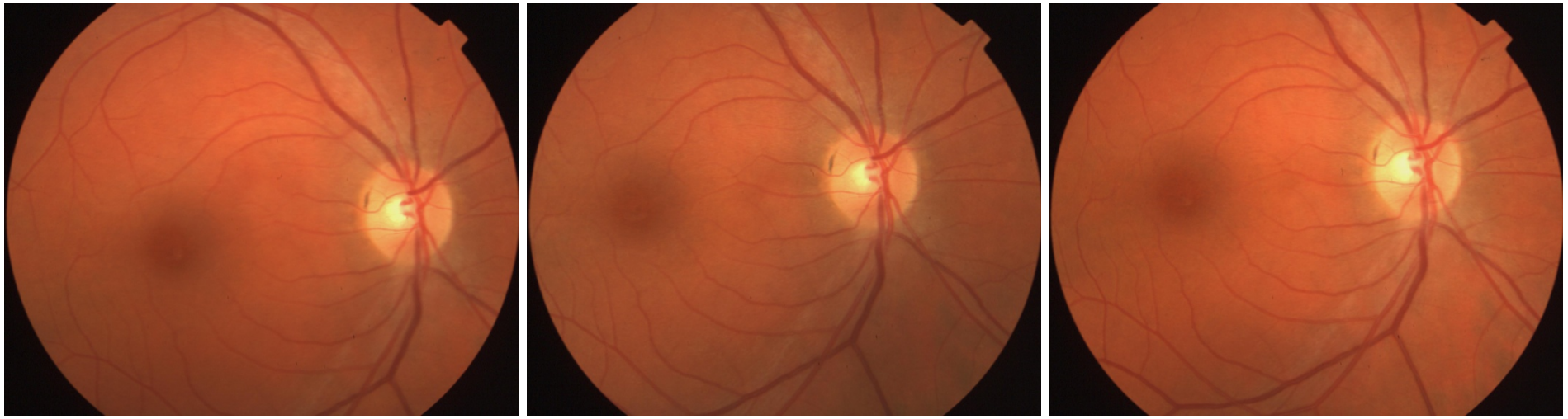
- Handheld (pre-BR, in-bed, post-BR)

Source: NASA

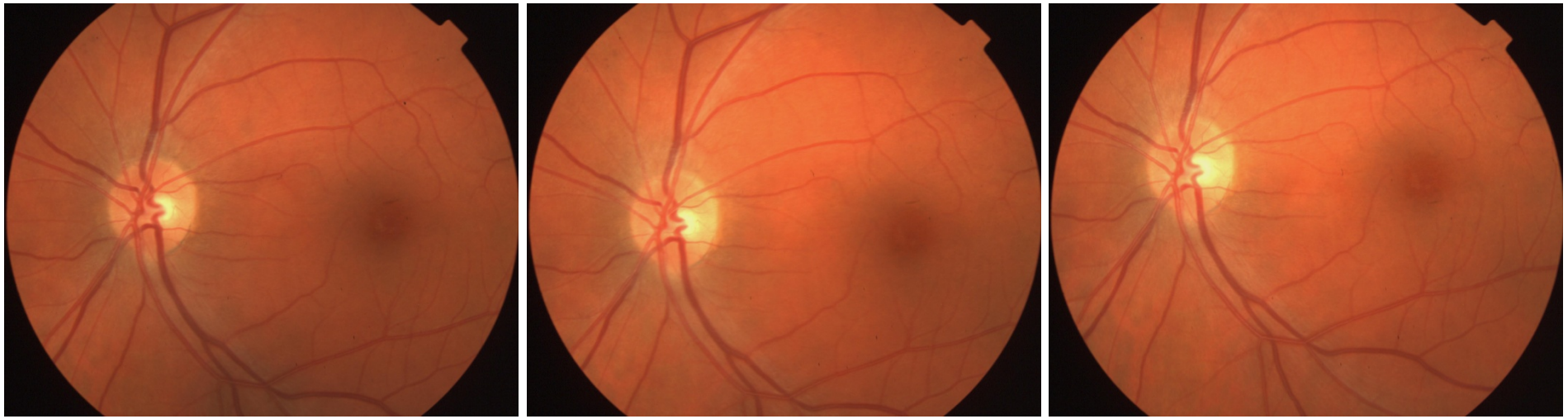
- Table-mounted (pre- and post-BR)

Source: topconmedical.com/products/trc50dx.htm

Color Fundus Photography



BR -12 BR +2 BR +8



Spectral-domain OCT

- **O**ptical **C**oherence **T**omography
- Non-invasive ocular imaging technology
- C11: 3 different SD-OCTs used
  - ➢ Devices **NOT** interchangeable
- Available SD-OCTs differ in:
  - ➢ Scanning protocols
  - ➢ Parameters measured
  - ➢ Printouts

Spectral-domain OCT

- Pre-BR, in-bed, post-BR
- Cirrus HD-OCT
- Spectralis OCT
- iVue OCT

Spectral-domain OCT

- Pre-BR, in-bed, post-BR
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Source: NASA

Spectral-domain OCT

- Case example:
  - 43 y/o M
  - At baseline:

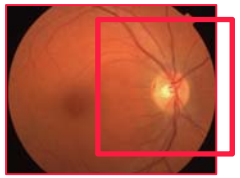
	RE	LE
IOP (mmHg)	12	13
BCVA (logMAR)	-0.16	-0.14
Sph Equiv (D)	+0.63	+0.88

