# COMPARISON OF VARIOUS CLINICAL TECHNIQUES USED TO DETERMINE ACCOMODATIVE LAG OF A PATIENT

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Dynamic retinoscopy has long been a clinically accepted procedure for determination of an accomodative lag. Various techniques have emerged over the years. All of these variations are assumed to be measuring the same clinical entity and therefore should yield the same results, but is this the case? In an attempt to answer this question, a comparison between two types of dynamic retinoscopy and two procedures that do not employ the use of a retinoscope, will be performed.

The first method will be M.E.M. This will be performed by holding a retinoscope at 40cm with M.E.M. cards attached to it. The subject will be asked to read the letters out loud while the clinician makes one quick sweep with the streak oriented vertically across the pupil. The patients habitual prescription will be in the phoropter and the lighting will be at a constant level for all the subjects.

Nott retinoscopy will be the second technique used for the comparison. It will be performed by placing a series of letters at 40cm and making the patient read them out loud. As the patient reads, the clinician varies his distance form the patient with his retinoscope until a neutral response is observed. The distance is recorded from the letters at 40cm and converted to diopters. The lighting will be held constant and equal between both techniques.

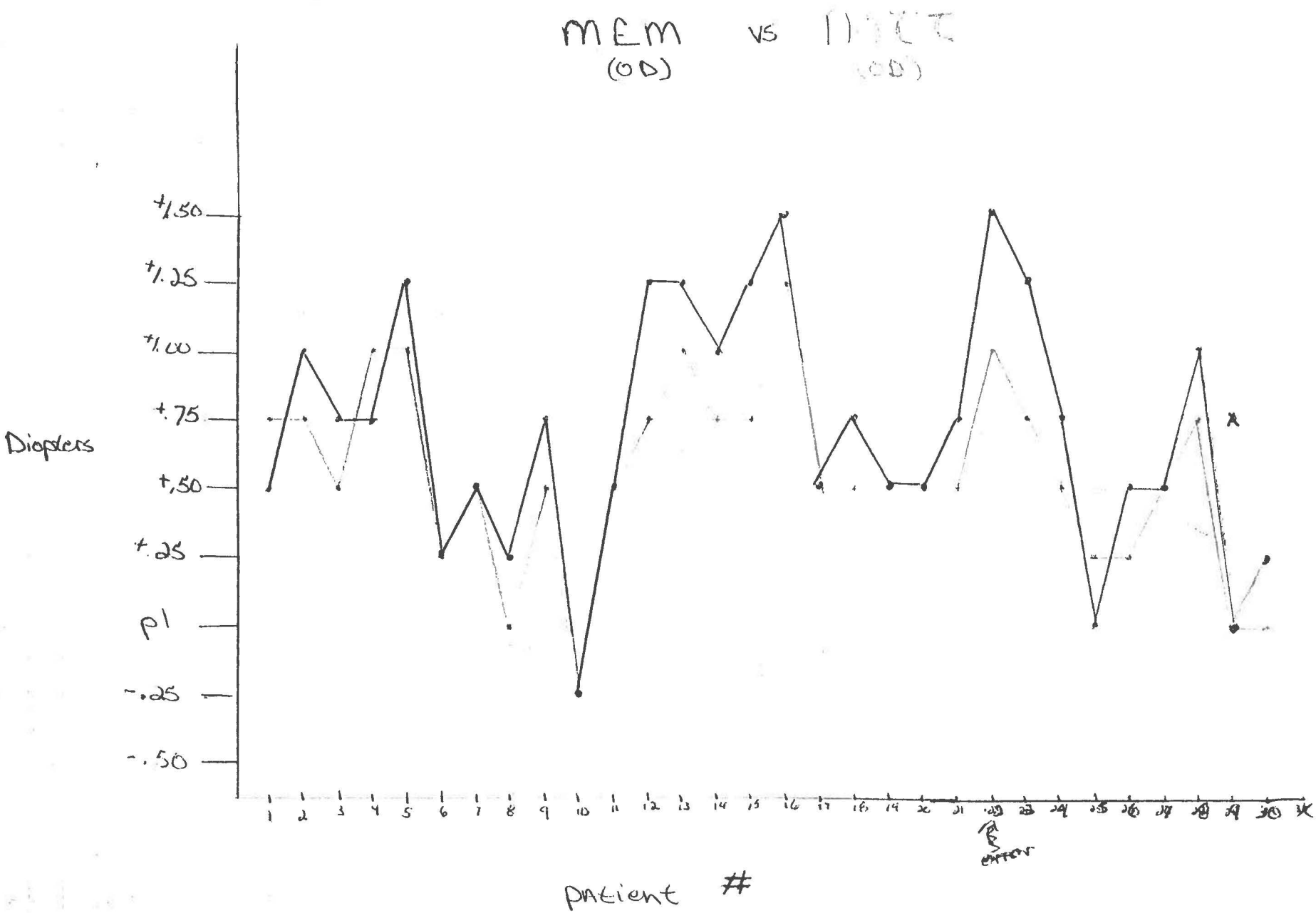
Binocular and monocular cross cylinders will be the other two techniques utilized to obtain the accomodative lag. The patient's prescription was determined and placeed in the phoropter, after which $\pm$.50 diopter cylinders were put in place. The patient's attention was

