

# Standardized Training to Improve the Quality of Screening Diabetic and Hypertension- Related Ophthalmoscopic Exams

Ashley Faye, MD, Pradeep D’Souza, DO, and Elizabeth Suniega, MD

## Background

Nearly half of adults in the United States have hypertension (30.1-31.9% in Texas), but less than 25% of these patients have well-controlled blood pressure, while almost half of these patients (totaling around 37 million people) have an average blood pressure greater than 140/90. Hypertensive retinopathy has been identified as a risk factor for stroke and cardiovascular mortality. Retinal microvascular changes in hypertensive retinopathy can be visualized on fundoscopy. Generalized retinal arteriolar narrowing and arteriovenous nicking suggest chronic hypertensive damage; while more transient effects such as focal arteriolar narrowing, retinal hemorrhages, microaneurysms, and cotton-wool spots are reflective of acute hypertensive changes.

Multiple studies suggest that signs of hypertensive retinopathy are often seen in 6-15% of non-diabetic adults age 40 or older (2). Medication nonadherence is a challenge in managing hypertension and has been shown in a recent meta-analysis to occur in about 45% of patients (6). However, retinopathy can slowly regress with improvements in blood pressure control (5).

Diabetic retinopathy (DR) affects 10.5% (about 34.2 million people) of the U.S. population and 10.9% of Texas residents. It is the leading cause of vision loss in adults between 20-74 years of age, and the prevalence of DR is 35.4% for patients with both diabetes mellitus types 1 and 2 (DM1 and DM2) (3). The most recent ADA recommendations, which were published in 2017, for diabetic eye exams include:

- Adults with DM1 should have an initial and dilated and comprehensive eye exam by an ophthalmologist or optometrist within 5 years after the onset of diabetes, and patients with DM2 should have an eye exam performed at the time of diabetes diagnosis. (B)
- If there is no evidence of retinopathy for one or more annual eye exams, then exams every 2 years may be considered but if any level of retinopathy is present, dilated retinal exams for both DM1 and DM2 should be repeated annually by either an ophthalmologist or optometrist. If retinopathy is progressing or sight-threatening, then exams will be required more frequently. (B)
- While retinal photography may serve as a screening tool for retinopathy, it is not a substitute for a comprehensive eye exam, which should be performed at least initially and at intervals thereafter as recommended by an eye care professional. (E) (4)

Data from the CDC shows that 73.6% of individuals age 18 or older with DM also have hypertension (1). On average, diabetes care costs the U.S. at least \$237 billion annually (and more than \$34 million in Texas), whereas hypertension-related care costs the U.S. about \$131 billion each year (information for Texas is currently unavailable).

Ophthalmic changes due to both hypertension and diabetes often precede other severe complications such as cardiovascular, cerebrovascular, and renovascular disease. Of note, the only anatomical location in the body where microvasculature can be directly inspected is along the retina (7). Eye exams for retinopathy allow us to assess the risk of end-organ damage from chronic diseases and manage treatments earlier, leading to vision and life-saving outcomes. Schaneman and colleagues (2010) conducted a retrospective, claims-based analysis of employed adults living in the US and found that individuals who detected a chronic disease through a routine eye exam had lower first-year health plan costs and fewer missed work days, and were less likely to terminate employment than individuals who did not detect chronic conditions early through eye exams (8)

## Objective

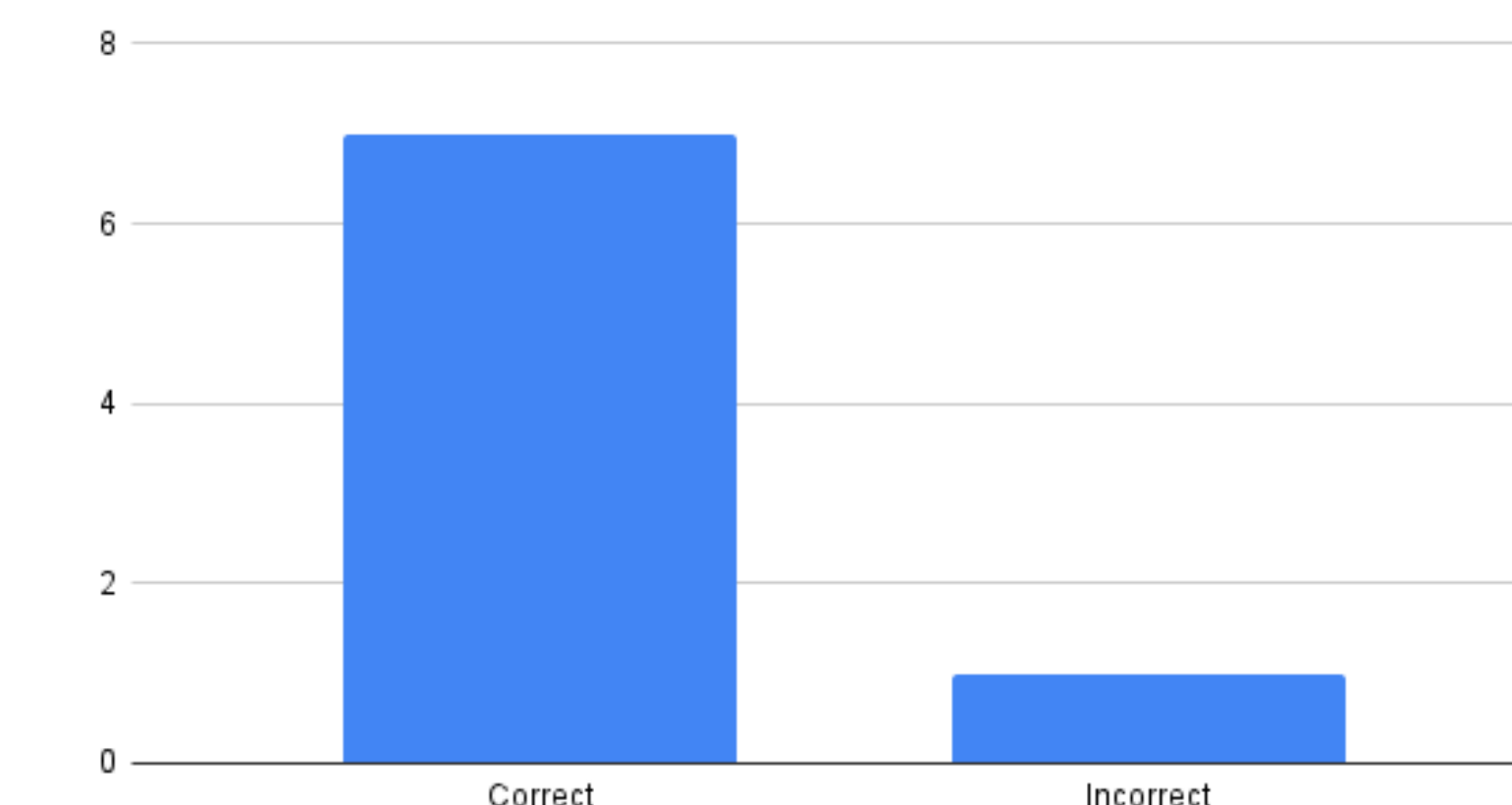
The fundamental change desired is an improvement in the quality and occurrence rate of hypertensive and diabetic eye exams in the Family Medicine Department at the Hope Clinic - Main. This project will focus on modifiable factors and include interventions to overcome these barriers. These changes will include formal knowledge and skills training regarding eye exam best practices, streamline the process for equipment and documentation, and create standardized documentation components. The external focus will stem from the production of standardized training materials that will be created for use in the intervention.

