

**Title:** PLATEAUED VISION MARKERS: PREDICTING PROLONGED POST CONCUSSIVE SYMPTOMS USING NEAR POINT CONVERGENCE AND KING DEVICK TESTING

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**Background/Aims:** Concussions can influence oculomotor function. The purpose of this investigation was to signify if visual markers such as Near Point Convergence (NPC) or King Devick (KD) assessments are useful in predicting whether patients will endure prolonged symptoms due to acute mild Traumatic Brain Injury (m-TBI) incident. These visual examinations are both easily administered, quick and inexpensive assessments.

**Methods:** We performed a retrospective cohort study of 101 patients between the ages of 11-25 who visited a private concussion clinic with an initial appointment for concussion symptoms no later than 4 weeks from their date of injury (DOI). The initial appointment was between the dates of 11/01/2018 and 4/31/2019. Patients were not included if they were not tracked until cleared or a prolonged post concussive symptoms diagnosis, which occurred after 6 weeks of symptoms. Every initial and subsequent appointment we presented each patient with the NPC and KD assessments, and we evaluated their first completed test measurements. The subsequent appointment was most often within 1-5 weeks from the initial appointment with an average of 27 days for the cohort.

**Results:** Patients diagnosed with PPCS had a larger total average in both visual marker assessments in initial and subsequent appointments versus the cleared group. Patients with a NPC farther than 13cm on initial presentation were diagnosed with PPCS at 83.8%, yielding an average length of 13.29 cm. Patients unable to complete all 3 KD test cards faster than 70 seconds upon initial test completion were diagnosed with PPCS at 74.1% while yielding an average time of 66 seconds.

**Conclusion:** Patients were more likely to develop PPCS when their NPC was longer than 13cm, or total KD time was longer than 70 seconds. Patients who exhibited measurements longer than either test limit at their initial test completion without improvement beyond this limit on their subsequent appointment expressed the highest risk for experiencing PPCS at 94% and 100% in our cohort.

Cohort	Number of patients	Initial Average NPC (cm)	Average NPC (cm) at subsequent appointment	Initial Average KD Time (sec)	Average KD Times (sec) at subsequent appointment
No PPCS	38	9.22	7.46	58.87	45.44
PPCS	63	13.29	14.45	66.09	56.30

Group PPCS Rate: 63/101	62.3%
Initial NPC >13(cm)	83.8%
Initial KD>70(s)	74.1%
Initial + Subsequent NPC >13(cm)	94.1%
Initial + Subsequent KD>70(s)	100%