then directed to a grid pattern (  ) located 40cm away. The patient was then asked if any series of lines appear darker than the others. The normal response is that the horizontal lines appear darker. Plus lenses were then added in .25DS steps until the vertical lines and horizontal lines appear equal. 6 prism diopters were used to induce vertical diplopia and thus enabling it to be a monocular test. The lighting was held the same throughout all the different techniques.

Rouse proved the validity of M.E.M. by comparing M.E.M. to a phoro-accommodometer. The two techniques showed equivalent finds for accomodative stimuli up to 3.00D. Keeping this finding in mind, the M.E.M. will be considered the standard and the other techniques the comparitives.

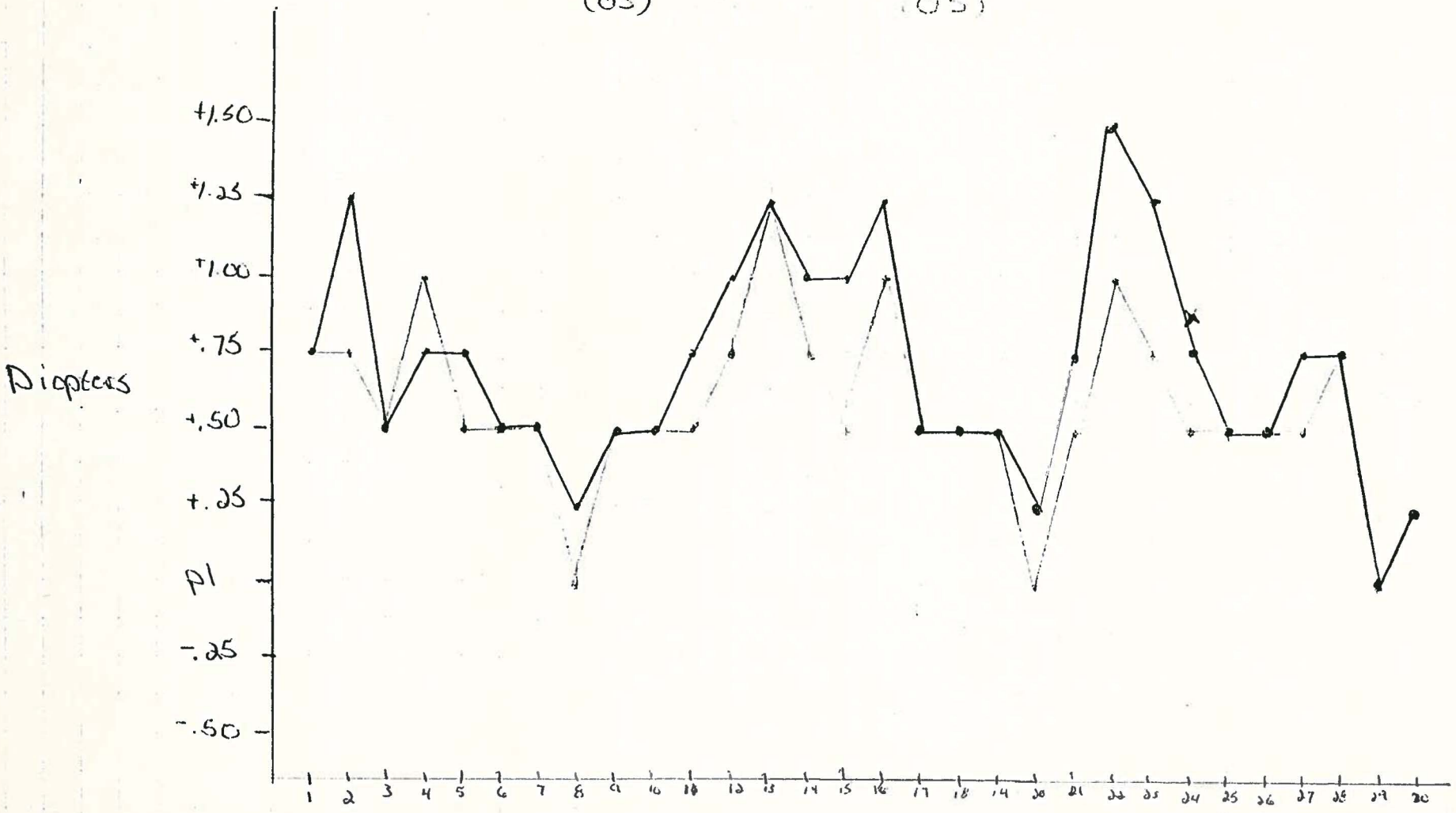
The following graphs summerize the data.

Graph #1


MEM vs
(OD)
(OD)
+1.50
+1.25
+1.00
+.75
+.50
+.25
pl
-.25
-.50
Diopters
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
EXTRA
patient #