## Methods

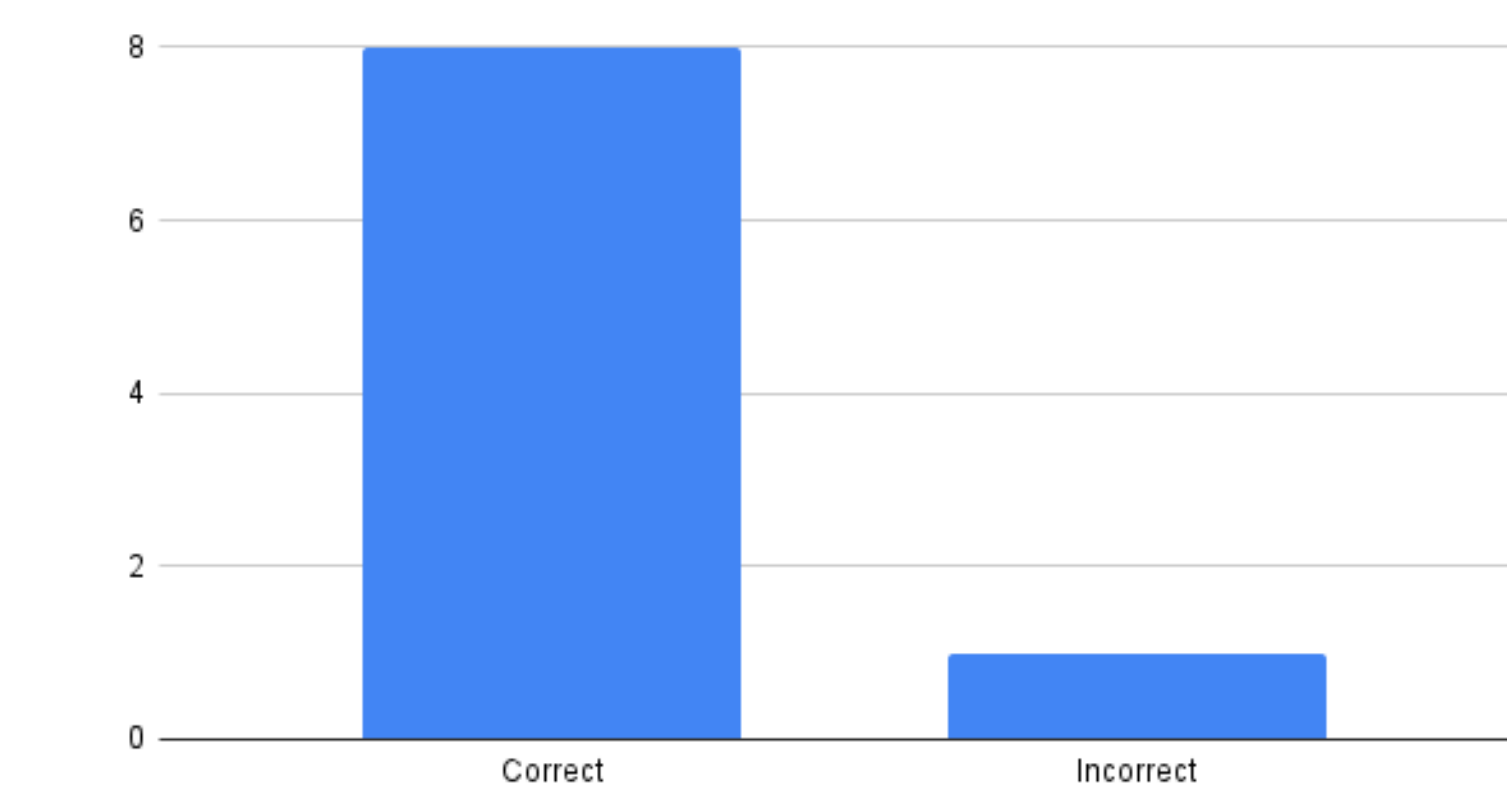
- A 2 hour workshop was held during didactics, where the first hour consisted of educations and the second hour consisted of practice.
- A pre- and post- survey was conducted

