**Introduction to Mastering Resilience**

Mastering resilience is something that applies to every athlete individually. No two bodies are the same, and every athlete has been through completely different circumstances, in terms of upbringing, environment, training, and competition. But the same fundamental principles apply across a wide range of athletes, not to mention a multitude of sports and disciplines.

This has led me in my practice to work with a system that I refer to as the Functional Sports Medicine Matrix. This accounts for all of the major influences on athletic performance, and enables me to work with athletes, using this matrix to help them achieve optimum performance. The Functional Sports Medicine Matrix is only a foundation for understanding athletic performance, and does not account for all factors. But it does deal with the most important aspects that lead to the development of resilience, or hamper it.

**Why me, why now?**

When any athlete experiences physical ailments or injuries, there are three questions at the heart of the matter that always inform my perspective:

- Why is this particular athlete suffering?

- Why has this particular injury or condition arisen?

- And why is it happening now?

So if we examine the first of these questions, asking why it is this athlete then leads to investigating what is unique about this athlete that predisposes him or her to this injury. And this could also lead to the follow-up question - why has some other injury not occurred?

What this implies is that there is something unique about the current situation, which has contributed to the development of the injury. Why has this injury appeared now, as opposed to one month ago, or two weeks into the future? There could also be some aspect of the athlete, whether anatomical, behavioral, or both, that predisposes them to the condition.

Addressing these questions and identifying satisfactory answers is critical if an athlete is to get to the bottom of why they are experiencing problems, and if they are to achieve this athletic potential going forward.

**Health to disease**

When we contemplate the human body, there tends to be a prevailing wisdom that we begin from a point of health, and veer from this robust foundation straight into the state of disease.

But that is often far from the case. In fact, that model of injury and maladaptation is usually only applicable with major trauma cases. An example of this would be when a patient is bitten by a mosquito, snake, or other malignant animal. This creates an episode of shock, and the disease of the body follows inevitably from this initial traumatic incident.

However, most athletes, and indeed most human beings, spend large swathes of time going through periods of dysfunction. This means that the relationship between health and disease is by no means one-way, or even reciprocal, instead it involves several interconnected states. Dysfunction can improve to a healthy state, while healthy states can deteriorate into disease, and disease can go to dysfunction…along with any other possible combination.

There is a close relationship between the three states, and the human body is rarely in stasis within one of the particular states. And the evolution of the anatomical state doesn't necessarily have to be negative, as the disease states can be reversed to dysfunction, and eventually to health. Which is obviously extremely important.

It is more accurate to view the human anatomy as being in a condition of continuous flux. Parts of the body may be heading from dysfunction to health, and there may be other parts drifting into dysfunction from their currently healthy states. Meanwhile other aspects of the anatomy may be heading towards disease. In short, all parts of the body are in different states, having different experiences, and in differing degrees of health and well-being.

But whatever state the body is in as a whole, and whatever the condition of individual parts, it is important to note that all conditions are reversible.

**Dysfunction and disease**

At this point, it’s important to define some of these terms, so that we’re entirely clear on what we’re dealing with. Disease can be defined as:

A disorder of structure or function that affects a specific location and is not simply a direct result of physical injury.

While dysfunction can be defined as:

Abnormality or impairment in the operation of a specified bodily organ or system.

Dysfunction can thus be extremely subtle. It could be something as simple as a slight brain fog, or a lack of vitality, or generally just feeling less than sharp. An individual may have a diminished sex drive, or feel their energy levels dipping significantly. Conversely, it could also be something more obvious and symptomatic, such as a woman being unable to menstruate, a person with asthma wheezing more than would be usual, or episodes of headaches or coughing. Essentially, each of these are symptoms that have yet to progress to a major illness, that manifest themselves as aches and pains in the body.

**Chronic inflammation**

I have spent the majority of my life and career studying dysfunction, and the foundation of this physical condition is always chronic inflammation. Inflammation refers to the negative biological response that body tissues have to harmful stimuli, and chronic inflammation refers to prolonged periods of inflammation that last for several months, or even years. An athlete suffering with chronic inflammation is effectively in a constant state of disorder.

Chronic inflammation originates from one of the five following areas:

- cellular energy pathways

- immune system

- detox pathways

- hormones and brain chemistry

- neuroskeletal structure

And then also affects one of these five areas. For example, if the immune system is struggling and causing inflammation, this will then have the knock-on effect of impacting on cellular energy pathways. Similarly, if your neuroskeletal structure is not working well, chronic back pain will almost always emerge. This will then begin to affect sleep, which will consequently alter the brain chemistry and hormones of the individual affected. And this can then impact on the immune system and cellular energy pathways. So these five areas are very much symbiotic and interconnected in nature.