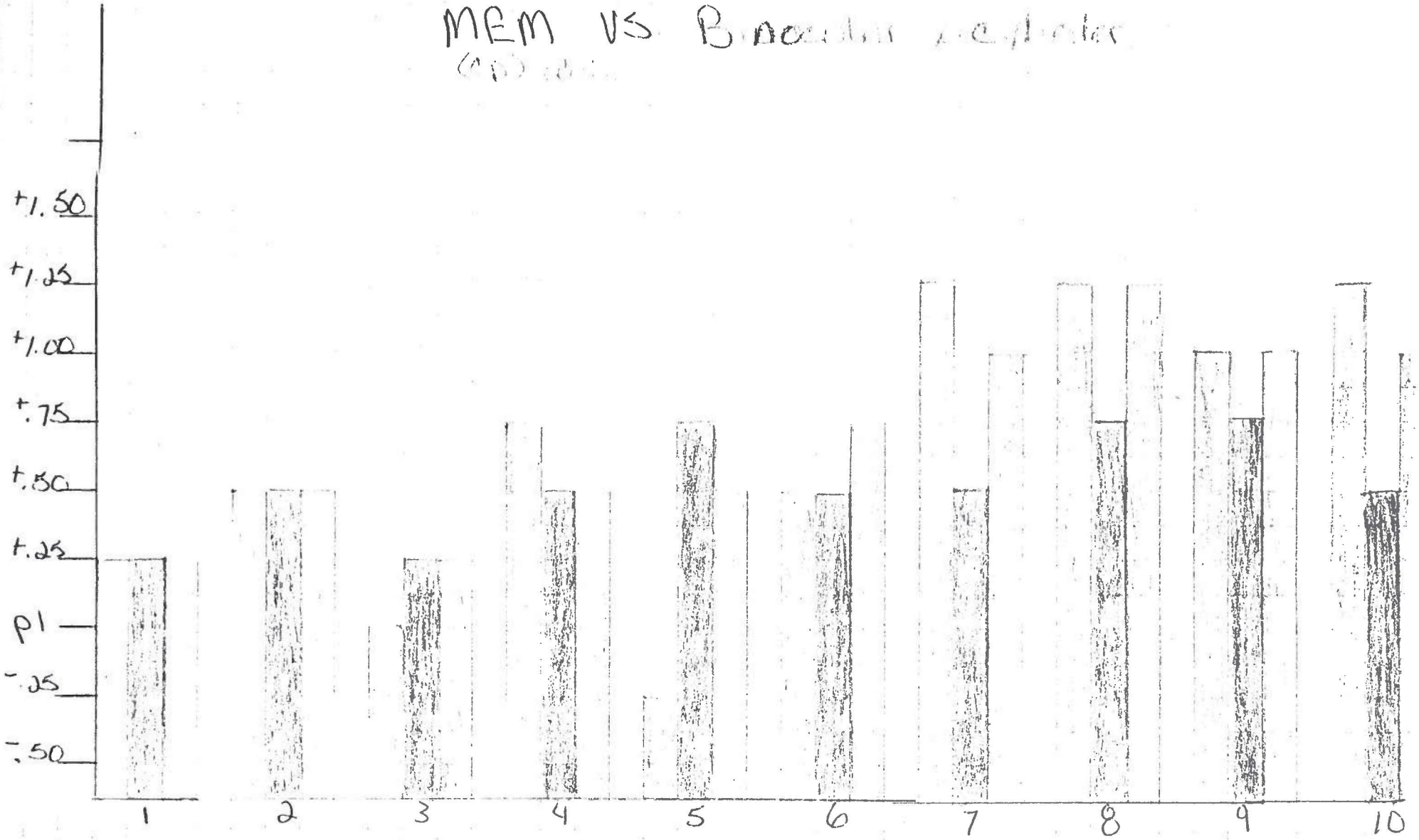
Graph #2

MEM vs [illegible]
(OS) (OS)