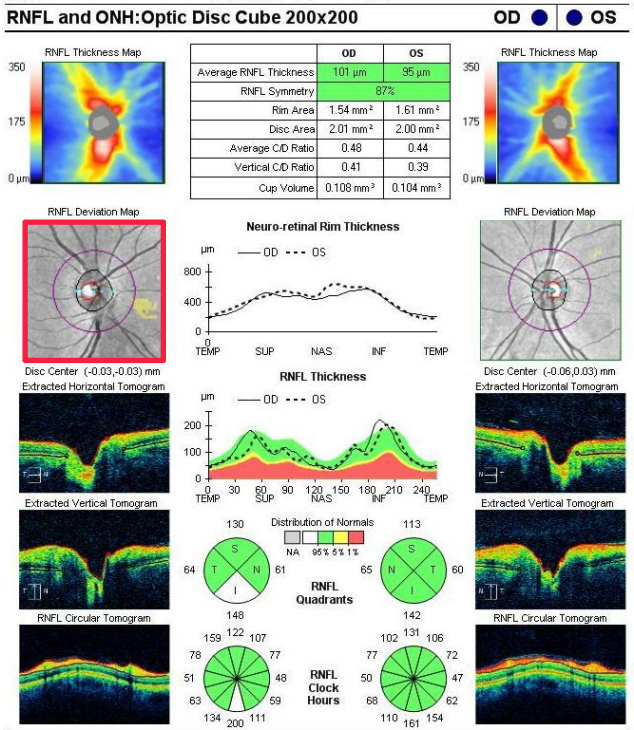
  - ALL functional tests WNL throughout

Cirrus HD-OCT

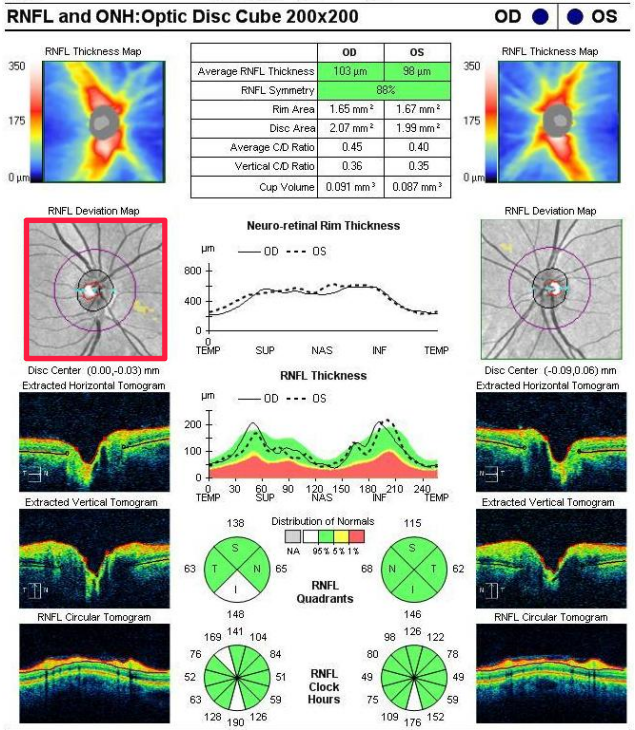
Cirrus HD-OCT

- Optic Disc Scan

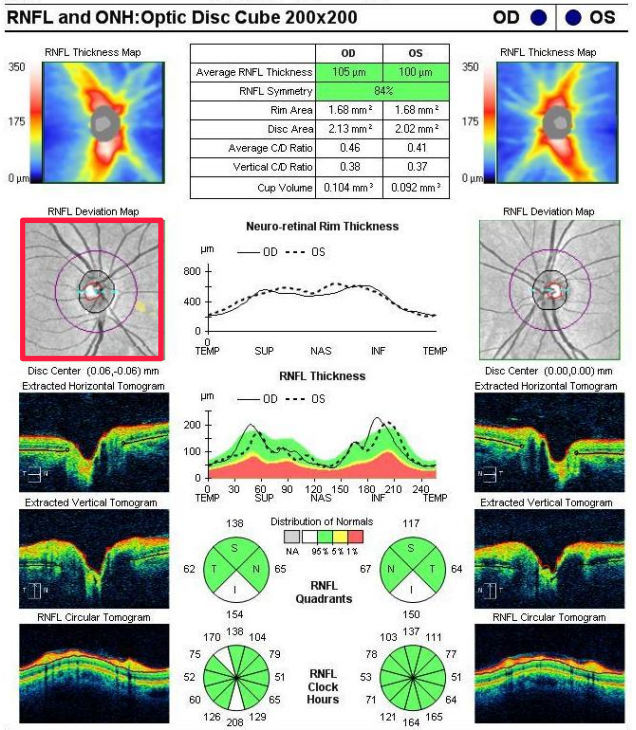




BR -12



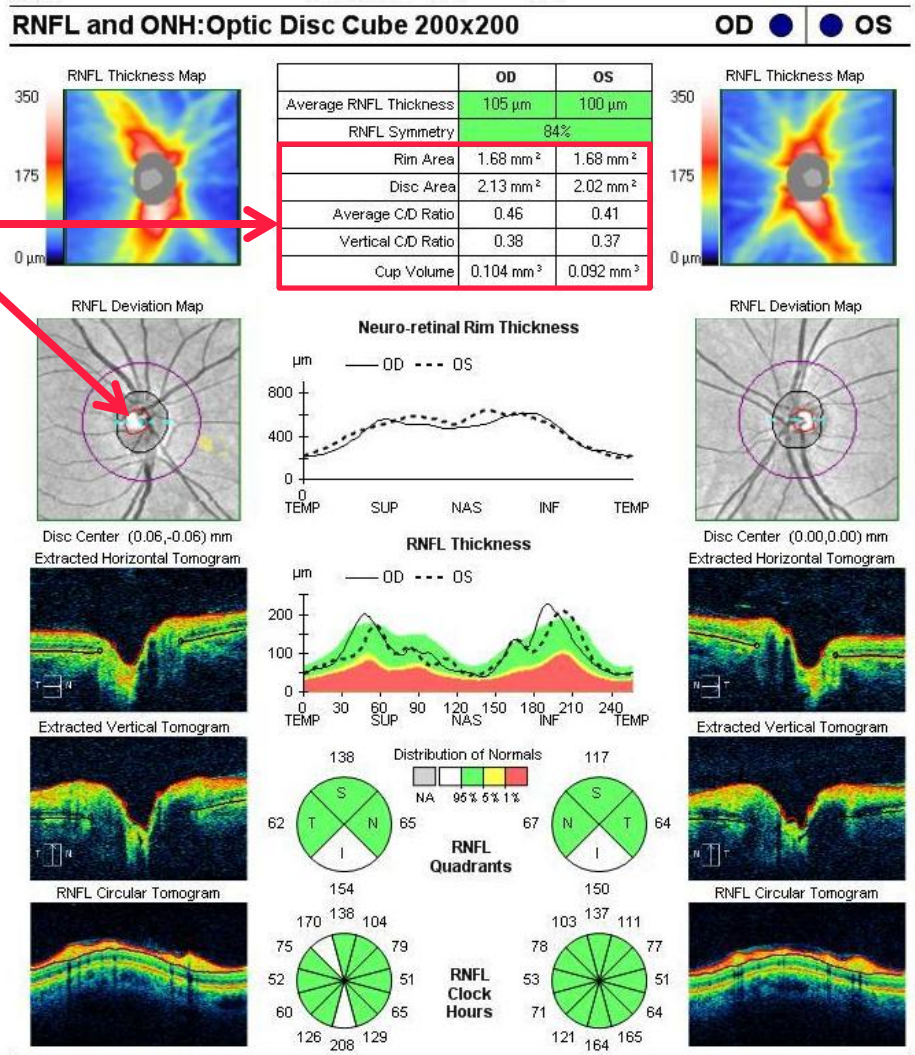
