

Predicting Anti-VEGF Therapy Response in Wet-AMD Patients



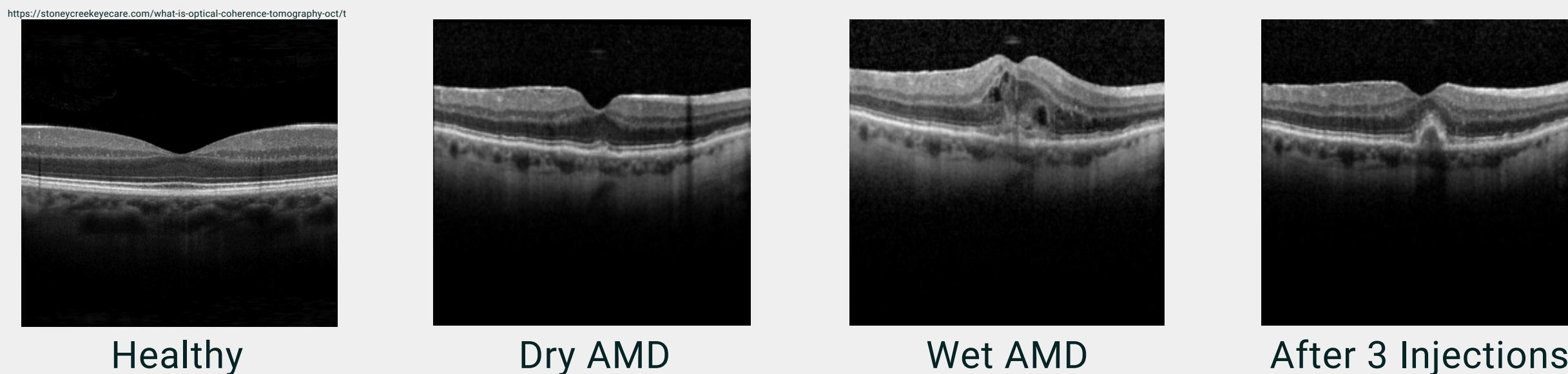
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BACKGROUND

Age-related Macular Degeneration (AMD) is predicted to affect almost **300 million people** globally by 2040. Wet AMD rapidly progresses to blindness and accounts for about **90% of blindness** due to AMD.



Wet AMD's gold-standard treatment is lifelong anti-VEGF intravitreal injections, but about **10-20% of patients are unresponsive to this therapy**. For many patients, efficacy can currently be assessed **after 3 injections**.

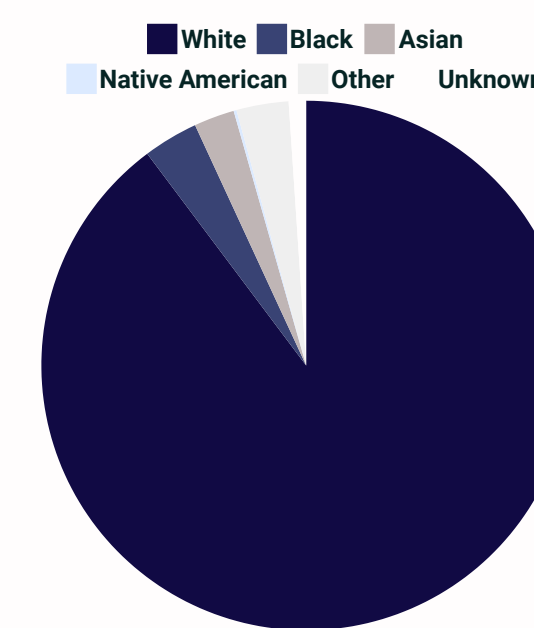
DATA

566 Eyes | 487 patients

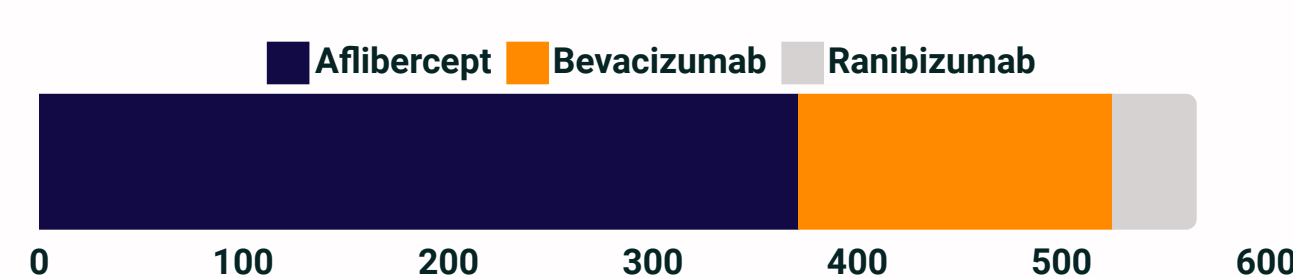
Average Age: 79 years (SD = 9)

