P COMPANY'S STEEPLECHASE

A BIOMECHANICAL AND PHYSIOLOGICAL APPROACH TO 10PTS

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INTRODUCTION

The Parachute Regiment's and Airborne Forces Pre-Parachute Selection (P Company) is a renowned bout of multiple scored tests of physical and mental resilience.

The steeplechase, a brutal event within P Company, epitomises this demanding selection process, but is often the forgotten test . This document analyses the biomechanical and physiological demands of the steeplechase, focusing on the crucial role of Repeated Sprint Ability (RSA), and drawing on current literature to provide a comprehensive understanding of the challenges involved. Furthermore, it will touch upon the cognitive demands inherent in such a dynamic and unpredictable event.

BIOMECHANICAL DEMANDS:

A. Running Style and Adaptability:

The steeplechase, with its obstacles, water jumps, and varied terrain, demands a highly adaptable running style. Efficient running requires minimising ground contact time and maximising elastic energy utilisation (1). This is crucial in the steeplechase, where obstacles disrupt rhythm & momentum. The ability to transition between running styles, from sprinting on flat ground to bounding over obstacles and navigating uneven terrain, is a key determinant of success.

B. Obstacle Clearance:

The biomechanics of obstacle clearance are particularly important. Utilising a short, powerful stride and a low, efficient obstacle clearance to minimise energy expenditure is recommended (2). Excessive vertical displacement wastes energy that could be used for forward propulsion (stay low on the obstacles). This is further compounded by the fatigue induced by the preceding running sections. Developing a consistent and efficient technique is crucial for minimising energy expenditure and maintaining momentum. Achieve this through drills focusing on proper foot placement, stride length, and body positioning.

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BIOMECHANICAL DEMANDS:

C. Water Jump Technique:

The water obstacles present another unique biomechanical challenge. These obstacles demand a powerful jump and landing, placing significant stress on the lower limbs. Plyometric exercises highlight the importance of proper landing mechanics to minimise impact forces and reduce injury risk (3). The ability to absorb and dissipate the impact upon landing is crucial, especially in a fatigued state. Reactive strength plays a key role here, enabling the soldier to rapidly regain momentum. Plyometric training, including exercises like box jumps and depth jumps, can improve the explosive power needed for the water jump, the leg drive through the water and enhance reactive strength for quick recovery after.

D. Terrain Negotiation and Proprioception:

Beyond specific obstacles, the varied terrain necessitates excellent proprioception – the body's awareness of its position in space. Running on uneven surfaces requires constant adjustments in stride length, foot placement, and body posture to maintain balance and prevent falls. This constant recalibration of movement patterns adds an extra layer of neuromuscular demand, contributing to overall fatigue. The nervous system must continuously adapt to the changing environment (4). Training on varied terrain, including trails and uneven surfaces, can improve proprioception and enhance the body's ability to adapt to changing conditions.

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PHYSIOLOGICAL DEMANDS

A. Repeated Sprint Ability (RSA) Defined:

RSA is the ability to conduct and recover from repeated bouts of high-intensity activity over a prolonged period. Tactical athletes, and P Company candidates, require the ability to repeatedly produce short, maximal efforts with incomplete and varying recovery periods. The steeplechase perfectly embodies this demand.

B. The Importance of Aerobic Capacity for RSA:

A higher aerobic capacity plays a vital role in RSA. As the number of repeated bouts increases, so does the aerobic contribution. Enhanced aerobic capacity influences recovery between bouts of high-intensity activity, thus improving RSA, which is critical for steeplechase performance. A strong aerobic base allows for quicker recovery between obstacles, enabling athletes to maintain performance throughout the steeplechase.

C. Training Implications:

Improving sprint ability requires strength development, while improving RSA requires enhanced aerobic capacity. Elite tactical athletes must excel in both. This aligns with current research demonstrating the importance of both strength and aerobic fitness for tactical performance. Combining strength training with high-intensity interval training (HIIT) that mimics the demands of the steeplechase (e.g., sprints interspersed with short recovery periods) is crucial for developing both sprint speed and RSA.

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COGNITIVE DEMANDS:

Beyond the physical and physiological challenges, the steeplechase also presents significant cognitive demands. Lets look at the sport of Obstacle Course Racing (OCR)... It is not just a physical challenge; it's a dynamic problem-solving activity. Athletes must constantly assess the terrain, anticipate upcoming obstacles, and adapt their strategies on the fly. This cognitive flexibility, combined with physical prowess, is what truly defines success in trail running and OCR. This is exactly what the steeplechase is (an obstacle course race) and it highlights the need for:

- ***Adaptability: Adjusting plans based on unforeseen circumstances and changing conditions.***
- ***Spatial awareness: Navigating the course efficiently and anticipating upcoming challenges.***
- ***Fatigue management: Maintaining focus and cognitive function even when physically exhausted.***

However, the cognitive demands of the steeplechase are multifaceted and require a more in-depth examination:

A. Perception and Interpretation:

Soldiers must quickly and accurately perceive and interpret the environment, including the terrain, obstacles, and other soldiers. This involves visual scanning, pattern recognition, and the ability to extract relevant information from a complex and rapidly changing scene. For example, judging the distance to a water jump, assessing the slipperiness of a surface, or identifying the most efficient path through a section of uneven ground all rely on accurate perception and interpretation.

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COGNITIVE DEMANDS:

B. Planning and Sequencing:

Soldiers must plan their approach to the course as a whole, anticipating upcoming challenges and sequencing their actions accordingly. This involves deciding when to conserve energy and when to push harder. Effective planning and sequencing can significantly improve overall performance.