BR +2



BR +8

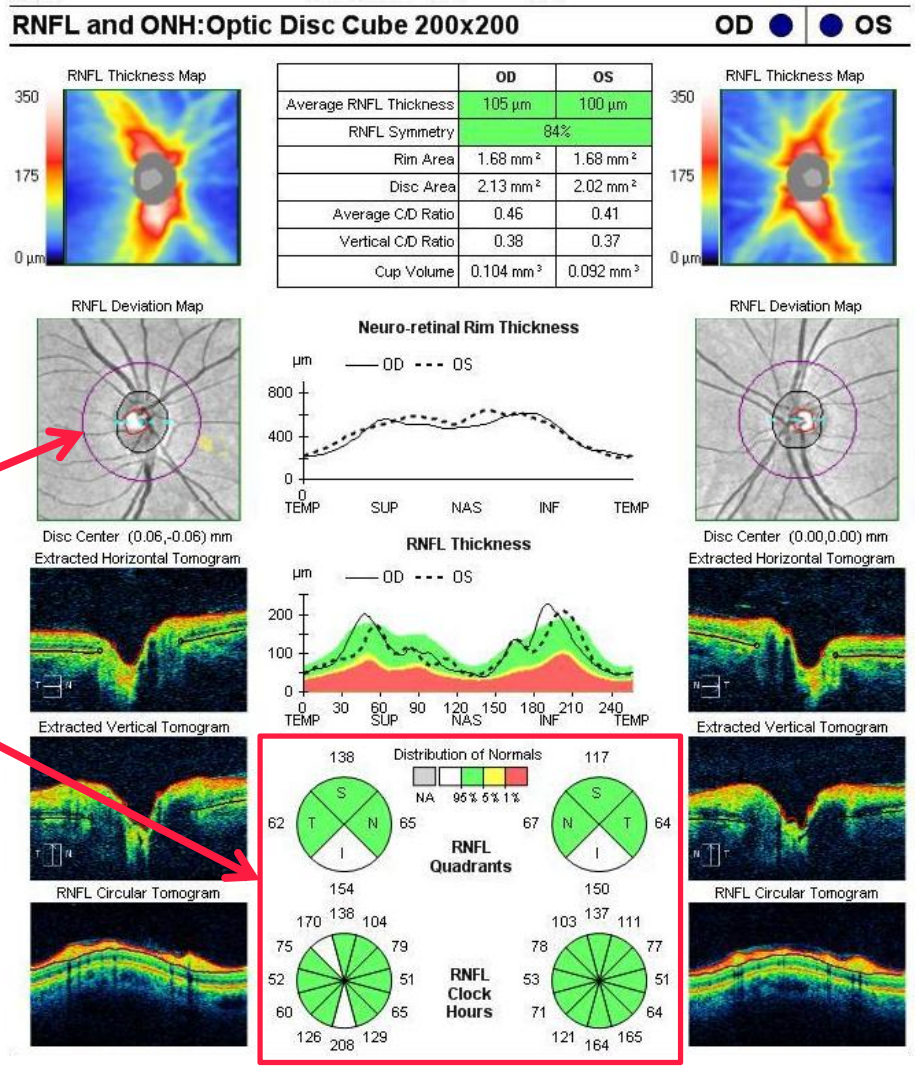
Cirrus HD-OCT

- Optic Disc Parameters

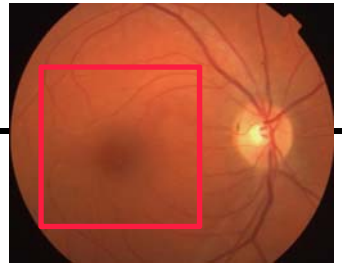


Cirrus HD-OCT

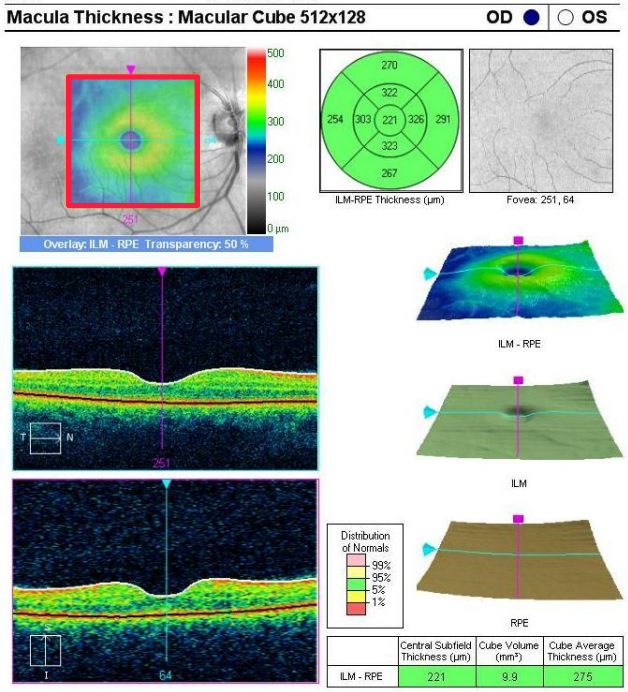
- Optic Disc Parameters
- RNFL thickness

