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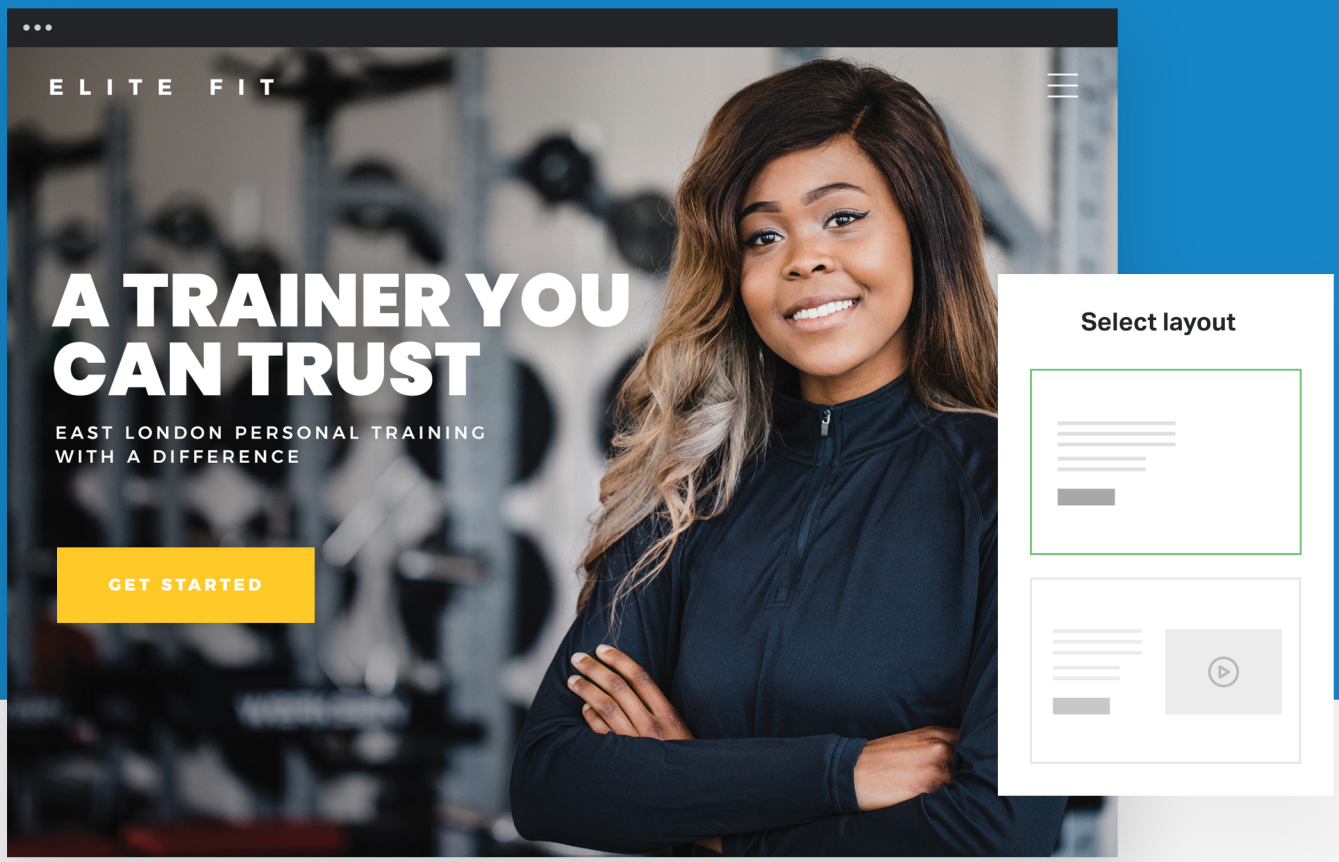

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Welcome

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Educate • Connect • Support

2019 has been a big year here at FitPro with lots of exciting changes. We've moved offices, transferred to digital publishing, and welcomed some new members to our team. As we've looked back at our first print magazine from 1990, we've been feeling nostalgic and we're proud to see how far we've come. However, with all that change, there are some constants: education remains at the core of what we do and how we communicate.

From our big conventions in the 1990s to our new, fully comprehensive online education platform, we've adapted to a changing landscape and continue to provide content that arms you, the fitness professional, with knowledge. However, while digital learning is a massive leap forward, we have also seen some worrying changes in our always-on culture, with what can seem like a never-ending production line of content. There are reports of unqualified 'Instagrammers' driven by commercial demands giving out questionable advice, and the creation of false social media accounts and bots. We've even found some gyms prioritising a trainer's social media following over qualifications.

We've watched as pseudo-scientific 'systems' and 'new' ways of getting fit come and go, and seen quackery given a voice with self-publishing and clever marketing. However, recent research has shown that the tide is turning and the public are not willing to be hoodwinked. In May this year, advertising magazine, *The Drum*, reported on a study by media agency UM, which tracked more than 56,000 active internet users across 81 countries, evaluating trust in social media. Of this substantial global sample, only 4% said they trusted information shared on social media by influencers.

The thing is … solid science isn't marketable; mediocrity isn't sexy; research isn't instant, and validation of theories takes time and effort. It's in this noisy world of clean eating, green drinks, and quick-fix fitness routines that we remain steadfast in our belief that authentic, trusted content, training, education and continued learning remain a priority.

As we roll out the next 30 years, we'll be working with a team of like-minded authentic fitness professionals who share and support our values, and will help us to continue to connect with our community, both on and offline. We also make a promise to continue sharing our valued education content. Help us by joining our campaign to raise standards and follow our hashtags: #FitProEducation, #FitPro. For our range of education services, don't forget to visit fitpro.com/courses to find a fully accredited course to accelerate your fitness career. ***fp***

Brent Hallo and Jane Waller
Executive Directors

Contents

Dementia and exercise

Helen Green from Dementia UK's Admiral Nurse Dementia Helpline reports on the impact exercise can have on those living with dementia.

The benefits of maintaining our physical health through diet and exercise have been well documented, but what is not so well known is the positive impact exercise can have on those living with the condition.

It is estimated that there are 850,000 people with dementia in the UK, and 225,000 will develop dementia this year – that's one every three minutes.

Exercise is known to improve blood supply, reducing the risk of heart disease and vascular problems, which are factors in dementia. Other benefits include improved co-ordination and muscle strengthening, leading to a reduced risk of falls. Exercise can also aid awareness of your own body in relation to the environment, thus reducing the risk of accidents, and research suggests that improvements in cognitive functioning can result.

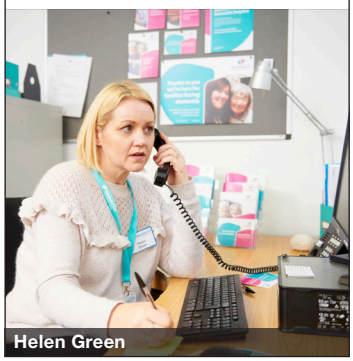
Living with dementia can frequently lead to social isolation, low mood, loss of confidence, and anxiety. Exercise is effective in lifting overall mood and can also be done with others, thereby increasing social connectivity.

For any trainers considering delivering sessions to people with dementia, it's important to understand the needs of this group. At Dementia UK, we advocate a person-centred approach, and this same method can be introduced among trainers. Offering a range of classes means you can cater to different needs; people with dementia may still be able to get involved in activities such as chair-based exercises and boxercise.

In Liverpool, a small, non-profit provider, Healthiness Ltd, delivers exercise and education classes for people over 50 or those living with dementia. "We deliver around 30 classes per week ranging from cycling and boxercise, to our very own Active Bingo. Of our regular 400 weekly service users, 250-300 of those are living with or are at risk of dementia," said Andy Ireland, dementia and exercise development manager.

For a more in-depth understanding, there is the Skills Network NVQ Level 2 in Dementia Care, as well as Dementia UK's Admiral Nurse Dementia Helpline for general advice and how trainers can tailor their classes. *fp*

DementiaUK
Helping families face dementia



Helen Green

Research review

This issue, **Dr Paul Batman** reviews the total amount of physical activity required to reduce risk factors in certain cancers, diabetes, ischemic heart disease and stroke.

Title: *Physical activity and risk of breast cancer, colon cancer, diabetes, ischemic heart disease and ischemic stroke events: systemic review and dose response meta-analysis for the Global Burden of Disease Study 2013*

Authors: *Hmwe H. Kyu, Victoria F. Bachman, Lily Alexander, John Everett Mumford, Ashkan Afshin, Kara Estep, J. Lennert Verrman, Kristen Delwiche, Marissa Iannarone, Madeline Moyer, Kelly Cercy, Theo Vosm, Christopher Murray, Mohammad Forouzanfar*

Source: *BMJ 2016; 354:i3857*

Introduction

For decades, the National Physical Activity Guidelines have been used as the 'yard stick' for selecting the correct intensity, duration and frequency for combating chronic diseases such as heart disease, cancers and metabolic disease. The dose typically prescribed was 75-150 minutes of moderate to vigorous exercise for 30-60 minutes three to five times per week, generally performed during leisure time, which constitutes only a small part of total daily activity.

Despite the extensive information available on the causal relationship between dose response and chronic diseases, little is known about how much the risk is further reduced with an increase in the total amount of daily activity.

The World Health Organization recommends at least 600 MET minutes of total activity per week, irrespective of the type of physical activity used. This is equivalent to 75-150 minutes of Moderate to Vigorous Physical Activity (MVPA) per week.

This study estimated the total amount of physical activity required to significantly reduce risk factors in colon cancer, diabetes, breast cancer, ischemic heart disease and ischemic stroke.

Method

The authors completed a meta-analysis of more than 174 articles: 35 for breast cancer; 19 for colon cancer; 43 for ischemic heart disease; 55 for diabetes; and 26 for ischemic stroke disease, to determine the optimum dose of physical activity expressed in MET minutes per week to significantly reduce their risk factors.

Information was collected on physical activity programmes with METs and minutes representing workloads. One (1) MET is a metabolic equivalent equal to 3.5ml/kg/min-1, which is the minimum amount of oxygen required to meet the resting energy expenditure. Physical activities can be expressed as multiples of resting energy expenditure or increased METs, e.g., 4 METs is four times the resting energy expenditure = 4 x 3.5 = 14ml/kg/min-1. Four METs was regarded as representative of moderate intensity, while 8 METs represents vigorous intensity.

Results

A review of the literature of the 174 studies (and 149,184,285 total person years of follow up) revealed that higher levels of physical activity was associated with a lower risk for breast cancer, colon cancer, ischemic heart disease, ischemic stroke and diabetes.

