

MedicalLiveWire

# NUTRITION & SPORT THERAPY 2017

## EXPERT GUIDE

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## Introduction

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What does David Haye, Venus Williams and Carl Lewis all have in common? Aside from being elite athletes whom at one stage or another have dominated their respective sports, each of these individuals have achieved their phenomenal success whilst living on a vegan diet.

According to figures from the Vegan Society, the number of vegans in the UK has risen by 350%, whilst research company GlobalData claims veganism has grown by as much as 500% in the United States in just three years. This reflects the substantial growth in the amount of people around the world converting to a plant-based diet in recent years. However, when it comes to nutrition many people have questioned how it is possible for a vegan athlete to sustain a protein-rich diet necessary to aid muscle recovery. The “Nutrition Technician”, Lisa J Lowery-Jones, tackles fact and fiction in order to provide useful advice on achieving success using a vegan diet.

This expert guide also discusses another important aspect of nutrition for athletic performance. In Sarah

Kirkham’s article about hydration we learn that just 4% dehydration can affect athletic performance by up to 25%. Sarah offers helpful guidance on how much hydration is enough whilst also outlining the different benefits of hypotonic, isotonic and hypertonic drinks. For day-to-day hydration, Sarah also provides useful tips for meeting your fluid needs.

Also in this edition, Christopher Holland, Senior Lecturer in Sports Therapy at the University of Worcester, shares his expertise in discussing joint mobilisation in the treatment of lateral ankle sprains – one of the most common lower extremity injuries within the physically active population. We also interview Dragos Luscan to learn more about his work as a personal trainer and wellness & physical coach. The former professional handball player in the Romanian National League has since worked as a physical coach for the national team and has also helped guide tennis superstars, Horia Tecau and Florin Mergea, to medals at the Rio Olympic Games in 2016.



*James Drakeford*  
Editor In Chief





# DNAFit<sup>®</sup>

ACHIEVE YOUR GENETIC POTENTIAL

Professional sports teams have utilised analytics and science for many years in order to enhance athletic performance. However, much of this analysis is now easily accessible to everyone from the aspiring athlete to the casual hobbyist. Our editor, James Drakeford, provided a cheek swab sample to DNA Fit to learn more about his genetic build and discover how this information can be utilised to help live a healthier life.

For more information about DNA Fit visit [www.dnafit.com](http://www.dnafit.com)

POWER/ENDURANCE RESPONSE

30.0% 70.0%



## DNAFit<sup>®</sup> DIET

### OPTIMAL DIET TYPE



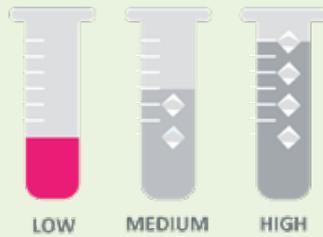
MEDITERRANEAN



LOW CARB



LOW FAT



LOW MEDIUM HIGH

#### CARBOHYDRATE SENSITIVITY

Refined carbs are rapidly digested and absorbed, which may result in large swings in blood glucose levels and can also affect our energy levels and weight control.

Some genetic variants are associated with an increased response to refined carbohydrates, which can have a negative effect both on glycaemia and weight management.

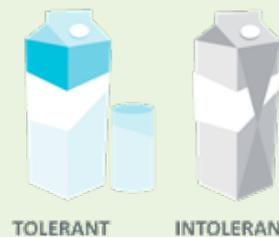
HIGH  
MEDIUM  
LOW



#### SATURATED FAT SENSITIVITY

Long-term overconsumption of saturated fats is associated with many health problems, and limits are advised.

However, the way saturated fats are handled varies according to genetic variation—some of us are more efficient at getting fats from food, so in these cases a lower intake is advisable.



TOLERANT INTOLERANT

#### LACTOSE INTOLERANCE

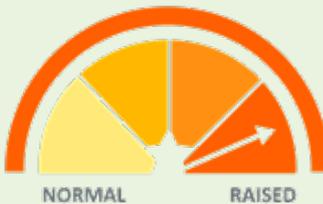
Lactose is a sugar present in milk and most dairy products, and it is digested by an enzyme called Lactase. In many people the presence of this enzyme decreases significantly with age—determined by the lactase gene variant. This results in a reduced ability to digest lactose itself, which can cause symptoms of bloating, pain and discomfort for those affected.



LOW MEDIUM HIGH

#### COELIAC PREDISPOSITION

Coeliac disease is a condition that occurs as an adverse reaction to gluten in grains such as wheat. Coeliac disease can affect approximately 30% of people who carry certain genetic variants.



NORMAL RAISED

#### ANTI-OXIDANT NEED

Anti-oxidants are molecules found in fresh foods like vegetables and fruit; they play a role in the removal of free radicals, which can be harmful to our health. The Anti-Oxidant vitamins are Vitamins A, C and E.



NORMAL RAISED

#### OMEGA-3 NEED

Omega-3 fatty acids are a type of unsaturated fat, often referred to as 'essential fatty acids' thanks to their role in making our bodies function normally. Oily fish, such as mackerel, salmon and sardines are a great source of dietary Omega-3's.



NORMAL RAISED

#### VITAMIN B NEED

Our nervous system, digestion and red blood cells depend on vitamin B to maintain normal function. Certain B Vitamins work in conjunction with folic acid to support our heart health - one gene in particular is well known for its roles in the utilization of folic acid and vitamins B6 and B12.



NORMAL

#### VITAMIN D NEED

Vitamin D helps us maintain healthy levels of calcium in our bones. Although we can get Vitamin D from our diet, our skin can produce it when we are exposed to sunlight. Vitamin D deficiency is associated with increased risk of osteoporosis and other conditions.