## Results

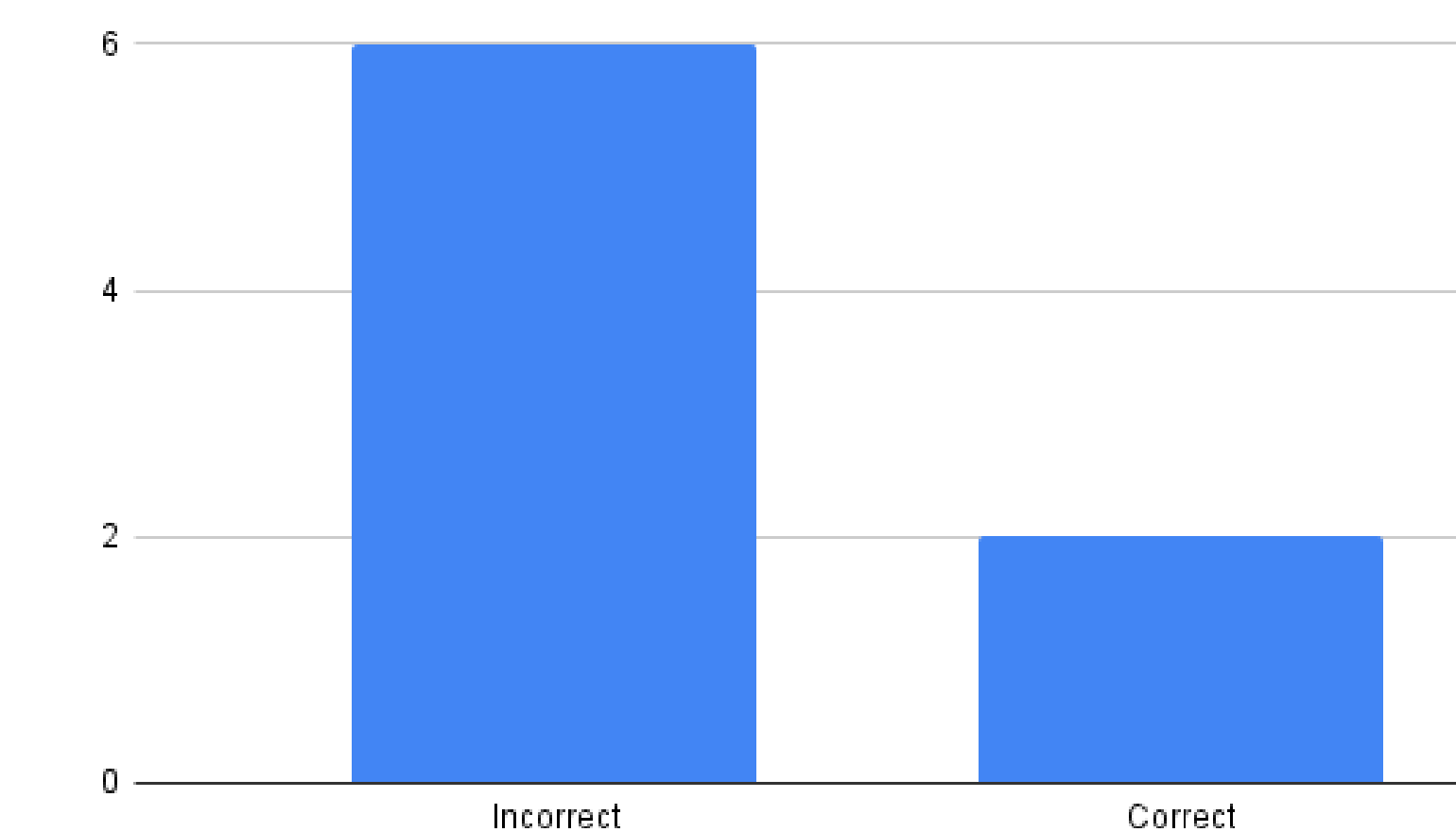
Pre survey Q1) What pathology is seen?



