The performance lifestyle – a multidimensional approach to enhancing recovery and optimising performance

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There is no doubt that the training programmes employed by strength and conditioning professionals are more sophisticated than ever before, employing a wide variety of systems and methodologies. These programmes are meticulously planned, and based on a whole host of scientific information. Despite this, it must always be kept in mind that no matter how sophisticated and well planned our training programmes, the gains our athletes can expect to make will always be dependent upon the relationship between stress and recovery,[14] and we will only be able to optimise performance when we can optimally balance training stress and subsequent recovery.[21]

Unfortunately, despite the need to balance training and recovery, there is a great discrepancy between the emphasis given to training and the emphasis placed on recovery.[15] If this is not addressed, it has the potential to reduce the effectiveness of even the most sophisticated training programme. In simple terms, if the athlete is not recovered, then they cannot make optimal gains from training.

In our quest for ever improving performance levels, a well planned recovery programme needs to become a core part of an athlete's regimen. Indeed, Norris and Smith (2002) suggests that the correct timing, structure and use of recovery strategies may be the most powerful weapon in a coach's arsenal. What is clear, is that ensuring our athletes are optimally recovered is a key in constructing an effective training programme.[14]

Why recovery? – The fitness fatigue theory

According to the fitness-fatigue theory, the net immediate effect of any training session is dependent upon the balance between two processes.[38] The first is a potentiation (or potential improvement in performance), and the second is a fatiguing effect, resulting in a deterioration of performance level. The level of subsequent performance depends upon the interplay between these two effects. In general, actual performance immediately following a workout is reduced, as fatigue is generally greater then potentiation. However, potentiation tends to last longer than fatigue, resulting in the super-compensation process, and a subsequent improvement in overall performance. This process does not always occur, as with inadequate recovery, the super-compensation effect cannot be optimised, and performance levels may decline. In this way recovery needs to be stressed if optimal training effects are to be elicited.

The actual interplay between the potentiating and fatigue effects, depends upon the characteristics of both the stressor (workout) and the athlete (in terms of their capacity to handle the session and the complex multi-dimensional factors that will affect their recovery ability). In this way, any training programme needs to examine carefully not only the nature of the training dose, but also the individual capacities of each athlete to tolerate the dose and to subsequently supercompensate. This is made more challenging by the

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fact that the athlete's recovery ability is not a fixed quantity, and will vary in response to the total stresses being placed upon the athlete at any one time, and their unique capabilities to deal with the stresses being placed on them.[1]

The nature of fatigue

Any programme aimed at enhancing recovery, needs to have a clear indication of the nature of fatigue. Fatigue can be defined a failure to maintain a required or expected force or power output.[5] Fatigue can also be defined as the inability of a physiological process to continue functioning at a particular level, and/or the inability of the total organism to maintain a pre-determined exercise intensity.[23] Using this latter definition, fatigue may manifest itself on a functional system level or on a whole organism level.[37] This presents a vital definition, as fatigue can be a cumulative process, the result of the accumulation of multi-dimensional stressors and not solely the training load. All stressors have the capacity to produce fatigue, and must be accounted for when looking at the overall levels of fatigue experienced by an athlete at any one time. Calder[3] also identifies a number of fatigue types, namely metabolic, neural, psychological and emotional, further emphasising the multi-dimensional nature of fatigue.

The importance of each type of fatigue will vary between sports, often between playing positions, and also with the environment surrounding individuals at any time.[15] Recovery strategies need to vary depending upon the exact nature of stress and fatigue being encountered by an athlete at any time. By targeting techniques at the major stressors found within the activity and within an athlete's current life, an optimal recovery system can be developed.

The nature of recovery

Before we can fully address an athlete's recovery needs, it is important to determine the nature of recovery itself. Recovery can be defined as "an inter and intra individual, multi-level process in time for the re-establishment of performance abilities".[21] Important in this definition is the inter and intra individual processes involved in recovery. As will become evident later in the article, recovery requirements relating to stress will vary between individuals, and ideally individualised responses will be needed to optimise recovery. This is even further complicated by the fact that an individual's recovery requirements will vary over time, and in response to the various stressors placed on them at any time.[15] In this way, an individual's recovery programme will constantly need to adapt in response to their ever changing stress environment.

