CAN NEAR POINT CONVERGENCE IN PEDIATRIC CONCUSSION PATIENTS PREDICT STUDENTS' SUCCESSFUL RETURN TO LEARNING?

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Purpose: The purpose of this study was to identify whether abnormal near point convergence (NPC) could be used as a clinical predictor of a 10-18 year old student's ability to successfully return to learning (RTL).
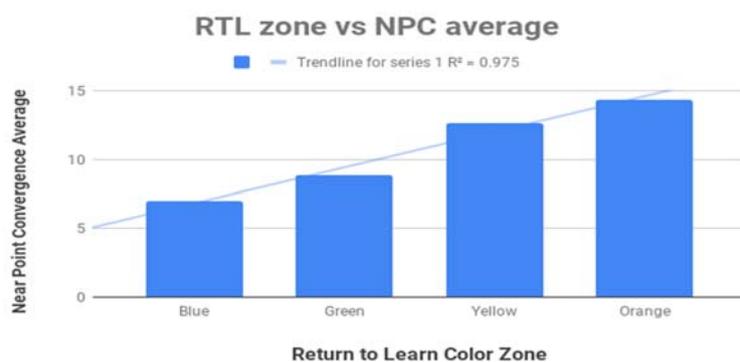
Methods and Study Design: This was a retrospective chart review of 122 students who initially visited a sports medicine clinic between 11/22/17 to 02/27/19 due to a concussion. A total of 268 visits were analyzed. RTL is graded in color zones, with red = no school, orange = half time or less, yellow = half time or more, green = full time with accommodations, and blue = full clearance. No patients were reported in the red zone in our cohort due to its severity. Patients with learning disabilities or oculomotor deficits were excluded.

Results: Of the patients who met the inclusion criteria, we found a statistically significant difference in average NPC between the blue and orange zones ($p < 0.001$) using a pooled proportions test. Average NPC was 7.03cm for blue, 8.84cm for green, 12.67cm for yellow, and 14.40cm for orange representing a positive linear correlation with an R^2 of 0.975. Whereas 81% of patients in the blue zone had a normal NPC (<9cm), this was true for only 31% of patients in the orange zone. There was a 43% increase in average NPC from yellow to green zone. Yellow was the most frequent color zone with 56.7% of all visits in this zone.

Conclusions: NPC appears to have a strong correlation with academic tolerance and can be predictive of RTL zones.

Significance: Currently, little research has been done on *clinical* predictors of RTL. This data supports the use of *oculomotor testing,* such as NPC, which can easily be completed at office visits, as predictive tools that may indicate which patients presenting with concussion need increased academic accommodations.

Graph 1:

RTL zone vs NPC average