The higher doses at 3,000-4,000 MET minutes produced the greatest gains. It was suggested that a person could accumulate this dose by undertaking different types of physical activity into their daily routine, for example, climbing stairs for 10 minutes, vacuuming for 15 minutes, or gardening for 15 minutes, in addition to a daily formal fitness programme.

Those subjects who completed the National Physical Activity Guidelines, or 600 MET minutes per week, received the lowest reduction in risk factors for all chronic diseases identified, e.g., a 2% reduction in diabetes risk factors compared to 19% for those who accumulated between 600-3,600 MET minutes.

Workloads at 8,000 MET minutes produced smaller improvements than 600 MET minutes and 3,000-4,000 MET minutes.

Conclusion

This was one of the first studies to show that higher levels of physical activity, five to six times the National Physical Activity Guidelines, produced a greater reduction in risk factors for breast cancer, colon cancer, ischemic heart disease, ischemic stroke and diabetes:

- The risk of breast cancer was reduced by 3% at <600 MET minutes, 6% at 600-3,999 MET minutes, and 14% at >8,000 MET minutes
- The risk of colon cancer was reduced by 10% at <600 MET minutes, 17% at 600-3,999 MET minutes, and 21% at >8,000 MET minutes
- The risk of diabetes was reduced by 14% at <600 MET minutes, 25% at 600-3,999 MET minutes, 28% at >8,000 MET minutes
- The risk of ischemic heart disease was reduced by 16% at <600 MET minutes, 23% at 600-3,999 MET minutes, and 25% at >8,000 MET minutes
- The risk of ischemic stroke was reduced by 16% at <600 MET minutes, 19% at 600-3,999 MET minutes, and 26% at >8,000 MET minutes

The greatest relative reductions in risk factors were reported between 3,000-4,000 MET minutes, with diminishing reductions at the higher workloads. These results indicate that focusing on the lower levels of 600 MET minutes is the lowest workload that produces only the minimum reductions in risk factors. While risk factors for all chronic conditions were reduced at the 600 MET minutes level, much higher workloads, several times higher than currently recommended, are required. It is unrealistic to prescribe only leisure time physical activities to meet the 3,000-4,000 MET minutes workload. A broader prescription is required that stresses the importance of NEAT activities (Non-Exercise Activity Thermogenesis) of daily living at home, at work, and during transport over the full day to accumulate the required number of MET minutes.

It is now apparent that varying workloads in MET minutes is required to reduce risk factors across breast cancer, diabetes, ischemic heart disease, ischemic stroke and colon cancer. ***fp***

BIOGRAPHY ▶

Dr Paul Batman has been involved in health and fitness for more than 40 years as a university lecturer, vocational educator, author, researcher, international conference presenter and workshop facilitator. Over the last 18 years, Paul has built, owned, operated and sold two leading health and fitness vocational training institutes, and has received a Lifetime Achievement award for his services to the Australian fitness industry. Paul originally contributed to our *Network* articles back in the 1990s.

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Blood flow restriction training

Why would you choose to restrict blood flow and lift lighter weights when training – and how does it relate to rehabilitation from injury? **Tony Boutagy** investigates.

The weights room has been my office for more than 25 years. During this time, I have read about or seen many pictures of training where blood flow has been restricted. I have even tried it a few times with the occlusion cuffs you use when having your blood taken at the doctors. I admit, to my embarrassment, that I didn't really give it the proper consideration I should have. This changed instantaneously upon a work trip to New Zealand several years ago.

I was being given a guided tour through the sports science and training facility of a top international Olympic training centre. After seeing the muscle testing labs and heat chambers, we made our way down to the bottom floor where the gym was located. We passed a sprinter doing multiple box jumps and a weightlifter performing front squats before arriving at the weights room where a woman was lifting what appeared to be a light load (by Olympic standards) on a trap bar deadlift. I was wondering why she had not just one but three spotters. I didn't need to wait long. After the last repetition, she just stood there holding the bar, clearly in discomfort, and then her legs started to shake uncontrollably. Within seconds, she sat down 'forcefully' and two of the spotters removed restriction straps that were wrapped around her upper thighs. The other spotter was there to ensure she didn't fall over!

This was my introduction to blood flow restriction (BFR) training at an elite level. As we will see, BFR is not just a tool for athletic conditioning, but also a valid method that can be used in a range of settings including muscle building, endurance training, older populations, and rehabilitation. But where did the idea of tying a strap around a limb to reduce blood flow to an exercising muscle originate?

The origins of BFR training

As a training concept, blood flow restriction can be traced back to 1966 in Japan when 18-year-old Yoshiaki Sato noticed that the numbness in his legs caused by sitting in an awkward posture during a prolonged Buddhist ceremony was not dissimilar to the sensation he experienced when he lifted weights. This muscular ache, he realised, was due to the occlusion of blood circulation.

Over the next several years, Sato experimented on himself using bicycle tubes, ropes and straps, and developed the system from which BFR training would evolve, which he termed 'Kaatsu' (Ka meaning 'additional' and atsu meaning 'pressure'). Sato's idea was to apply pressure around the top of the arms or legs while lifting a light load in order to impede the flow of blood to exercising muscles.

In some early studies of this type of training, when pressures as high as >300mmHg were applied in order to completely occlude blood flow, researchers referred to it as 'vascular occlusion training'. The move towards maintaining arterial inflow while occluding venous return, however, makes the term 'blood flow restriction' more appropriate.

What is it and how does it work?

BFR training involves attaching pneumatic belts, straps or occlusion bands around the upper portion of the thighs or arms and performing traditional strength exercises. The pressure is set in such a way that blood is able to enter the muscle, but venous return is reduced. As such, the selected training load is often around 20-40% of the individual's 1RM.

Despite several decades of research investigating

"The most impressive application of BFR training is in rehabilitation after injury, surgery, disuse, and muscle-wasting conditions"

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BFR, the precise explanation for its effectiveness in improving strength and muscle mass is not fully known. The prevailing theory is that the reduction of venous flow causes blood to pool in the limbs, resulting in increased and sustained metabolic acidosis and disruption to the antioxidant systems. Receptors in the muscles send stronger signals to the brain and large quantities of human growth hormone are produced[1], fast-twitch muscles are recruited[2], and muscle growth pathways are activated[3].

The 30-second article

- Blood flow restriction (BFR) training involves attaching pneumatic belts, straps or occlusion bands around the upper portion of the thighs or arms and performing traditional strength exercises
- Blood is able to enter the muscle, but venous return is reduced, and the individual trains with loads between 20-40% of their 1RM
- BFR training has been shown to effectively increase muscle mass, strength, muscular endurance, aerobic endurance and sporting performance, while reducing pain during rehabilitation
- Research has indicated that lower loads may help to reduce risk of injury or excessive soreness in athletes, and enable injured and older individuals to safely reap the benefits of strength training

Contraindications

Safety concerns with BFR training appear to be few. In a study that surveyed 12,642 individuals who had undergone BFR training, including both young (<20 years old) and older people (>80 years old), athletic and healthy population groups, and those with various kinds of physical conditions such as cerebrovascular diseases, orthopaedic diseases, obesity, cardiac diseases, neuromuscular diseases, diabetes, hypertension and respiratory diseases, BFR training resulted in a very small number of complications. The incidence of side effects was as follows:

- Venous thrombus (blood clot in a vein) – 0.055%
- Pulmonary embolism (blood clot in artery of the lung) – 0.008%
- Rhabdomyolysis (breakdown of muscle tissue) – 0.008%

These results indicate that BFR training is a safe and promising method for training athletes and healthy people, and can also be applied to those with various physical conditions[4].

Applications

So we know what BFR training is and what it does, but why would you choose it over regular training methods? That is, why not just lift what you can lift?

Athletic development and body composition training

Australian blood flow restriction expert, Dr Brendan Scott, has suggested one of the key benefits of BFR training in the athletic conditioning setting is in the reduction of high training loads that may result in injury over time or excessive soreness, which has a negative impact on the quality of the training week. "Implementing BFR during various phases of an athlete's periodised training plan could help counter the potential negative effects of high mechanical training loads. Indeed, while BFR training seems to provide a physiological stimulus for muscular adaptations, the low loads used do not cause measurable muscle damage."[5]

This low-load/recovery concept becomes more attractive to ageing athletes and those who have a reduced ability to recuperate between training sessions. As a coach, I see two primary advantages to BFR in an athletic setting:

(1) Comparable improvements in muscle mass and strength are seen with lower loads and BFR, allowing negligible impact of the conditioning workouts on the specific sessions, which do not interfere with the high-quality training (or, put another way, strength sessions make the athlete less sore and sluggish for the primary workouts)
(2) Due to less soreness with BFR, a higher volume of training in the weights room can be periodically performed if the mesocycle calls for increased frequency or volume

BFR training has repeatedly been shown to be an effective method for increasing muscle mass[6], strength[7], aerobic endurance, muscular endurance[8] and sporting performance[9] in both males and females[10]. Research has not demonstrated a superior training effect of BFR when compared to traditional, high-load resistance training, therefore the key benefit is that a comparable[11] training response can be achieved with considerably lower loads, which has the potential to minimise load-induced injuries and reduce recovery duration between

training sessions. It is also useful when the trainee does not feel sufficiently motivated to perform a high-load strength training session (that is, they are mentally fatigued and just 'not feeling up to it').

Several studies have shown BFR to be a novel way of improving aerobic endurance adaptation and performance with cuffs being worn during exercise, such as walking or cycling, or in the recovery periods during interval training. That is, forcing the muscles to become hypoxic during the relief period of a HIIT workout and stressing several pathways known to be involved in muscle adaptation.

Rehabilitation

The most impressive application of BFR training is in rehabilitation after injury, surgery, disuse, and muscle-wasting conditions such as paralysis injuries, cancer cachexia and sarcopenia, and for astronauts[12]. Muscle wasting is an inevitable consequence post-surgery or during recovery after an injury where a limb or muscle requires rest or immobilisation in order to reduce pain. Research has demonstrated that BFR is a highly effective training method to preserve or even build muscle mass in these conditions[13], which is especially important when high-load training protocols might not be indicated due to potential aggravation to the surgery site, compromised joints or weakened connective tissue.

A similar argument can be made for the effective application of BFR in the ageing population where high loading may not be appropriate. BFR training has been shown to promote similar gains in strength and muscle mass compared to high-load training in older people[14].

World BFR expert, Professor Jeremy Loenneke, has proposed a four-sequential-phase rehabilitation protocol for those recovering from injury[15]:

1) BFR alone during periods of bed rest or immobilisation
2) BFR during low-work rate walking
3) BFR during low-load resistance exercise
4) Low-load BFR training combined with normal high-load training

Progression through these different phases should follow a continuum, with gradually increasing exercise intensities within each stage to limit risk of further injury resulting from a return to training too early[16].