Another key aspect of recovery which coaches need to note, is that optimal recovery strategies need to encompass an action-oriented component,[21] incorporating self initiated activities that can be systematically used to optimise situational conditions to build up and refill personal resources and buffers.[9,21] The use of self initiated activities throws up another key challenge for any coach – that of time. Many of the activities required for optimal recovery will need to take place away from the training environment (over which the coach will have little direct control). In these instances, the coach will need to rely on the athlete to make wise decisions in a range of lifestyle areas, and educating all athletes into elements of a Performance Lifestyle is a crucial part of any recovery strategy.[15]

Recovery versus overtraining

The area where a body of research does exist is that of overtraining. Overtraining syndrome has traditionally been defined as an imbalance between training and recovery.[25] A number of indicators have been identified such as feelings of depression, decreased self esteem, emotional instability, impaired performance, lack of super compensation, restlessness, irritability, disturbed sleep, weight loss, loss of appetite, increased resting heart rate, increased vulnerability to injuries and illness, and hormonal change.[20] However, this definition may be limiting when looking to instigate optimal recovery strategies, in that athletes suffering from symptoms of overtraining would automatically look for a physical reason for the overtraining syndrome symptoms. Indeed, the term overtraining itself suggests a mistake in the training programme, implying an excessive training load and the need for a physical response via a reduction or change in the training load. In reality this may not always be the case, given that stress is a multi-dimensional phenomenon, and can manifest itself in any of the three domains of fitness. The term overtraining, by definition, may present us with too narrow a focus, and may limit the potential of providing a solution to an athlete's symptoms. A better definition of overtraining is presented by Lehmann et al,[26] where overtraining is due to an imbalance between stress and recovery. This definition also explicitly asserts that stress includes all training, competition and additional non-training stress factors. This definition is clearly more favourable if the multi-dimensional approach to recovery is to be taken. However, it still uses the term overtraining, which in itself suggests a factor outside an athlete's control. A key part of the Performance Lifestyle approach is that athlete's need to take proactive measures to help them recover, and the term overtraining runs counter to this approach.

Budgett[2] proposed that under-recovery, not necessarily too much training, leads to the symptoms referred to as overtraining syndrome. Under-recovery can be thought of as an imbalance between total stress and recovery.[15] By

using the term under-recovery, rather than overtraining, a change in approach to the issue can be instigated. Rather than being simply a matter of semantics, using this term shifts the whole emphasis of recovery strategies. By using the term under-recovery, focus is immediately on the balance between overall stress and recovery. In this way the need for increased recovery is stressed, encouraging an increase in proactive measures to enhance recovery. As recovery actions are able to be influenced by an athlete's actions, the change in terms also implies that an athlete has greater control over the problem. Additionally, the expansion of the term to include all stressors, emphasises that the stresses on an athlete will come from a range of sources, and that a multi-dimensional approach should be followed to optimise recovery. In this way the importance of the multi-dimensional, pro-active approach of the Performance Lifestyle can be emphasised and instigated.

The multi-dimensional nature of stress

It is crucial that a coach remembers that training is only one of a range of stressors on an athlete at any time. At times it is easy to simply view athletes as a physical entity, when in reality any athlete is a psychosociophysiological entity.[22] In this way they will be affected by stressors that exist outside the training environment as well as in it. In this way the dose-response relationship of training and effect can never be seen as fixed. Instead it is a fluctuating entity that needs to evaluate both the training dose and the capacity of the athlete to tolerate and recover from this dose, in light of their total stress state and capacity.

Stressors can be seen to exist in three dimensions of fitness: physical, psychological and emotional[1] *(Figure 1).* At any time, athletes will