Sex: 63% Female

Race:



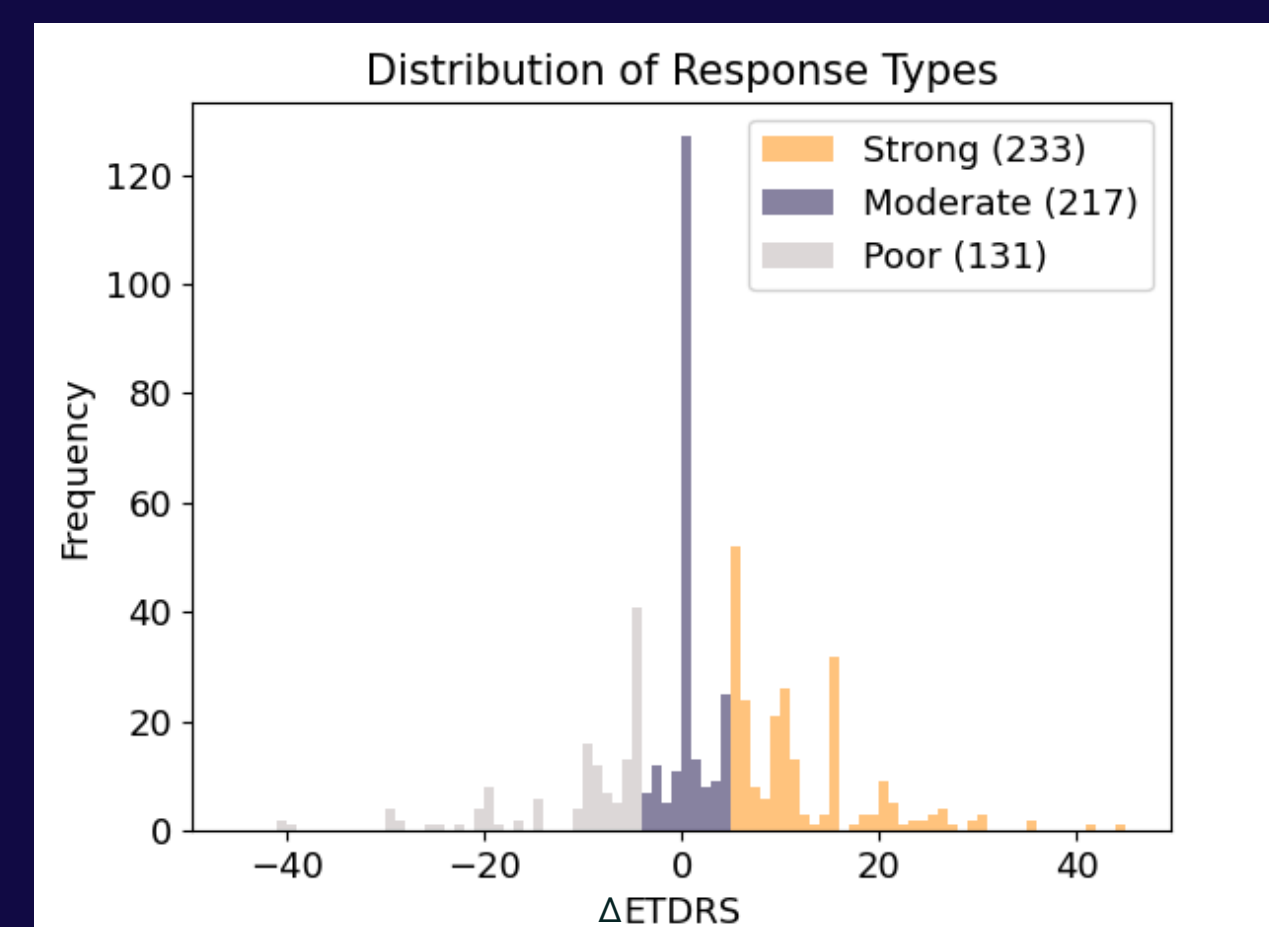
Medication:



CLASSIFICATION

After 3 injections, classes are:

- Strong: $\Delta\text{ETDRS} > 5$
- Moderate: $-5 \leq \Delta\text{ETDRS} \leq 5$
- Poor: $\Delta\text{ETDRS} < -5$



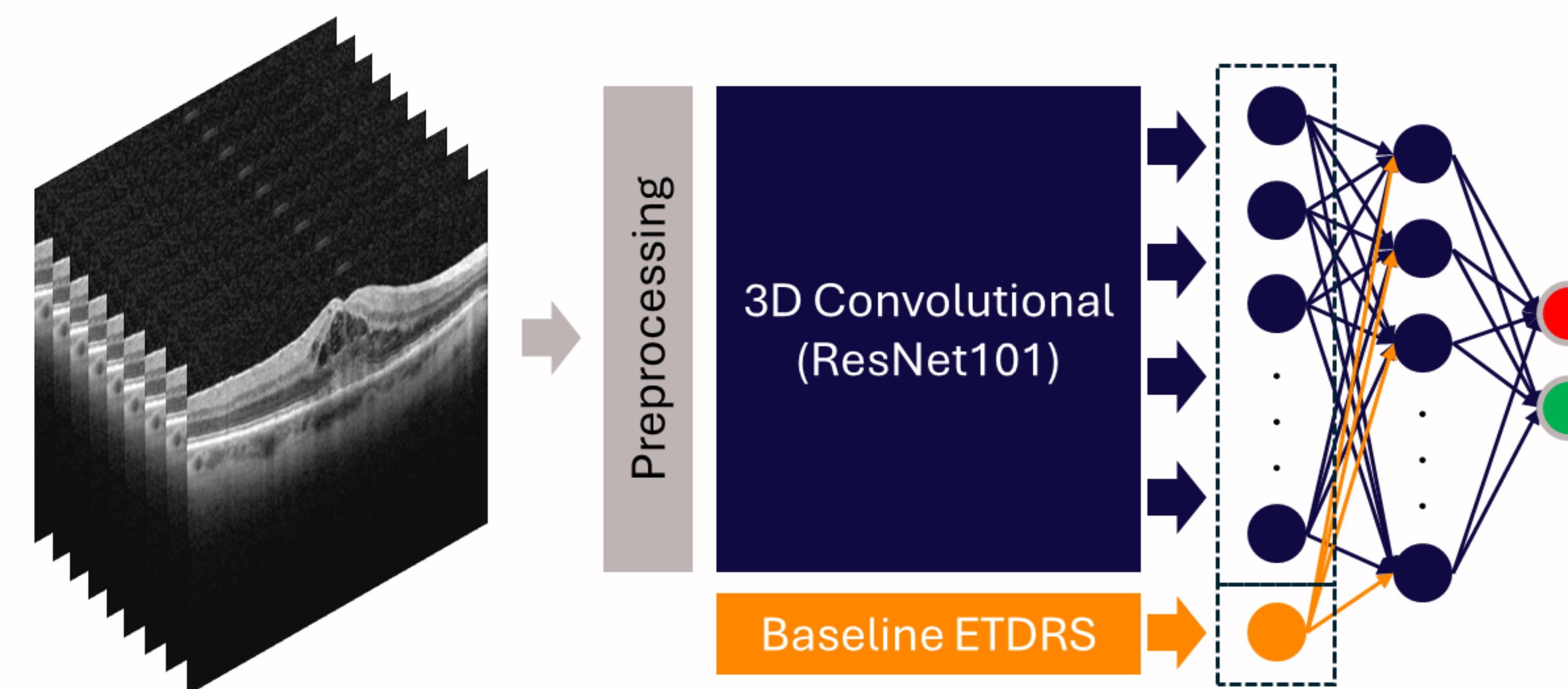
CONCLUSION

3D residual networks are **promising tools for classifying anti-VEGF therapy responses** as poor, moderate, and strong. Incorporating time series OCT images and additional clinical features has the potential to enhance the accuracy of predictions, leading to more **personalized treatment plans for patients**.

Accurately predicting anti-VEGF treatment response could aid healthcare professionals in making more informed decisions regarding future injections and overall treatment strategies, **ultimately improving patient outcomes**.

DEEP-LEARNING ARCHITECTURE

We are creating a machine learning model that is capable of **predicting wet AMD patients' responses to anti-VEGF therapies** to help ophthalmologists choose optimal treatments on a personalized basis for each patient before they suffer irreparable eye damage.



Can **Poor** responders be distinguished from **all others**?

Can **Strong** responders be distinguished from **all others**?

BINARY CLASSIFICATION RESULTS