"Another interesting recent finding is the pain-reducing effect of BFR during rehabilitation"

Click here to view BFR cuff pressure

Another interesting finding is the pain-reducing effect of BFR during rehabilitation. Studies have demonstrated that exercise performed with blood flow restriction induces hypoalgesia (decreased sensitivity to pain). Research into exercise-induced hypoalgesia with BFR has identified several potential mechanisms, including opioid and endocannabinoid-mediated pain inhibition, conditioned pain modulation, recruitment of high threshold motor units, exercise-induced metabolite production, and an interaction between cardiovascular and pain regulatory systems. These exercise-induced responses are likely triggered by the high level of intramuscular stress in the exercising muscle generated by blood flow restriction including hypoxia, accumulation of metabolites, accelerated fatigue onset and ischemic pain.

Protocols

The most common protocol is to inflate the cuff around the upper thighs or upper arms and perform 75 reps of a movement in the following manner: 30 repetitions, rest for 30 seconds, perform three more sets of 15 reps with the same exercise and the same weight. The cuff would stay on for the entire four-set duration and only be removed after the final set has been completed. The 30/15/15/15 (or another similar protocol: 30/20/15/10) repetition schemes are the most commonly used BFR training methods, using approximately 30% of the individual's 1RM.

Cuff pressure

To which pressure should the cuffs be inflated during training? Studies have used a wide range of pressures, typically between 50mmHg to 300mgHg. Research determines the pressure by using a percentage of the amount of pressure required to fully cease arterial blood flow to a limb (the arterial occlusion pressure, or AOP). The AOP is related to a range of individual limb characteristics, tourniquet shape, width and length, the size of the limb or an individual's blood pressure. It has been shown that a larger limb will require a greater cuff pressure to fully restrict arterial blood flow, and this is true across a range of cuff widths. Studies normally use 40-80% of AOP, which corresponds to pressures between 180mmHg and 250mmHg. ***fp***

BFR devices can be purchased from Go B Strong and Kaatsu Training. Thanks to Go B Strong for providing video and imagery for this article. For more product information visit bstrong.training (UK stockist rp-x.com).

The author has no affiliation with any BFR products.

BIOGRAPHY ▶

Tony Boutagy has been a trainer for 25 years, specialising in strength and endurance, and training for body composition. He holds a PhD in exercise science and is an accredited exercise physiologist (ESSA). Tony runs courses for PTs in his facility in Sydney. **tonyboutagy.com**

This article was originally published in Australian Fitness Network.

The menstrual cycle and strength training

Join the conversation on social and share your stories with us, #Strongwomen.

In our new three-part series in association with UKSCA, the UK Strength and Conditioning Association, we're focusing on women and strength, looking at how hormones affect performance and sharing practical advice for trainers coaching women to get strong.

Oestrogen can affect strength development in female athletes. In particular, the hormonal fluctuations in oestrogen across the menstrual cycle can influence the best time to plan and programme for strength gains.

Effects of oestrogen on muscle growth and strength

Although many factors can affect an individual's response to a hypertrophic training stimulus (e.g., nutrition status, genetics, fibre types, injury, concurrent training)[12], for female athletes there is an accumulating evidence base suggesting that the female sex steroid oestrogen may favourably influence hypertrophy. For the normal menstruating female, this may create 'windows of adaptation' for accelerated strength development via increases in muscle size.

Oestrogen receptors

Oestrogen receptors have been identified in nearly all tissues, including skeletal muscle, and these show a positive response to increases in circulating oestrogens[9,41,45,46], such as the differing fluctuations across the menstrual cycle, and can be increased following exercise training[50], which could lead to increased muscle mass and strength[28]. Conversely, oestrogen receptors may be less responsive in chronically oestrogen-deficient populations such as menopausal women[16,25,46] and those suffering from Relative Energy Deficiency in Sport (REDs) leading to decreased muscle mass and strength[29,30].

A meta-analysis (23 studies) investigating the effects of hormone therapy (HT) on post-menopausal women reported a small beneficial effect (effect size = 0.23; p=0.003) on muscle strength for those on oestrogen-based treatments, which equated to ~5% greater strength than the non-HT group[16]. It is clear that oestrogen has a meaningful effect on muscle function, but for females also engaging in structured strength training programmes, the magnitude of these effects is likely to be far greater[20].

Oestrogen has also been shown to exert several other biological effects that may influence strength development, including muscle contractility[13,25,41,46], substrate utilisation[31] and connective tissue stiffness[3,5,15,38].

What are the mechanisms by which oestrogen affects strength development?

The abundance of oestrogen receptors throughout the body means that its impact on strength training adaptations could be viewed either as 'ergogenic' or 'detrimental', depending on the tissue type under discussion. In general, there are two collective effects of oestrogen on strength development:

1. Oestrogen effects on muscle force development

From a hypertrophy perspective, the combination of the following oestrogenic effects will enhance absolute force generating capacity of the muscle following strength training via stimulated muscle mass gains:

- Increased muscle size via increased myoblast cell activity
- Reduced muscle damage and improved ability for muscle repair
- Reduction in musculotendinous unit (MTU) compliance that changes the orientation of the muscle fibres

While these effects would be expected to increase performance, the body's ability to generate and co-ordinate forceful movements is representative of output from the whole neuromuscular system. Muscle CSA is just one component of the muscular determinants of strength[6,26], so future evaluation of the effects of oestrogen on strength performance must also take into account other essential muscle and neural elements.

Effects of oestrogen on tendons

One element to consider is the effects of oestrogen on other connective tissues such as tendons. Tendons transmit force from the muscle to the bone in order to cause movement, and a 'stiffer' MTU can significantly boost force transmission by transferring muscle force to the bone faster (i.e., improved rate of force development capabilities)[26,43]. This is achieved by a reduction in the electromechanical delay (EMD) – time delay between the onset of electrical activity and measurable force/tension in the MTU[52]. Numerous studies show that MTU stiffness is lower in females compared to male populations[15,38,52]. Indeed, estradiol-ß-17, the most prevalent circulating oestrogen[5], has been reported to have a negative association with MTU stiffness.[3] This relationship may indicate that MTU stiffness may be influenced by oestrogen concentrations, with higher levels having a detrimental impact on strength and rate of force development.

Summary

The effects of oestrogen on muscle force development are complex. High oestrogen concentrations promote a hypertrophic environment for muscle mass development (i.e., increased force capability), but they also cause a reduction in MTU stiffness, increasing EMD and, subsequently, the ability to produce large forces quickly – a major requirement for explosive sports performance[17,26,42].

MTU 'stiffness' describes the relationship between the force applied to the MTU and the resultant change in length. A stiff MTU will only change length a small amount when a large force is applied. Conversely, a compliant MTU will change length to a greater degree when the same amount of force is applied.

2. Oestrogen effects on muscular work capacity

Higher levels of circulating oestrogen may have positive effects on muscular work capacity through its influence on changes to substrate utilisation; primarily an increase in fat rather than carbohydrate utilisation. In addition, the ability to offset fatigue in sustained

Below: Kylie Benadie (MSc sports strength and conditioning student, strength and conditioning coaching scholar, and 1st team squad volleyball at the University of Gloucestershire)

Above: start position for the clean exercise

Above: finish position of the push press exercise

high-intensity muscular contractions, plus an increase in the muscle's intrinsic ability to generate force, has the potential to allow a greater training load to be accumulated.

Volume (i.e., how much work) and intensity (i.e., how hard you can train) are two acute training variables that are manipulated across training blocks to create overload – an essential ingredient to achieving desired training adaptations[18]. The ability of oestrogen to increase the amount of force produced by muscle tissue (i.e., quality/intensity of the contraction)[13,25,41,46] and the increased endurance capabilities afforded by a greater reliance on fat oxidation (i.e., more volume)[31] mean that increases in training load may be possible at certain times (i.e., when oestrogen is high) of the menstrual cycle. Typically, higher 'volume loads' (sets x repetitions x load) will induce a bigger training stimulus and, provided the participant is not over-training, will result in larger training adaptations[18].

While an increased training load is positive, there are further points worthy of discussion. If the training goal is hypertrophy, mechanical tension, muscle damage, and metabolic stress have all been identified as necessary stimuli to elicit required training adaptations[36].

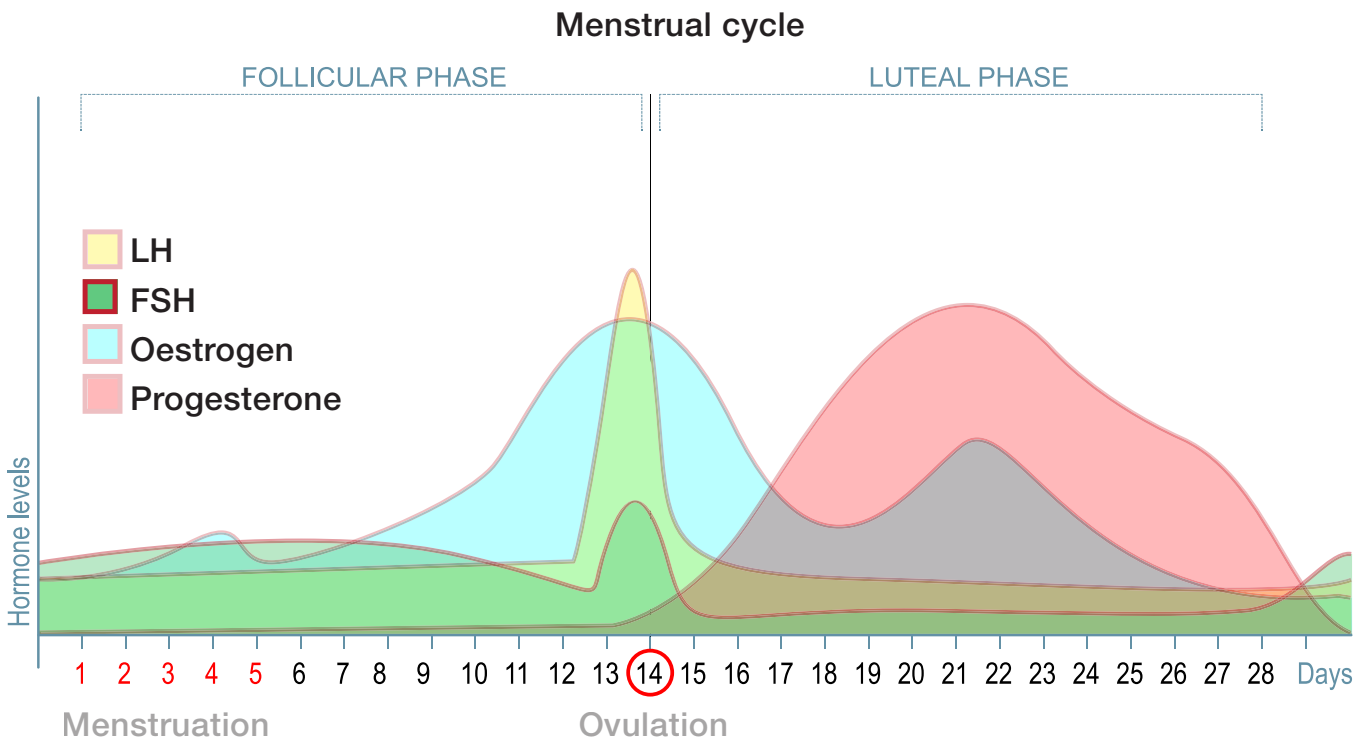
When oestrogen is high, the combined effects of an increased ability to repair and regenerate muscle, and a reduction in fatigability, may suggest that the training prescription for hypertrophy needs to extend to the higher volume ends of the hypertrophy prescription spectrum to prevent under-loading.