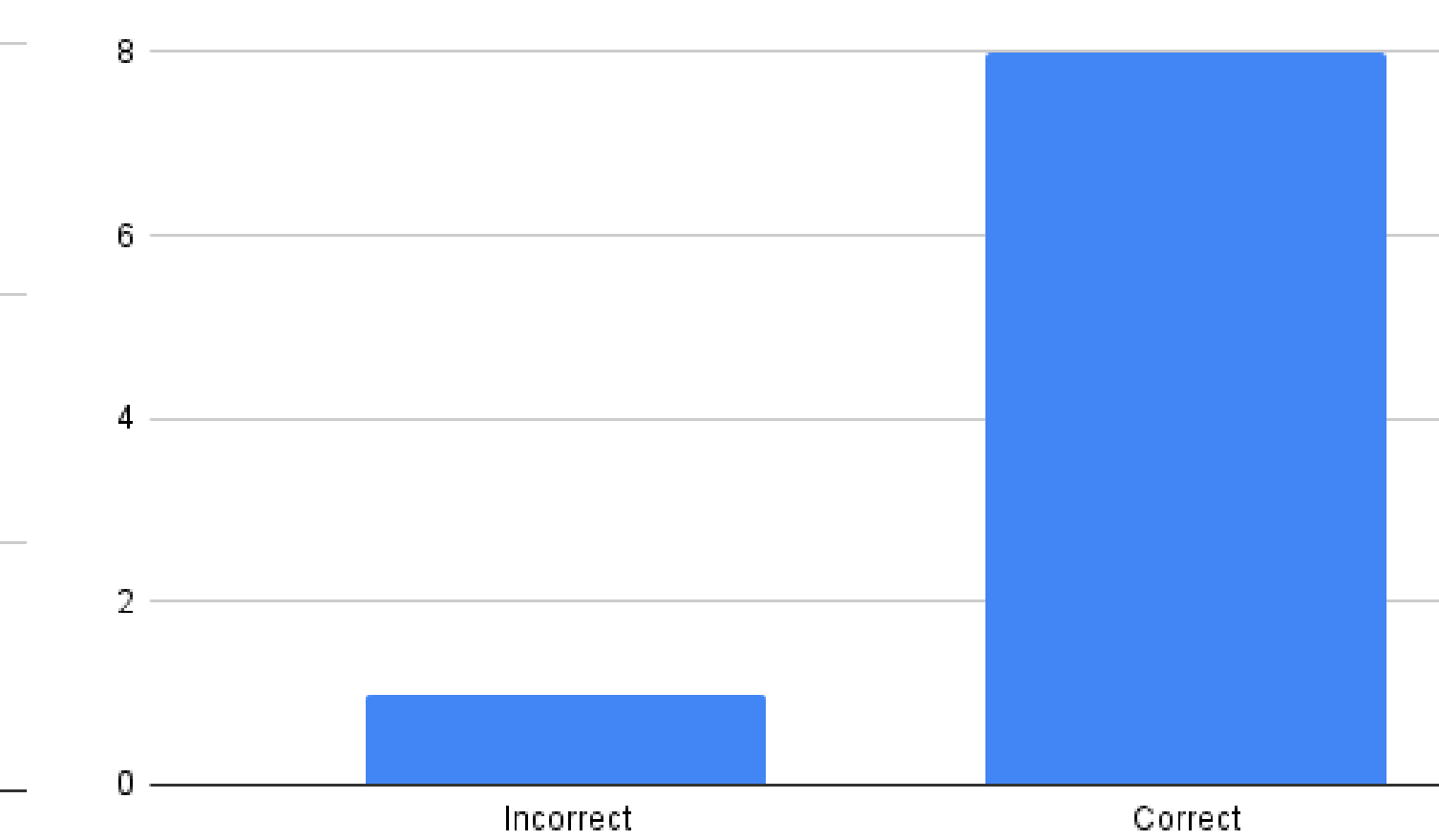
Post Survey Q1) What pathology is seen?



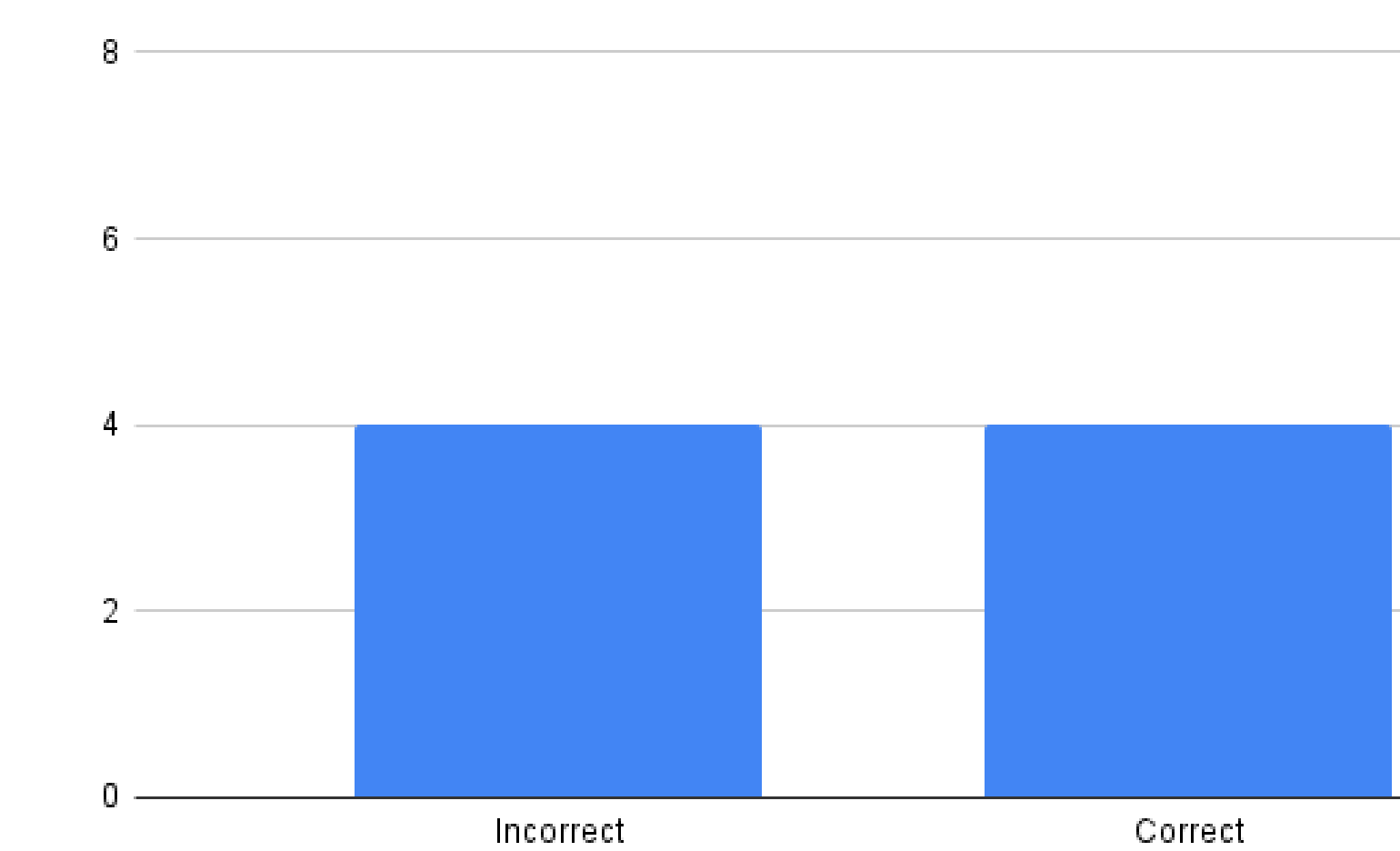
Pre survey Q2) What pathology is seen?