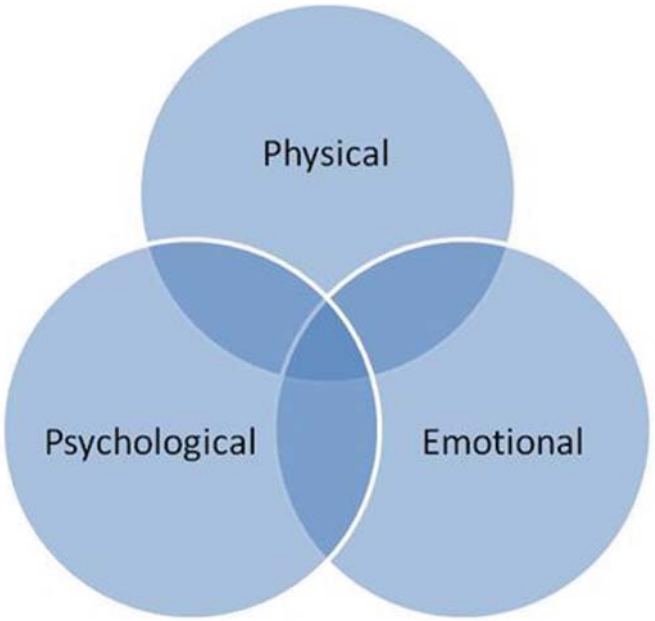

Figure1. The Domains of fitness/stress

be subject to stress from all three domains, with the relative intensity, volume and duration of these varying over time. While the three domains can be identified, what is vital to note is that regardless of the stress, it all affects the athlete on an organismal level. While the source of stress can often be identified as falling into one of the three domains, the results can manifest themselves in all three,[15] as all three domains are dynamically related.[1] There is a cybernetic link between the three areas within the body, and stress from one source can manifest itself in another area of fitness, both acutely and chronically. For example, psychological stress such as anxiety prior to a competition can manifest itself physically in the form of increased heart rate, butterflies in the stomach, sweating etc.[8] Similarly in the long-term, extended periods of psychological stress can manifest themselves through a reduction in the immune system (physical) and an increase in irritability (emotional).[32] In this way, coaches and athletes need to take a multi-dimensional view of stress, enabling athletes to develop individualised approaches to their major needs. Stressors are accumulative, and may not immediately manifest themselves. Therefore, coaches need to take a long term view on recovery as well as a short term view. Poor nutrition is a good example. The consequences of poor nutritional habits aren't always immediate, and may take a considerable time to manifest themselves, as evidenced by the chronic obesity problem being faced by the western world. This accumulation of stress over a long period of time also adds a challenge when trying to identify and address any causes of under-recovery, as accumulated fatigue such as that accrued after a long period of poor nutrition, may not be at first obvious to the athlete/coach.

Another important difference in the Performance Lifestyle approach to recovery, is its focus on capacity development as well as recovery methods. Building the capacity to cope with stressors is fundamental to enhancing recovery. By carefully planning training, potentiation can be optimised and overall capacity in each fitness elements enhanced, while fatigue levels are controlled. In this way, the athlete develops the ability to cope with stressors to optimise both performance and recovery. For optimal application, an athlete needs to be able to build the capacity to deal with stressors in each domain of fitness. While we as strength and conditioning professionals are adept at building capacity in the physical domain, many athletes never develop capacity in the emotional and psychological domains, which often create weak links within the system.

In terms of the physical workouts a number of characteristics of the stressor such as work type, session duration, session intensity, volume of work, work distribution over time etc, will

contribute to its net effect, and all need to be considered in planning the session. Avoiding "junk training" (training that provides little potentiation but high levels of fatigue) needs to be a priority. Additionally, by utilising proactive recovery methods, the rate of recovery from fatigue can be enhanced. This is further supported by utilising a Performance Lifestyle approach, whereby a number of multi-dimensional pieces are put in place which creates an environment within and around the athlete which helps reduce fatigue levels and which maximises the levels of recovery.[18]

The empowered athlete

While as coaches we can closely monitor, and to an extent control, the activities of our athletes when they are in our environment, this is simply not possible when an athlete leaves our environment. In reality, the athletes are in our controlled environment for a very small time period each day. The type of environment that they create, and the activities they undertake, away from the training environment, will play a massive role in the overall level of recovery. Only by creating a Performance Lifestyle away from the training arena can athletes hope to maximise recovery and subsequent performance.

A vital role in creating this environment is education and empowerment. To develop an athlete's ability to make informed decisions in their recovery and lifestyle requires that we educate and empower athletes in a range of key areas that have the potential to affect their recovery and performance. The Performance Lifestyle provides a framework around which to structure an educational programme. However, education is only part of the process, and providing information does not necessarily result in an empowered athlete. At all times education is only useful when the information is put into action, and therefore what is just as important is empowering athlete's to initiate actions that put the education into practice.