So that is a critical platform when understanding athletic performance and resilience in the body. On top of this foundation, we can then place training and recovery. If these are suitably matched and appropriate in scale than an athlete will build resilience, both in mental and physical terms. And then the icing on the cake of that physical resilience is the ultimate athletic performance produced.

When you put all of these factors together, this is how I evaluate an individual athlete. It is based on the system that I have developed over a significant period of time. But there is one final component. In order to ensure that the system is applicable to the individual athlete, it is also important to take genetics and environment into account, along with the process of epigenetics; which effectively determines the way that genes are turned on or off.

All of this has a role and an impact on cellular energy pathways, the immune system, detox pathways, hormones and brain chemistry, and neuroskeletal structure. It determines what sort of training athletes can engage in, their level of recovery and resilience, and their ultimate performance development.

**Triangular performance**

According to my model, every human being and every athlete has a triangle! Some are tall and thin. Some are squarer. And all of them have different divisions and proportions, in order to reflect the prevailing characteristics of the individual. Each of these triangles is dependent on the factors that I have discussed previously.

At this time, the clinical implications of this are still being researched, but I believe that the triangles will become a manifestation of what type of training and sport it is possible for the individual to participate and excel in, along with the quality of athlete that you the person will become. But the key point is that we all have a triangle, and that all of our triangles are individual to us.

So if we examine chronic inflammation then we see that when it increases the cellular energy pathways, immune system, detox pathways, hormones and brain chemistry, and neuroskeletal structure that we discussed previously remain the same. The reason for this is quite simple - each of these are innate. You cannot change the size of your heart, you cannot change the size of your liver. you can’t specifically alter your microbiome.

But inflammation does have an impact on the next layer of the pyramid. As inflammation increases, so it reduces your ability to absorb training and recovery, consequently impeding resilience. Which then ultimately blunts athletic performance.

And this is where my work is centrally focused, as if inflammation can be driven down then the body is far more able to absorb training and recovery, and thus resilience is significantly increased. This is how chronic inflammation, and recovering from chronic inflammation, can be linked to building resilience and improving performance

**Examining inflammation**

Now let’s examine inflammation on its own. There are several factors that we can control in order to reduce cases of chronic inflammation. This is typically achieved via three overarching elements - lifestyle, nutrition, and supplements.

The case of life star, such issues as sleep, breast work, and cold exposure can have an impact. The key elements of nutrition are raw colours, low glycemic intake, and low omega 6 included in diet. And supplements can also play a role in health, with fish oil and vitamin di being two of the more common and helpful examples. This is by no means a complete impression of the way that chronic information can be addressed, rather it represents an introduction to the subject.

Nonetheless, sleep is a huge indicator of the degree to which you will generate information in the body. The more and deeper sleep is engaged in, the less information that there will be in the body. Similarly, breath work and meditation fires the vagus nerve, which is a key component of reducing inflammation. And cold exposure, with the ice bass or cold showers, can also play a role in diminishing the level of information in the body.

With this in mind, nutrition should be based on a roll, colourful vegetables, with a low glycaemic index that does not spike blood sugar, while omega six should be as low as possible, and, conversely, diet should be rich in omega 3. raw colours are rich in antioxidants, have a large water content, and also deliver fibre and nutrients in large quantities. It's also possible to supplement your diet with a variety of beneficial substances, including facial and vitamin day.

There are numerous aspects related to the three overarching areas that we can discuss further, but this is a good introduction to the concept.

**Understanding your anatomy**

Next weekend examine the five separate systems that we introduced earlier in this passage, namely:

now let’s look separately at these:

- cellular energy pathways

- immune system

- detox pathways

- hormones and brain chemistry

- neuroskeletal structure

Cellular energy pathways essentially refers to your mitochondria. To explain this briefly, mitochondria are found in large numbers in most cells, in which the biochemical processes of respiration and energy production occur, and are therefore critical to anatomical functioning. In this area, the health of DNA cells is particularly important, and stem cell health is a critical constituent part of this broader whole.

There are a variety of ways of achieving mitochondria health, but some beneficial processes include using homesis, sauna time, regular exercise, breath work, appropriate nutrition (low-calorie or fasting diet), while there are other possibilities as well. But all of those things, whether implemented individually or collectively, assist mitochondrial health and biogenesis (the synthesis of substances by living organisms).

DNA health is also critical in ensuring that energy pathways are strong, with stem cell health being a central part of this process. And your immune system is predominantly gut-based, so your microbiome is of central importance here as well. Microbiome refers to the genome of all the microorganisms living within the body, and the gut microbiome is comprised of the collective genome of microbes inhabiting the gut, including bacteria, archaea, viruses, and fungi.