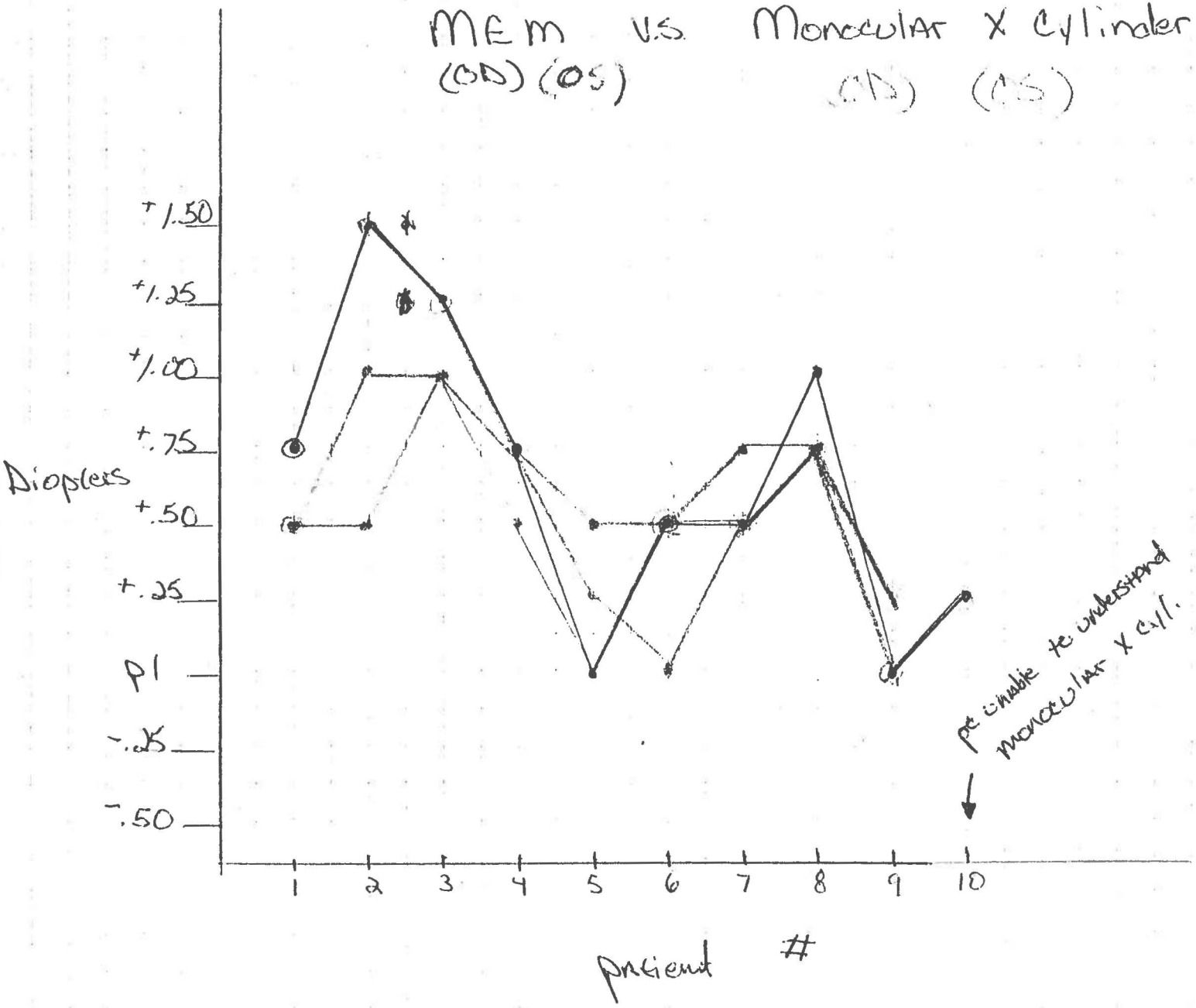
Graph #3

MEM vs Binocular




Patients #

Graph #1


MEM V.S. Monocular X Cylinder
(OD) (OS)
(OD) (OS)
+1.50
+1.25
+1.00
+.75
+.50
+.25
PI
-.25
-.50
Diopters
1
2
3
4
5
6
7
8
9
10
patient #
pt unable to understand monocular X cyl.

Graph number 1 is a comparison between M.E.M. and Nott Dynamic Retinoscopy procedures for the right eye only. The largest variation between the two techniques displayed by the graph os a .50D. It was found that 86.7% of the trials were within ±.25D of each other. To help demonstrate its reliability, graph number 2 shows the same comparison of the left eye only. Again a .50D was the largest separation between the two techniques. Surprisingly, the same percentage, 86.7%, was found to be how often the two findings were within ±.25D. These findings help establish the validity of Nott Retinoscopy as a viable procedure to predict the accomodative lag of a patient.

Patient understanding was one of the most prominent problems with binocular cross cylinder and especially with monocular cross cylinder. They seemed to have a difficult time understanding what they were supposed to see, thus it is felt that it could possibly influence their lag. Graph number 3 shows this technique less accurate and hard to interpret. Graph number 4 shows the largest difference of 1.00D, but had an 80% accuracy given a ±.25D deviation. This percentage was found to be the same between both eyes. It is important to stress that this procedure required much more patient education and attention and in one case had to be abandoned.

M.E.M. and Nott Retinoscopy appear to be quick, accurate, and objective. They require little patient education. The cross cylinder techniques appear to be just the opposite, although they may be just as accurate, depending on the patient. These findings help show that there is more than one way to measure accomodative lag clinically.

REFERENCES

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