In the majority of instances, the adoption of a Performance Lifestyle should not be seen as creating immediate, radical changes in an athlete's life. Any changes need to be sustainable, and rather than making large changes, a far more effective policy is to instigate a series of small steps, which over time represents a series of significant changes in an athlete's lifestyle.[28] This series of small steps, provides a far more achievable approach, than trying to change a whole lifestyle at once, and assists in both motivation and compliance to the programme.[18]

Recovery needs to be individualised

The nature of stressors on an athlete at any time will be very individual, and consist of elements from both within and outside the training environment. In this way recovery is highly individual, and subject to individual appraisals.[20] Similarly, the effect of various recovery methods can also differ, depending upon the perception of both the stressors and the recovery technique in each individual. In this way a technique that produces excellent recovery for one athlete may not work for another. For example, massage may prove a degree of physical recovery and psychological recovery (relaxation) for some athletes.[10,35] On the other hand, for athletes who are uncomfortable with massage, the massage itself may cause great psychological stress, and despite any potential physical benefits, the activity may have a net stressor effect rather than a recovery effect for that athlete.

In this way, athletes need to be empowered to choose activities that target their areas of stress, and which they are comfortable with. Athletes should be encouraged to experiment with, and monitor, different recovery protocols, evaluating whether they provide benefit.[18] In this way they can monitor the individual effects of a range of methods, and decide what works for them. This allows individualised strategies to be developed, even within a team framework.

The concept of a Performance Lifestyle

The Performance Lifestyle approach to enhancing recovery attempts to provide a framework around which an athlete can structure their lives to provide for both optimal recovery.[18] This approach also has an added bonus of providing a framework which supports optimal performance both in athletics and in life.[15] Given the amount of time an athlete spends away from the training environment, there needs to be a structure around which to build an effective lifestyle, that will both optimise recovery and also optimise performance. With this structure an athlete can make small incremental changes, which, over time, can significantly enhance both recovery and performance, providing for optimisation of fitness and recovery in all three fitness domains.

In this way an individualised approach can be developed which is crucial for optimal application.[1] This approach can then be adapted as and when needed, and in response to changes within each individual athlete's situations. Only by empowering an athlete to take proactive actions within and away from the training environment can the multi-dimensional individualised approach which is vital for optimal application be achieved.[15] This approach also allows a 24/7 application of optimal recovery techniques.

The seven pillars of the Performance Lifestyle

As with any sound structure, a Performance Lifestyle needs to be built on solid foundations, in this case seven key pillars. These pillars provide

for separate areas of application, but link together to provide an approach, which through effective combination, provides a whole that is bigger than the sum of the parts.[18]

The seven key pillars are:

Pillar one – Find your purpose and action your dreams

Pillar two – Build self awareness

Pillar three – The power of positive

Pillar four – The power of rituals

Pillar five – Build capacity then disengage

Pillar six – Quality nutrition

Pillar seven – Quality sleep

Pillar one – Find your purpose and action your dreams

Management of energy is fundamental to enduring high performance in athletics and life,[28] especially in today's culture where the demand on athlete's time is greater than ever.[1] An athlete will often lead a complex life, with many demands on their time and energy. A vital part of the management of energy is a clearly defined focus. This focus allows energy to be expended in the most productive activities, rather than being squandered on less productive activities. Unmet needs can cause an energy leakage in an athlete,[28] and effective goals and actions can help reduce these leaks. In addition to athletic goals, it is important that an athlete is aware of their major life needs and dreams, and that these are catered for in the same way as their athletic dreams, with clear goals and actions.

Effective goal setting provides a framework around which an athlete can structure their time and energy . This increases the focus and direction of efforts, ensuring optimisation of energy, and maximisation of results with the minimal of wasted energy expenditure.[18] This clear focus also helps produce the flow state which is conducive to optimal performance and optimal recovery.[4]

Effective goals are fundamental to any Performance Lifestyle and these goals need to be both long term and short term in nature. The long term goal needs to be the athlete's big dream. It needs to be big enough to get them going each and every day.[30] Once this is established, medium and short term goals need to be effectively planned and written to allow for the achievement of the dream. In essence, these provide the roadmap and milestones towards the goal.