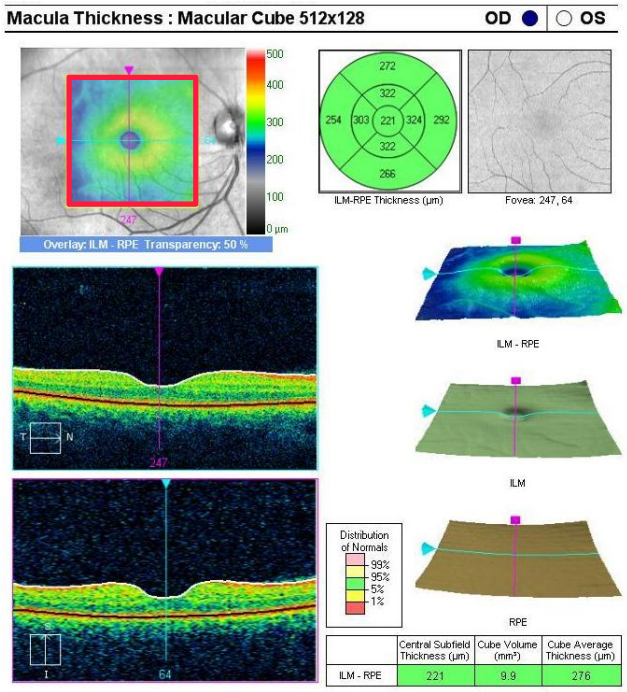


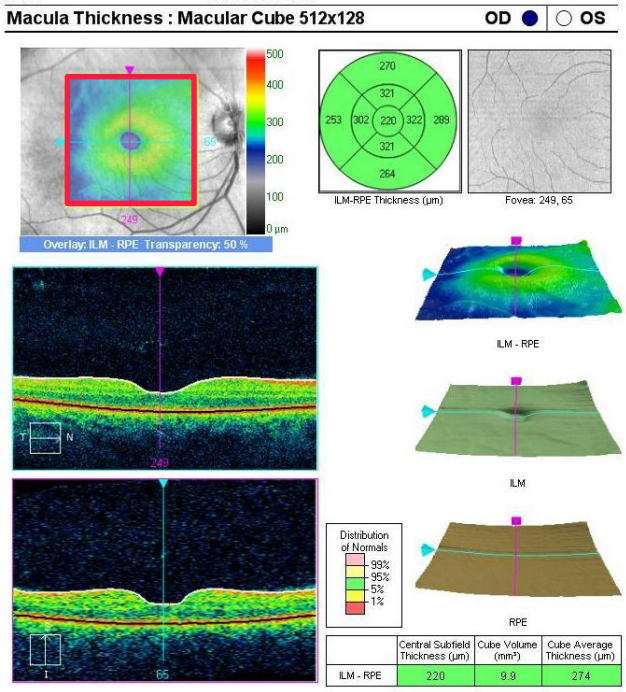
Cirrus HD-OCT



- Macular Scan



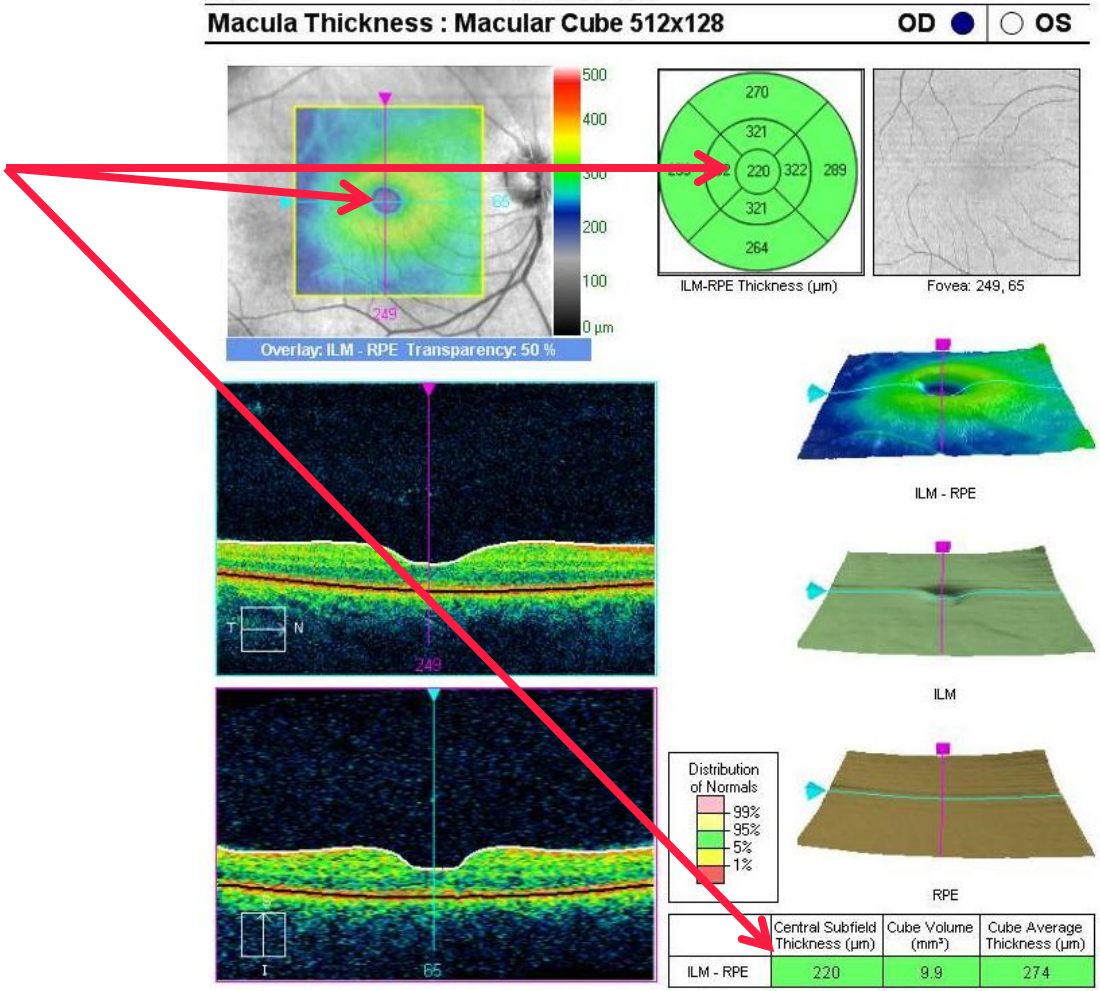




BR -12 **BR +2** **BR +8**

Cirrus HD-OCT

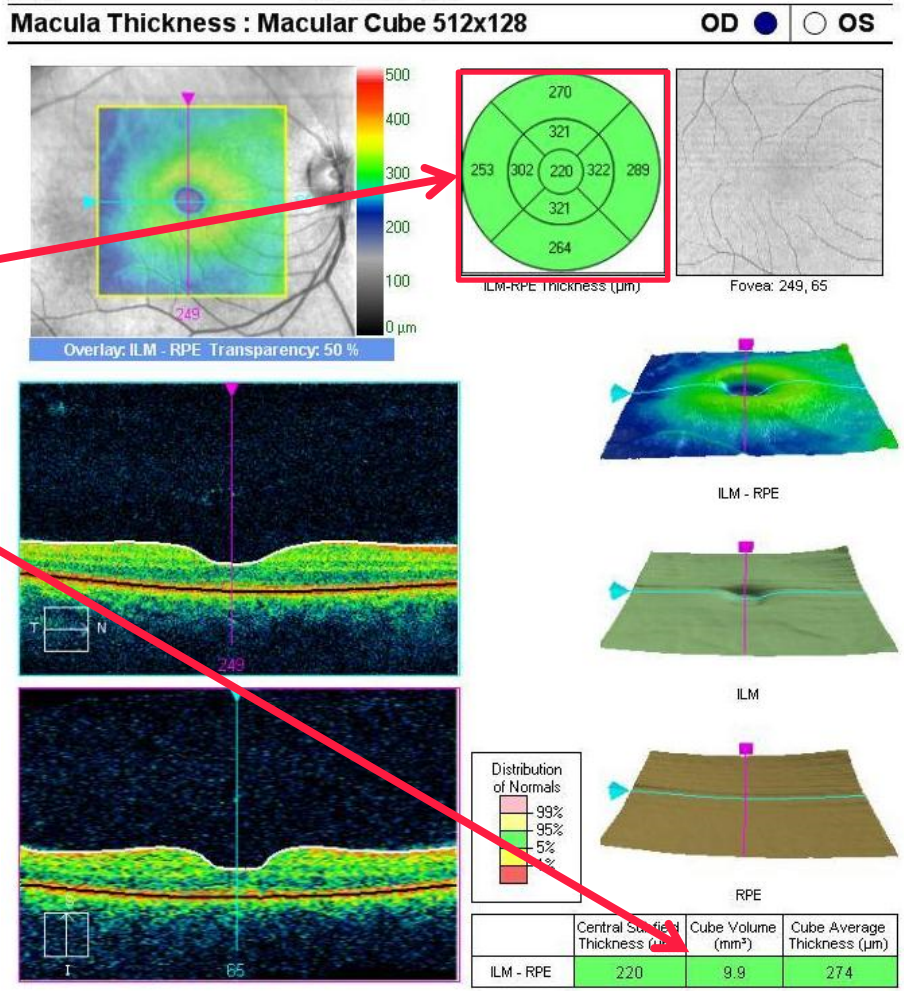
- Macular Scan
- Macular Thickness



Cirrus HD-OCT

- Macular Scan

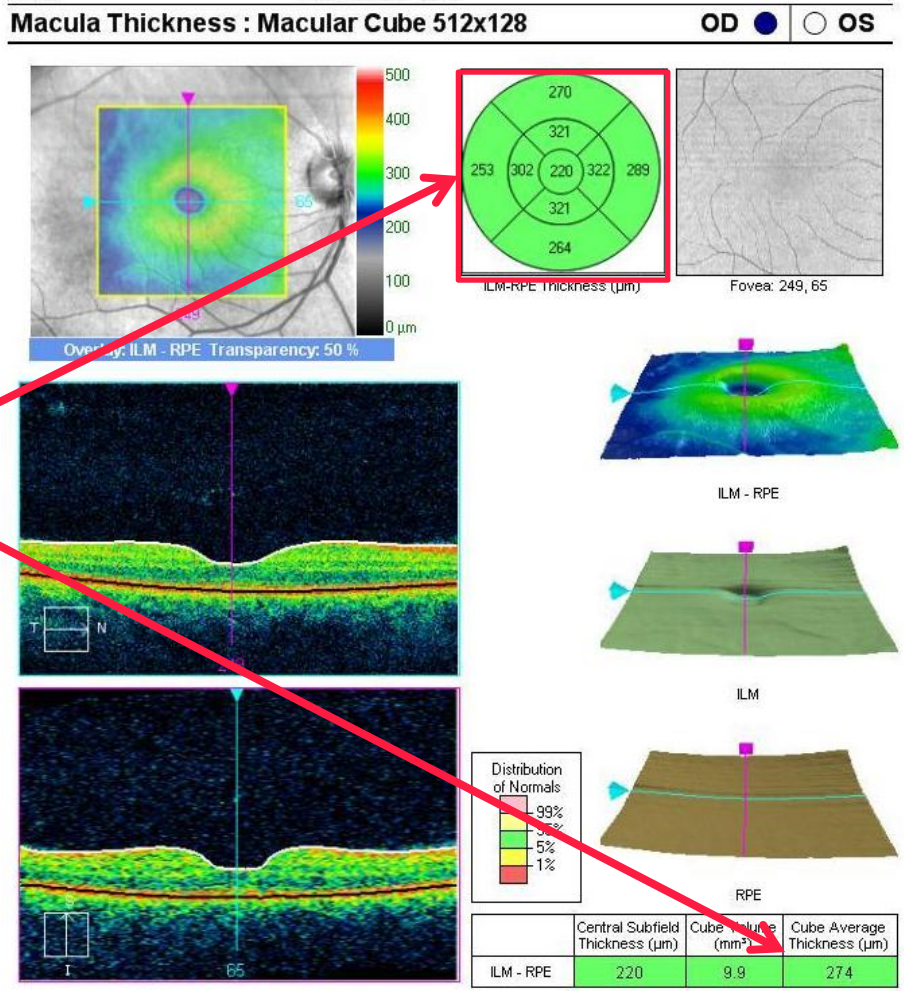
- Macular Thickness
- Cube Volume



Cirrus HD-OCT

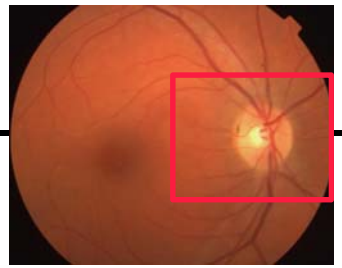
- Macular Scan

- Macular Thickness
- Cube Volume
