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USE OF HUMAN PERFORMANCE RESPONSE CURVES TO DEMONSTRATE CIRCADIAN ADVANTAGES FOR TEAMS PLAYING NIGHT GAMES ACROSS A NATIONAL FOOTBALL LEAGUE SEASON
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Introduction: It is well established that west coast (WC) teams of the National Football League (NFL) win more night games, dating back to the 1970s. Recent data (Brager and Mistovich, 2017) show that this night game advantage for WC teams is due to fewer regular season injuries to linemen. Here, we extend upon these historical datasets to determine additional factors producing a circadian advantage in performance due to season schedules.

Methods: We generated human performance response curves (hPRCs) based on biological time for points scored, yards gained, and the number of turnovers for each of the 32 NFL teams during the 2013 regular season (n=257). The hPRCs compared changes in the performance metrics relative to biological time (normalized to Eastern Time).

Results: Game time did not change the extent of points scored and yards gained for winning (p=0.30 and 0.45, Kruskal-Wallis) or losing teams (p=0.46 and 0.87, Kruskal-Wallis). As expected, winning teams scored more points (11.3 ± 0.1 spread) and gained more yards (40.7 yd ± 0.2 spread) than losing teams (all, p<0.01). In Brager and Mistovich, 2017, we reported that losing teams had one more turnover than winning teams (2.1 vs. 1.1). Here, we found that the extent of fewer turnovers for winning teams is additionally circadian-dependent (p=0.003, Kruskal-Wallis). Winning teams had fewer turnovers during late evening games (2000, 2100 EST) - upswing of circadian-regulated alertness — compared to afternoon games (1300, 1600) - down swing of circadian-regulated alertness.

Conclusion: These analyses lend further credence to the observation that the circadian timing system exerts significant influence on performance metrics of professional sporting teams independent of talent, geography, and home field advantage. Thus, appropriate countermeasures may need to be implemented to counteract circadian-regulated influences on game day statistics.

Support (If Any): none.

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U.S. POLICE DEPARTMENT ROSTERS: PUBLIC COMPLAINTS AND ON-DUTY ACCIDENTS
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Introduction: Police officers respond to emergencies, patrol neighborhoods, and handle citizen complaints around-the-clock, and their sleep opportunities are frequently reduced by extended duty hours and secondary employment. Twenty-five percent of U.S. protective services (including police) also work shifts. Shift work and sleep loss increase fatigue, sleepiness, and accident risk, and are associated with changes in mood. These stressors have economic and community consequences. We examined associations between unscheduled work hours, fatigue and sleepiness, and public complaints and on-duty accidents.

Methods: Officers at four police departments reported work hours, and reported public complaints (2 departments) and on-duty accidents from 2–29 weeks. Peak FAID/KSS scores (i.e. max scores while on shift) were predicted using FAID Quantum, and were tested as predictors of complaints and accidents. Odds ratios determined fatigue/sleepiness benchmarks that were predictive of complaints and on-duty accidents (2-levels: benchmark met/not met; FAID range tested: 60–100; KSS range tested: 1–9).

Results: 379 officers and 32,712 work shifts were studied. Nightshifts and court appearances were more prevalent prior to days with...