As well as the goals themselves, the commitment to writing them down, and the way in which they are written is vital. The sheer act of writing goals down, greatly enhances the likelihood of the actions needed to achieve them being undertaken.[29] Additionally, sharing them with a close friend or relative further enhances the adherence to the actions.[29]

Pillar three looks at the power of a positive outlook, and this is equally true in the wording of goals. Goals must always be positively written, involving a movement towards an action, rather than an avoidance of an action. In this way a nutritional goal worded "I will eat a piece of fruit at mid morning break each day" is far more effective than "I will stop eating chocolate at mid morning break". In the former, the focus is on the desired action while with the latter, it is on the avoidance of a given action, actually placing the focus directly on the action to be avoided. This concept reinforces the principles of positivity, which are outlined in pillar three.

However, effective goals are not enough in themselves. What is crucial is an action orientation. An athlete needs to plan, record and carry out specific actions that will lead to the achievement of the short term goals, and ultimately lead them along the path to the long term goal. Goals that have associated actions are the key to initiating the rituals that lead to enhanced recovery via an enhanced Performance Lifestyle, and are the key to Pillar 4.

Pillar two – Develop self awareness

A crucial part of the "Performance Lifestyle approach to enhancing recovery is the ability to take self initiated, proactive actions to address times of under-recovery. Crucial to this is the athlete's ability to identify times of under-recovery as well as identifying sources of stress that could be contributing to this. Developing a high degree of self awareness in these areas is fundamental to the effective application of the Performance Lifestyle, and is also a skill that can greatly contribute to athletic performance and also to the quality of an athlete's life.

Self awareness needs to be developed in both the identification of times of under-recovery as well as possible causes of stress. Tools such as a training/recovery log,[13] lifestyle profile,[16] psychological profile,[27] all provide excellent tools with which an athlete can increase their self awareness. Additionally the use of a daily log in which athletes record all of their key thoughts/worries etc is a great tool in the development of self awareness, and can be incorporated into a training/recovery log.[15]

With this increased self awareness, the athlete becomes aware of the nature of stressors at any given time, and their effect on performance. Additionally, through effective evaluation of different recovery strategies, effective recovery strategies can be utilised to proactively enhance recovery at times when it is needed.

Pillar three – The power of positive

The impact of stressors on the body depends

largely on the overall health of the body. This health is in turn affected by the athlete's psychological and emotional health, as well as physical health. Psychological and emotional health is greatly affected by the athlete's explanatory style, and the way in which the stressors are viewed, especially whether athletes employ an optimistic or pessimistic explanatory style.[33] The way in which we view the world is controlled largely by our thoughts and beliefs, all of which can be positively impacted upon.[34] The ability to recover will be closely linked to the emotional and psychological health of the athlete and the nature of their belief and thoughts. Goleman[7] believes that the emotional domain is probably the most powerful domain of total fitness and emotionally healthy athletes have a massive capacity to tolerate stressors,[1] which itself facilitates both performance and recovery.

Our emotions can be set out on an emotional quadrant *(see Figure 2)*, and it is important that athletes are facilitated in their quest to achieve ideal mood states, for both performance and recovery. Optimal gains from training will occur when we are experiencing the emotions associated with the positive high energy quarter of the quadrant. These emotions are those identified as being associated with "flow" states.[4] In this way, coaches need to select activities that can promote these feelings within their athletes. Similarly, optimal recovery will occur when athletes are experiencing feelings within the positive low energy quarter, again the "Flow" state of recovery.[4] Athletes need to be encouraged to experiment with and select activities that promote these feelings.

Where negative feelings occur, athletes should be encouraged to note them, along with an explanation of why they are feeling like this. Where these feelings are regularly identified, rituals and strategies can be set up which try to alleviate these feelings. Much of the work carried out in the field of positive psychology can be effectively applied to the field of athletic performance and recovery, and can help build an emotional environment which both optimises performance and also facilitates optimal recovery.[18]

Pillar four – The power of rituals

Without consistent action, no recovery strategy will ever be optimally effective. A key to the effective utilisation of the "Performance Lifestyle" is positively taking action to address key aspects which are undermining recovery, and to take these actions on a consistent basis. Fundamental to effective action is the ability to transform the intention into effective action.