- Cube Avg Thickness

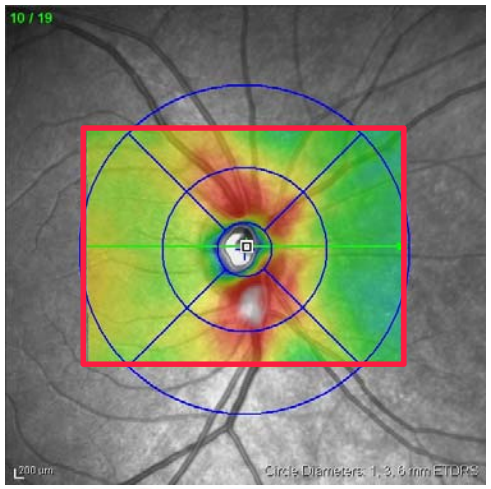


Spectralis OCT

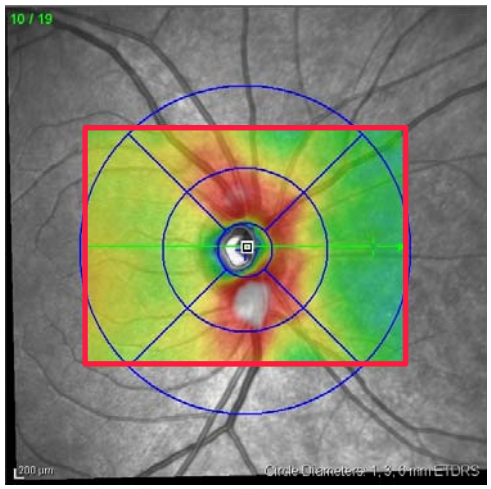
Spectralis OCT



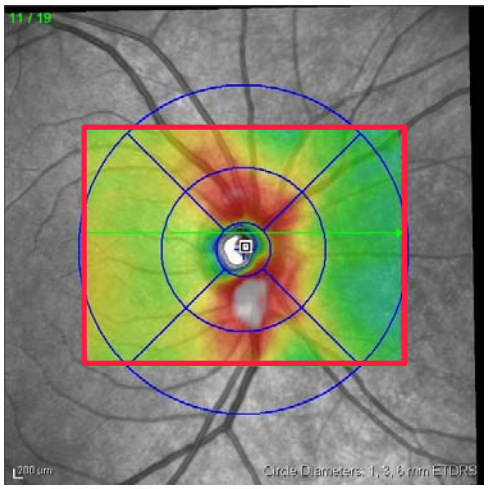
- Optic Disc: Volume Scan



BR -12

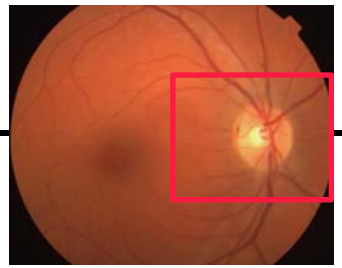


BR +2

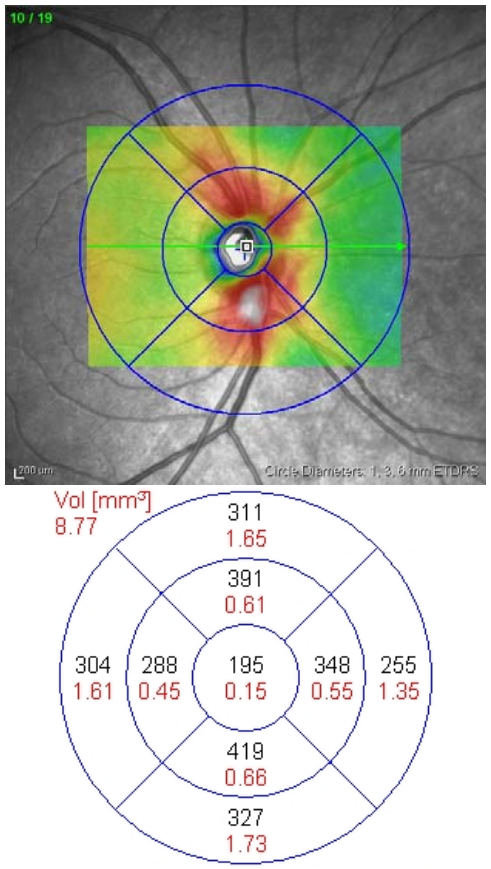


BR +8

Spectralis OCT



- Optic Disc: Volume Scan



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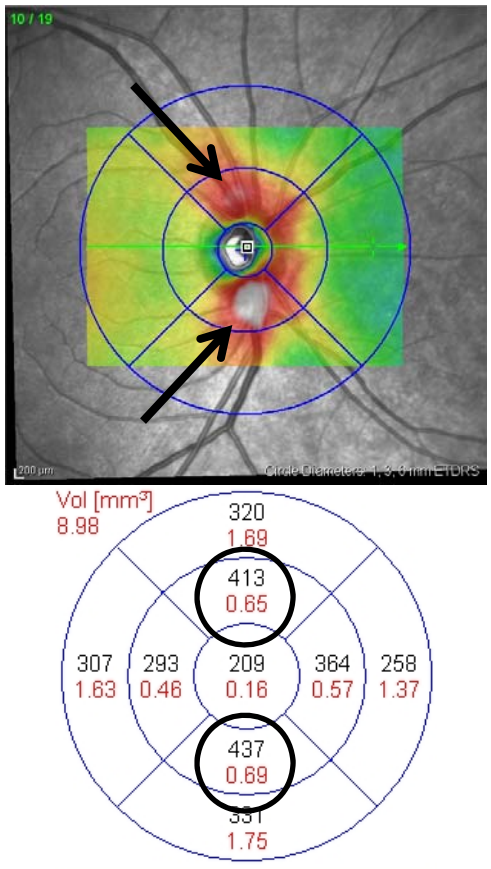
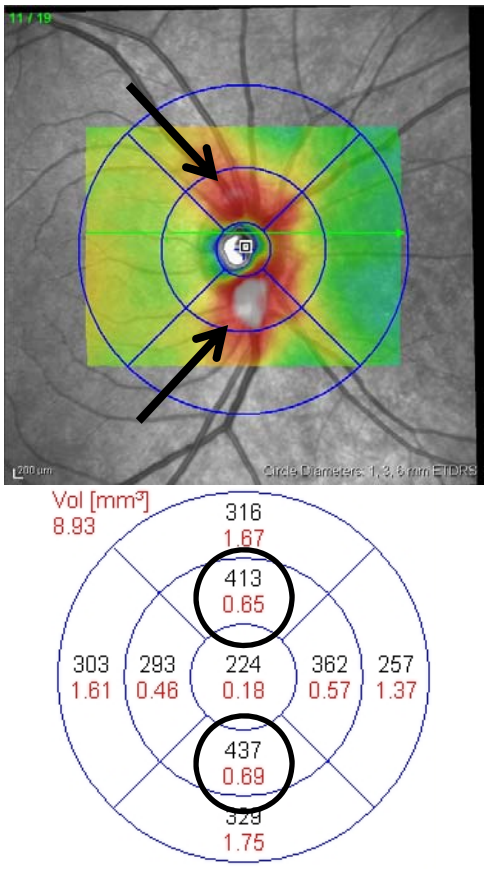