# DNAFit<sup>®</sup>

INJURY RISK

VERY HIGH

HIGH

MEDIUM

LOW

VERY LOW

VO2 MAX RESPONSE

VERY HIGH

HIGH

MEDIUM

LOW

VERY LOW

MEDIUM

SLOW

VERY SLOW

VERY FAST

FAST

RECOVERY SPEED

LOW FAT

MEDIUM

HIGH



NORMAL



RAISED

## ALCOHOL SENSITIVITY

Moderate alcohol consumption is associated with some health benefits, e.g. improved lipid profile. But, it is well known that over consumption has both short and long term negative consequences. The benefits to HDL cholesterol levels seem to be influenced by genetic variation in metabolizing alcohol enzymes and some benefit more than others – though of course always in moderation!



SLOW



FAST

## CAFFEINE SENSITIVITY

Caffeine is the most common stimulant we ingest on a regular basis. Primarily we get our caffeine from coffee, but also from energy drinks, tea and even certain medicines. While a moderate amount of caffeine is usually harmless, in some people excessive caffeine intake can cause anxiety, insomnia headaches and stomach irritation. Individuals can be classed as slow or fast caffeine metabolisers, determined by personal genetic variation.



NORMAL



RAISED

## SALT SENSITIVITY

Salt is made up of Sodium and Chloride. For health reasons we are mostly concerned with sodium intake as it can cause high blood pressure in those who are genetically susceptible. Commercial food foods that we buy from supermarkets often include large amounts of hidden sodium, before we even add salt to our cook ourselves. Some individuals appear to be more susceptible than others to hypertension associated with sodium intake.



RAISED



NORMAL



RAISED

## CRUCIFEROUS VEGETABLE NEED

Cruciferous vegetables are named for their cross-shaped flowers; they include cabbage, brussel sprouts, broccoli, cauliflower and kale. Their well-known health benefits are related to substances called glucosinolates, which help maintain cellular and cardiovascular health and promote removal of toxins.

## DETOXIFICATION ABILITY

Cooking certain meats at high temperatures creates the formation of chemicals that are not naturally present in uncooked meat. Variations in detoxification genes can influence our removal of these chemicals.



SLOW

FAST

POSITION

Common digestive disorders when a person has an intolerance to gluten, a protein found in wheat, barley and rye. Intolerances do not develop only in those with certain genetic variants.

VITAMIN D NEED

Individuals with low Vitamin D levels may not maintain normal blood sugar levels and strengthens our bones. Vitamin D is found in certain foods and can also be synthesized in the body through sunlight. Lack of Vitamin D over the long term, is associated with an increased risk of osteoporosis and other health problems.



# United Kingdom





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## Athletic Performance and a Vegan Diet

By Lisa J Lowery-Jones

Amongst athletes, usually the first question a vegan athlete gets asked is: “How do you get your protein?” This may be because we’ve had it drummed into us by the producers of protein powders that protein is paramount, especially in muscle-building activities. Whereas protein is, of course, important for the repair and building of muscles there should be more than enough in a vegan diet.

Six times World Ironman Triathlon Champion, **Dave Scott**, says that he feels healthier and has more energy on a vegan diet, and what could be more challenging than a 2.4 mile swim, 112 mile bike ride followed immediately by a 26.2 mile run? He says that he is sleeping better and can keep his weight better under control since going fully vegan from vegetarian.

**Robert Cheeke** was America’s top ranking vegan body builder, winning championships. He now writes, lectures and blogs about his diet and lifestyle inspiring many people to move over to a vegan diet. He recently cut back on supplements of protein powders and decreased his protein intake noticing that he gained more muscle mass. “When I cut out protein powders and all other sports supplements from my diet I, like many people, worried about my ability to build or even maintain muscle, and wasn’t exactly feeling optimistic, but proceeded anyway. The result? I was stronger than ever before, and not only maintained muscle mass, but I have built significant muscle over the past few years following a whole-food, plant-based, supplement-free diet, and I am now bigger and stronger than I have ever been!”

**John Machin** is a 61 year old lifelong vegan who demonstrates his strength and ability on his vegan diet his YouTube channel where you can see how much muscle can be built on a vegan diet. At 61 he has more muscle than most even half his age. He is a personal trainer and has a background in Sports Nutrition.

There are many vegan groups on Facebook where various athletes demonstrate just how well they are doing on their vegan diets. UK Vegan Runners has over 3,700 members whilst Vegan Bodybuilding and Fitness has well over 240,000 members.

More high profile athletes who have achieved incredible results on vegan diets include: 9 x Olympic gold medallist sprinter Carl Lewis who has been vegan since 1990; Tim “Livewire” Shieff – freerunning champion and finalist in *Ninja Warrior UK*; David Haye – former WBA Heavyweight boxing champion; Venus Williams – 23 x Grand Slam winning tennis player; and Fiona Oakes – 3 x world recording holding marathon runner who has been vegan her whole adult life.

### So what nutrients do we actually need for muscle-building athletic performance?

The first big one that most people are convinced that vegans can’t get enough of is the macro-nutrient **protein**. The building blocks of protein are amino acids and these are required to both build and maintain muscle-mass – amongst other things.

We know that meat eaters get their protein mainly from



the animals that they eat, but where do those animals get their protein from? – Plants. Therefore, where can vegans get their protein from? *Also from plants.* But they cut out the intermediate step, they get their amino acids directly from the source.

Sources of protein on a vegan diet include: vegetables, fruits, nuts, grains, peanuts, pumpkin seeds, peas, oats, tofu, tempeh, whole wheat bread and quinoa.

**Carbohydrates are paramount in all sports as a primary energy source.** Energy is important if we want

to exercise and build muscle. Carbohydrates are also important to help with the various cellular processes that go on within the body. Vegan diets provide high amounts of carbohydrates through vegetables.

**So called antioxidant nutrients are helpful in combating the damage caused by free-radicals.** As we exercise, free radicals are produced, especially in intense exercise. Fruit and vegetables are high in antioxidants and having a variety of different types and colours of fruit and vegetables gives us the best variety of antioxidants.



### Calcium

This is needed to help with muscle contraction and is found in almonds, sesame seeds and fortified foods.

### Magnesium

This is also involved in muscle contraction and to boost energy levels also helping to reduce fatigue and muscle cramps. This is found in: nuts, seeds, green leafy vegetables and garlic.

