CONCLUSION: The results of the study suggest that both internal and external metric requirements differ between high school lacrosse practice and game sessions, as well as across varying positions. This data could be used to alter practice sessions to better mimic the higher intensities of games and provide coaches the ability to train athletes at game-like and position-specific intensities.

3776 Board #93 May 30 8:00 AM - 9:30 AM
Performance Profile Of International Male Lacrosse Players
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(No relationships reported)

PURPOSE: Even with its rising participation numbers worldwide, there has been little quantitative analysis on the activity profile of Lacrosse players. Therefore, this study aimed to determine (a) the overall activity profile and differences over the course of plan, and (b) differences between players position.

METHODS: Data involved eight World Championships games of the male Austrian lacrosse national team using micro technological devices. Assessed parameters included total distance covered (m), mean heart rate (HRmean), time spent in different HR-zones (HRz) (<75; 75-84.9; 85-89.9; ≥90%), distance covered (m) in five different Speed-zones (Sz) (0.0-0.2; >0.2-1.8; >1.8-3.3; >3.3-5.7; >5.7)ms), and mean respiratory frequency (RF). Additionally, to total game values differences between quarters and players position were analyzed. Statistical significance was set at p ≤ 0.05 and for an estimate of effects Cohen’s ES was calculated.

RESULTS: Overall activity results show a total distance covered of 4,511.6 ±1,151.3m, a RF of 25.4 ±1.7bpm, and a HRmean of 72.3 ±5.1%. Greatest distance was covered in Sz 2 (1,578.4 ±627.2m), and most of the time spent in HRz 1 (3.028.4 ±714.2s). Comparison between quarters showed lower HRmean values (p= 0.00; n²p= 0.08), more time spent in HRz 1 (p= 0.00; n²p= 0.12) and less in HRz 3 (p=0.03; n²p= 0.03) and HRz 4 (p= 0.00; n²p= 0.09), and a lower RF (p= 0.00; n²p= 0.09) over the course of play. Regarding players position, attackers showed more time spent in HRz 2 compared to other positions (1,482.3 ±51.2s; p= 0.00; n²p= 0.69), and covered greater distance in Sz 2 (2,275.8 ±149.4m; p= 0.01; d= 3.10 ±1.55) compared to midfielders. On the other hand, midfielders showed greater distance covered in Sz 4 (1,334.0 ±320.9m; p= 0.05; d= 1.32 ±1.15) compared to defenders.

CONCLUSIONS: Players’ profile data are in agreement with recent research. Furthermore, results indicate a reduction of activity along with an increase of physical stress over the course of play. Regarding players position our findings support the hypotheses that midfielders are exposed to higher intensity bouts with longer rest periods compared to other positions. Overall, findings will be of interest for coaches and practitioners for a deeper understanding of demands players are exposed to in lacrosse match-play.

3777 Board #94 May 30 8:00 AM - 9:30 AM
An Evaluation Of Internal And External Load Metrics In Games In Women’S Collegiate Lacrosse
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(No relationships reported)

PURPOSE: There is little published data to guide coaches and sport scientists about important variables for measuring game and training load in sports outside of soccer and rugby. The purpose of this study was to statistically evaluate the relationship of internal and external load metrics in women’s collegiate lacrosse games.

METHODS: Twelve Division I collegiate female lacrosse players wore a heart rate (HR) monitor and global positioning system (GPS) during 17 collegiate games. Seven measures determined training load: two internal measures [mean HR and training impulse (TRIMP)] and five external measures [total distance, high-intensity distance (HID), distance rate, accelerations, and decelerations]. The training load measures were analyzed for the whole game and by first and second halves. Principal component analysis (PCA) was used to determine which internal and external load variables were most associated with each portion of the game. A paired samples t-test was used to compare differences in first and second half metrics.

RESULTS: The whole game and each half extracted only one principal component. For the whole game, HID, decelerations, accelerations, TRIMP, and total distance explained 58% of the variance (p < .001). The same metrics explained 55% of the variance for the first half (p < .001). For the second half, the same metrics with the addition of distance rate explained 57% of the variance (p < .001). Interestingly, the distance rate measure was only significant in the second half, although total distance contributed the most to the component, as it did in the first half and whole game data. The paired samples t-test showed differences between first and second halves for HID (p < .001), accelerations (p < .001), and decelerations (p < .001). In all cases, there was greater distance and more intense efforts in the first half than the second.

CONCLUSIONS: These results show that a combination of internal and external load measures should be used to determine load during games. The loaded metrics should be compared to a complimentary analysis for drills to ensure that training load metrics are similar. This information should be used to bolster appropriate training methods to improve second half fitness.

3778 Board #95 May 30 8:00 AM - 9:30 AM
Cut-Off Values In The Prediction Of Success In Olympic Distance Triathlon
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PURPOSE: To determine cut-off values to reach a Top-3 position in an Olympic distance triathlon by investigating which discipline has the most influence in overall race performance, and whether or not this has changed over the decades.

METHODS: Data from 1989 to 2018 of 33,099 men and 18,928 women (n=52,027) who competed in the Triathlon World Cup, World Triathlon Series, and Olympics race events were included. In addition to exploratory data analyses, linear regressions were applied for performance trends in overall and top-3 of each race. A t-test for independent samples was applied for sex comparison. Multivariate analysis was performed to assess which discipline may have the greater influence. The cut-off value to achieve a top-3 position was calculated.

RESULTS: The cut-off values for Men were: swimming=19.5min; cycling=60.7min; running=34.1min. Women’s cut-off values were: swimming=20.7min; cycling=71.6min; running=38.3min. Based on this analysis, it was shown that running is the discipline with the most influence on overall race time for men, while swimming is the discipline with most influence for women. Cycling is the discipline with least influence on overall race performance for both men and women.

CONCLUSIONS: In conclusion, the established cut-off values were set in order to increase the chances of achieving a successful rank in an Olympic distance triathlon. In summary, swimming split seems to be the better predictor of overall race performance in women, while running time is a better predictor for men. Our analyses showed that this influence pattern has not changed in the last three decades.

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Differences In Mechanics Between First And Second Drop Vertical Jump Landings

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PURPOSE: A drop jump and landing, followed by another maximal jump and landing, has been used when assessing injury risk using the Landing Error Scoring System (LESS). The LESS provides a way to measure frontal and sagittal plane alignment during landing and has traditionally used the first, but not the second, landing for assessment. Additionally, vertical ground reaction force (vGRF) and knee excursion are commonly analyzed during a drop vertical jump. The purpose of this study was to investigate whether there was a difference in LESS scores, vGRF, and knee excursion between the first and second landings of the drop vertical jump.

METHODS: Forty healthy subjects performed a drop vertical jump from a 30 cm box with an initial landing (L1) immediately followed by a second maximal jump and landing (L2). Three trials were scored using the LESS. Subjects were dichotomized as “high risk” on the LESS if they had a score greater than 5 (including moderate and poor scores) and “low risk” (including good and excellent scores) if they scored 5 or under. Jump height, peak vGRF, and knee excursion were recorded using an in-ground force plate and a 3-D motion analysis system. To further...