An increased reliance on fat utilisation also may compromise very high-intensity efforts – for maximum strength adaptations, the exercise prescription dictates that intensity upwards of 87% 1RM is required to elicit the desired training adaptations. A reduced reliance on carbohydrate availability may, therefore, affect the development of strength qualities that require very heavy loading paradigms.

Summary

Fluctuations in oestrogen concentrations and their effects on work capacity suggest that there may be certain types of strength training that may be developed more effectively at certain times of the menstrual phase:

- When oestrogen concentrations are low – this might be the time to prioritise training that requires near maximal efforts (e.g., high-intensity explosive activities, maximum strength and strength development), especially as MTU stiffness will also be higher
- When oestrogen concentrations are high – training qualities that rely more on higher 'volumes' (e.g., muscle endurance, hypertrophy) may be better targeted



Takeaway:

- Low oestrogen levels (during menstruation, immediately post ovulation) = near maximal efforts best
- High oestrogen levels (mid-late follicular phase) = higher volumes should be targeted

Windows of adaptation

The physiological effects of oestrogen that have previously been discussed indicate that windows of adaptation may exist across the menstrual cycle according to fluctuations in oestrogen concentrations. Depending on the physiology, the windows may exist either because oestrogen levels are high (e.g., improved muscle repair) or because they are very low (e.g., maximal strength, increase MTU stiffness).

Although there is a large intra- and inter-individual variation in menstrual cycle length, a typical healthy cycle is typically 28 days, ranging between 22 to 36 days[49].

Three distinct phases of the menstrual cycle:

1. Follicular (starting with the first day of menstrual bleeding)
2. Ovulatory
3. Luteal phases[5]

Across the menstrual cycle, there are two periods where oestrogen peaks are evident – first occurring during late follicular, peaking at ovulation, and then again mid-luteal phase. In the second peak, progesterone concentrations are also high (> oestrogen concentrations), which is significant. The physiologic effects of progesterone are antagonistic to those of oestrogen and are thought to be associated with increased protein catabolism[31]. Therefore, to take advantage of the full effects of high oestrogen concentrations, the mid-to-late follicular phase is a key time point.

Conversely, early to mid-follicular and immediately post-ovulation are periods of relatively low oestrogen concentrations that can be exploited if high oestrogen concentrations are not conducive to the desired training adaptations.

In conclusion, oestrogen is a powerful hormone that affects almost every tissue within the female body and naturally fluctuates 10 to 100-fold over the course of the menstrual cycle. Development of strength qualities is likely to be much more effective in the follicular phase (i.e., the first half of the cycle) due to the presence of high oestrogen and relatively low concentrations of the catabolic hormone progesterone. However, every female athlete's menstrual cycle experience is unique and can affect an individual's training dramatically.

It is well-established that the menstrual cycle can have pronounced effects on psychological well-being and mood. Consequently, in order to programme effectively, understanding the physiology is only one half of the equation. The next article in this series will look to explore the psychological impact of the menstrual cycle and what practitioners can do to tie physiology and psychology together to optimise the strength training of female athletes. ***fp***

BIOGRAPHY ▶

Debby Sargent MSc, ASCC has 20 years of coaching experience, working with individual and team-sport athletes. Currently, Debby is a Lecturer in Strength and Conditioning at the University of Gloucestershire. She is also the author of *Strength and Conditioning for Female Athletes* (The Crowood Press), providing guidance on how to adapt training to be specific for women and their unique needs.

Ripped or ruined:

UKAD partners with the fitness industry to tackle IPEDs in gyms

Following a recent survey, UK Anti-Doping revealed alarming statistics in relation to doping within the gym environment. We hear from a former user and how the fitness industry is committing to protecting gym users.

It was announced in May 2019 by the Leisure Database Company that a record 15% of the population are now members of one of the 7,200 fitness facilities across the country, numbers which contribute to the gym and fitness industry being worth in excess of £5 billion annually in the UK.

In part, this can be attributed to promotion and awareness of the benefits of living an active and healthy lifestyle, but another big factor surrounds body image, spurred by social media and societal trends and fashions, including television programmes such as *Love Island*.

While this increasing societal desire to get healthier and, in some cases, gain or maintain a certain body image has clearly seen more people flocking to our gyms, there may be more worrying trends, too, with some turning to 'quick-fix' solutions that could have harmful and potentially dangerous consequences.

Moving to try and help combat this is UK Anti-Doping (UKAD), an arms-length Government body that previously dealt exclusively with tackling doping in sport. Earlier this year, UKAD teamed up with not-for-profit health body ukactive to carry out a survey within the gym and fitness sector, to establish the scale of any potential issue surrounding the use of Image and Performance Enhancing Drugs (IPEDs) among gym users. The results provide a new picture of the landscape and will help the sector to work together to draw on the expertise in the gym and leisure industry, as well as public health experts and academics, to combat the issue.

The survey found that a third (34%) of gym users surveyed said they were aware of other members of their gym taking IPEDs, while nearly a sixth (14%) knew someone suffering from the side effects of IPED use.

"It's a worrying statistic and if it's not addressed properly, it could increase, which is even more concerning," said weightlifter Jo Calvino, 21-time British senior champion and member of UKAD's Athlete Commission. "It's something we can now work on as an industry to try and bring that number down over the next few years."

Around 14% of gym users surveyed confirmed they had taken an IPED at some point, with a quarter of that number (27%) currently still using, while 5% of IPED users said they had been advised to use IPEDs by personal trainers or gym staff. Of those who had ever used IPEDs, 51% said the main motivation was to improve their body image, with the remainder saying it was to increase muscle growth.

Huw Edwards, acting CEO of ukactive, said, "As the fitness industry has grown, the UK's gyms have changed dramatically from the weights-room stereotype of yesteryear, now offering a cleaner and more welcoming environment for all.

"However, these survey findings show how important it is that we shine a light on the dangers of IPED use in all corners of the fitness sector so that no one is unaware of the dangers to their body.

"With leadership from the fitness sector, we can ensure that people of all ages make informed decisions about whether to use supplements, and that starts with a joined-up approach to the education of staff, gym users and athletes.

"Working with UKAD and the Chartered Institute for the Management of Sport and Physical

"Because of the pressure of social media and other things around at the moment, there's an increase in people wanting to make themselves look a certain way" – Dani Halsall

Activity (CIMSPA), together we can improve education so that people know the risks and so staff are able to offer the best possible guidance and information on IPEDs."

Historically, IPEDs in this sector have been stereotypically associated with male bodybuilders in underground gyms, and rarely seen as coming into contact with the mainstream, commercial enterprises. Many will also associate drugs such as steroids, the most commonly known IPED, with sports such as weightlifting and rugby, where size really does matter.

However, with a shift in societal trends has come a transition in where, how and why these substances are being used, and the demographics using them – something that has been spotted by former Team GB athlete-turned-personal-trainer, Dani Halsall.

"With things such as steroids, there are risks around kidney and liver failure, heart attacks, strokes and possible blood clots, but I also have big concerns around fat burners. I've definitely seen an increase in the use of these within commercial gyms. Because of the pressure of social media and other things around at the moment, there's an increase in people wanting to make themselves look a certain way.

"When a gym-goer changes in physique rapidly, it raises my suspicions," she added. "If someone has a very lean physique, very low body fat and a very dramatic change in a short period of time, especially concerning an increase in muscle mass, it certainly sets alarm bells ringing."

There's little doubt that certain IPEDs can give a user big results, and fast, when used in conjunction with a good training programme. However, that quick-fix solution can come at a price as use of certain IPEDs have been connected with a range of detrimental side effects.

"Use of anabolic steroids by females has been linked with hair loss, hirsutism (facial hair growth), and deepening of the voice"


Acne


Hair loss

For instance, use of anabolic-androgenic steroids in males can result in a number of side effects such as acne and gyneco-mastia (or 'man-boobs'), as well as more serious consequences such as chronic hypogonadism, infertility, cardiomyopathies, cognitive disorders, and reductions in brain volume and cortical thickness.

Further, use of anabolic steroids by females has been linked with hair loss, hirsutism (facial hair growth), and deepening of the voice. Female users are also likely to be at risk of some of the more damaging outcomes such as cardiomyopathies and cognitive disorders.

Dr Ian Boardley, senior lecturer in sport and exercise psychology at the University of Birmingham, has seen evidence of some of these effects in his research with male and female IPED users over the last 10 years.

"Anabolic steroid users who we have interviewed have described how they have experienced physical effects such as acne and gynecomastia, and physiological effects including hypogonadism and infertility, often taking ancillary drugs alongside the steroids to limit and/or manage such effects," he said.

Steroid use can also lead to harmful social impacts, too, as supported by Dr Boardley's research. "We have interviewed IPED users who have experienced marital problems through being secretive about their steroid use and have subsequently been found out by their spouses. Similarly, physiological effects such as infertility can lead to significant relational difficulties when this prevents a couple from starting a family."

Beyond physical and social harms, IPED use has also been connected with detrimental psychological outcomes including depression, anxiety and muscle dysmorphia. Boardley's work has also unearthed relevant findings on these outcomes. "In particular, we have seen evidence of how steroid use can at times exacerbate symptoms in those who have pre-existing mental health issues such as depression."