### Zinc

Has a role in the production of testosterone which helps to build muscles, and it also helps the muscles to recover from exercise. Zinc can be found in pulses, pumpkin seeds, spinach, nuts and mushrooms.

### Vitamin D

Has been shown to help in muscle strength and performance. Found in mushrooms, tofu and fortified foods such as plant milks. Best obtained from being in natural sunlight and so both vegans and meat-eaters may find the need to supplement in the winter months or if they are not out in the sunlight very often.

### Omega-3

May decrease muscle breakdown and enhance strength training. Best sources for vegans are from walnuts, flax seed, chia seeds, nuts and even fresh basil.

### Vitamin C

Important for the health of blood vessels (some of which will supply oxygen to muscles), as well as being important for collagen and elastin synthesis. Vitamin C is available in broccoli, tomatoes and strawberries.

### Vitamin E

Helps cells to recover from the oxidative stress of muscle damage thus helping them to repair better. Found in almonds, spinach, carrots, avocados and olive oil.

### B Vitamins

Paramount for energy production, and without these there may not be enough energy to work the muscles effectively. B vitamins can be found in: nuts, rice, bread, peas, legumes, potatoes, soya beans, mushrooms and brewer's yeast. **B<sub>12</sub>** may need to be taken from fortified foods such as yeast extract, plant milks and nutritional yeast. *This is one vitamin that can be lacking in both vegan, and meat-eating diets.* Although B<sub>12</sub> is produced in the gut of animals and thus would normally be ingested



when eating meat, with the change in farming practices and what the animals are given to eat, this means that even the animals often need to be given supplements of B<sub>12</sub>.

As well as providing the necessary nutrients an athlete needs on a vegan diet, it is also more beneficial in terms of an acid/alkali balance. A meat-eating diet is fairly acidic and this is not good – even more so for athletes. An acidic diet may lead to muscle wasting and an increased risk of injury.

### Conclusion

Like any way of eating that may exclude certain food items, you must make sure that you are eating a wide variety of different foods covering all macro and micro nutrients.

So to the question, ‘Do vegan diets contain enough nutrients to build muscle?’ Then I believe that the evidence shows that it is. Getting regular check-ups with your Doctor is not a bad idea. That way you can be sure that you are covering all your bases. It is always worth researching everything yourself before embarking on a new way of eating. Keeping a training diary will ensure

that your training and recovery are still on track also. If in doubt, always consult with your local Nutritional Therapist for advice on nutrient intake.

**Lisa J Lowery-Jones, Bsc(Hons), NT Dip, PG Dip, mBANT.**

*Lisa began her interest in nutrition when studying Sports & Exercise Science at Brighton University. A two-year course from Premier Training in Nutritional Therapy gave Lisa her qualification to practice, and offer advice and modifications to people’s diet to optimise health and well-being.*

*In today’s hectic lifestyle it is often difficult to follow the ‘perfect’ diet, and so Lisa offers clients a personalised diet and lifestyle plan to fit in with everyday life and stresses. After all – everyone is different! Consultations can be in person or via Skype. Each client receives personalised hand-outs and a programme specific to them.*

#### References:

Minich D & Bland J. Acid-alkaline balance: role in chronic disease and detoxification. *Alternative Therapies*, Jul/Aug 2007, Vol. 13, No. 4



## Sara Kirkham

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## Hydration – how much is enough?

By Sara Kirkham BSc.(Hons) Nutritional Medicine, CNHC, MBANT

Adequate hydration is crucial for good health, and critical to mental and physical performance. The human body is over two-thirds water weight, and whilst 2% dehydration will begin to affect our mental performance, 4% dehydration can affect aerobic performance by up to 25%. Water is involved in almost every metabolic reaction in the human body. It lubricates the eyes and joints, facilitates digestion, keeps the skin healthy and flushes out waste and toxins through the kidneys and sweat. Surveys have reported that less than 1% of people meet fluid intake recommendations, and 20% of GP visits are with symptoms such as tiredness and headaches, which can be caused by dehydration.

But dehydration can be much more serious than a headache and lack of energy. BBC2's *Trust Me, I'm a Doctor* programme illustrated that dehydration was a potential cause of increased strokes in the winter months. Reduced body temperature causes blood to be directed away from peripheral tissues in an attempt to maintain core body temperature, but the increased amount of blood in the core stimulates fluid loss through urine formation as the body attempts to reduce blood pressure. If this increased fluid loss is not corrected with an increase in fluid intake, dehydration occurs. This link between stroke and dehydration was also illustrated in the THIRST study (Rodriguez et al, 2008).

### How the body copes with dehydration

The hypothalamus in the brain measures blood osmolarity, the measure of solid particles in the blood compared to fluid (plasma). Dehydration results in

the hypothalamus stimulating the posterior pituitary to release anti-diuretic hormone, which travels in the bloodstream to the kidneys and increases the porosity of the collecting ducts in kidney nephrons. This results in more water being reabsorbed back into the blood stream from the filtrate that is creating urine, elevating blood plasma (fluid) levels, decreasing osmolarity, and even correcting a previously reduced blood pressure in more extreme dehydration. At the same time, the hypothalamus sends a nervous impulse to the thirst centre in the brain, so feeling thirsty is an indication that blood osmolarity has already risen and body metabolism and performance have already been affected. Therefore, it is better to prevent this from happening in the first place!

### So how much should we be drinking?

The NHS Eat Well Guide states that we should drink six to eight glasses of fluid daily, based upon original recommendations from the Food and Nutrition Board (1945) that we consume one ml of water per calorie consumed. The Institute of Medicine recommends 3.7 litres for men and 2.7 litres for women. However, a more accurate guideline is based upon an individual's body weight. The Oxford Handbook of Nutrition and Dietetics (2012) recommends that we consume 35ml of fluid per kg body weight, but all of these recommendations are not taking account of the fluid consumed within our diet, from, for example, high water content fruit and vegetables, milk or soup. However, if your diet is not meeting the recommended five (to 10) portions of fruit and vegetables per day, your diet is less likely to be contributing much to your fluid requirements.



