

# Multi-Focal ERG Application Note

## Diagnosys Multi-Focal ERG

**Industry leading functional imaging for clinical private practice**

*Diagnosys LLC, the industry leader in ophthalmic electrophysiology for over thirty years, presents the first Multifocal Electroretinography (mfERG) system tailored for use in clinical private practice.*

The mfERG has been well documented to aid in the diagnosis and monitoring of retinal disorders, hereditary diseases and drug toxicity.

## Clinical Applications

- Retinotoxic Drug Screening: mfERG is the only preferred functional test for plaquenil screening<sup>1</sup> and has been shown to detect toxicity before other preferred methods.<sup>2</sup>
- Age-related Macular Degeneration: Physicians can now visualize functional degradation that has been shown to predict drusen progression.<sup>3</sup>
- Diabetic Retinopathy: Functional delays seen with mfERG testing can precede structural damage, allowing physicians to intervene in patient care before permanent damage occurs.<sup>4</sup>

## Diagnosys Objective Functional Imaging

- Most sensitive objective functional test for maculopathy
- Aids in streamlined patient care with simplistic interpretation
- Correlates functional test results with structural tests such as OCT and fundus photography
- Increases sensitivity and specificity in the diagnosis of maculopathies when combined with other diagnostic tests
- Maximize patient flow with quick and easy protocols
- Includes normative data



E<sup>3</sup> Desktop mfERG system



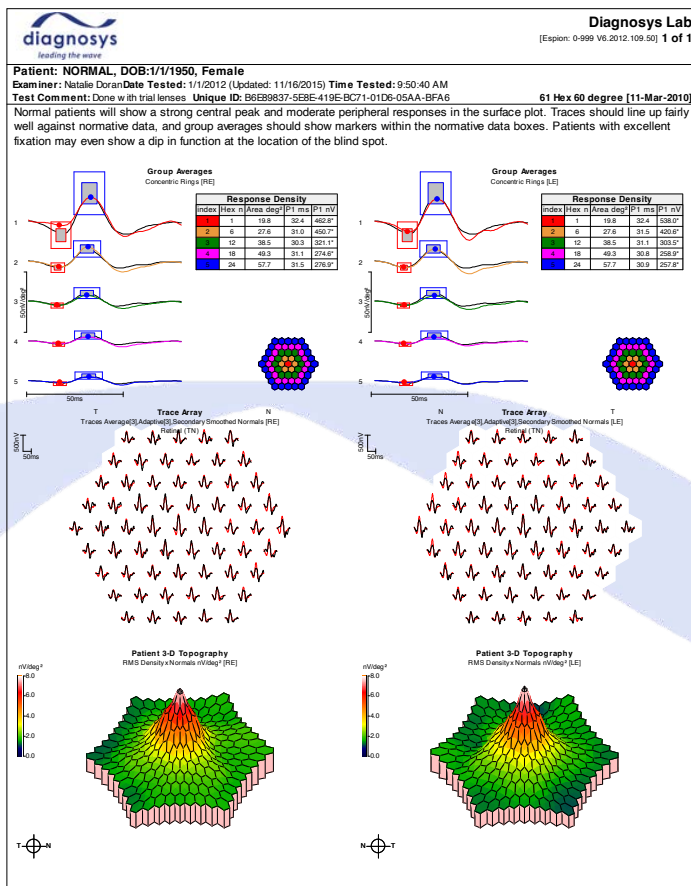
Profile™ Power  
Lift Cart mfERG system

# Plaquenil Toxicity

## What the Experts Say

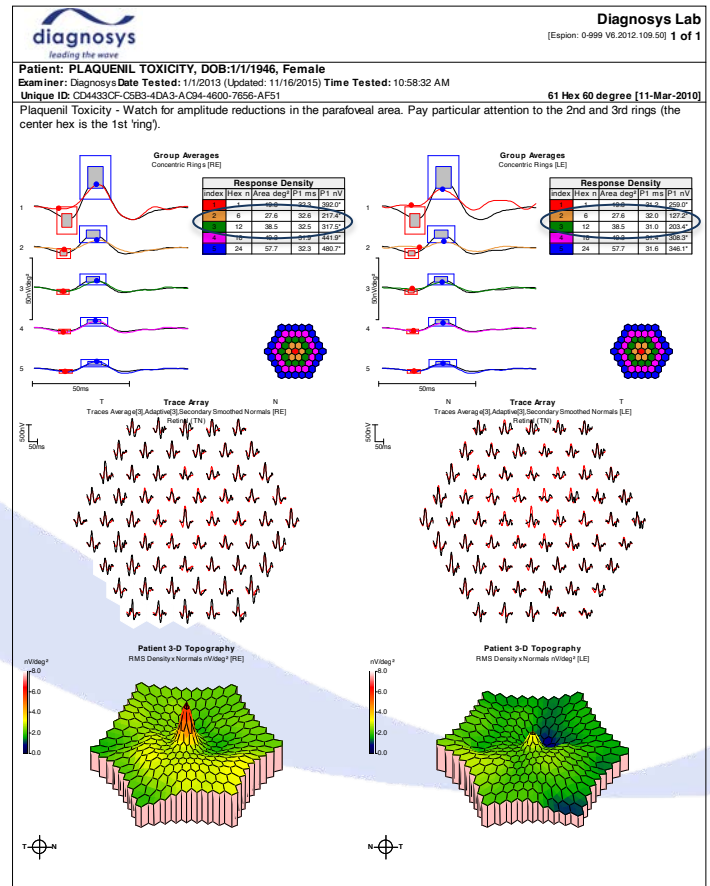
- Only 54.8% of patients receive appropriate evaluation for hydroxychloroquine screening.<sup>1</sup>
- mfERG may have the ability to detect cases of toxicity earlier than other modalities.<sup>2</sup>
- Updated American Academy of Ophthalmology screening guidelines for plaquenil toxicity specifically recommends multifocal ERGs as they “objectively evaluate function and can be used in place of visual fields”<sup>5</sup>