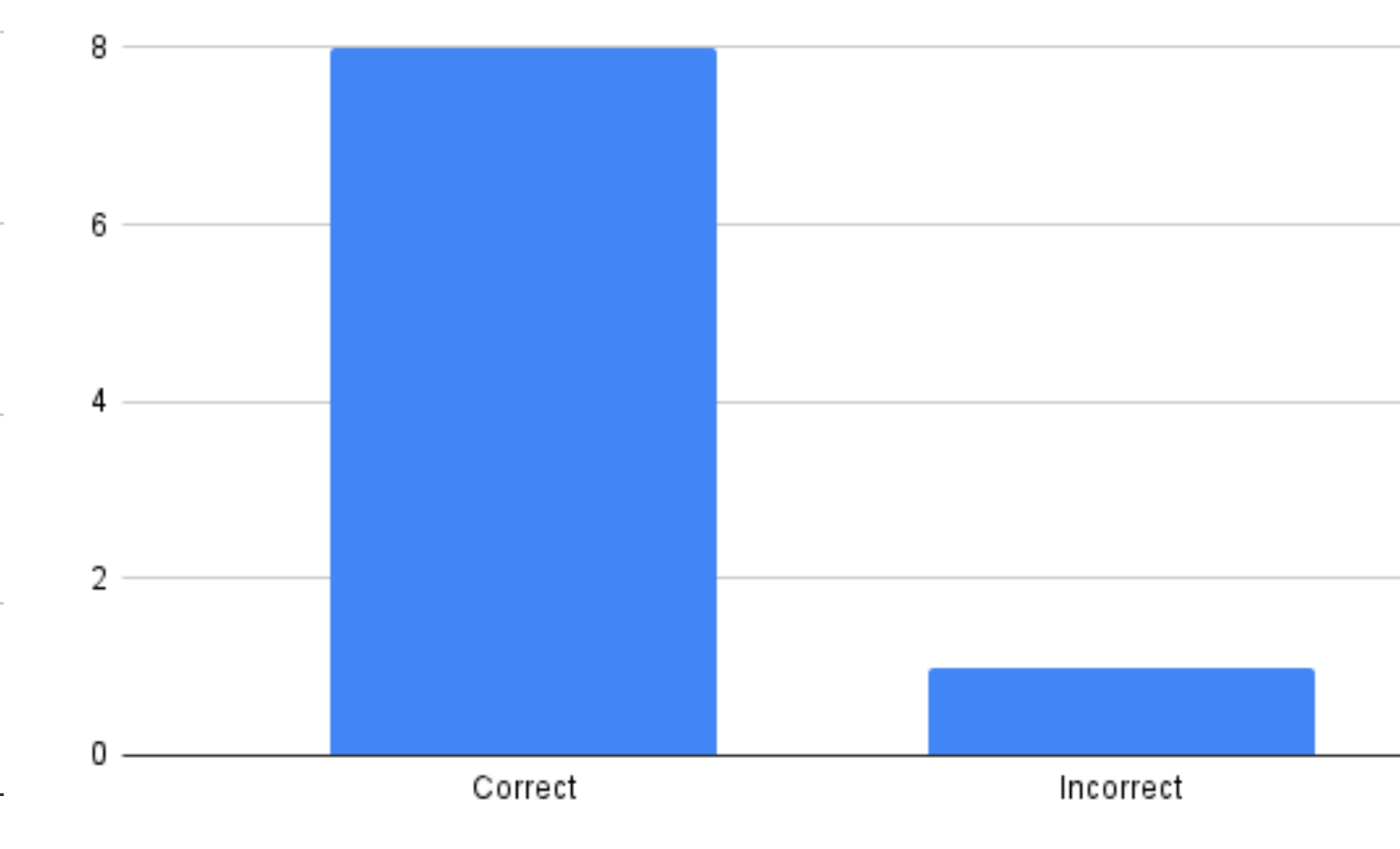
Post Survey Q2) What pathology is seen?