For exercising individuals, the American College of Sports Medicine (ACSM) provides guidelines for rehydration during and after exercise, as fluid requirements are higher for anyone engaged in regular activity. Although replacing weight lost through exercise at the rate of 'a pint for every pound of weight lost' is relatively well known, Evans et al. (2017) suggest that volume replacement during recovery should exceed that lost during exercise to allow for ongoing water loss, and that the addition of sodium, carbohydrates and protein to a rehydration solution is beneficial for fluid balance and maintenance, due to the effects on fluid distribution, extracellular osmolality and blood volume. In other

words, less water is lost in urine formation when taken in the form of 'liquid food' or with food. For the average exerciser replenishing fluids during and after activity, water should usually be sufficient, but if sweating has been excessive or the exercise session longer than 90 minutes duration or particularly strenuous, an isotonic/electrolyte drink should be considered. However, after this period of time exercising in conjunction with not eating for a while beforehand, a meal of some sort is likely to be on the cards, which would provide the recommended carbohydrates, protein and electrolytes without them having to be present in hydration replenishment.

“  
*Hyponatremia is usually caused by excessive consumption of water without correcting electrolyte loss, often after endurance or strenuous exercise.*  
”

Water	Already contains electrolytes such as sodium, potassium, magnesium, calcium and chloride.
Freshly 'blitzed' fruit or vegetables in a blender	Better than juicing as you still get the fibre in a blended fruit or vegetable. This option requires digestion, so is not absorbed as quickly as plain water or an isotonic drink, but will contain lots of vitamins, minerals (including electrolytes), phytonutrients (e.g. carotene, lutein, lycopene) and sugars for energy.
Choose individual fruits or vegetables for specific hydration properties and/or glycaemic index (GI) values. A higher GI value will replenish sugars in the bloodstream and carbohydrate stores more quickly.	Watermelon has a high GI meaning its sugars are predominantly glucose and will replenish energy quickly. The water content will also replenish fluid levels.

**Can I drink too much?**

Hyponatremia is when there isn't enough sodium compared to the water content in the blood. Sodium is essential for many essential bodily functions including nervous impulses, maintenance of fluid balance and maintenance of blood pressure. Hyponatremia is usually caused by excessive consumption of water without correcting electrolyte loss, often after endurance or strenuous exercise. A study published in the American Journal of Physiology (2002) and a further study in the Journal of the American Society of Nephrology (2008) demonstrated no significant health benefits of drinking the recommended eight glasses of water daily. However, the kidneys do an excellent job of filtering and secreting excess water from the body, so surely it's better to keep our organs and internal environment well watered for optimum health and performance, rather than accept sub-optimum existence or run the risk of ill health?

**Best options for hydration – hypotonic, isotonic or hypertonic?**

Hypotonic drinks contain a lower level of solutes (sugars, mineral salts) than human blood. These types of drinks, such as water, are best for general on-going re-hydration. Isotonic drinks contain 4-8% of solutes in solution, the same concentration as in blood (hence the prefix of iso-). The isotonic solution can enhance absorption across the intestinal and capillary membranes into the bloodstream, re-hydrating and replenishing mineral salts and sugars more quickly. Although not necessary for the average exerciser, these drinks can be useful after prolonged or very strenuous activity.

Hypertonic drinks are those that contain more than 8% solutes, and include most carton fruit juices, which are usually 10% sugar, fizzy drinks and sports gels. These require digestion and are best for replenishing carbohydrates after sport or activity, rather than for rehydration purposes. However, you can use juices to make your own isotonic drink – just mix 50% fruit juice (containing 10g per 100ml sugar content) with 50% water, and you have diluted the sugar content down to 5%, creating your own isotonic drink.



### Tips for meeting your fluid needs

- Start the day with a drink of hot water rather than a caffeinated drink which stimulates urine production and therefore fluid loss. Add a squeeze of fresh lemon/lime, or a drop of red grape juice or apple juice if you need a little flavour.
- Fill a 1.5 or 2 litre bottle and take keep it with you at work/home – drinking from this through the day gives you a measure of how much you've drunk, and having the bottle in front of you will remind you to drink regularly.
- Keep smaller water bottles in the car or in your gym kit bag, so you are never caught out without water to hand.
- Always take a filled water bottle to your exercise session (and drink it!).
- Sip fluids throughout the day – hydration is achieved more successfully in this way, rather than drinking a large amount quickly.
- Drink herbal or fruit teas through the day as these will hydrate you rather than act as diuretics like tea, coffee, hot chocolate and many energy drinks. A diuretic such as drinks containing caffeine stimulates urine production as a result of the caffeine prompting adrenaline release and the resulting increase in blood pres-

sure. An increase in blood pressure is corrected by releasing more fluid from the blood via urine production, hence promoting the loss of fluid and electrolytes.

- Alcohol is also a diuretic as it switches off the release of anti-diuretic hormone from the posterior pituitary gland, so you need to drink more water whenever you consume alcohol.
- Consume foods with high water content such as fresh fruit (not dried) and vegetables.

Adequate hydration is achieved when the volume of urine produced matches fluid intake, or when the colour of urine is a pale straw colour – an easier way to monitor hydration levels!