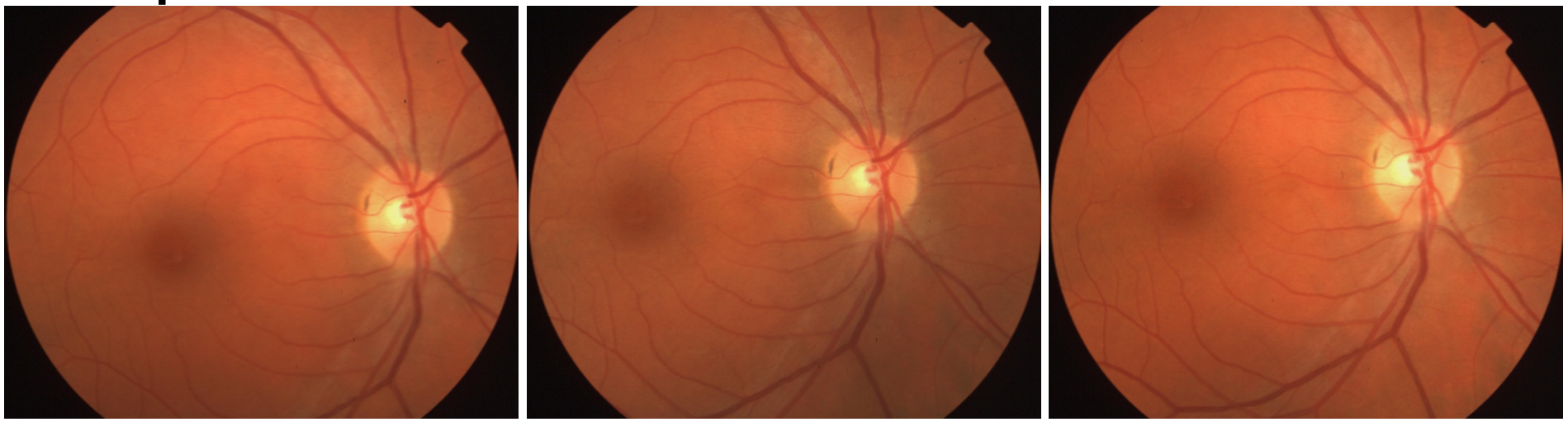
BR +2



BR +8

Spectralis OCT

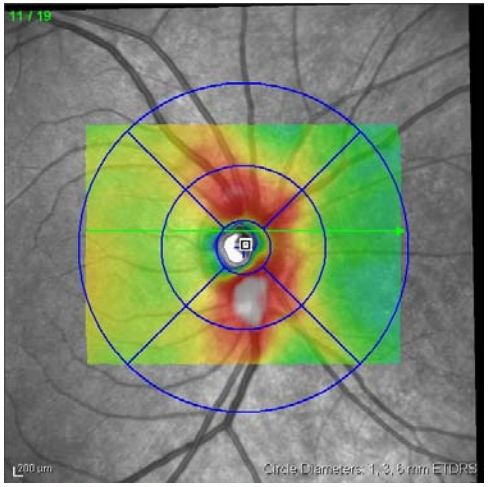
- Optic Disc: Volume Scan

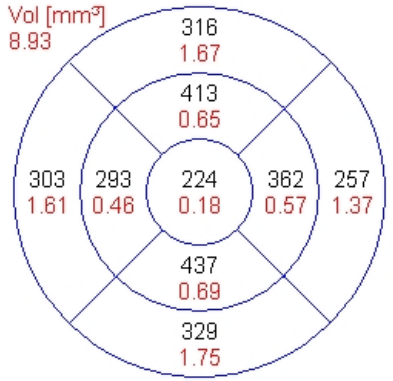


BR -12 **BR +2** **BR +8**

Spectralis OCT

- Optic Disc: Volume Scan

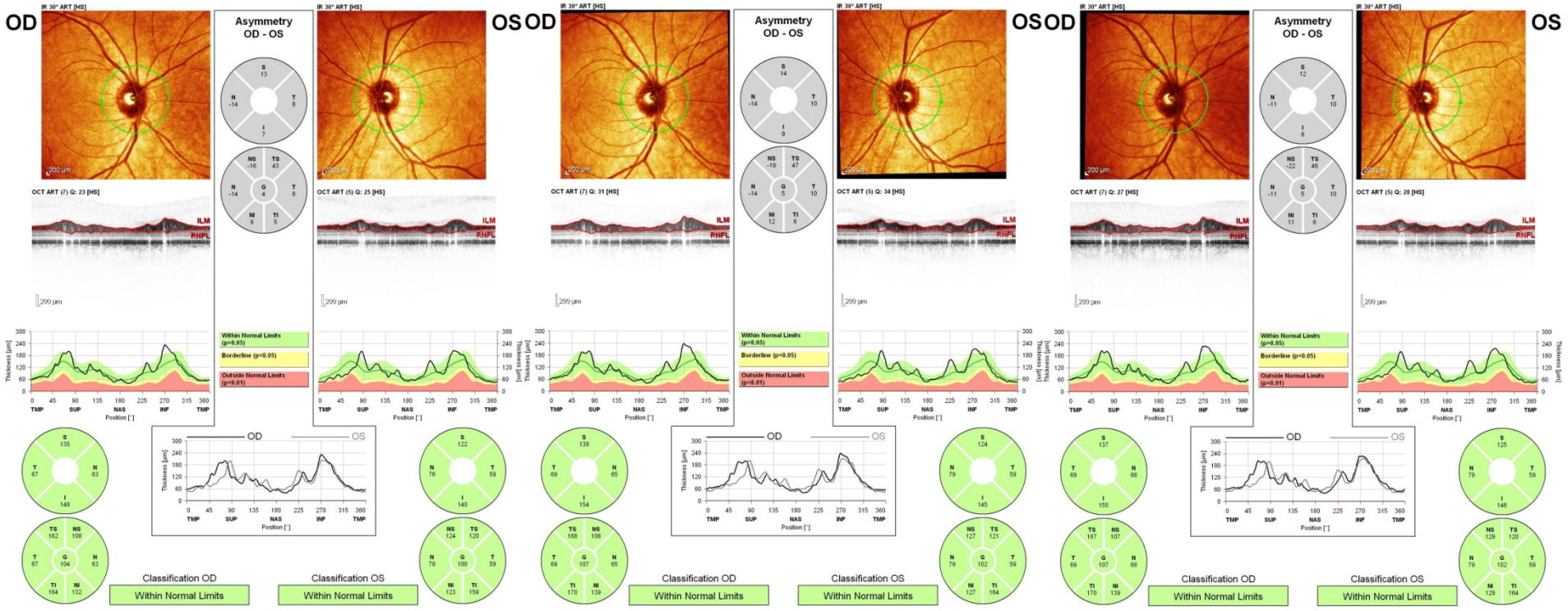




- Retinal thickness
- Retinal volume

Spectralis OCT

- Optic Disc: Circular Scan

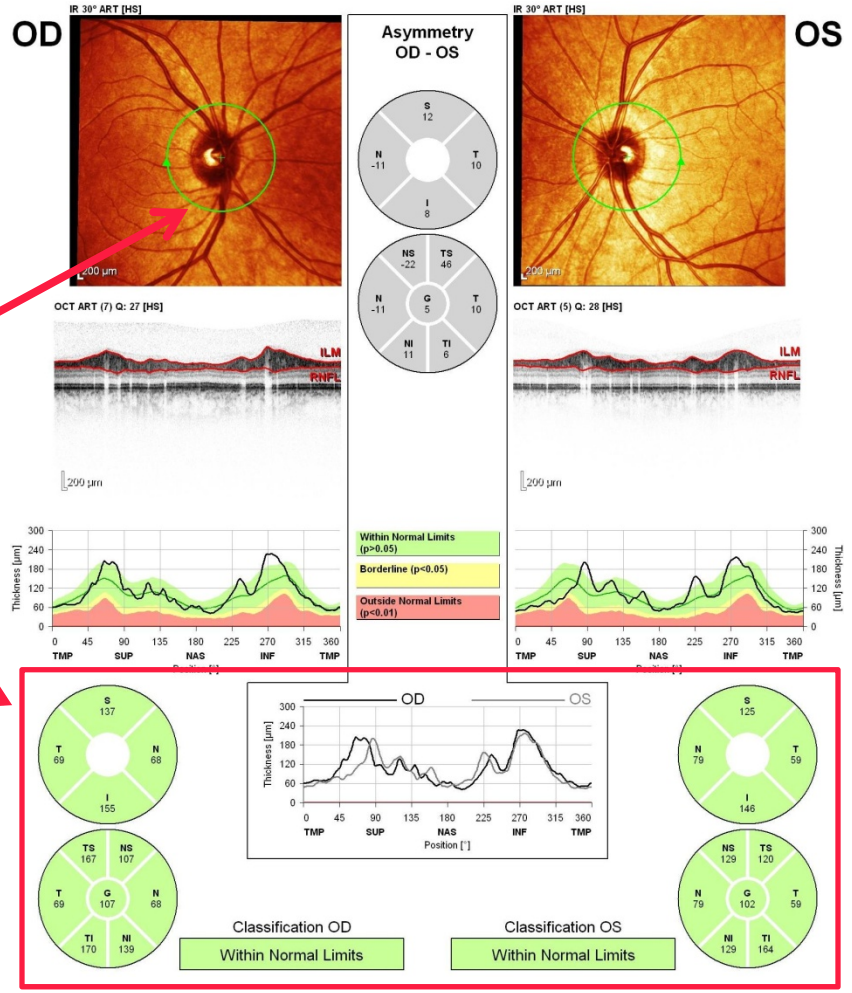


BR -12 **BR +2** **BR +8**

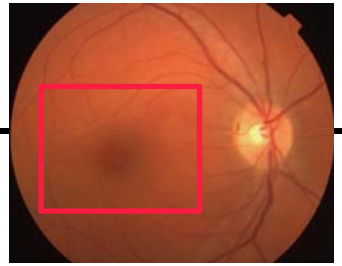
Spectralis OCT

- Optic Disc: Circular Scan

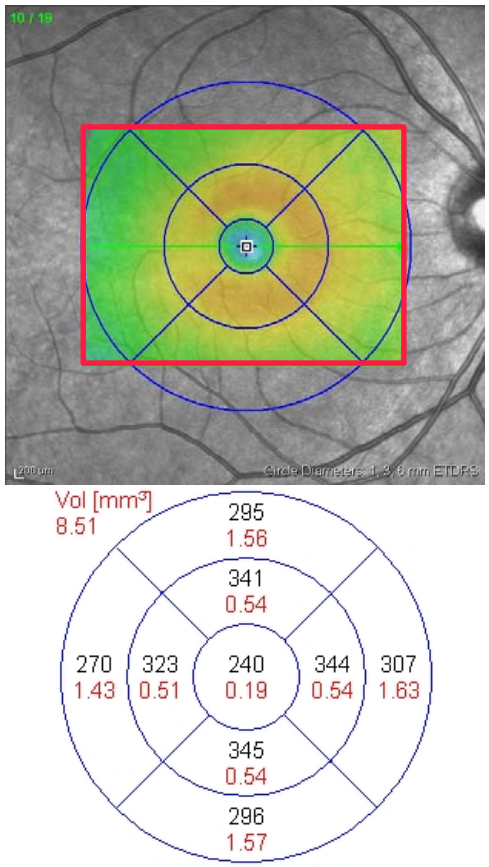
- RNFL thickness



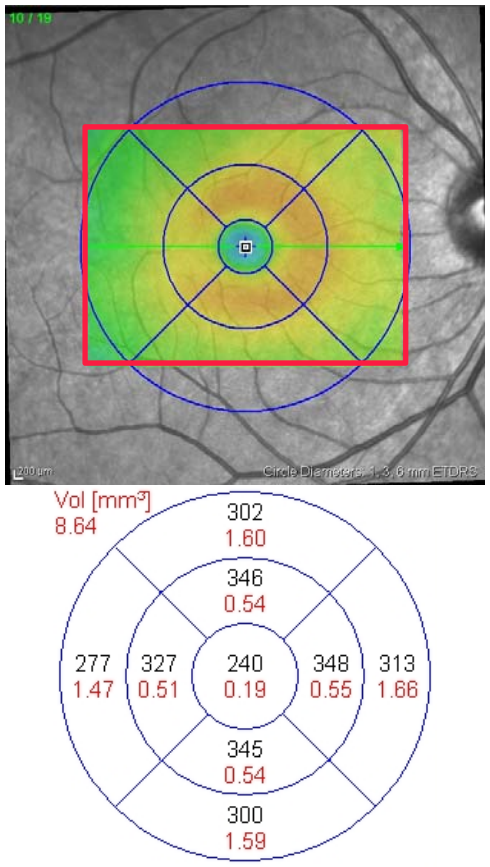
Spectralis OCT



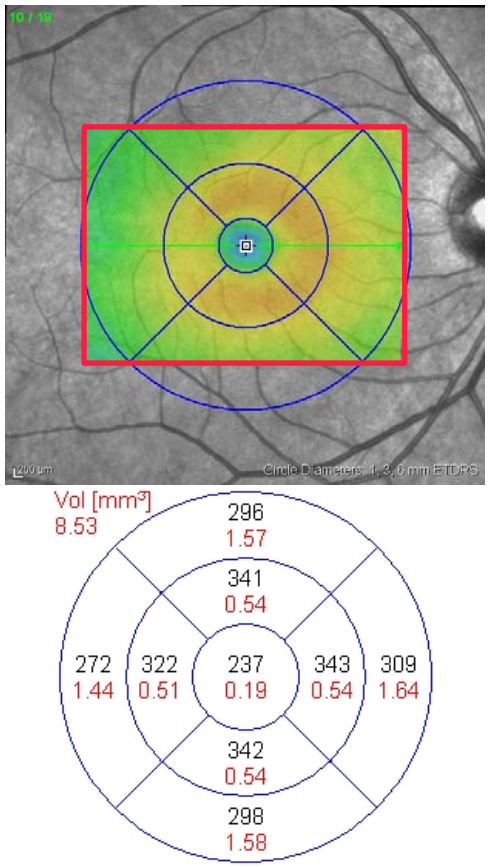
- Macula: Volume Scan



BR -12



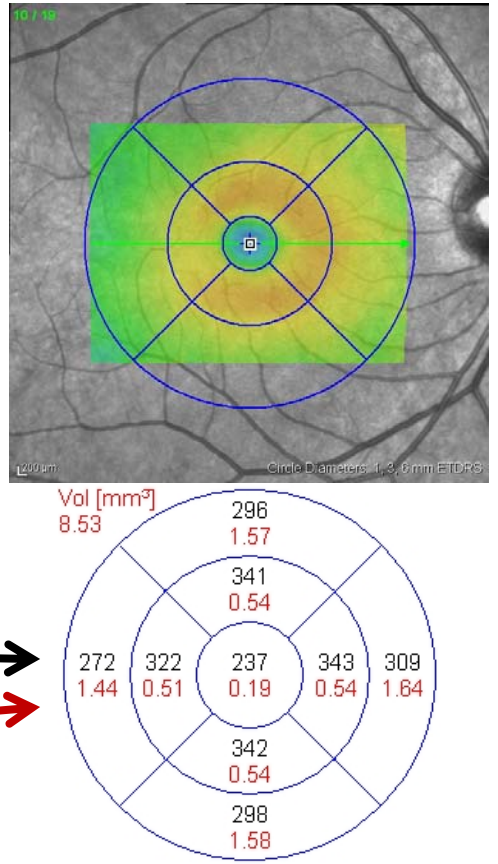