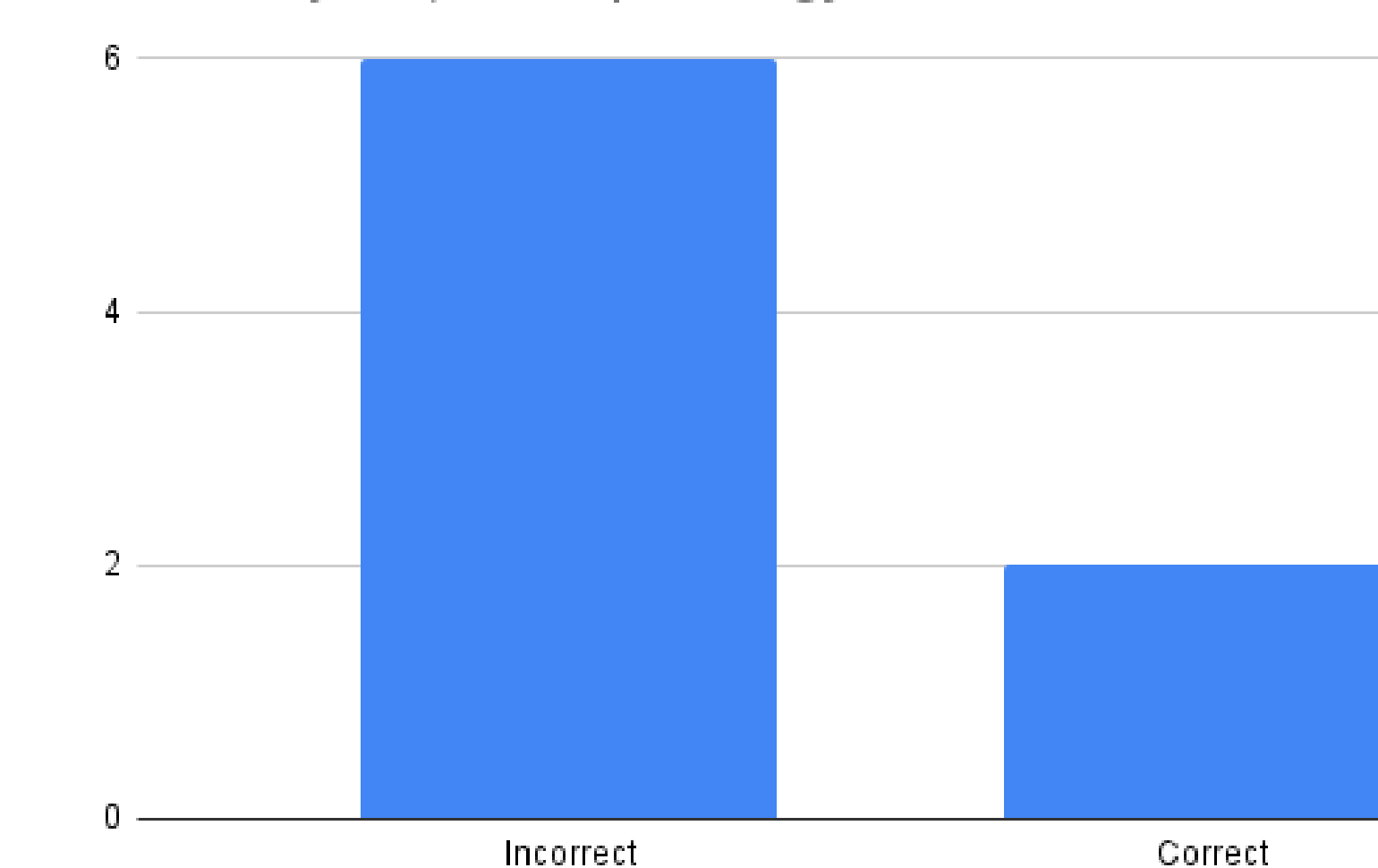
Pre Survey Q3) What pathology is seen?