*Sara Kirkham is a registered nutritional therapist with a first class honours degree in Nutritional Medicine. After 20 years working in the health and fitness industry, she now runs nutritional therapy clinics in Cornwall and lectures physiology, human chemistry and nutrition for Cornwall College and Plymouth University. She has published research and a number of books, all available at [www.amazon.co.uk](http://www.amazon.co.uk) or at good book stores. Further information on healthy eating and hydration can be found in 'Food for Health – The Essential Guide' or 'Lose Weight, Gain Energy, Get Healthy'; further sports nutrition advice is included in 'Get into Running', both by the author.*



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## The Joint Mobilisations in the Treatment of Lateral Ankle Sprains

*By Christopher Holland*

Lateral ankle sprains are amongst the most common lower extremity injuries within the physically active population. The mechanism of injury typically involves the ankle being forcefully plantarflexed and the foot inverted, leading to damage of the lateral ligaments and joint complex. Injuries to these structures can lead to a reduction in the mobility at the ankle. This reduced mobility stems from altered arthrokinematics of the joint which produce restrictions in the movement of joint surfaces. The most common deficit is a decrease in dorsiflexion. Restrictions in ankle dorsiflexion produce limitations in gait and other functional activities. Normal walking, descending stairs and kneeling requires at least  $10^{\circ}$  of dorsiflexion, with between 20 and  $30^{\circ}$  needed during running. It has been shown that individuals with dorsiflexion deficits walk more slowly and take smaller steps, whilst contralateral step length and single support time is also influenced. In addition, limited dorsiflexion has also been shown to increase the risk of future ankle sprains in both healthy and symptomatic populations.

Deficits in dorsiflexion ROM following lateral ligament injury are related to an anterior talar displacement and restricted talar glide of the talus. During normal dorsiflexion movements the convex talus should roll and glide posteriorly in the concave mortise. Restrictions and injury to the noncontractile tissues surrounding the ankle can inhibit the posterior talar glide thus decreasing ROM. Because these restrictions are arthrogenic, active and passive stretching techniques are not sufficient to address the arthrokinematic restrictions. To treat these deficits manual therapy practices are frequently used by Sports Therapists.

Manual therapy is a set of techniques designed to minimise pain and restore mobility and function through the application of passive motion to joints or soft tissue. Joint mobilisations are an integral part of these techniques and are commonly used to treat patients with joint hypomobility through the restoration of accessory or arthrokinematic movements that occur between joint surfaces. This treatment technique has been proposed by Maitland and consists of the application of passive, oscillatory, rhythmical forces. The foundation of this technique is a grading system that varies from I to IV. Grades I and II are primarily used to treat painful conditions and consist of oscillatory movements performed before resistance is felt. This refers to the point at which a significant resistance to deformation is imposed by the tissue. Grades III and IV mobilisation are performed after resistance is felt and may continue up to the point of maximal resistance that determines the end of range. This aims to restore joint range of motion (ROM) through the elongation of articular and periarticular tissue.

The core tenet of the Maitland technique is a conceptual framework of clinical reasoning, which forms the basis for the selection of the specific grade, oscillatory frequency, treatment duration and volume. Joint mobilisations such as this produce increases in ROM through the repeated stretching and deformation of tissues that increases the extensibility of joint structures. This alteration in ROM is well documented and is achieved through changes in the biomechanical integrity of the joint structures and associated tissue.



Research has shown that a recovery of the accessory movements of the talocrural joint improves both the articular congruence and its rotational centre, leading to improvements in the lost dorsiflexion ROM through a reduction in the mechanical attrition of the joint surfaces. This restoration is accomplished through an accessory mobilisation technique where the talus is glided in an anteroposterior direction within the mortise.

Graded mobilisations that focus on the end of the available arthrokinematic range are intended to elongate connective tissue that may be abnormally restraining

motion. Connective tissue provides resistance to the forces acting on joints, and act in conjunction with the fibrocartilaginous structures and articular shape and orientation of the joint in order to establish the osseokinematic and arthrokinematic ROM. These higher grade mobilisations (III and IV) affect the length of the connective tissue through a process of plastic deformation, which creates an internal microfailure mechanism at the cellular level that results in an increase in the resting length of the connective tissue. This corresponds to a breaking of the cross-links of the periarticular tissue, and a disconnection of some of the individual collagen

“  
*The microfailure associated with plastic deformation affects the physical relationship between collagen, associated macromolecules, and the ground substance of the extracellular matrix, and is necessary to achieve permanent lengthening.*  
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fibres and bundles due to the progressive loading and ultimate tissue deformation. This correlates to the linear to end-linear phase of the structures stress-strain curve. In addition, the rapid stress-relaxation mechanism that is associated with oscillatory Maitland mobilisations causes tissue to more rapidly reach a ductile state than with sustained mobilisations, leading to the earlier attainment of plastic deformation. The microfailure associated with plastic deformation affects the physical relationship between collagen, associated macromolecules, and the ground substance of the extracellular matrix, and is necessary to achieve permanent lengthening. In addition the collagen is also stretched along the lines of stress leading to collagen realignment. This process is known as Davis's law of soft tissue remodelling, and is analogous to Wolff's law of bone remodelling. Although this law is more often associated with muscle lengthening it implies that all soft tissue, including periarticular tissue, seeks metabolic homeostasis commensurate to the stresses being applied to it. A result of this realignment, and particularly the microfailure that has been induced, a known cycle of tissue inflammation, repair, remodelling and consolidation occurs. This subsequent cellular proliferation and matrix remodelling is medi-