BR +2



BR +8

Spectralis OCT

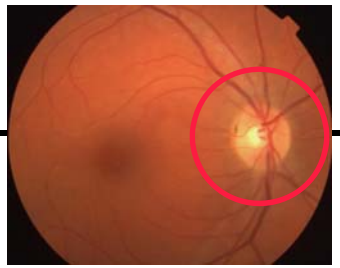
- Macula: Volume Scan



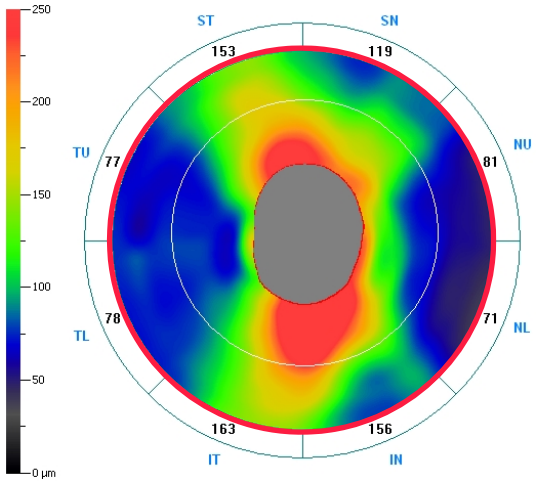
- Retinal thickness
- Retinal volume

iVue OCT

iVue OCT

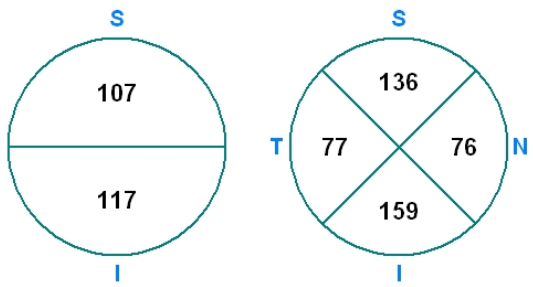


- Optic Disc Scan

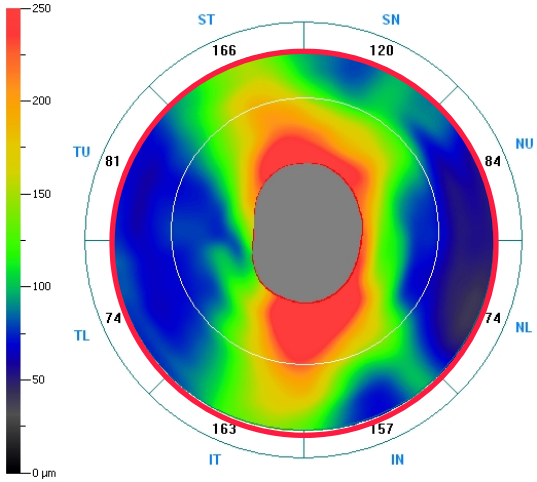


Average RNFL Thickness = 112µm

Disc Area = 2.07mm²

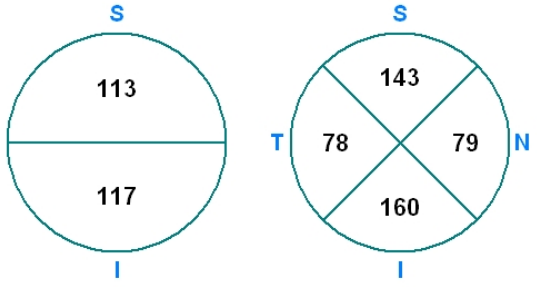


BR -12

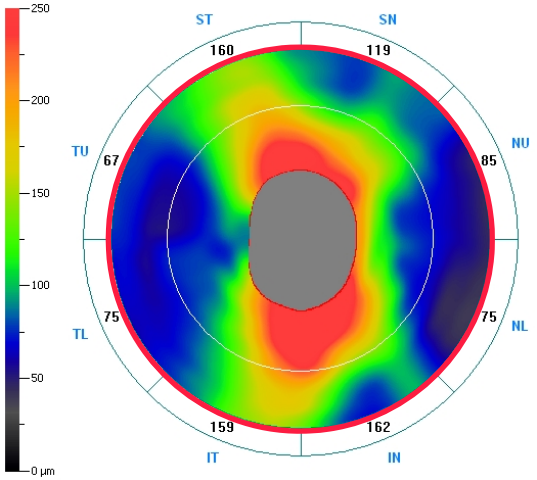


Average RNFL Thickness = 115µm

Disc Area = 2.06mm²

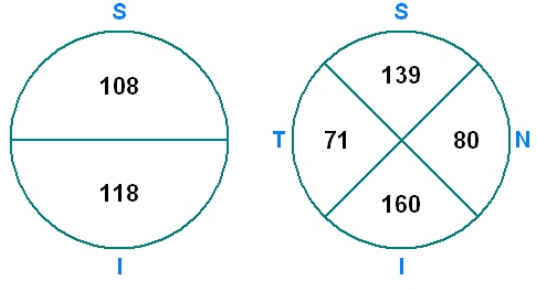


BR +2



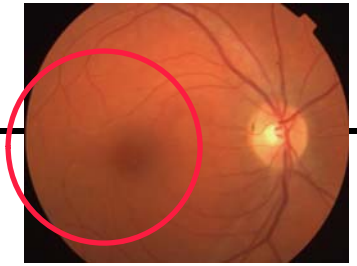
Average RNFL Thickness = 113µm

Disc Area = 2.06mm²

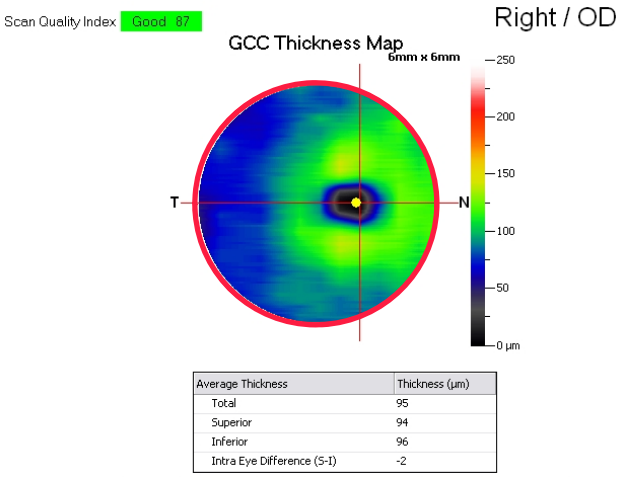


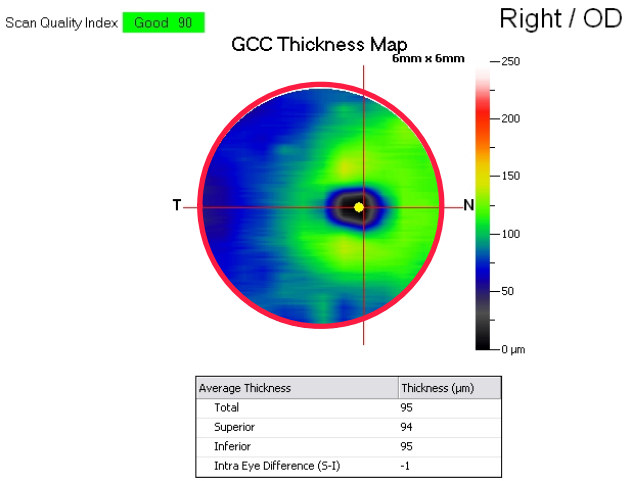
BR +8

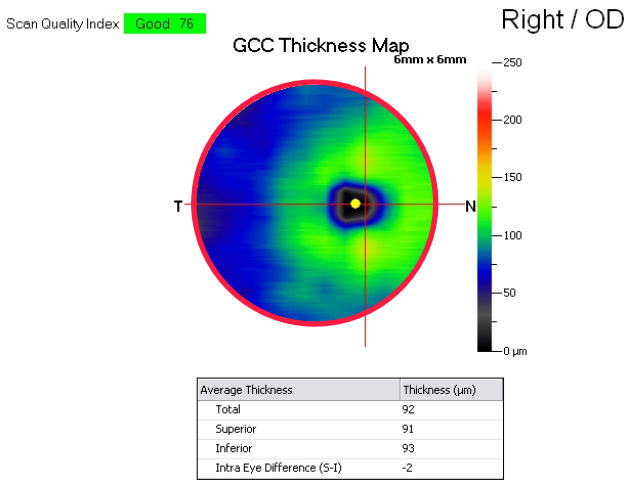