If we examine a typical day, we will see that many of our daily actions are performed ritualistically, without the need for any real thought in the carrying out of these actions. Take most people's morning routines, they probably do the same thing each morning, without ever really thinking about it. It has become a ritual. Unlike self discipline, which has a high energy requirement, rituals have low energy requirements but are highly effective.[28]

Figure 2. The Emotional Quadrant

LOW ENERGY	HIGH ENERGY	
Relaxed Content Peaceful Tranquil In control	Excited Vigorous Engaged Confident Invigorated Challenged Patient Optimistic	POSITIVE
Depressed Exhausted Concerned Agitated Fearful	Anxious Resentful Angry Bored Impatient Pessimistic Defensive	NEGATIVE

The key to the effective use of rituals, is for the athlete to use the results of their increased self awareness, and identify a small number of areas that need attention. This may be areas such as nutrition, sleep, psychological relaxation etc. Within these areas they then need to identify a small number of achievable actions that they could take, and turn these into rituals which would help them alleviate some of their issues. Effective rituals need not be elaborate, for example taking their own recovery mix together with a shaker could be an effective ritual to help optimise post workout nutritional recovery. In fact, rituals can be used effectively in all of the fitness domains and provide a key tool in the development of a Performance Lifestyle.

Again the key to effective accomplishment of ritualistic action is working on developing a small number of rituals at a time. Then, once these are established, the athlete should move onto others. Despite being relatively small steps the achievement of these actions will provide a massive increase in the quality of an athlete's lifestyle over time, and an associated increase in both their recovery levels and also their performance levels.

Pillar five – Build capacity and regenerate

A unique feature of the "Performance Lifestyle" is that it does not view recovery as inaction. It stresses the need for proactive recovery techniques, where the athlete is empowered to take positive action to enhance recovery. Another unique feature is that it aims to enhance recovery by building capacity. The greater an athlete's capacity for stress, then the lower the fatigue associated with these stressors will be. A coach needs to utilise methods by which capacity can be built in all domains of fitness (physical, psychological and emotional). In reality, while many athletes have excellent physical capacity as a result of well planned training programmes, seldom are psychological and emotional capacity developed to anywhere near the same degree. This leaves a massive potential energy leak, and often under-recovery and performance breakdowns can be traced to psychological and/or emotional issues and not simply physical problems.[15] In this way, athletes need to ensure that capacity is built in all three fields of fitness, and where possible, that the priority areas identified through their enhanced self awareness become the major focus of their efforts.

Building capacity is just one part of the equation. Following effective capacity building there is an urgent need for regeneration, and again this regeneration needs to be multidimensional, and can also target the nature of stress/fatigue encountered.[17] An athlete needs to develop strategies by which they can effectively regenerate in all domains. Again the enhancement of self awareness facilitates this regeneration in that their ability to select individual strategies which optimise regeneration will have been enhanced. Additionally, their ability to establish achievable rituals provides them with the mechanism by which to integrate successful strategies into appropriate "Performance Lifestyle" rituals.[18]

It was noted previously that different activities can have different effects on different people. In this way athletes need to be encouraged to experiment with different regeneration activities to find out what works for them in all three fitness dimensions. By providing education on the options available and the basis on which they work, athletes can be provided with the framework around which to select their own preferred activities. This also helps provide a degree of athlete control and choice, which can facilitate adherence to the activities. In this way, individual strategies can be utilised within the framework of teams.

A key point to note, is that for optimal regeneration, it is not simply the activity itself that promotes recovery, but the way in which it is carried out. For example, an athlete may like to play a round of golf, as a means of psychological recovery. However, if during a round of golf their mind is pre-occupied with problems at the training ground, the round will not provide the normal levels of regeneration. Only by being disengaged from the psychological stressors can the round of golf provide effective regeneration.

Pillar six – Quality nutrition

Quality nutrition must play a fundamental role in any recovery strategy. Without this, the internal environment for optimal gains and optimal recovery from training cannot be provided. A vital aspect of the Performance Lifestyle approach is that quality nutrition should be a 24/7 aim, and not simply focus on pre, during and post workout nutrition. In many instances athletes will do the right things pre, during and post workout, and then blow the whole effect with poor eating habits for the rest of the time. While pre, during and post workout nutrition are an important part of any Performance Lifestyle, initial focus should always be on the overall quality of an athlete's nutrition.