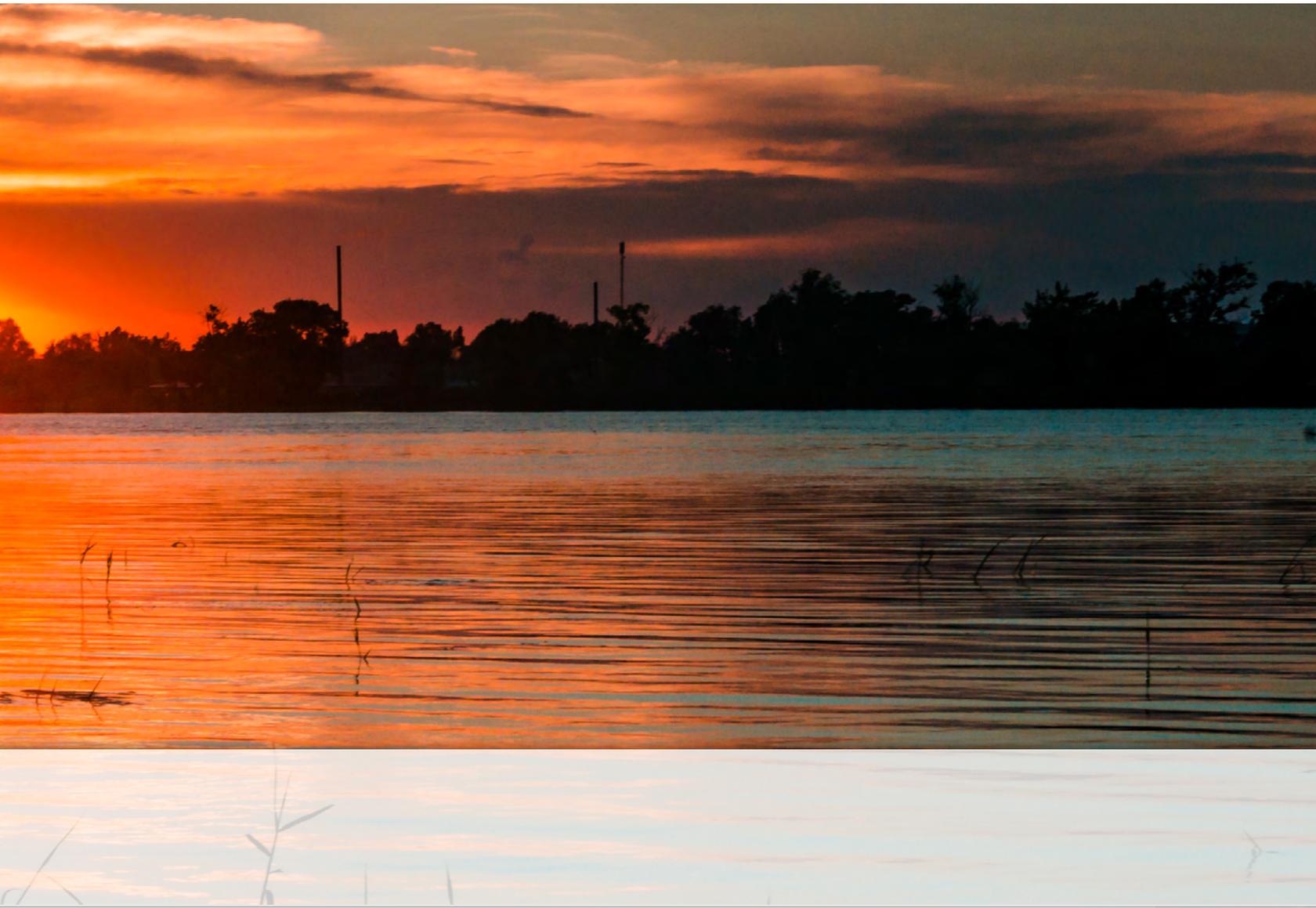
ated by the upregulation of insulin-like growth factor (IGF-I), along with cytokines and further growth factors. With an anteroposterior grade IV mobilisation of the talus, these adaptations result in an increase in the dorsiflexion ROM through a restoration of the accessory motion that has been limited by the restricted periarticular tissue. The benefits of which is a reduction in functional deficits, disability, and injury risk for those who have suffered injury to the lateral ligaments of the ankle.

*Christopher is a Graduate Sports Therapist and a Certified Strength and Conditioning Specialist. He is a Senior Lecturer in Sports Therapy at the University of Worcester and runs his own successful private Sports Injury Clinic. He has significant experience within professional and semi-professional football, as well as working with athletes from a variety of other popular sports. At present, Christopher also leads the Sports Therapy provision for the Worcester Wolves professional Basketball team, and the Wales under-18 Basketball squad. His research interests focus on the use of mobilisations to treat dysfunction in individuals with chronic ankle instability.*





Romania





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## An Exclusive Q&A With Dragos Luscan: Personal Trainer & Wellness and Physical Coach

Dragos is a former professional handball player in the Romanian National League. During his illustrious career he played for Uztel Ploiesti, Dinamo Bucuresti and Steaua Bucuresti, as well as the national junior and youth teams. In addition to being a personal trainer at Stejarii Country Club, Dragos is a physical coach currently working with the Romanian national handball team. He has also worked as a physical coach for some of Romania's leading professional tennis players.

### **Can you tell us about the work you still do with the Romanian National Handball team?**

It is a privilege and a big honour to represent my country. The World Championship medal is a tipping point in my career and a moment I will never forget. Now, it is my job to ensure that the national team is in the best shape to play. This includes periodisation of power training, injury prevention exercises, performance nutrition, regeneration and sleeping.

### **What about your collaboration with Horia Tecau, Florin Mergea and Simona Halep?**

I have always had an interest in tennis ever since I was a child and after retiring from professional handball I was able to dedicate more time to studying all aspects of this sport. I started working with Horia and Florin six months before the 2016 Rio Olympic Games in order to ensure they were at peak fitness level for the big competition. Everything went well and Romania achieved its first Olympic medal in tennis with Horia and Florin winning the silver medal in men's doubles.

Then, in September 2016, I started to work with Simona Halep. She is one of Romania's best athletes with a huge potential to progress to the highest WTA rankings.

### **What are the typical goals and objectives your clients come to you in order to achieve?**

Each person has their own goals and objectives. The main ones in my experience have been: to improve health; increase sport performance; lose weight; increased strength and stamina; improved mental health; the list, however, goes on.

### **What would be the perfect workout if your goal is weight loss?**

If your goal is to lose weight, you should know that working out isn't enough on its own to achieve the desired results. There's so much more that goes into weight loss and body fat loss. I wouldn't ever recommend a weight loss regimen that doesn't include exercise, though, because exercise is good for you and it's a healthy way to live. On that note, even if you are doing everything "right"—working out regularly, eating appropriately—lifestyle habits like sleep and stress, and health conditions can get in the way of your weight loss efforts. Weight loss is an extremely personal journey that doesn't look or work the exact same way from one person to the next.

### **What would you say to someone who tells you they 'don't have the time to maintain an active lifestyle?'**



Exercise doesn't kill people, exercise buys you time. To me, exercise, food, and sleep are the three most important medicines for the body. In fact, I believe that if we take the correct dosage of these medicines, we probably wouldn't need most of the prescribed medicines that are consumed daily in the first place!