## Normal mfERG:



- All ring average responses within normal ranges for both amplitude and implicit time
- Trace array consistent with normative data
- 'Volcano-shaped' 3D plot represents healthy macular response with good fixation

## Plaquenil Toxicity:



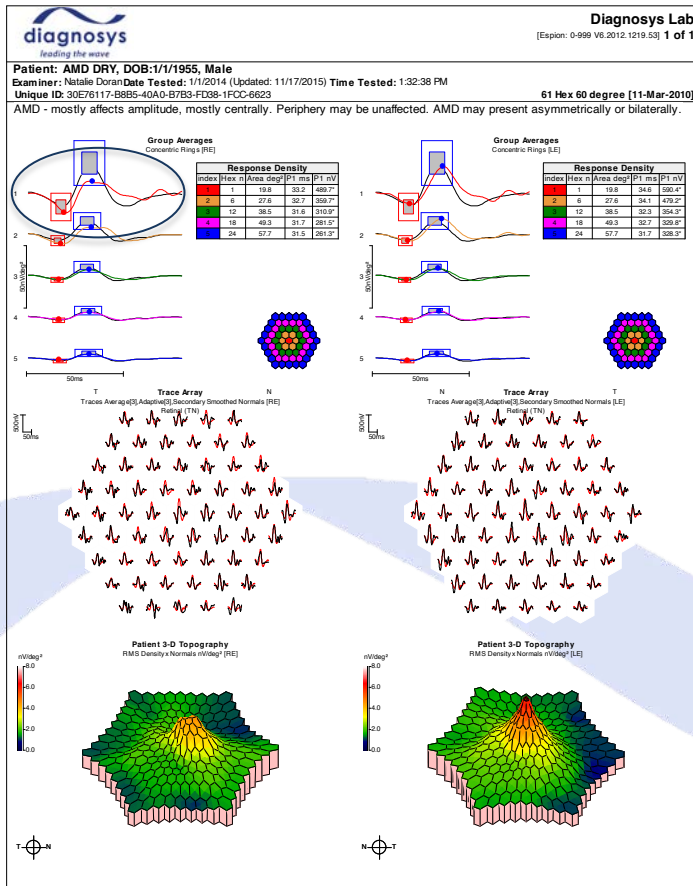
- Degradation in 2nd ring response OU demonstrates paracentral functional loss found in bull's-eye maculopathy
- Parafoveal functional degradation illustrated by trace arrays and 3D plots allows practitioners to discontinue retinotoxic drugs and limit both functional and structural losses

# Age-related Macular Degeneration

## What the Experts Say

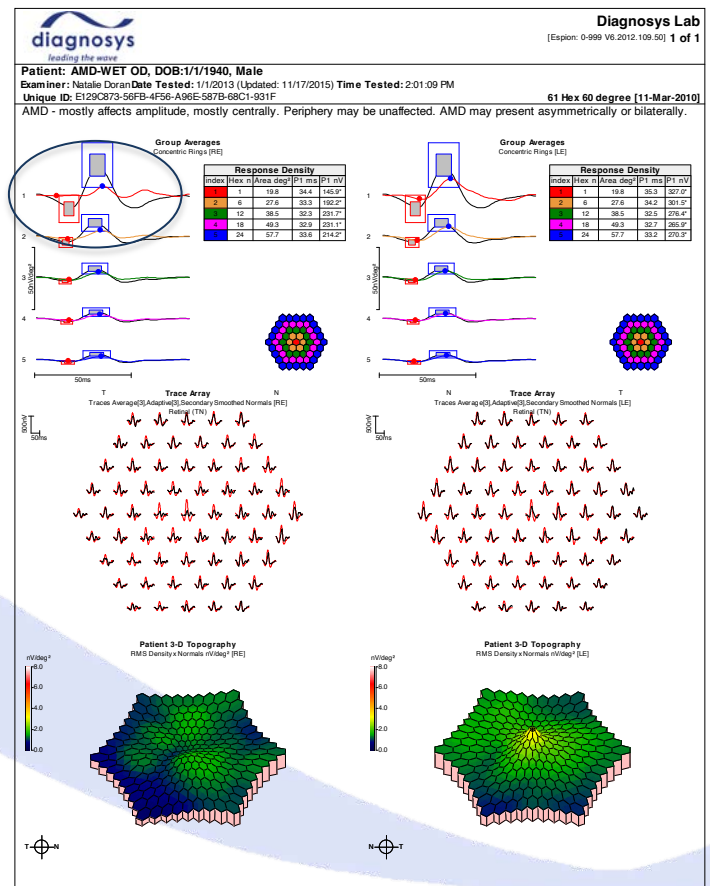
- mfERG Implicit times are shown to be an important predictor of drusen regression.<sup>3</sup>
- mfERG ... should be used more to enhance the clinical monitoring of disease progression.<sup>6</sup>