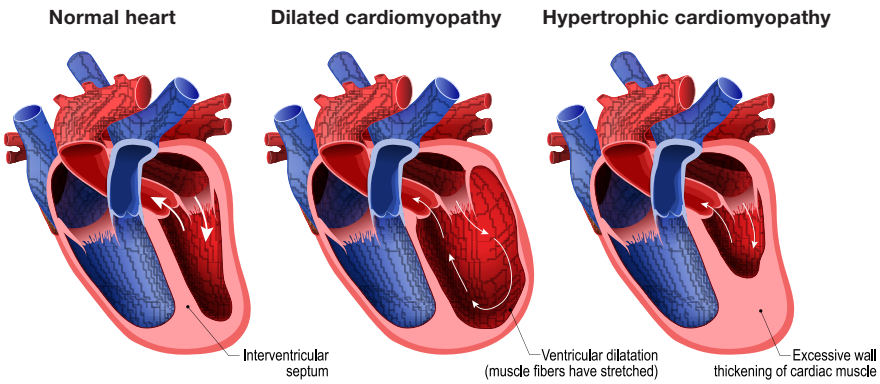
This is supported by the experiences of a former steroid user who managed to successfully move away from injecting after visiting Open Road – an Essex-based drug and alcohol charity that provides services to support individuals on their journey to recovery from drug and alcohol addiction.

Speaking anonymously, the former steroid user said, "I think there's a lot of peer pressure to be honest. People look at these magazines and they see the ideal body of a bloke that they like, with the six-pack, the big arms, the big chest, and they think the only way they can get that is by taking steroids.

"You get the 'roid rage', the bad moods, the grumpiness. You start to isolate, you just hang around people who are doing the same things. Relationships break up, marriages break up, that kind of stuff. I found it wasn't very good for my mind, my health, my psychological state.

"I've got an enlarged heart and I had really bad palpitations when I was on

The many side effects of anabolic steroids can include cardiomyopathies



> ***"The evidence linking IPED use with harmful outcomes begs the question whether risking such outcomes is a price worth paying"***

steroids, although it has calmed down since I've come off them. I've got an extended belly from too much growth, my kidneys are swollen and my liver enzymes are as high as an alcoholic – and I don't drink. It's all down to steroid abuse."

Beyond findings relevant to the potentially harmful effects of steroid use, Dr Boardley's research has also supported some worrying trends regarding IPED use. "For one, there seems to be a move in male users towards longer steroid cycles and higher dosages. Also, there seems to be evidence of greater use among female populations. Both of these trends are concerning given the greater risk of harm associated with longer cycles and increased dosages, as well as the additional risks associated with use by females."

Overall, the evidence linking IPED use with harmful outcomes begs the question whether risking such outcomes is a price worth paying when significant gains in strength and size can be achieved through effective long-term training and nutritional practices.

Looking ahead, UKAD and CIMSPA have recently announced a partnership to promote clean sport across the industry, including accreditation for CIMSPA members.

"Education is always important," said Jo Calvino. "We have a thing called the internet and a lot of people will use it as their only source of information. It can also have some really naive information and not present all the facts, and that's a concern.

"For those in the fitness industry, it's our responsibility as coaches and personal trainers to have that knowledge and be able to tell people, if that's what they want to do, these are the consequences and these are the long-term side effects. I think it's a very short-term gain and people don't think about the damage it can do."

In addition, education of gym owners and staff, providing them with the tools to promote the right messages to their clients, is something Dani Halsall thinks is a vital next step.

"My understanding of IPED use has come from the knowledge I gained throughout my sporting career. I am very aware of the signs and symptoms of those that use them. Unfortunately, there is little information provided to PTs during their training courses and within the gym environment.

"In my opinion, it is so important that this is changed to build awareness from management right through to gym members to minimise risk to all involved."

UKAD is continuing to work in partnership with both ukactive and CIMSPA to develop educational programmes and resources for the gym and fitness sector.

For those working with athletes or their support personnel, further information relating to anti-doping can be obtained through UKAD's Accredited Advisor course. The programme is a step-by-step learning module that explains the role of the advisor, the principles of clean sport, and all the essential anti-doping information advisors need for the role.

Intelligence is a crucial part of keeping sport clean, so if you have any concerns that someone who competes in sport, or works with others who do, is taking a prohibited substance, you can contact UKAD anonymously via the Report Doping in Sport form on the UKAD website. Alternatively, you can:

Email: intelligence@ukad.org.uk
Telephone: 08000 32 23 32
Whatsapp: +44 (0)7587 634711 ***fp***

UKAD Protecting Sport

UK Anti-Doping is responsible for ensuring sports bodies in the UK are compliant with the World Anti-Doping Code through implementation and management of the UK's National Anti-Doping Policy. UKAD's functions include an education and information programme, athlete testing across more than 40 Olympic, Paralympic and professional sports, intelligence management, and exclusive results management authority for the determination of anti-doping rule violations. ukad.org.uk

Together against loneliness

Stefania Dall'Armi reports on Silverfit, a charity that teaches us that one of the most effective ways to defeat loneliness is through social fitness groups. What do you think of when you hear the word 'loneliness'? For some, it's a distant problem mostly associated with the fear of being forgotten, while for others it may feel closer to home and be a constant threat to their mental health.

Today was going to be another dull day for Susan. Another tick on the calendar, waiting for the time to pass. No alarm set. No plans for the day. "After my mum died, to whom I was the sole carer for some years, my reason to get up in the mornings disappeared," explains Susan. "I became the perfect couch potato; watching daytime and evening TV, snacking, lonely and depressed."

Unfortunately, Susan is not the only retired person to feel this way. Loneliness is not simply a singular emotional experience, but the topic of scary, concrete growing data.

Growing numbers

Any age group can be affected by loneliness. A UK Gov study[1] conducted in June 2019 for Loneliness Awareness Week reveals that the highest levels of isolation are actually in the 18-24 age group. However, the numbers are quite unstable at this stage, with most reporting a short period of transition to adulthood.

On the other hand, isolation in people aged 50 and over is more likely to become a permanent condition. According to a recent research conducted by Age UK[2], there are 1.4 million 'chronically lonely older people in England, and many more across the rest of the UK'. The number is set to reach two million by 2025.

"Loneliness often isn't being alone, but feeling alone and having low-quality interactions," explains Dr Josephine Perry, chartered psychologist at Performance in Mind. "When we add the change of life that comes with retirement, losing day-to-day engagement with work colleagues and sometimes reduced mobility as we age, it is not surprising we can get hit by loneliness."

Once the causes of isolation and depression are recognised, we have to be aware that there are also available solutions.

How to defeat loneliness

Dr Perry reveals three successful ways to help with isolation:

1. **Positive mindset** – If we can reframe the negative thoughts around being alone into 'this is a great blank canvas to go and find interesting people, exciting conversations and new experiences', we will start to build up confidence and find we have much more engaging interactions
2. **Visit welcoming places** – Recent research that I ran on physical activity in retirement found that retirees were keen to go out, meet people and be active, but they wanted to do so in places that are welcoming, non-intimidating, have toilets, and where they feel physically safe
3. **Make social plans** – Recent research suggests that the times we are most likely to feel lonely are weekend evenings, so having a plan for how to have some quality engagement at this time is important; perhaps ringing a friend for a chat or getting together with others for a social event

Since isolation has become a major problem in our modern society, more options are available for older people. Volunteering is one of the most popular, where people feel satisfied doing something useful for others. Social communities, such as Age of No Retirement, Age Watch or Encore Future are also very common as people have the chance to meet up regularly and chat with professionals about their problems. There are thousands of charities across the UK that aim to bring older people together and defeat isolation.

Susan's antidote

Susan's escape from isolation and depression has been through fitness groups. "I was browsing the Internet and noticed an advert for a new exercise group in Crystal Palace for the over 45s called 'Silverfit', which offered spinning, Pilates and Nordic walking.

"I was the second person to arrive and was impressed by Silverfit members from Burgess Park who had come to welcome us. They joined in the sessions and stayed to chat afterwards. I tried all the exercises offered over the next three weeks and I have taken up Pilates with an amazing, enthusiastic and fun lady called Bagusha; you can't help but smile in her classes.

"I have made good friends with whom I socialise outside the classes and have also gone on holiday with. It turned a very miserable existence into being more positive, sociable and healthy, both mentally and physically. Thank you Silverfit and thank you Eddie, the inspiration behind Silverfit. This woman is outstanding in every way. Once met, never forgotten!"

Silverfit

Eddie Brocklesby, 76, is not only the mind behind Silverfit, but the energy, the spirit, and especially the legs. She keeps this charity running in every sense. The day I went down to Burgess Park around 10am to chat with some regular Silverfitters, Eddie had already done more than 25k. She woke up at 5am, did an hour or more on her bike getting ready for the upcoming RAAM – the toughest cycling challenge in the world – had a good breakfast, a shower, time to work on the Silverfit organisation, catch the train then bus to Waterloo to greet Silverfit volunteers and participants, and always with a big, friendly smile.

I ask her where the idea of Silverfit came from. "After 50 years of social work, you cannot stop trying to help other people. I was part of the Serpentine Running Club and with a few friends we wanted to change the statistics that said 'the least active members of our population are also the least fit, happy and healthy'.

"We started to look where we could make a difference. Could we, as a charity, run by older people for older people, create our own oldies formula to scale up and get the message out there that it was never too late to get a bit more active?"

After six years, the Silverfit charity keeps growing. It has 15 venues around London and has just opened a new cheerleading session in Elephant and Castle.

Nordic walking

Nordic walking was one of Silverfit's first sessions and it is still one of the most popular. On Tuesday mornings, Burgess Park café is always full. Winter or summer, rain or shine, they always try to be on time to have a drink and a chat before starting to exercise.

"It is very rewarding when you manage to make it on time; I like to be there for the socialisation and warming up," says Tina, a new member of Silverfit. "I find the sessions very inspirational and I try to do an activity when I can." Two years ago, she ended up with a bad case of flu, which meant spending most of her days alone at home. "The doctor didn't give me any treatment so I tried to do what I could to keep active and healthy." And social it would seem, as Tina seems to enjoy talking and rarely takes time to drink from her cup of tea!

Usually, Silverfit sets up two walking groups to suit everyone's speed and age. While I try not to lose sight of one group while walking with the other, I had the chance to have a brief chat with Michael, who is over 70. I ask him what is the best thing about Nordic walking with Silverfit? "It's finishing it after going for one hour," he says smiling, and adds: "You always walk further than you would normally do alone."

For more information, explore the Silverfit website (silverfit.org.uk). Silverfit needs all possible support to keep reaching more older people, from every part of London, to combat loneliness and to show that happy and healthy ageing is possible.

You can donate to Silverfit through JustGiving: justgiving.com/silverfit. ***fp***

This Christmas season...

FitPro urges our wonderful members to reach out and help an elderly neighbour. To help combat loneliness in the community, check out **ageuk.org.uk** and **contact-the-elderly.org.uk**

Yoga for men

As well as the physical side, yoga can also help with self-development and tuning into the individual. In our stressful, always-on lives, men are increasingly turning to yoga for mind and body benefits. Fiona Bugler speaks to yoga4men founder, **Rad Kaim**, about his tailored classes.