#### **What is the best exercise for achieving visible abs?**

Having visible abs is all about achieving low overall body fat and the biggest factor in this is your diet. You could do a million sit-ups every day for a year, but

if you have too much body fat you will never see your defined abs. Turn your focus to eating the right amount each day and creating a structured and enjoyable training programme.

Doing hundreds of reps on a muscle or your abs won't make it grow too much. 40-60 heavy reps per muscle group is the optimal range for stimulating and building muscle. Building muscle will not only help achieve better body shape, but will accelerate the rate you lose body fat. HIIT is also a great alternative to boring, steady cardio to help reduce body fat.

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**Can you tell us a little bit about your own training regime? Do you stick to your training plan rigidly?**

All my life I was training a lot in all the ways possible but with different goals. In the beginning when I was a child I was practicing just by playing games and helping my parents with different activities. Then, when I played handball professionally I had to train to improve my sport performances. After two severe injuries I had to train to rehabilitate and get back into shape. Currently, I am training to stay healthy and to have more energy. Every week I am playing handball for fun, I am practicing strength workout and working on my flexibility. When I wake up I have a few routine exercises to keep my spine strong.

**You do quite a lot of work with personalised nutrition programs. How important is nutrition for those looking to maximise results?**

Nutrition and training are both important, but, at certain stages of your training progress, I do believe placing more attention on one component over the other can create larger improvements.

If you're a beginner and you don't possess nutritional knowledge, then mastering nutrition is far more im-

portant than training and should become your number one priority. I say this because improving a poor diet can create rapid, quantum leaps in fat loss and muscle building progress. No matter how hard you train or what type of training routine you're on, it's all in vain if you don't provide yourself with the right nutritional support.

The muscular and nervous systems of a beginner are unaccustomed to exercise. Therefore, just about any training program can cause muscle growth and strength development to occur because it's all a "shock" to the untrained body.

For intermediate or advanced level training, with the correct nutrition now firmly in place, changes in your training become much more important. This is when your training must become downright scientific.

Once you've mastered nutrition, it's all about keeping that nutrition consistent and progressively increasing the efficiency and intensity of your workouts, and mastering the art of planned workout variation, which is also known as "periodisation." The more advanced you become, the more crucial training progression and variation becomes because the well-trained body adapts quickly.

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So, to answer the question, while nutrition is ALWAYS critically important, it's more important to emphasise for the beginner (or the person whose diet is still a “mess”), while training is more important for the advanced person (in my opinion).

#### **What are good pre and post workout snacks?**

Pre-workout snacks are used to give energy for the activity. A few examples include: fresh fruit, small whole-meal sandwich filled with honey or peanut butter, cereal bar or dried fruit bar, breakfast cereal with milk, rice. I use these one hour before.

Post-workout snacks are used to restore the energy levels, reduce the inflammation and build new cells. A few examples include: fresh and dried fruits, nuts and raisins, recovery milk, fruit yoghurt, protein bar and powders.

#### **Do you use or recommend any supplements?**

The most efficient way to develop your natural sports ability and achieve your fitness goals is through efficient training combined with optimal nutrition. There is a huge variety of supplements marketed including pills, powders, drinks and bars, which claim to increase

muscle, strength or burn fat and I guide my clients upon their goals. I am using Powder Lean Protein, Energy Bars and a raspberry flavoured pre-workout drink. I occasionally take multivitamin complex, calcium, magnesium and sea fish oil.

#### **What's your ultimate cheat meal?**

A cheat meal is that one meal where planning has no place. There's no tracking, no macros, and no shame. My cheat meals could be burgers, pancakes, ice cream, French fries – but not all together!

#### **Finally, what would be your number one piece of advice those looking to implement a more healthy and active lifestyle?**

That's easy: Create a perfect day from when you wake up until you go to bed. 90% of our daily actions run in our subconscious, so we have to really work to upgrade our daily rituals. But by building yourself a healthy, what I call “perfect” day, you can fill it out (hydrate more, eat better, move more, get more sleep) and then each day see how well you did across those simple things. Oh, and keep smiling!



# Dominican Republic





## Dr. Silvia Raquel Bueno

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**SILVIA  
RAQUEL  
BUENO**

## Why is it important to obtain nutrients from external sources nowadays?

*By Dr. Silvia Raquel Bueno*

Have you ever asked yourself this question “why don’t foods have the same nutrients that they had a couple of decades ago?” If you have, then you’re creating awareness that it is imperative to change the way we feed and nourish ourselves. Most importantly, this is about our children, to ensure that they are eating foods rich in nutrients. In my opinion, here’s the answer to that question; a few decades ago our soils were rich in minerals. They were virgin lands full of nutrients, and they were not contaminated as pollution had not harmed them yet.

The food was allowed to grow in their natural way without the rush caused by greed and technology. The food was grown in its own time; now, chemicals are used to make today’s food grow faster. The idea of “planting the food in the ground” was respected in the same way as respecting a woman’s gestational period. A baby is not ready at five months, or at six, or even at seven. Our Creator determined that the ideal time was nine months; likewise, every food on earth has its time of preparation before it should be used for personal nutrition needs.

We live in a world where technology is always advancing; this means that things can be produced faster, but that doesn’t necessarily mean everything is better because it’s fast and this has its consequences when it comes to our nourishment. For example, microwaving ready-made foods is certainly faster than cooking, but we all know it is not healthy because it leaves us devoid of most nutrients.

We have to change our mindset and reprogram ourselves. Feeding ourselves well does not necessarily mean eating a very expensive meal, or eating in the best restaurant in the city, or eating in large or small portions. The thing that determines whether we feed ourselves well or not is the concentration, quality, quantity, and variety of nutrients contained in the foods we eat, the freshness and purity of them.