Fundamental to any Performance Nutrition programme is education. For optimal effectiveness this needs to focus on the why and how, as well as the what. Only by seeing the impact that nutrition can have on recovery and performance, will athletes buy into it. Additionally, the programme needs to be individualised to the precise situations surrounding the athlete, with strategies and rituals set up to improve, step by step, the overall quality of nutrition. In this way the move towards a quality nutritional intake can be seen as achievable, with the athlete able to make

choices within broad nutritional guidelines. This again individualises the programme, which can enhance adherence.[18]

It is always best to aim for a slow gradual improvement, which an athlete can work with, than to try to solve all of the problems immediately. Radical changes in nutrition patterns are often seen as either unachievable or unsustainable by athletes[18] and these often compromise the results, almost before the programme has started. This step by step process will involve examining a sound nutrition framework, and then prioritising areas for the individual athlete to work on. The next step is for the athlete to set up simple achievable rituals that can help solve the prioritised problems.

For example, an athlete may go a long time between breakfast and lunch, and when hungry revert to poor quality snacks. A simple, ritual here may be to take a shake with them, or pack a piece of fruit which they can snack on mid morning. This ritual would be agreed within the athlete's own framework (cost, access, time etc), but once set up can make a significant change over time in overall nutrition quality.

Pillar Seven – Quality sleep

Optimal recovery cannot happen without optimal sleep, as sleep is fundamental to recovery and ultimately optimal performance.[14] Unfortunately sleep is not valued, and High School and College athletes are amongst the most sleep deprived people in the country.[6,12] This is ironic as these are the groups who need more sleep.[24]

Again education is the key to an effective strategy. This needs to focus on the need for sleep, explaining the nature of sleep cycles, and why sleep quality is equally as important as sleep duration.[36] This education forms the cornerstone of the Performance Lifestyle approach to sleep.

Once athletes have been educated in the need for sleep, then they need to evaluate their current sleep patterns and their own individual requirements. Part of this may come from their own lifestyle analysis[16] or may require specific sleep surveys.[18] What is important is that they are able to identify areas of weakness, and then instigate rituals that can address any areas that need work. For example, athletes may find difficulty getting to sleep due to worries going through their head. In this instance a ritual involving the use of a pre-sleep disengagement strategy, could be effectively set up.

Conclusion

Effective recovery is crucial to optimising performance. However, for optimal effectiveness, the strategies for enhancing recovery need to be multi-dimensional and individualised. The Performance Lifestyle provides a framework around which to construct multi-dimensional, individualised recovery strategies. The Performance Lifestyle approach also has the added bonus of creating an environment in which athletic performance can be optimised, as the mechanisms used to enhance recovery also contribute directly to improved performance. With the framework in place, coaches and athletes are encouraged to research and experiment with systems that they may feel could benefit them in their quest for their own ideal Performance Lifestyle. These may, or may not, come from traditional sport science or strength and conditioning sources, but athletes should be encouraged to experiment and review them within their own framework, and select whether or not to use them depending upon their efficacy in assisting with their overall recovery.

References

1. Botterill, C. and Wilson, C. Overtraining : emotional and interdisciplinary dimensions. In: Enhancing Recovery: Preventing Underperformance in Athletes Kellman, M. Champaign Ill: Human Kinetics. 2002 pp 143-159
2. Budgett R (1988) Fatigue and under-performance in athletes: The overtraining syndrome. British Journal of Sport and Medicine 32 107-110
3. Calder, A. Recovery: Revive Survive and Prosper. In: Smart Sport: The Ultimate Reference manual for Sports People Gascoigne, H. (Ed) Canberra: RWM Publishing. 1996. Chapter 7 pp 1-17.
4. Csikszentmihalyi, M. Flow. London: Random House. 2002
5. Edwards, R.H.T (1983) Biochemical Basis of fatigue in exercise performance; catastrophe theory of muscular fatigue. In Knuttgen, H.G., Vogel, J.A. and Poortmans, J (1983). Biochemistry of exercise,. Champaign Ill: Human Kintetics pp 3 -28
6. Faigenbaum, A.D., Mediate, P., and Rota, D. Sleep need in high school athletes. Strength and Conditioning Journal. 24(4): 18-19. 2002.
7. Goleman, D. Emotional Intelligence. London: Bloomsbury. 1995.
8. Gould, D, Greenleaf, C. And Krane, V. Arousal –Anxiety and Sport Behaviour. Horn, T. Advances in Sport Psychology (2nd Ed). Champaign Ill. Human Kinetics 2002. pp 207 -241
9. Hanin, Y.L (Ed) Emotions in Sport, Champaign Ill: Human Kinetics.
10. Hemmings, B., Smith, M., Graydon, J. and Dyson, R. Effects of massage on physiological restoration, perceived recovery, and repeated sports performance. British Journal of Sports Medicine. 34 (2): 109-114. 2000.
11. Horn, T. Advances in Sport Psychology (2nd Ed). Champaign Ill. Human Kinetics.
12. Hudson-Walters. P. Sleep, the athlete and performance. Strength and Conditioning Journal. 24(2): 17-24. 2004.
13. Jeffreys, I. A system for monitoring training stress and recovery in high school athletes. Strength and Conditioning Journal 26(3): 28-33. 2004.
14. Jeffreys, I. A multidimensional approach to enhancing recovery. Strength and Conditioning Journal. 27(5). 78-85. 2005
15. Jeffreys, I. A Multidimensional approach to enhancing recovery – The Performance Lifestyle. NSCA National Conference presentation, Washington DC. July 2006
16. Jeffreys, I. Lifestyle Monitoring in High School Athletes. Strength and Conditioning Journal 28(3) 77-79 2006.
17. Jeffreys, I Post Game Recovery Strategies for Rugby. Performance Training Journal. 6 (4) 13-16. 2007
18. Jeffreys I A Coaches Guide to Recovery – The