### Dry AMD:



- Degraded central response OU outside normal limits for both amplitude and implicit time
- 2<sup>nd</sup> and 3<sup>rd</sup> ring responses OU show borderline results in both trace array and group averages
- 4<sup>th</sup> and 5<sup>th</sup> ring responses OU and trace array quantify residual parafoveal function
- Absent 'volcano-shaped' 3D plot represents loss in foveal response

### Wet AMD:



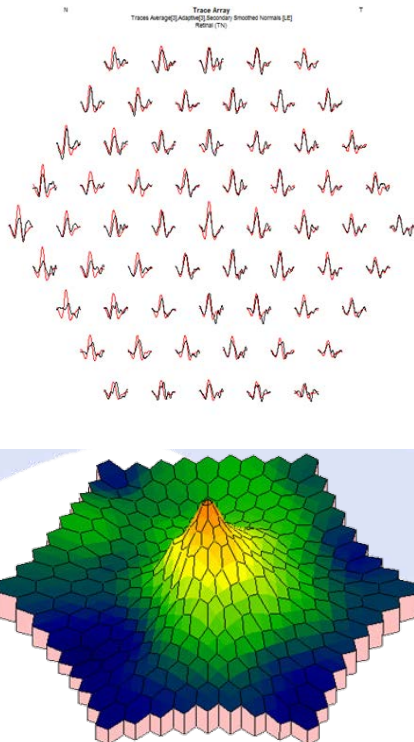
- Degraded central response OD outside normal range for both amplitude and implicit time (OS response within normal limits)
- 2<sup>nd</sup> and 3<sup>rd</sup> ring responses OD show borderline results in both trace array and group averages
- 4<sup>th</sup> and 5<sup>th</sup> ring averages and trace arrays OU validate and quantify residual parafoveal function
- Absent 'volcano-shaped' 3D plot represents total loss in foveal functional response OD

# Diabetic Retinopathy

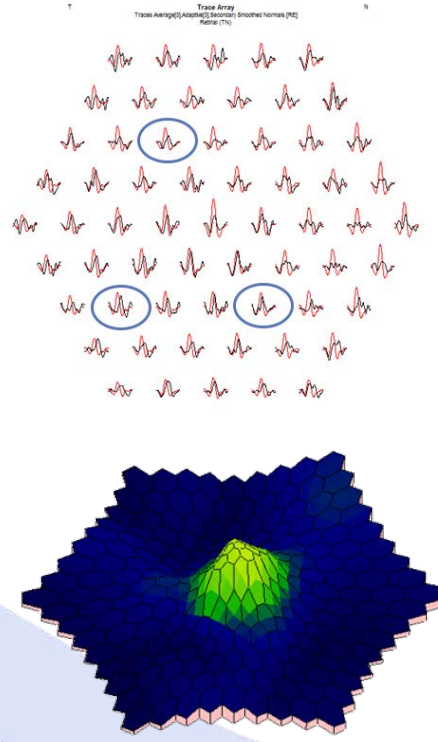
## What the Experts Say

- Localized functional abnormalities of the retina reflected by mfERG delays often precede the onset of new structural signs of diabetic retinopathy (DR).<sup>4</sup>
- mfERG implicit time provides clinicians a powerful tool to screen, follow up, and even consider early prophylactic treatment of the retinal tissue in diabetic patients.<sup>7</sup>

## Non-Proliferative DR:



## Proliferative DR:



- Trace array and 3D plot OU provide geographic evidence of retinal dysfunction that may precede vascular changes
- Trace array and 3D plots illustrate clear functional degradation OU compared against normative data and non-proliferative cases, as well as geographic evidence of retinal dysfunction
- Trace arrays more important than group averages as averages may hide latency shifts
- Changes in latency - particularly of the PI peak - are the hallmark of diabetic retinopathy

### References:

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