Context: Stress to the neurons caused by mechanical forces to the brain initiate a neurometabolic cascade, which includes an indiscriminate release of neurotransmitters that causes calcium to accumulate. Genetic variations [e.g., single nucleotide polymorphisms (SNPs)] within the calcium channel, voltage dependent, R-type, alpha 1E subunit gene, which plays a role in the influx of calcium into the neuron, is likely to modulate the recovery from a concussion. Objective: To examine the association between concussion recovery and the calcium channel, voltage-dependent, R type, alpha 1E subunit (CACNA1E) SNPs (rs704326 & rs35737760). A secondary purpose was to evaluate the association between CACNA1E SNPs and three acute concussion severity scores (i.e., vestibule-ocular exam, balance error scoring scale, and Immediate Post-Concussion Assessment and Cognitive Testing). Design: A prospective between-subject study. Setting: Athletes were examined at the University Concussion Center. Patients or Other Participants: Collegiate and high school athletes who sustained a concussion during athletic competition and required evaluation by a physician (N=40). Interventions: The independent variable was genotype. This variable had three levels: dominant model, recessive model, and codominant model. Athletes were assessed utilizing a standardized concussion assessment protocol. After diagnosis, IRB approved forms were obtained and saliva samples were collected from the athletes. Athlete’s recovery time was followed prospectively to full medical clearance and were placed into either normal or prolonged recovery groups. DNA was extracted from the athlete’s saliva and genotyped. Statistical analysis included the Hardy-Weinberg equation, 2x2 chi-squares, Fischer’s exact tests, regression analysis, independent t-tests, and one-way ANOVAs. Main Outcome Measures: The dependent variables were concussion recovery and severity. Prolonged duration was defined as returning to play 30 days or greater after the date of the injury. Results: There was an association found between the dominant model GG genotype ($\chi^2 = 5.41, p = 0.027$) within the rs704326 SNP and the prolonged recovery group, where athletes carrying the GG genotype were associated with prolonged recovery. Additionally, athletes carrying the GG, rs704326 SNP in the prolonged recovery group scored worse on the vestibular ocular exam ($p = 0.030$) compared to those in the normal recovery group. There was also significant association found between acute balance deficits and the prolonged recovery group ($\chi^2 = 5.66, p = 0.017$), where athletes that reported acute balance deficits were more likely to have prolonged recovery. Conclusion: Athletes carrying the homozygous common genotype GG and athletes who reported balance deficits at the time of injury are at a greater risk of a prolonged recovery. The prospective genotyping of athletes may help identify athletes predisposed to prolong recovery, and ensure proper management and medical clearance for return to play. Word Count: 431