INTRODUCTION

We all know that the hamstrings are the most commonly occurring injury in elite football, with each twenty-five man squad suffering from an average of seven injuries per season (1). We also know that the problem is only getting worse with a 4% annual increase in training-related hamstring injuries (2) being reported over a thirteen year period. So why if we are seeing so many of these injuries and there is such a wealth of literature being published, are we seemingly struggling to prevent them from occurring? The answer to this question is obviously multi-faceted, but this article will look at the role that the Nordic Hamstring Exercise could play, and how it could be implemented within an elite football environment.

THE NORDIC HAMSTRING EXERCISE

The Nordic Hamstring Exercise has received a lot of attention within the literature over recent years with the invention and availability of the Nordbord in elite sporting practice. This device has led to much more interest in the screening and development of eccentric force production in the hamstrings. There is a general consensus that the exercise is effective in reducing hamstring injuries with a recent systematic review suggesting a potential 51% reduction in hamstring injuries following implementation of a NHE program(3). Despite this apparent drastic impact on reduction of hamstring injuries there is a lack of compliance from elite football clubs, with only 11% of clubs deemed fully compliant(4).

This lack of implementation of the Nordic Hamstring Exercise protocol suggests that the desired number of repetitions may not be appropriate within an elite football setting. This is understandable as the heavily utilised protocol is usually performed within a group of subjects participating in a recreational sports setting, with one game a week and no other strength training included within their weekly program. In an elite football setting where there is a desire to develop other physical attributes whilst still ensuring that players are in optimal physical condition for the heavy fixture schedules, then prescription of 100 weekly repetitions of the NHE is unfeasible. Therefore below I will look to discuss some possible strategies for practical implementation of the exercise.
HOW MUCH IS ENOUGH?
If we feel that 100 repetitions each week is not a suitable figure for our day-to-day practice, then how low can we go in terms of prescription whilst still achieving our desired physiological outcomes of increased eccentric force production and increased fascicle length? Well a recent paper (5) has looked to address this question, and it appears to suggest that low loading protocols were just as effective as higher loading. The study suggests that as little as 8 repetitions a week was as effective in development of hamstring eccentric force and fascicle lengthening as the previously discussed high load program. This is really important for us as clinicians as such a small number of repetitions should be able to be performed in our players weekly programs without interfering with performance. It is worth noting however that both groups did complete a two week standardised program comprising of 48 repetitions at the beginning of the study.

These findings maybe highlight that increased exposure does not necessarily mean increased chance of success (5). Instead there is an argument that ensuring the exercise remains supramaximal through individualised prescription is more important. Presland et al. (5) ensured that any player who was able to complete three repetitions down to the final 15 degrees of range were then provided with an additional external weight for future performance. This ability to perform throughout full range of movement was assessed weekly throughout the study.

So we have decided upon our loading levels that we are comfortable with in the squad and may even have decided to start this program prior to preseason commencing, however when can we finish the program? Well the research would suggest that we shouldn’t cease Nordic Hamstring loading, with as little as 14 days shown as sufficient time to completely reverse the positive benefits gained from six weeks of eccentric hamstring loading (5).

WHEN TO IMPLEMENT?
This leads us on nicely to discussing when we should perform the exercise both in relation to the season, and secondly at which point in the week. If we are to accept that the work of Presland et al. (5) gives us an evidence base from which to prescribe 8 repetitions a week, then we must also acknowledge the importance of the initial two weeks of moderate loading. It may therefore be appropriate to try and prescribe this moderate loading phase to our players in the final two weeks of the off-season program. This would negate the argument of muscle soreness hampering performance that we so often hear, and also place our players in a much decreased risk of hamstring injury come the intense preseason training schedule. We could then work with a low volume program alongside the already hectic preseason work.

If this decision has been made to include the ‘Nordic’ within our injury prevention program then we must also be aware of when is the optimal time in the day to implement the program. Lovell et al. (6) recently assisted in answering this question by studying the different physiological outcomes that can be expected if the exercise is performed prior to, or following squad training. Their findings that pre-exercise performance induces greater changes in fascicle length, with post-training performance resulting in greater changes to muscle thickness suggests that we may be best trying to vary players exposure. However if we then take into account previous work by the same group (7) showing a decrease in eccentric hamstring strength, particularly in outer range then we may consider that NHE performance prior to training is too great a risk.

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Table One: Taken From Presland et al. (2018).

Photo Credit – Paul Hazlewood
EVIDENCE BASED PRACTICAL SUGGESTIONS

The Nordic Hamstring Exercise has received a lot of attention, with some research and discussions suggesting that the exercise is either not effective, or not applicable to the elite football environment. Hopefully this article will result in some discussion and highlight that although maybe not appropriate for all club environments/philosophies, there is more clinically applicable research coming out to support and guide its use in elite football. Below is a summary of potential ideas for successful incorporation of the exercise:

- Prescribe moderate load (48 weekly repetitions) protocol in the final two weeks of the off season program to allow for a low load program to be implemented in the preseason period.
- Prescribe the exercise following training sessions to decrease fatigue-induced injury risk.
- Ensure that the exercise remains supramaximal through addition of an external weight once three repetitions can successfully be achieved through full range of movement.
- Be consistent with prescription of the exercise, with reversal of adaptations seen in as little as 14 days detraining. Consistency will also improve the ratings of soreness felt by the players following performance.

To finish off this article I would like to highlight that this is just one piece in the hamstring prevention puzzle. However if correctly executed then the research would suggest it is an important piece of this ever growing puzzle.