C. Working Memory and Attention:

The steeplechase places a heavy demand on working memory and attention. Soldiers must remember the layout of the course, keep track of their progress, and maintain focus on the task at hand despite distractions and fatigue. The ability to filter out irrelevant information and focus on the most important cues is crucial for getting past the soldier in front and achieving maximum points.

D. Cognitive Flexibility:

The unpredictable nature of the steeplechase requires cognitive flexibility – the ability to adapt to changing circumstances and switch between different tasks or strategies. Unexpected obstacles, changes in weather conditions, or the actions of others may require soldiers to adopt new approaches.

E. Motor Control and Coordination:

The steeplechase demands precise motor control and coordination. Soldiers must execute complex movements, like jumping, climbing, and balancing, while maintaining speed and efficiency. This requires the integration of sensory information with motor commands and the ability to adapt movements to changing conditions.

F. Metacognition:

The awareness and understanding of one's own cognitive processes – plays an important role in the steeplechase. Soldiers who are aware of their strengths and weaknesses, who can accurately assess their performance, and who can effectively regulate their cognitive effort are more likely to succeed.

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PSYCHOLOGICAL DEMANDS:

The accumulated fatigue, the repeated challenges of the obstacles, and the pressure of the selection process all contribute to a significant psychological burden. The ability to maintain focus, control emotions, and persevere through discomfort is crucial. This mental resilience is arguably as important as the physical attributes discussed above. As evidenced by studies on the effects of stress on performance (5), managing stress and maintaining a positive mindset can significantly impact running economy and overall performance. Mental rehearsal and visualisation techniques can be valuable tools for preparing for the psychological challenges of the steeplechase. However, the psychological demands of the P Company steeplechase go beyond simply managing stress. They encompass a range of factors that can significantly influence performance, including:

A. Your Why:

Maintaining a high level of intrinsic motivation is essential for pushing through the pain and discomfort of the steeplechase. Soldiers who have a clear understanding of their reasons for wanting to join the Parachute Regiment / Airborne attachments who can effectively set and pursue short-term goals with substance behind the why during the event itself are more likely to succeed.

B. Self-Efficacy and Confidence:

Belief in one's ability to successfully complete the steeplechase is a powerful motivator. Developing self-efficacy through consistent training and positive self-talk can significantly impact performance. Visualising successful completion of the course and focusing on past achievements in training can bolster confidence and reduce anxiety. Earn the confidence in training.

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PSYCHOLOGICAL DEMANDS:

C. Emotional Regulation:

The steeplechase is likely to evoke a range of emotions, from excitement and anticipation to fear and frustration. The ability to effectively regulate these emotions and prevent them from becoming overwhelming is critical. Techniques such as deep breathing, mindfulness, and cognitive reappraisal can help Soldiers manage their emotions and maintain focus.

D. Resilience and Grit:

The ability to bounce back from setbacks and persevere in the face of adversity is essential for success in the steeplechase. Soldiers who possess grit – a combination of passion and perseverance for long-term goals – are more likely to push through pain and fatigue. Developing resilience through challenging training experiences can prepare Soldiers for the mental toughness required to compete

E. Attention Control and Focus:

The ability to maintain focus and resist distractions is crucial for effective performance in the steeplechase. Soldiers must be able to concentrate on the task at hand, consider personal pace and ignore distractions throughout.

F. Coping Strategies:

Developing effective coping strategies for dealing with pain, fatigue, and stress is essential. This might involve techniques such as self-talk, imagery, or distraction. Soldiers who have a repertoire of coping strategies are better equipped to handle the challenges of the steeplechase. Your ability to cope is earned in training. You have to do hard things in training.

Furthermore, the pressure of the selection process itself adds another layer of psychological complexity. Soldiers are constantly being evaluated, by P Company Directing Staff and the fear of failure can be a significant source of stress. Learning to manage this pressure and focus on performance rather than outcome is crucial. They are just another soldier in different coloured pants!

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CONCLUSION

The P Company steeplechase presents a unique challenge, demanding a combination of speed, endurance, agility, RSA, cognitive flexibility, and, perhaps most importantly, mental fortitude. The varied terrain and obstacles necessitate a highly adaptable running style, efficient obstacle clearance, effective landing mechanics, and a robust aerobic base to support repeated high-intensity efforts. The ability to manage fatigue, maintain balance, persevere through discomfort, demonstrate high levels of RSA, effectively solve the dynamic problems presented by the course, and maintain psychological resilience are all critical factors for success. Therefore, to optimise performance and achieve a faster steeplechase time, training should focus on three key areas:

A. Enhanced Aerobic Capacity:

Building a strong aerobic base through long-distance running and interval training is crucial for improving recovery between high-intensity bursts and sustaining performance throughout the event.

B. Refined Obstacle Proficiency:

Drills focusing on efficient obstacle clearance techniques, plyometric exercises for explosive power, and varied terrain running for improved proprioception will enhance the ability to navigate the course quickly and efficiently

C. Targeted RSA Development:

Incorporating repeated sprint training with incomplete recovery periods, mimicking the demands of the steeplechase, will specifically improve the ability to perform repeated high-intensity efforts and recover quickly, a critical factor for success.

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CONCLUSION

Beyond these physical training priorities, developing the psychological skills outlined above is equally important. Mental toughness, resilience, and the ability to manage stress and maintain focus are crucial for success in the P Company steeplechase. By prioritising these three key areas of training, and by actively developing psychological skills, potential candidates can significantly improve their steeplechase performance and better prepare themselves for the rigours of P Company.

Understanding the biomechanical, physiological, cognitive, and psychological demands, particularly the critical role of RSA, is essential for maximising training effectiveness and achieving peak performance in this gruelling test.

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