> ***"In our teaching we focus on areas of tension for men – the shoulders, hips and hamstrings"*** – Rad Kaim

Yoga is a 5,000-year-old practice that continues as one of the most popular ways to undertake mind-body exercises. Research by the British Wheel of Yoga, as discussed in *YOGA Magazine*, estimates that there are 10,000 active yoga teachers in the UK, teaching between 20,000 and 30,000 classes each week. For anyone who has been to a class, it's clear to see that yoga and other mind-body sessions are female-dominated; however, things are changing.

For recovery and injury prevention, Premier League footballers and Gareth Southgate's England team are regularly found to be practising yoga. At Watford Football Club, it's compulsory to do yoga. And it's not just footballers, many sportsmen are making yoga part of their training to improve flexibility, strength and posture, and help them gain mental clarity and focus.

In addition, yoga is a great antidote to modern living. "There is an underlying neurosis in our society. Men are under a lot of pressure to compete, perform and provide – and it's well known that more men kill themselves than women, and suicide

remains the biggest cause of death for men under the age of 45," says Rad Kaim, founder of yoga4men. "In our 'suppressed' society, we lose the ability to connect the heart and the mind," he adds. "As well as helping to relieve emotional stress, in our teaching we focus on areas of tension for men – the shoulders, hips and hamstrings," he explains.

Key tip 1: Beginners matter

"In my experience as a yoga teacher, I've seen most men fall away at the beginner level when they get frustrated as they struggle to do some of the moves that women seem to be able to do easily. They are harsh on themselves and rate their 'performance' in a competitive way. That's why it's vital to get teaching right in the beginner classes," says Rad.

"In the first class, I will always ask, have you done yoga before? And, importantly, what are you looking for from yoga? This informs me what to focus on," he adds. "Having all men in the beginners' class makes it much easier, taking the pressure off and allowing them to focus on the moves."

Key tip 2: Teaching breathing

"I avoid going too deep in beginner sessions and focus on teaching basic moves, shapes and breathing. Breathing is where the magic happens in yoga. Once my group has mastered yogic breathing, they can move to the next level. This is when I will introduce themes for classes, for example, empowering and elevating," says Rad. "As men progress through yoga, they can deepen the emotional side of the practice," suggests Rad. "My passion is to, in some way, enable men to recognise their own definition of happiness, integrity and power."

Key tip 3: Undoing old habits

"Many of the men who come to my classes have come direct from the gym; a fast-paced environment where the focus has been on aesthetics, bulking up and masculinity. The result of this is tight, short muscles, and sometimes we have to undo this to start releasing energy to relax the body and get the best from the class. The nervous system needs to be rebuilt for yoga," says Rad.

Key tip 4: Understanding the difference between men and women

"It's important to teach men to 'be in the body', starting with basic movements and by targeting common areas of tension: shoulders, hips and hamstrings. Women are more in tune with their body – they have an intrinsic skill set. They are also more open emotionally," concludes Rad. ***fp***

BIOGRAPHY ▶

Rad Kaim is the founder of yoga4men and is a senior RYT Hatha yoga teacher interested in coaching, energy healing and meditation. He's on a mission to get more men on the yoga mat. yoga4men runs classes, one-to-one sessions, and regular events and retreats in both London and Los Angeles. Find out more at **yoga4men.com**

› 1. Side hip opener

› 2. Modified shoulder stretch

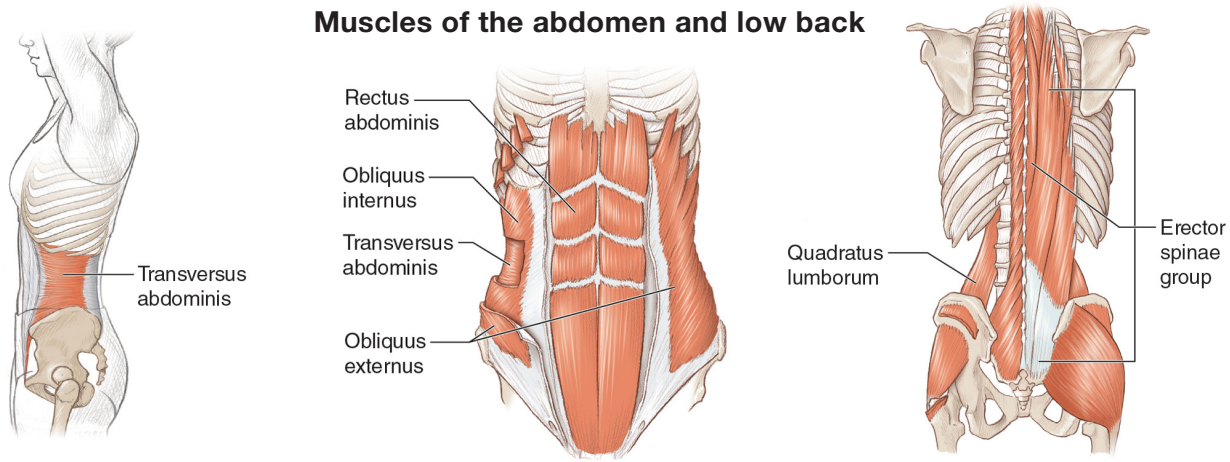
› 3. Shoulder/chest release

› 4. Calf smash

Core stability

Bodyweight resistance is the most common mode of strengthening the abdominals and low back, also called the core. Adding external resistance such as an elastic band may increase the training stimulus to these areas, particularly in programmes where progress has stalled. Elastic resistance training may improve the muscle activation ratio of exercises limited by gravity resistance. The abdominal and low back regions are key areas for whole-body stabilisation and sports performance, most likely because of their ability to generate or transmit forces between the lower and upper extremities. All functional activities of the extremities have some contribution of the core in terms of force production or stabilisation. Therefore, core strengthening is vital to performance enhancement in all sport and functional activities. In addition, the abdominal and low back regions are important areas for prevention and rehabilitation of low back pain.

Muscles of the abdomen and low back



Lower abdominal crunch

Lower abdominals

Lie on your back with your hips and knees flexed. Stretch the band over your knees and cross it underneath you. Secure each end of the band under your hands on the floor (a). Lift your knees upward, lifting your hips off the floor (b). Slowly return.

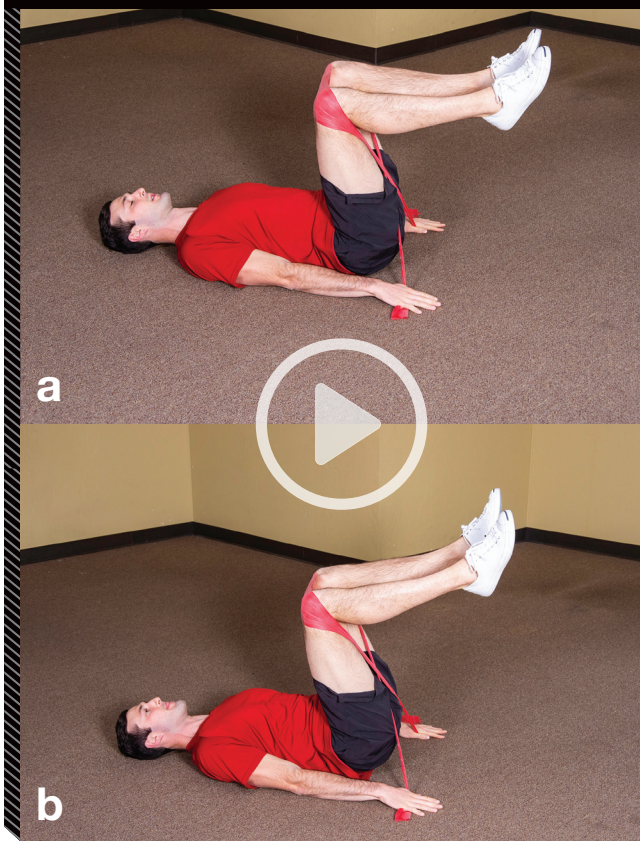
Variation

Perform the lower abdominal crunch with knees straight. Stretch the band around your feet and push your legs upward, lifting your hips off the floor.

Technique tip

Avoid arching your back or flexing your hips.

› Lower abdominal crunch



Trunk rotation

Oblique abdominals

Sit with your legs extended at least shoulder-width apart. Securely wrap the middle of the band around both feet. Grasp both ends of the band with your arms extended forward (a). Rotate the trunk to one side (b) and return slowly to the other.

Variation

Perform the exercise while standing in an athletic stance. Securely attach one end of the band to a sturdy object, then rotate your trunk over your hips to one side and repeat on the other side. Keep your neck and shoulders aligned.

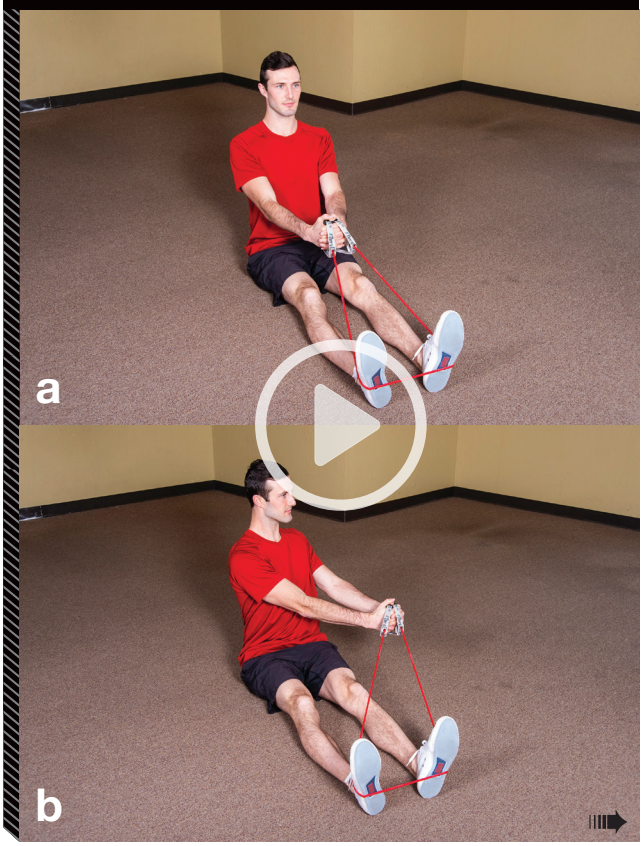
Progression

Perform while sitting on an exercise ball. Securely attach one end of the band to a sturdy object, then rotate your trunk to one side and repeat on the other side.