A well-balanced and healthy functioning microbiome will contribute to favorable anatomical functioning, and consequently athletic performance. Indeed, recent studies have suggested that the microbiome is far more important to overall health than has been believed traditionally. Cutting edge research continues to uncover more in this area, and it’s very much a pioneering field of science, nutrition and research currently.

There are other aspects to this element of building resilience and athletic performance as well. It is advisable to assess how well your immune system is functioning in terms of the extent of viral reactivation. And it’s also important to look at aspects such as overtraining syndrome and NK cell dysfunction. NK cells search for viruses and abnormal cells; if a particular cell is malfunctioning then you are more prone to becoming unwell or injured, and indeed generating inflammation.

Moving on to detox pathways, these typically rely on your liver, and are dependent on the total toxic burden within your body; the amount of toxicity that has been created within your anatomy. This comes from a variety of sources, including air, food, water, cosmetics - essentially, all of the pollutants that we encounter in the modern world. While the liver is the major pathway, the skin, kidneys, and gut can also make a contribution.

The liver is a particularly critical organ in the body, as it takes toxins and eliminates them from the bloodstream. If the toxin in question is soluble in water, it will be possible for a person to pass this via urine. However, if the toxin is not soluble in water, the liver then needs to modify its structure in order to ensure that it can be passed effectively through the body. And it does this in two ways. The first is to take the toxin and effectively scrub its surface. And the second is to add a molecule - usually either an amino acid or fat, something of this nature - which then results in the toxin becoming inert; effectively ridding the body of its presence.

As one might imagine, this is a complex anatomical process, and if the liver doesn't function well then this entire system is compromised. This will then have the subsequential effect of reducing the effective functioning of the body. And if this pathway doesn't work effectively, a large amount of inflammation inevitably follows.

Moving on to hormones and brain chemistry, what is critical within this system is the amount of cortisol that is being produced (cortisol being an important hormone). If you're producing an excess of cortisol, or not enough, this will cause a vast amount of inflammation in the body. Furthermore, if the thyroid - a key regulator of body functioning - is not working correctly then this will also have an impact on mitochondria, also resulting in large amounts of inflammation.

Elsewhere, your sleep hormones, such as melatonin, are potent antioxidants, and if the body doesn't produce a sufficient amount of them then this can also be harmful. This will also affect brain chemistry, and this can have a longer term effect on the anatomy, and ultimately the athletic performance of an individual.

The neuroskeletal system essentially refers to the nervous system, joints, muscles, tendons, and ligaments. It is the system from which pain emanates. One example of a condition related to this system that can create a large amount of inflammation is skeletal asymmetry. This condition causes the joints to wear out, which then leads to significant pain and fluid buildup, and ultimately disease in the body. This will have a hugely detrimental impact on resilience and athletic performance.

And, finally, the nervous system can also be a source of inflammation, particularly when there is an imbalance between the sympathetic and parasympathetic nervous systems. Another issue can be an unreactive nervous system, which is deemed unhealthy and can be another major source of inflammation.

When each of these systems works at an optimal level, the amount of inflammation in the body will be minimal, possibly even non-existent. This provides an ideal foundation for anatomical functioning, and it is on this foundation that training blocks are built; this training being how athletes derive their level of performance.

**Training and resilience**

The relationship between training and resilience is also of critical importance. It is quite easy to jump to the conclusion that the harder you train, the more resilient that your body becomes. But this is far too simplistic to be accurate, and in fact is a completely misleading impression of the actual picture.

In any training block, if an athlete continues to train incredibly hard, and to an excessive degree, the level of physical recovery of his or her anatomy is seriously reduced. As a result of this, the level of resilience of this athlete plummets, because if you overtrain then you produce a tonne of inflammation in the body. This then eats into your powers of resilience, and your athletic performance diminishes as a result.

By the same token, if you're in recovery mode and not training, the body loses all adaptation and resilience, meaning that athletic performance is also damaged. What this means is that training and recovery has to be in balance, otherwise it’s literally counter-productive. It's not just overtraining that is detrimental, but also under-recovery. You can train really hard and push your body to its limit, but if you recover adequately then you can repeat this process continually. But if your recovery is insufficient then inflammation will inevitably result, and the negative chain reaction that we have already discussed will begin.

In my model, there are six physical aspects of training that contribute to the development of athletic performance. These are speed, endurance, power, strength, agility, and eyesight. On top of that, you also have sport-specific training; for example, if you're a tennis player then you need to be able to move on the court, hit the ball adequately, and so forth.