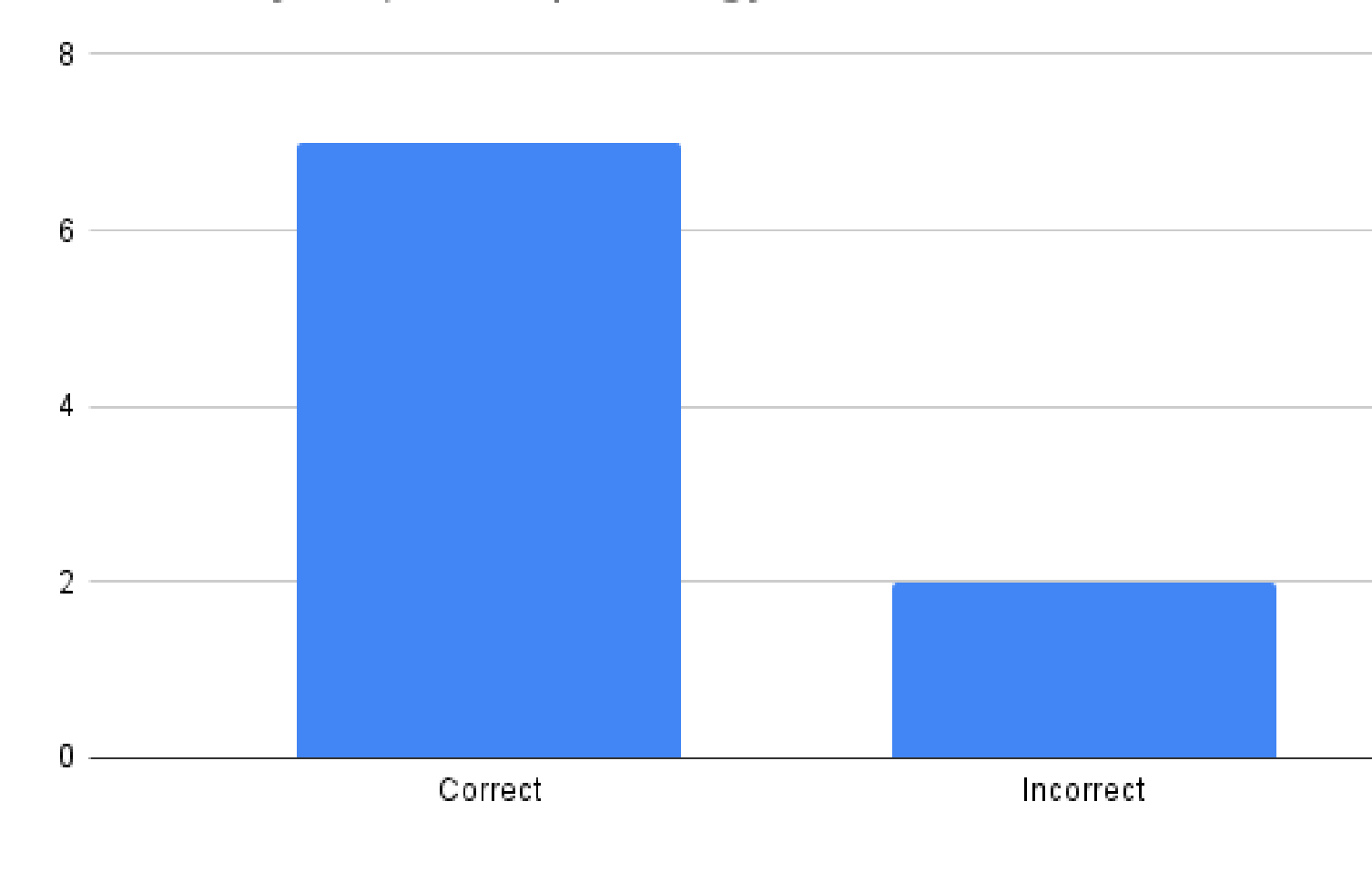
Post Survey Q3) What pathology is seen?



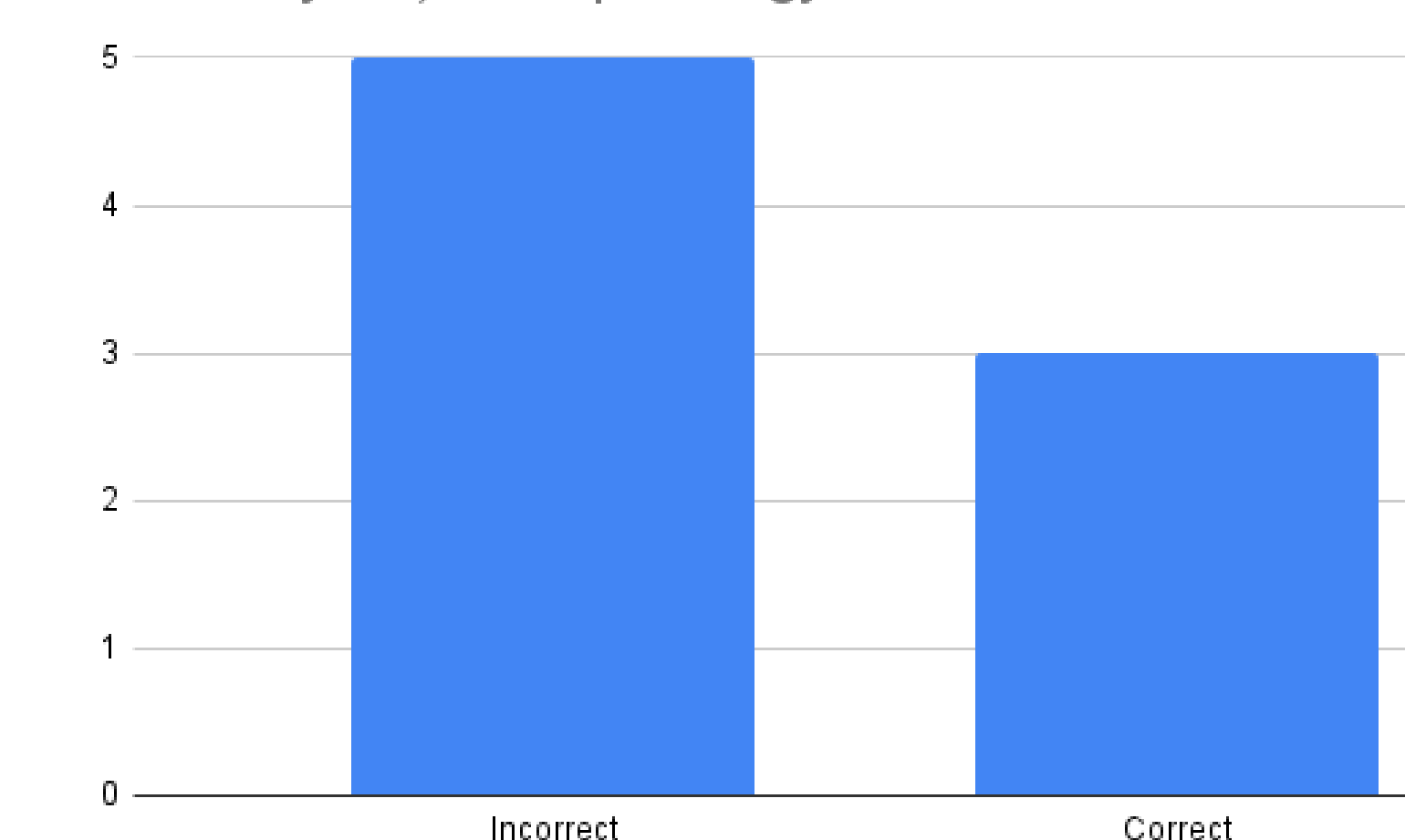
Pre Survey Q4) What pathology is seen?