Technique tip

Keep your back straight and avoid leaning to one side.

› Trunk rotation



Trunk rotation training tip

Effective alternative to machines

Performing a standing trunk rotation is as effective for muscle activation as using a seated machine. However, the elastic resistance exercise activates more erector spinae muscles, while the machine activates more external obliques[1].

Quadruped stabilisation

Lumbar stabilisers, glutes, obliques

Begin with your knees and hands on the floor. Wrap the middle of the band around the bottom of one foot and stabilise the ends of the band in your hands (a). Keeping your back and neck straight, extend your leg backward against the band, straightening your hip and your knee until they are parallel with the floor (b). Simultaneously extend your opposite arm in front of you. Slowly return to the starting position.

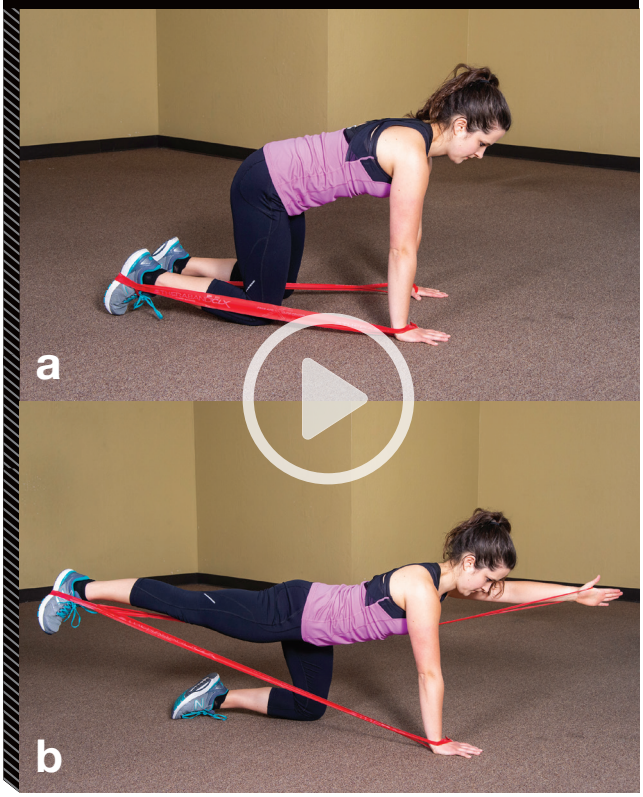
Variation

Perform a leg extension only, keeping your hands on the floor.

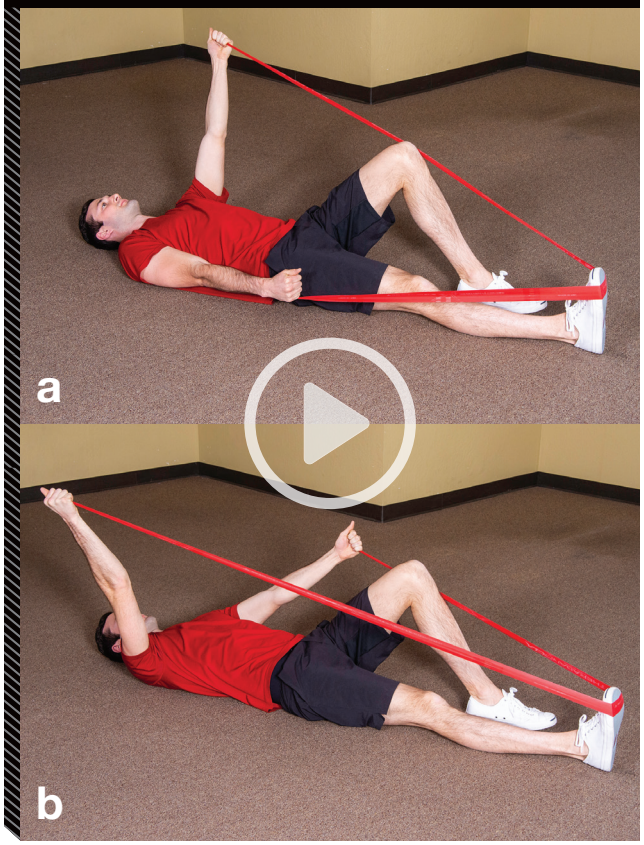
Technique tip

Keep your back and neck straight and in a neutral position. Don't arch your back or overextend your hips. Don't extend your neck or rotate your back.

› Quadruped stabilisation



› Supine stabilisation



Supine stabilisation

Lumbar stabilisers

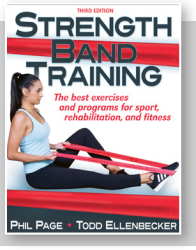
Lie on your back with one leg straight and the other flexed. Wrap the middle of the band around the bottom of the foot of the straight leg and stabilise the ends of the band in your hands with one arm extended upward (a). Alternate flexing your arms while keeping your elbows straight (b). Keep your back straight and slowly return to the starting position.

Variation

Perform hip flexion and extension (knee straight) against the band simultaneously with the arm flexion.

Technique tip

Keep your back and neck straight and in a neutral position. Don't arch your back.



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Visit uk.humankinetics.com. *The above extract has been taken from* **Strength Band Training – Third Edition** *by Phil Page and Todd Ellenbecker.*

Know your worth this January

New year, new me. The saying never gets old. As the fitness industry prepares for the January rush, **Olivia Hubbard** speaks to two PTs who seem to be one step ahead of the crowd.

Big business

The personal training industry is growing steadily. According to Statista, it will grow from £600 million in 2015 to £670 million in 2020 and, according to purchase data company Cardyltics, the spending of gym goers increases by 42% in January and February. So, how can the 57,000 PTs in the UK stand out from the flurry of competition?

Co-founder of the one-day workshop, *The Business of Fitness*, Vicky Anstey told *Fitpro*, "Manage expectations carefully and gently discourage over-zealous attempts to undertake a life-changing, new routine. Instead, set tangible goals, broken down into manageable chunks, so that clients are motivated by their on-going success. Statistically, to avoid burnout with new clients, you want to establish attendance at a frequency of no more than three times a week in the first month."

Anstey continues, "Don't play on insecurities or a sense of inadequacy – this may give you an initial spike in revenue, but will be short lived. Instead, focus on creating an aspirational image in your clients' minds. They are far more likely to gravitate to this and be incentivised to take action – and stay on track. Set up studio challenges, What's App groups, and involve other local businesses that may wish to get in front of your clients with giveaways and 'rewards' for reaching goals. Build a community that people want to be part of and play on extrinsic motivations to engender the deepest loyalties."

Independent insight

"If you're a personal trainer in a private studio, January is a hard time to attract new clients." These are the rather honest words of independent PT, Emily Pointer, who runs her own business, On Point Training, based in SW London (onpointpt.me).

With brightly coloured discount slogans splattered across our TV screens and posters offering a supermarket-style offer – it's hardly surprising that independent personal trainers (despite their incredible talents) may struggle to compete against the big club players.

However, by seeing the bigger picture, Pointer remains somewhat upbeat by the stiff competition. "I plant the seed of attracting new clients before Christmas. I do this with my social media content and emails. My messaging tells my clients that the gyms are going to be rammed in January, so I suggest making the most of the empty gym space in December, and then signing up to a PT in the New Year when they will have a more enjoyable time." Smart. Pointer's brand is all about making women feel confident through exercise; she's a firm believer that establishing your niche is the best thing a PT can do.

In January, it's tempting to open your arms wide and let all the eager new sign-ups flood into your studio. However, are they the right clients for you? Pointer conducts a rigorous consultation before taking on a new client. "I send a preliminary questionnaire to find out more about them. I also do a quick Google search on new clients to see what I can find out. I'll even see if they follow me on social media."

Pointer suggests the consultation takes place face to face and to make sure it happens outside of the studio. She continues, "I always ask about their job, because more likely than not, it will be high stress and long hours. Don't pussyfoot about when it comes to your profit. Know your worth and stick to it."

First date

Two words for the induction session: movement screening. Pointer explains to clients that the first session is all about seeing how they move. "I always explain to people why they are doing X, Y and Z, and what movements they will be progressing on to.

I also cannot express how important it is to let your clients talk! It's about them – not you."

It's pretty common that most people enter into exercise with 'key goals' in mind. Goals may include: to feel more confident; to have a stronger core; and to reduce diastasis post-baby (a lot of her clients are pre and postnatal). Pointer hopes that clients realise that they need to exercise as part of a healthy lifestyle.

Emily's key points

Marketing:

- Suggest they start training with you twice a week to build momentum and drop to once a week over time
- If price point is an issue, offer a package where they do one session with you per week and also create a programme for them to do in their own time

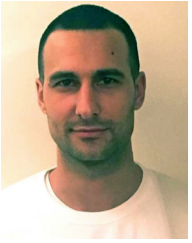
Use your free time wisely:

- Create engaging content to get the attention of future clients
- Set up an email newsletter
- To help market your PT business and make money, start running your own small group training classes
- Find some work on the side (when I first started out, I used to help with the social media for another PT business to make sure I had an income)

Retention:

- Get clients to buy into a number of sessions that go beyond the end of January
- Talk about their progression and how far they have come, for example, point out how their left leg is stronger and how they no longer get out of breath walking up stairs
- Ask them how great are they feeling in themselves and how is exercise enhancing their life
- Make sure it isn't a miserable experience – you are there to brighten up their day, so stay upbeat, no matter how bad your day has been

Weight loss and weddings



Meet the man behind Tailor Made Fitness (TMF) (tailormadefitness.co.uk). From his base in North London, Chris Antoni trains a variety of clients – from football players to after-school children's clubs. "I secure a lot of my new business via word of mouth. Business events such as BNI are also really great. The networking event unites people from different industries and covers multiple counties. It only allows one person from each industry category – so no other personal trainer will be there. You are allowed 60 seconds to stand up and say what you do."

Antoni makes a good point. For some people, talking about making a change in a fitness environment could be off-putting. When it comes to offering an incentive to win new clients, Antoni heads to local schools and fairs, and donates training sessions to the raffle.

Advice for other PTs running their own business is to be flexible and adaptable. "It's not about being in control – it's about making your clients believe they are in control. Clients should be held accountable, too. I ask my clients to commit to training on their own – but I never punish them for not doing anything. I ask them 'why' they haven't done it. Trainers who are too strict will put a lot of clients off."

Antoni always uses the SMART system: Specific, Measureable, Achievable, Realistic, Time. "I do this for the short-, medium- and long-term goals. Once a client hits those short-term goals – it's about being mindful that the other goals can then change."

