

# High speed fundus photography or optical coherence tomography angiography - which one is better for non-invasive capillary perfusion maps and velocity measurements?

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ARVO Annual Meeting Abstract | September 2016

# High speed fundus photography or optical coherence tomography angiography – which one is better for non-invasive capillary perfusion maps and velocity measurements?

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## Abstract

**Purpose :** To compare the non-invasive capillary perfusion maps and velocity measurements between the Retinal Function Imager (RFI) and versus spectral domain optical coherence tomography angiography (OCTA) using the AngioVue.

**Methods :** Fifteen healthy normal subjects were included in the study. Patients with a corrected distance visual acuity of less than 20/30, refractive error greater than +/- 4 D or any ocular or systemic abnormality were excluded. After dilatation they underwent macular imaging on the RFI and AngioVue. The enface capillary perfusion maps were compared between the two devices.

The 20 degree, 35 degree and 50 degree scans on the RFI were compared to the 3x3 mm (equivalent to 14.3 degree), 6x6 mm (equivalent to 28.6 degree) and 8x8 mm (equivalent to 38.1 degree) maps on the AngioVue. The

outstanding question of which imager provides higher quality angiography-like maps was resolved by direct comparison of the results of each eye using both imaging systems.

For velocity measurements the automated analysis of the RFI gave us the flow velocity in mm/sec for each segment of vessel. The same measurements are not available on the AngioVue.

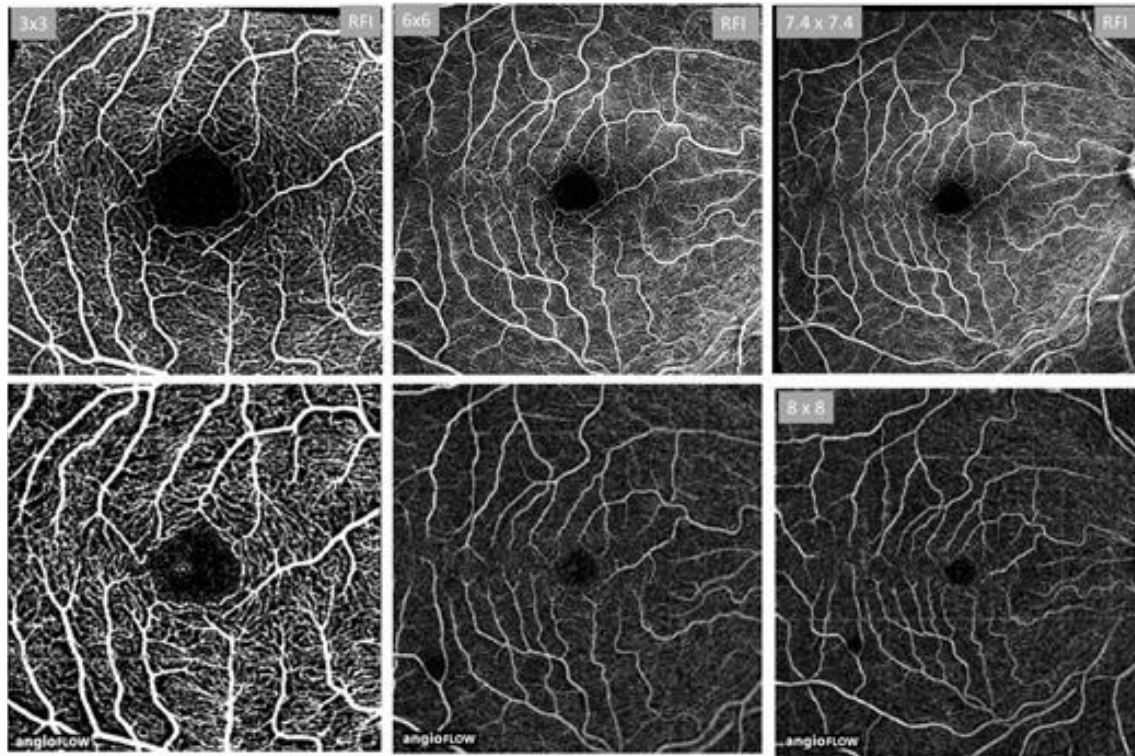
**Results :** All images were processed equally to achieve comparable and optimal quality. Figure 1 shows the comparison between the RFI and Angiovue for field of view, flank size, retinal area imaged, pixel resolution and number of images required to cover 100 mm<sup>2</sup>. Figure 2 demonstrates the quality of RFI images (resolution and field) in comparison to that of AngioVue. The average velocity obtained for arterioles was  $3.9 \pm 0.7$  mm/sec and for venules it was  $3.1 \pm 0.5$  mm/sec on the RFI.

**Conclusions :** The RFI offers a wider field of view with a higher pixel resolution in comparison to the AngioVue. Since the 35 degree image gives a large field of view, two images are adequate enough to completely image the posterior pole with an excellent pixel resolution.

This is an abstract that was submitted for the 2016 ARVO Annual Meeting, held in Seattle, Wash., May 1-5, 2016.

| Field of View in degrees |          | Flank size in mm |          | Retinal area imaged in mm square |          | Pixel resolution pixels/degree |          | Number of images required to cover 100 mm <sup>2</sup> |          |
|--------------------------|----------|------------------|----------|----------------------------------|----------|--------------------------------|----------|--|----------|
| RFI                      | Angiovue | RFI              | Angiovue | RFI                              | Angiovue | RFI                            | Angiovue | RFI  | Angiovue |
| 20.0                     | 14.3     | 4.2              | 3.0      | 17.6                             | 9.0      | 51.2                           | 21.3     | 5.7  | 11.1     |
| 35.0                     | 28.6     | 7.4              | 6.0      | 54.0                             | 36.0     | 29.3                           | 10.6     | 1.9  | 2.8      |
| 50.0                     | 38.1     | 10.5             | 8.0      | 110.3                            | 64.0     | 20.5                           | 8.0      | 0.9  | 1.6      |

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Figure 2: Comparison of image quality between the RFI and Angiovue

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