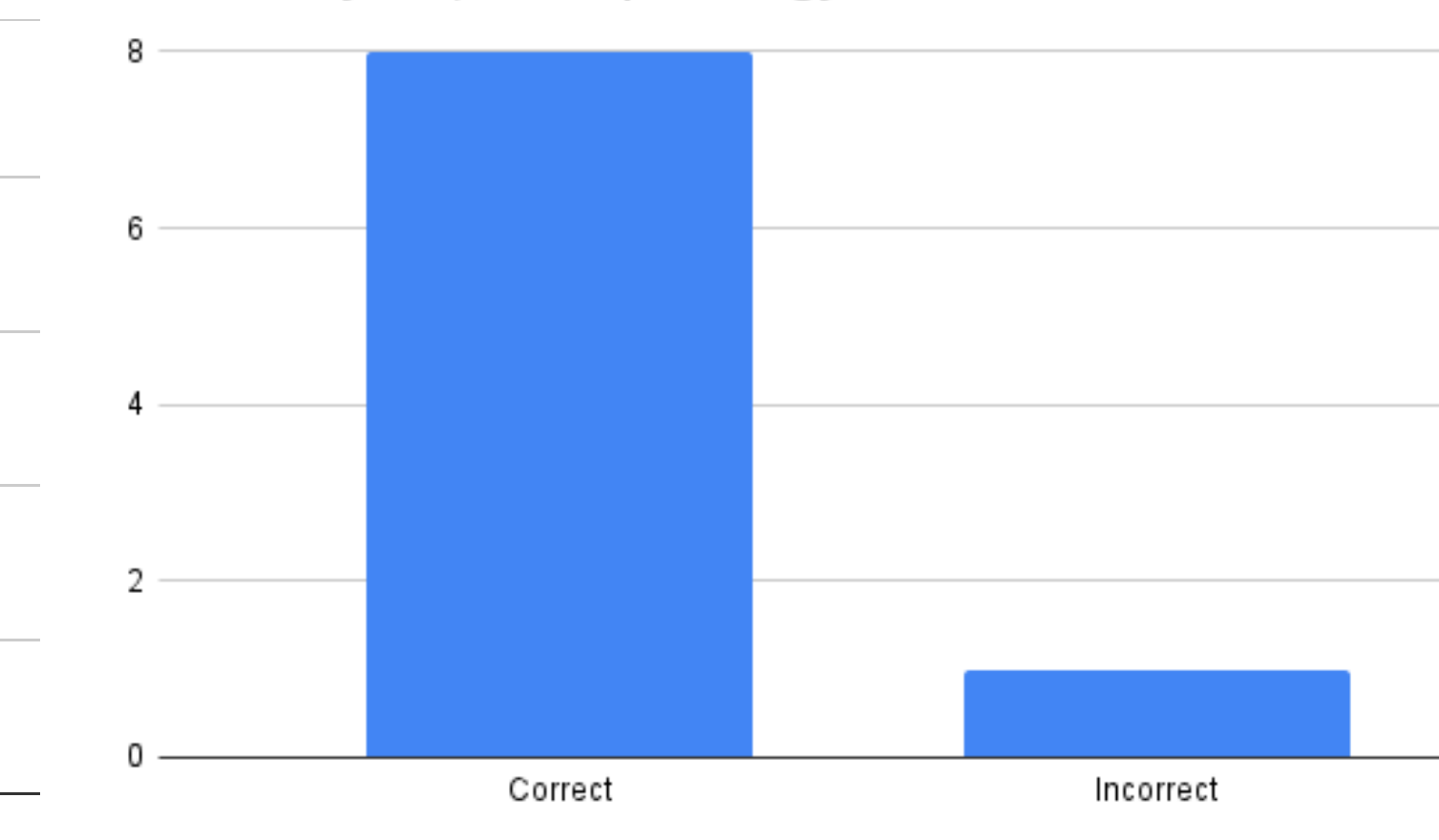
Post Survey Q4) What pathology is seen?



Pre Survey Q5) What pathology is seen?



Post Survey Q5) What pathology is seen?



## Discussion

- As can be seen from our survey results, residents did well after a 2-hour led practice session on ophthalmoscopic exams.
- Study was limited as only 8 residents participated in the pre-survey and 9 residents participated in the post-survey
- As the survey was anonymous, hard to tell if the residents learned about the different pathologies of the eye
- Also on the survey, majority of residents enjoyed having a workshop on ophthalmoscopic exam
- A 3- month survey was planned, but not performed as some residents who participated graduated, or were not available at the time the survey was given.

## Conclusion

- In conclusion, the survey suggests that residents did do well after a 2 hour didactic session
- More sessions like this will enable residents to be more comfortable in looking at eye pathology
- The goal is for residents to be comfortable looking into patients eye and help prevent deterioration of their patient's eye by starting medications for strict blood glucose control or strict blood pressure control

## References

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