Performance Lifestyle . Monterey CA. Healthy Learning. 2008
19. Kellman, M.(Ed) Enhancing Recovery, Preventing Underperformance in Athletes. Champaign Ill: Human Kinetics. 2002.
20. Kellman, M. Underrecovery and Overtraining: Different Concepts – Similar impact In: Enhancing Recovery: Preventing Underperformance in Athletes Kellman, M. Champaign Ill: Human Kinetics. 2002 pp 3-24
21. Kellman, M. and Kallus, K.W. Recovery Stress Questionnaire for Athletes: User Manual. Champaign Ill: Human Kinetics. 2001.
22. Kentta, G and Hassmen, P. Underrecovery and Overtraining: A conceptual model. In: Enhancing Recovery: Preventing Underperformance in Athletes Kellman, M. Champaign Ill; Human Kinetics 2002 pp 57 –77.
23. Knuttgen, H.G., Vogel, J.A. and Poortmans, J (1983). Biochemistry of exercise,. Champaign Ill: Human Kintetics. XXIV
24. Kubbitz, K.A., Landers,D.M., Petruzzelo, S.J. and Han, J. The effects of acute and chronic exercise on sleep. A meta-analytical review. Sports Med. 21: 277 –291. 1996.
25. Kuipers, H. and Keiser, H.A. Overtraining in elite athletes: review and future directions. Sports Medicine. 6. 79-92 1988
26. Lehmann.M., Foster, C., Dickhult, H and Gustmann, U. Autonomic imbalance hypothesis and overtraining syndrome. Medicine and Science in Sports and exercise. 30, 1140-1145. 1998
27. Loehr, J.E. The New Toughness Training for Sports. New York: Plume. 1994.
28. Loehr, J.E. and Shwartz A. The Power of Full Engagement. New York: Free Press 2003
29. Maxwell, J.C. Talent is Never Enough. Nashville TN,: Thomas Nelson 2007.
30. McKenna, P. Change your Life in Seven Days. London: Bantam Press. 2004
31. Norris, S.R. and Smith, D.J. Planning, Periodization and Sequencing. In Kellmann 2002 pp 121-140
32. Peterson, C. A Primer in Positive Psychology Oxford: Oxford University Press 2006
33. Seligman, MEP. Authentic Happiness. London: Nicholas Brealey. 2001
34. Seligman, M.E.P. Learned Optimism. New York: Vintage 2006
35. Tildus, P.M. Manual massage and recovery of muscle function following exercise; a literature review. Journal of Orthopaedic and Sports Physical Therapy. 25 (2): 107-112. 1997.
36. Verstegen, M. Core Performance. New York: Rodale 2004.
37. Viru and Viru (2001) Biochemical Monitoring of Sports Training. Champaign Ill: Human Kinetics pp 185
38. Zatsiorsky, V. The Science and Practice of Strength Training. Champaign Ill: Human Kinetics. 1995.