

# FACT: Enhanced diagnostic services: Quality of care. Quality of life.

## The Challenge:

*"The literature is replete with studies underscoring the close relationship between ocular ischemia and cerebrovascular disease. As eye care professionals, we are in a unique position to diagnose the eye's vascular disease, which then obligates us to continue searching for the associated vascular disease of the brain. Our offices have numerous technologies for examining the eye, but very few can determine the health of the blood supply to the brain."*

### **James L. Johnston, Jr., D.O.**

*Ophthalmology/Neuro-Ophthalmology  
Past President, Summit County Medical Society  
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## Why TCD?



**Enhanced  
patient  
experience**



**Proven clinical  
value**



**Easily  
integrated**



**Non-  
disruptive**



**No cost for  
implementation**



**Consistent  
with goals  
of medicine:  
saves lives**

## Research Turned Early Skepticism into Enthusiastic Advocacy

**Our Experience:** In recent years, many ophthalmic practices have integrated this testing protocol for patients with medical histories significant for Cerebral Vascular Disease. Before incorporating this technology clinically, I had many questions regarding its role in patient care and set out to find as many answers as I could.

**Our Process:** Initially, our doctors sought out the opinions of a variety of Ophthalmologists who were already using TCD in their practices and read the resource materials provided by HealthXMD.

**Our Decision:** Next, I also reviewed the current online literature and later, attended the 43rd Annual Meeting of The American Society of Neuroimaging. After performing our due diligence, we decided as a practice to proceed with the TCD program with the idea that early detection of otherwise elusive eye and brain disease would be of benefit to our patients.

# Research Made Clear that there are a number of questions shared by all physicians regarding TCD:

## What is TCD?

TCD is a non-invasive ultrasound test that looks at blood flow in the major arteries of the brain and can identify early warning signs for stroke and eye diseases such as glaucoma. Early detection of these disease states allows for early intervention to prevent irreversible neurological harm and permanent vision loss.

## Who should have TCD?

Individuals who are at high risk for stroke and eye disease are recommended for TCD testing. Ophthalmologic practices commonly identify for patients with general medical disorders that can result in cerebral vascular insufficiency such as Diabetes Mellitus, Hypertension, and Hyperlipidemia as well as patients with histories of prior Cerebral or Pre-cerebral Vascular Occlusive diseases such as prior CVA, heart or carotid stents, and peripheral vascular disorders. Eye specific indications include:

- Amaurosis Fugax
- Diplopia
- Exudative AMD
- Sudden Loss of Vision
- Homonymous Visual Field Defects
- Glaucoma
- Retinal Vascular Occlusions
- Retinal Ischemia
- Retinal Neovascularization

## What should I say to patients that I am recommending for TCD testing?

Patients are reminded that they are in a high risk factor group for stroke and eye disease based on their past medical history.

For more information about TCD from HealthxMD, please contact:

**Ken Metzler (631) 291-6562**

\*The incidence of positive findings is dependent on patient populations and inclusion criteria used. Your individual practice results may vary.  
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# Frequently Asked Questions

## Is TCD reimbursed?

TCD testing is safe, non-invasive, and covered by most insurance plans and Medicare/Medicaid.

## Once a patient has TCD performed, can it be repeated?

Yes. Annual repeat testing is recommended for patients in high risk groups and is covered by most insurances and Medicare/Medicaid.

## Why should I order TCD when I could just order a CT Angiogram or MRI Angiogram?

TCD is considered to be complementary to other angiogram technologies. Whereas angiograms will give a detailed look at anatomy, they give static information only. TCD by its very nature measures dynamic cardiovascular output and gives information that other technologies cannot. Specific to Ophthalmology, diminished blood flow velocities of the ophthalmic arteries represent a warning to look for eye disease, particularly Normal Tension Glaucoma.

## Is TCD a better test to order than Carotid Ultrasound?

Carotid Ultrasound certainly plays an important role in the evaluation of carotid, eye, and brain disease, however, it does not give comprehensive information about the other major cranial arteries. TCD measures flow velocities of all the major cranial arteries and also gives information about the carotid siphon.

## What do Diminished Flow Velocities of the Ophthalmic Artery signify?

This finding can be related to Hypertensive Retinopathy, Diabetic Retinopathy, or Glaucoma.

## Which medications should I choose for patients who demonstrate Diminished Flow Velocities of the Ophthalmic Arteries and show OCT and/or Visual field changes consistent with Glaucoma/Normal Tension Glaucoma?

Some literature suggests that Latanoprost may have a beneficial effect, not only for lowering intra-ocular pressure, but also in the regulation of Ophthalmic Artery blood flow.

## What percentage of positive findings might I expect with TCD?

In our review of our first 468 TCD results using the inclusion criteria described above, we found **201 total positive results or 43%**. Of these positive results, the finding of Diminished Flow Velocities of the Ophthalmic Arteries was **176 or 88%**. Total Neurologic findings were **35 or 17%**. (Note that some patients had both Ophthalmic and Neurologic findings.). Previously diagnosed cases of Glaucoma were identified in **53 patients (26%)**. New diagnoses of Chronic Open Angle Glaucoma/Normal Tension Glaucoma/Ocular Hypertension were made in **11 cases or 5.5%** of positive Ophthalmic Artery studies. Microembolization (15), Increased Velocity of Middle Cerebral Artery (16), and Abnormal VMR (4) were all identified.

## Treatments:

- **All patients underwent a detailed Glaucoma evaluation and were started on topical therapy, typically Latanoprost.**
- **For Neurological findings, Medical Management (31) or Surgical Management (4) were instituted as deemed appropriate per consultation with Internal Medicine or Vascular Surgery.**