Additionally, there is also the psycho-emotional aspect of sport, which is often related to the growing field of sport psychology. This is a fundamental part of training for athletes now, and one of the ways in which competitors develop grit. This quality can be described as the resilience required to bounce back from defeat. It also manifests itself in the mental strength required to lose an important point, but for the athlete to immediately put this behind himself or herself. Effectively, it is the ability to moderate emotion and stay in the present.

Recovery can also be split into physical and mental sides. The physical aspect of recovery is perhaps more immediately apparent. This comprises components such as heart rate variability, the ability of a nervous system to recover, the speed of muscle glycogen replenishment, and how ably and quickly joints, strength, and stamina return to normal after intensive training blocks. Sleep is another key aspect of physical recovery, and if an athlete isn't sleeping adequately then their performance will be somewhat impeded.

However, there is also a psycho-emotional aspect to recovery, which may not be as obvious at first consideration. But it is actually completely critical in the process. This probably most readily manifests itself as the ability of athletes to recover emotionally from taxing training sessions and competitive matches. The bottom line here is…can the athlete in question go back-to-back?

Many players can perform superbly on one day, but can they then back it up with another excellent performance the very next day? This phenomenon is often experienced in golf, clearly not the most physically demanding of sports, in which one day someone will shoot a brilliant 60, and the very next day plummet to a disappointing 74. This is simply because they cannot sustain their effort emotionally, and this is a massive component of being a successful athlete, and particularly an elite athlete.

**Building resilience**

When you are able to pull these components together, you will build physical resilience. However, physical resilience itself can also be broken down into three central components - psycho-emotional, physical, and genetic expression.

The first of these, the psycho-emotional aspect, refers to the ability of an athlete to handle joy and sadness without being dictated by them. This can be viewed as the ability to moderate emotions. Physical resilience refers simply to the ability to take a physical toll over and and over again, and keep coming back for more. While the genetic expression refers to all of the things required in order to adapt satisfactorily.

All of these qualities collectively represent resilience. Even then, there is more to the process than mentioned here, but what we have provided so far is an excellent foundation of the concept. And everything that we have discussed represents the platform on which athletic performance is constructed.

**The Selye model**

Finally in this section, when understanding resilience it’s important to consider the Selye model. This system of understanding stress is named after János Hugo Bruno "Hans" Selye; a pioneering Hungarian-Canadian endocrinologist. Selye worked on the model of stress throughout his life, being nominated for the Nobel Prize 17 times, but criminally never receiving one. But he remains a pioneering and esteemed name in the field.

Selye conducted an array of incredibly important scientific work, and is considered by many to be the first researcher to demonstrate the existence of biological stress. His General Adaptation System explains how the body reacts to various aspects of training, and how athletes can achieve peak resilience, and ultimately peak performance.

If we begin the Selye model with a steady state, we can then ask an athlete to train hard. And regardless of whether it’s physical or mental, the performance of an athlete will actually decline. This is because the body is learning to adapt, and has gone into what Selye described as the alarm state. This will happen early in an athlete's development, when the competitor is learning how to cope with a new physical or mental workload.

However, if you keep increasing training, the body develops compensation and adaptability. The athlete's anatomy now understands what is required, and it begins to cope with this workload and expectation. As part of the process of adaptation, the body will typically create new neuro-pathways, and will also steadily develop the ability to achieve muscular recovery more quickly, and generally coordinate anatomical performance in a superior fashion.

But after a certain point, big improvements will begin to drop off. Most people reading this have probably experienced that plateau in one field or another. However, the mistake that most will make at this point is to press down on the gas pedal harder. This seems logical, but will actually result in performance sliding.

Often at this time, athletes are in a place where they are somewhat mentally anxious, and cannot understand why they’re not improving while training so hard. So they enter into a process referred to as overreaching...they train harder when not fully recovered. If this is not discovered and responded to appropriately, athletes will veer into overtraining, which is completely counter-productive. If this is caught quickly then athletes can fully recover, but it can take months or even years to adapt if it is not recognised at an early enough juncture.

What athletes require is a good and informed coach, who is able to look at the numbers generated from training and performance, blood work, heart rate variability, and other key indicators, before adjusting the training program accordingly. When this is achieved optimally, the athlete will rebound rapidly, at which point they are able to return to training properly, and consequently approach their genetic potential.

When you minimise inflammation, maximise physiology, train really hard, build resilience, and carry out this process over and over again, you give yourself the best chance of fulfiling your genetic potential. And by fulfilling your genetic potential, you become the strongest and most capable athlete possible.