



The Medical **Bulletin**

Exercise Corner

Humans exhibit circadian rhythms and diurnal variations in their physiology and in the time of day in which exercise is performed, typically falling into a morning or evening preferring chrono type. Expression of purported molecular clock genes exhibits an individualized diurnal variation, which correlates with muscular strength, exercise performance, and the clock itself. The timing of exercise remains a controversial topic, with some investigators favoring morning exercise to enhance muscle adaptations and fuel, whereas others have shown afternoon/evening exercise is most favorable to improve muscle function. Morning exercise (AM) reduced abdominal fat and blood pressure, and evening exercise (PM) enhanced muscular performance in the women cohort. In the men cohort, PM increased fat oxidation and reduced systolic BP and fatigue.

Thus, ETOD may be important to optimize individual exercise-induced health and performance outcomes in physically active individuals and may be independent of macronutrient intake. In conclusion, the time of day when multi-modal (resistance, intervals, stretching, endurance; RISE) exercise training is performed (AM versus PM) has profound impacts on cardio-metabolic, body composition, and physical performance outcomes, which appear to differentially manifest in women and men.

Morning exercise in women enhances total and abdominal fat loss, reduces blood pressure, and increases lower body muscle power, whereas evening exercise greatly increases upper body muscle strength, power, and endurance, and enhances overall mood. For men, evening exercise lowers systolic blood pressure and fatigue, and stimulates fat oxidation compared to early morning exercise. These findings highlight the interaction of exercise time of day (AM versus PM) and circadian regulation and the impact this has on cardio-metabolic, body composition, and physical performance outcomes in healthy, exercise-trained women and men following twelve weeks of multi-modal training. As such, the length of training may also influence sex differences. Healthcare clinicians and fitness trainers/practitioners aiming to more precisely target or emphasize one outcome over the other should bear in mind time of day when making exercise and physical activity recommendations to individual patients or clients.

***Dr. V. Balachandran,
MD, MNAMS, FRCP, FACC***