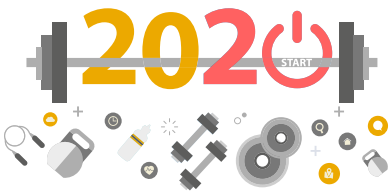
Antoni has quite the reputation for training bridal parties across North London. "I have quite a big uptake in January for this type of package. I try and encourage people to sign up the year before their wedding. They want the results quickly, so managing expectations can be tricky," he explains.

Chris's final words of advice:

- PTs shouldn't seek perfection in the programme they are offering – be more honest and realistic
- Consider that a client might not improve physically, but they will do mentally
- Don't use 'sales messaging'; I use video marketing throughout the year to build trust
- You're educating your clients – not just training them
- I used to do one-hour exercise sessions for people to do at home, but it wasn't viable, so I now set 20-minute sessions, which helps with discipline and structure, and encourages people to train when I'm not there

According to the Fitness Industry Association, 4% of new gym goers drop out before the end of January and there is a 14% drop off in February. By the sixth month of membership, you can expect a drop-off rate of up to 44%. Redundant gym memberships actually outstrip active gym memberships over time. We therefore hope this advice from two ambitious PTs has provided you with some constructive take-homes. ***fp***

Forecast trends



According to the Welltodo Consumer Wellness Trends report, the following are set to be key trends for 2020:

- **Extending the sexual wellness journey** – programmes and technologies around sexual health, fertility and erectile dysfunction
- **Cognitive optimisation** – driven by an insatiable desire to be the best version of ourselves and to reach optimal performance at work or at play; solutions that promise to boost brain health and increase productivity (such as CBD oils)
- **Inclusivity** – gone is the stereotypical, aesthetically driven image of 'fit' – we are re-defining what aspirational means by seeing the decline of 'insta-perfection' and the growth of an 'alternative' fitness community demonstrating that people from all backgrounds and of all shapes, sizes and levels of ability want to participate in the self-care movement
- **Healthy convenience** – think the Whole Foods of the fitness world where boutique studios convene in one space
- **Holistic health** – individuals who want to take charge of their health and make proactive changes that start with their everyday wellness via DNA tests and technologies that offer precise, personalised lifestyle recommendations

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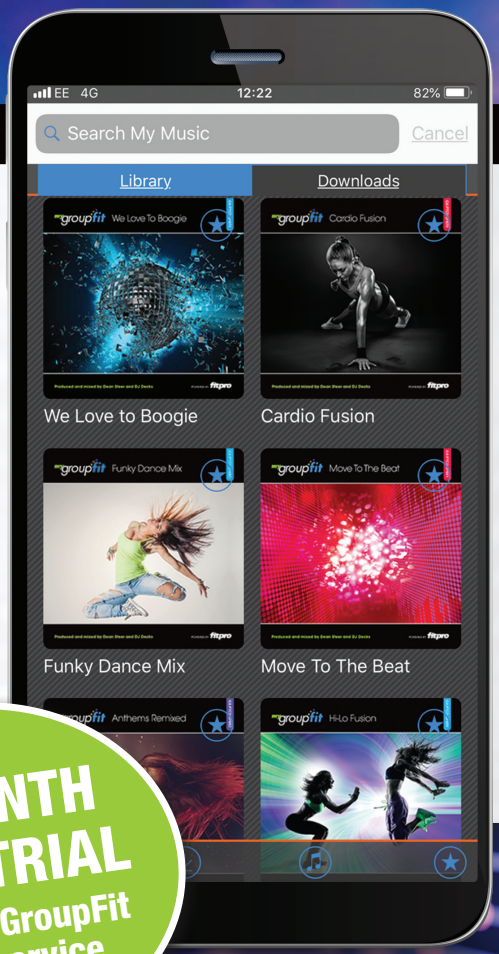

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Carbs: Friend or foe?

In a world of weight-loss diets, **Linia Patel** discusses the low-carb, high-protein eating plans that have waxed and waned in popularity over the years.

Cause of the obesity epidemic? Sugar. Experiencing inflammation? Then it's the grains. Want to lose weight? Cut the carbs. In fact, most people now believe that carbs are inherently fattening, but are they really the devil?

What are carbs?

Carbohydrates are essentially sugar molecules bonded together to varying degrees. Structurally speaking, there are two types of carbohydrates: simple and complex. Simple carbohydrates are smaller, more easily digested molecules known as mono- and disaccharides. These simple sugars are also called free sugars or added sugar. Think biscuits, chocolate, flavoured yoghurts, breakfast cereals and fizzy drinks. Sugars in honey, syrups (such as maple, agave and golden) and unsweetened fruit juices, vegetable juices and smoothies occur naturally, but still count as free sugars. Sugar found naturally in milk, whole fruit and vegetables does not count[1].

Complex carbohydrates, on the other hand, are called polysaccharides since they have more than two sugar groups linked together and therefore need more digestion. These include starchy carbs and fibrous carbs. The sugar molecules in starch are bound together to a lesser degree than in fibre, hence the body is able to completely digest starch while it is not able to fully digest fibre. If you eat too many starch-rich foods, your body can also convert the glucose in the starch to fat. Starch is found in root vegetables (potatoes, beetroot, parsnips) as well as grains. Good sources of fibre include vegetables, fruit, wholegrains, lentils and beans[1].

Blood sugar control

In essence, before being absorbed into the blood stream, all carbohydrates are broken down to sugar molecules with the help of a hormone called insulin. In general, sugary simple carbs such as white bread are rapidly digested and cause substantial fluctuations in blood sugar. On the contrary, complex carbohydrates such as whole oats are digested more slowly, prompting a more gradual rise in blood sugar [2].

Maintaining stable blood sugar levels has big implications for optimal mental and physical functioning. In the short term, blood sugar peaks and troughs can cause mood swings, energy dips, fatigue, irritability,

headaches, and cravings for refined (high-GI) carbohydrates or coffee. Long term, poor blood glucose control can lead to obesity and insulin resistance. Insulin resistance is a condition in which the cells of the body become insensitive to the hormone[3].

Who needs carbs?

All cells must burn fuel to function. One of the main roles of carbohydrates in the body is as a source of energy. However, not all carbs are created equal and herein lies the challenge[1,2,3].

The first thing to make clear is that we all need to keep our intake of simple carbs/free sugars to a minimum. Recent research provides compelling evidence that high-GI carbohydrates are associated with an increased risk of obesity. Current guidance is to reduce sugar to less than 5% total energy intake; however, for the majority, the less, the better[1].

In terms of complex carbohydrates, for most, we require some complex carbs to function at our best. In fact, research shows a very low-carbohydrate diet for too long can negatively affect our healthy bacteria. There is increasing evidence showing the importance of maintaining a healthy gut flora (they love complex carbs) and indirectly impacting hormone regulation and risk of disease[2].

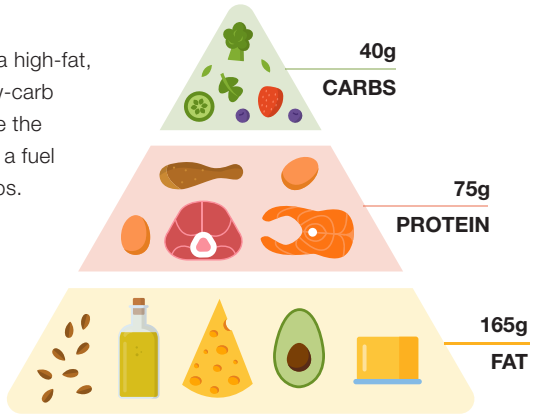
Very sedentary people, as well as those who have insulin resistance, may benefit from a lower overall carb diet for a while as part of a transition towards more activity and a healthier metabolism. A small proportion of the population will be able to function with an even lower carb diet[3]. Ketogenic diets (very low-carb diets) are actually prescribed for people with epilepsy, as they seem to reduce their symptoms and cut down on seizure frequency. There is also preliminary evidence that ketogenic diets benefit other neurological disorders such as Parkinson's and Alzheimer's[4].

On the contrary, a small proportion of athletes may benefit from a very high- or low-carbohydrate diet. Glucose is the preferred fuel of the muscles so it is therefore not surprising the vast majority of endurance athletes do better on high-carb diets; however, there are exceptions. There are a few athletes who are able to perform on a low-carb regime as they are better fat adapted. However, it's worth noting that, after a week of adaptation to the low-carb diet, although most cyclists felt that they could more or less perform normally, their sprint capacity did take a big hit. So, while studies will show that, on average, athletes tend to perform better with higher carb intakes, this is not a universal rule; there is always individual variability[5].

Each person is unique when it comes to carbohydrate requirements, so while grouping into body types may provide some guidance, it is purely guidance – one size doesn't fit all. For bespoke advice about your carbohydrate intake, you should see a registered dietitian or nutritionist.

KETO DIET

The ketogenic diet is a high-fat, moderate-protein, low-carb plan that aims to force the body into using fat as a fuel source instead of carbs. The keto diet relies on ketone bodies; a type of fuel that the liver produces from stored fat.



How does it work?

Burning fat may seem like an ideal way to lose pounds; however, it does come at a cost. Ketosis is reached in a few days after carb deprivation. In practice, although the exact ratio depends on your particular needs, the keto diet advocates a high-fat intake. In a daily 2,000kcal diet, for example, you would be looking to eat about 165g of fat, 40g of carbs, and 75g of protein. You are allowed to eat plant-based fat such as nuts, seeds and avocados. Olive oil and saturated fats from oils, lard, butter and cocoa butter are encouraged in high amounts. All fruits are rich in carbs, but you can have certain fruits (usually berries) in small portions. Vegetables are restricted to leafy greens, cauliflower, broccoli, Brussels sprouts, asparagus, bell peppers, onions, mushrooms, cucumber and celery. Protein is part of the keto diet, but it doesn't typically discriminate between lean protein foods and protein sources high in saturated fat such as beef, pork and bacon.

What does the research say?

The keto diet is an effective way to achieve weight loss. The issue is that the majority of the studies done have only produced short-term results and these have been mixed[6]. The long-term efficacy of such a diet needs to be studied; however, preliminary data suggests that it has a negative impact on the gut flora.

Practical tips

The keto diet is definitely not for everyone. If you have liver or kidney problems, then this diet is not for you. If you have a slow gut (i.e., are constipation prone) and you currently have a higher carbohydrate intake, then you will also struggle with the diet. However, if your current intake of carbs is already pretty low and you use the keto diet as a short-term kick start to fat loss, then it can be effective. Remember to focus on the healthier monounsaturated fats, lean protein, and eat lots of greens. ***fp***

BIOGRAPHY ▶

Linia Patel is a leading dietitian and sports nutritionist. She is currently a PhD candidate in Public Health. Her passion is translating nutritional science into easy-to-digest and practical advice.

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