iVue OCT



- Ganglion Cell Complex Scan

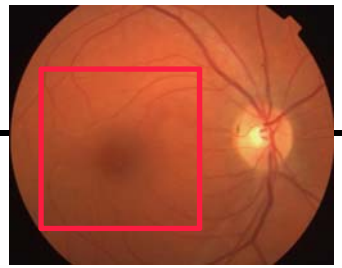




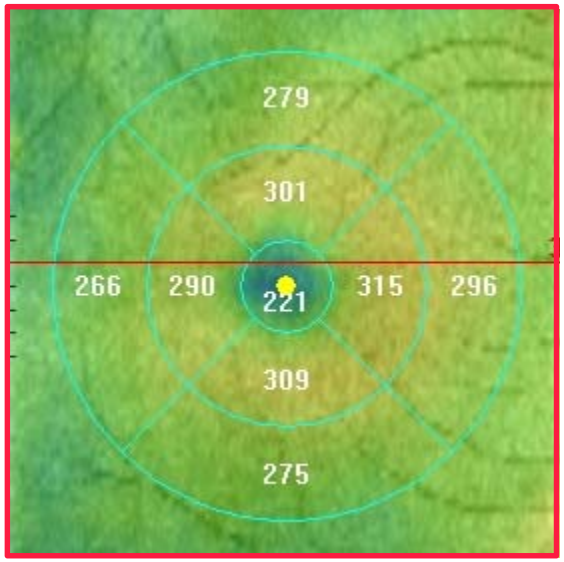


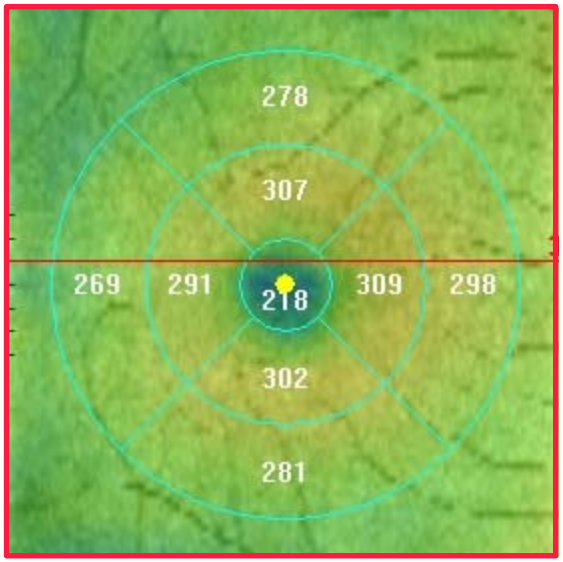
BR -12 **BR +2** **BR +8**

iVue OCT



- Macular Scan





BR -12 **BR +2** **BR +8**

Conclusions

- Surveillance study (DSMB)
- ALL visual function tests: WNL
- NO clinically relevant changes observed
- As per DSMB decision, C11 ocular monitoring terminated on 02/2013 (n=16)

Conclusions

- Next steps:
  - ➢ Ocular data analysis: in progress
    - 14-d vs 70-d BR (controls)
    - Effect of exercise during 70-d BR
  - ➢ Manuscripts preparation: in progress
  - ➢ Cardio BR study (pre/post: OCT, IOP)
  - ➢ Effects of BR + CO_2 (NSBRI Grant)

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