Our lack of knowledge, and in some cases our cultural beliefs, are the ones that lead us to make bad decisions about what we eat every day. In the end, we often eat some foods with excess nutrients and others that are totally deficient. This imbalance turns food into our worst enemy because over time this ends up in diseases, body weight disorders, poor physical conditions, and poor performance.

Another fact that we need to understand is that most people have assumed that this is a matter that concerns us doctors when it should be every adult person’s responsibility. Unfortunately, as a Doctor, I recognize that even we do not take the proper care when feeding ourselves, so we are not the best example. The reason why is because we are taught to study diseases - their causes, their evolution, their diagnosis, and treatment, but we are not taught how to take care ourselves or prevent the diseases from happening or how to eat properly. We know medicines and how to cure, but not how to feed, care and prevent painful diseases in humans.



So, it must be the responsibility of each one of us as individuals to make the decision to protect our most valuable asset, which is our body, and not let it get to the stage where you need to see a doctor. We will never get to you unless you knock at the door of our office, and although we will give you information, tools, treatment and even walk with you, there will always be a part of the process that is entirely up to you. It is you who must watch over and fulfill that part.

Your food and the care of your body will primarily determine the diseases that may affect you tomorrow because these are the diseases that are caused by poor diet. Some have been classified as “hereditary,” but the reality in many cases is that those conditions that affected our parents and which are now affecting their children are present simply because they are repeating the same erroneous eating patterns.

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Our nutrition should be based on  
our needs, taking into account:  
our lifestyle, work, activities,  
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year and our region.  
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We must take into account the following in addition to the factors mentioned above:

- Not all products found in an organic store are healthy, since sometimes these products may have refined ingredients such as flour, sugar or some other component not suitable for our bodies so we must be cautious whenever we buy and eat foods. Identify which products are nutritious and favoured by the climate and the location where they are produced before purchasing them.
- Our nutrition should be based on our needs, taking into account: our lifestyle, work, activities, gender, age, the season of the year and our region. There are also some symptoms that tell us about deficiencies in nutrition such as digestive disorders, headaches, irritability, bad mood, constipation, joint or bone pain in general, loss of flexibility, loss of muscle mass, low physical and mental performance among others.
- Getting to adulthood and ageing in a healthy way depends 30% on genetics and 70% on the lifestyle we have; this means a healthy lifestyle that includes maintaining a balanced diet in general – a balance of water, muscle, minerals and fat.
- Having a good relationship between these four components takes our bodies away from diseases, and so the physical and mental deterioration caused by age can occur in a more subtle way if we learn to take care of ourselves.

*Dr. Silvia Raquel Bueno graduated in general medicine from the prestigious university “Catolica Madre y Maestra” of the city of Santiago, Dominican Republic. She obtained her postgraduate degree in vascular surgery and angiology in Mexico City, D.F., in the “General Hospital Manuel Gea Gonzalez” and in the “Centro Medico Nacional 20 de Noviembre”*

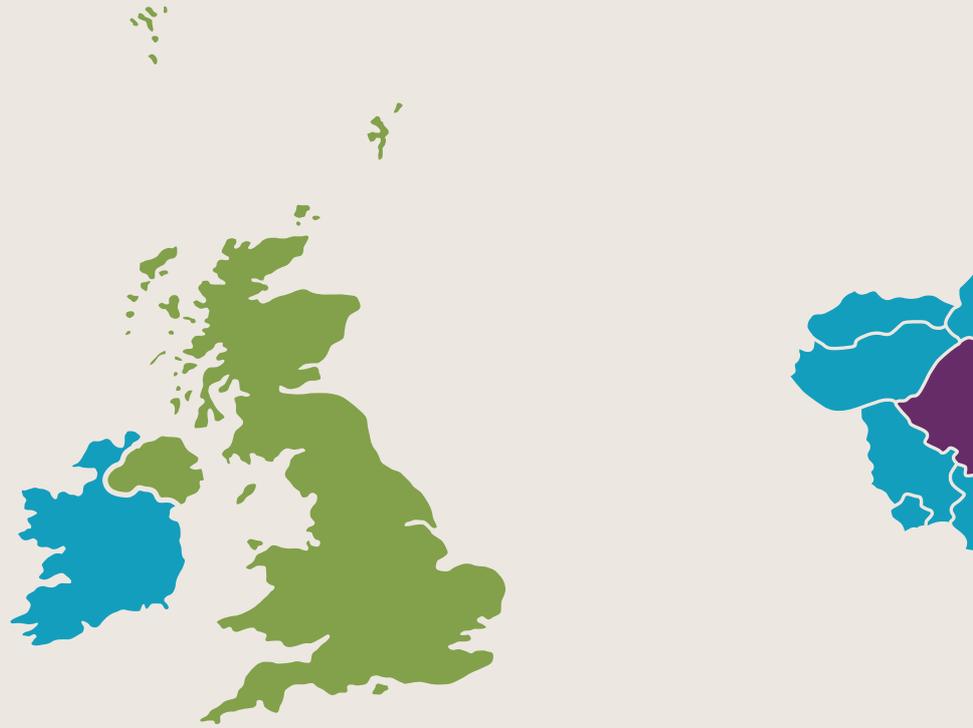
*After completing her postgraduate studies she began to practice in her hometown La Vega at the Hospital Dr. Luis Manuel Morillo King, as a private practice at the “Union Medica del Norte Clinic”, one of the most recognized clinics in the city of Santiago, where she currently practices. Since 2004, she has been a lecturer in conventions, seminars and workshops on nutrition, health and personal care both locally and internationally. She has participated in multiple media of informative nature on venous diseases.*

*She has recently written her first books as a contribution to her patients and the general public, in the areas of nutrition and vein diseases.*

*She is currently vice president of AMES “Asociacion Mundial para la Excelencia en la Salud” (World Association for Excellence in Health) for the Dominican Republic. Member of the Dominican College of Surgeons, Member of the AMD “Asociacion medica dominicana” (Dominican Medical Association), Member of EACTs The European Association of Cardio-Thoracic Surgery & Member of ESVS European Society for Vascular Surgery.*



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EXPERT GUIDE: NUTRITION 2017

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