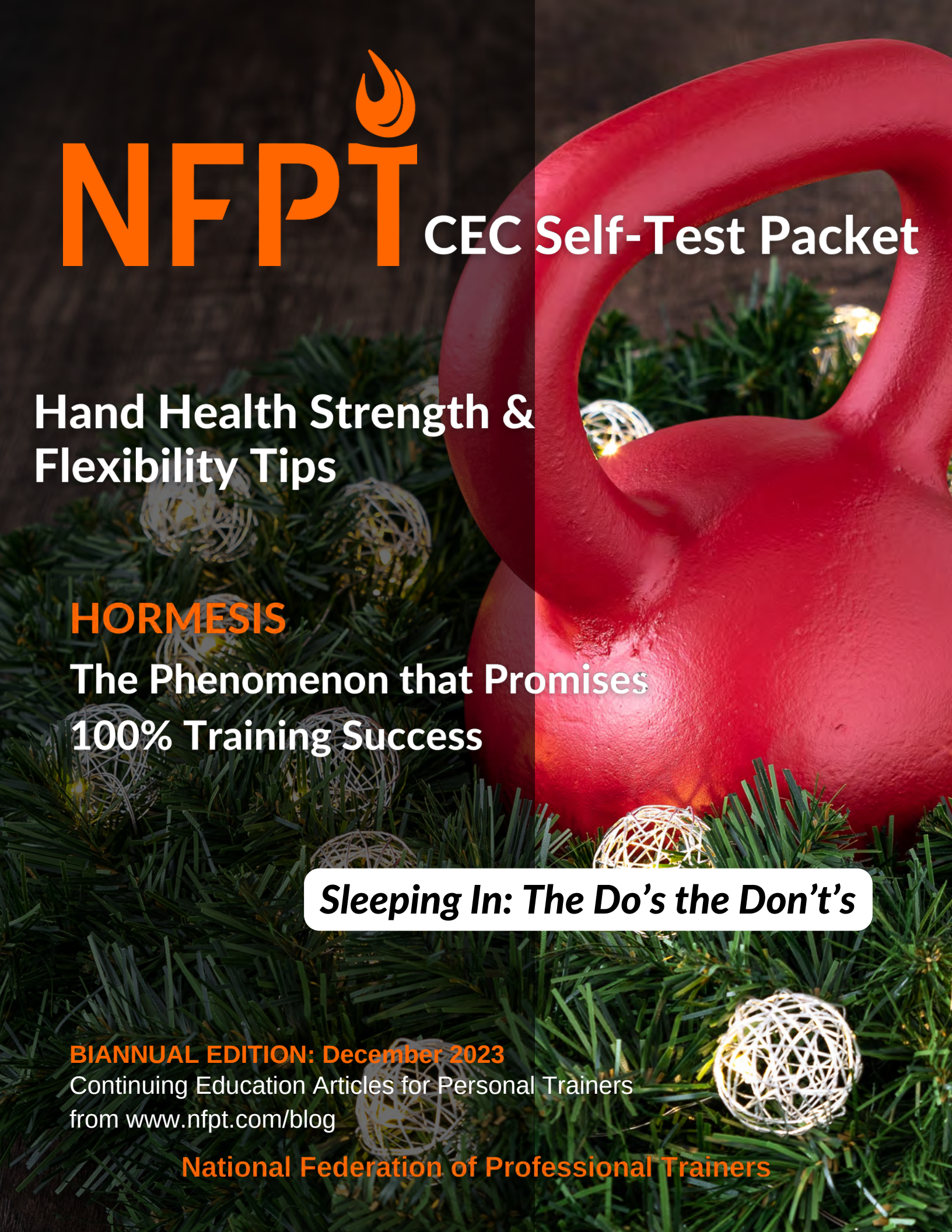

NFPT CEC Self-Test Packet

Hand Health Strength & Flexibility Tips

HORMESIS
The Phenomenon that Promises 100% Training Success

Sleeping In: The Do's the Don't's

BIANNUAL EDITION: December 2023

Continuing Education Articles for Personal Trainers
from www.nfpt.com/blog

National Federation of Professional Trainers

NFPT SELF - TEST

DECEMBER 2023 EDITION

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NOTE: there are articles in this packet which contain links and/or references to resources and information only available online. Go to: www.nfpt.com/blog/cec for these additional resources.

We thank you for your commitment to the fitness industry and to the NFPT organization of trainers. Please contact us at 800-729-6378 or at info@nfpt.com with any questions, or to just be in touch. *We wish you continued success in your endeavors!*

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Sleeping In: The Do's and Don't's

Ah, sleeping in, the ultimate luxury. Laying in bed, no alarm, getting as much rest as the body wants. Nowhere to be. It's the unspoken staple of vacations, time-off, and for many of our personal training clients, weekends. Yet, sleeping in too long can lead to feelings of grogginess and trouble going to bed the following night – which often creates a cycle of sleep loss and catching up.

There are benefits to sleeping in as well as consequences.

Sleeping in on a Sunday when one has to wake up early Monday induces a daylight savings time change every week, instead of just once a year.

Personal trainers and fitness clients often wake up early during the week to get to the gym — an incredibly healthy habit to instill–*unless* it comes at the cost of consistent sleep. Finding out what your clients (and considering your own) habits are in this arena can lead them to positive health change. Some people might work a typical 9-5 on weekdays, but others may have a different schedule.

Is Sleeping In a Problem?

Ask your clients:

What time do you wake up each day of the week?

Does it ever change, on the weekend?

Consistency is key with sleep (and getting enough volume). Shifting the body's internal clock by an hour or more every week and then back again has a cascade of physiological effects, because there are 3-trillion cells in the human body and each one has a clock. When bedtime and rising time change, so do digestion, heart rate, liver function, etc. Sleep timing matters more than

many people realize. We were designed to synch with the sun's rhythm, but artificial lighting and screens have altered that.

When to Sleep In

When traveling time zones. Sleeping in can help get the body into a different time zone, mostly with westward travel.

During illness. When the body is coping with a virus or infection it is important to let it sleep as much as possible.

After extreme sleep disruption. If a person traveled several time zones and is returning home, just gave birth, or had some sort of tragedy in their life, sleeping in for a few days or a week to catch up might be beneficial. But it is then imperative to get back on a routine for hormones like Melatonin.

With shift work. Ideally, a person working night shifts should get onto a sleep schedule that remains consistent with work, but if that's not possible due to family or life demands, it may be better to just sleep when they can.

If it's impossible to sleep enough during the week. Folks face the economic reality of working multiple jobs to support themselves and/or a family need to sleep when they can and do their best. This is a specific scenario and does not apply to people who are just staying up too late and could be in bed earlier by implementing sleep hygiene strategies.

When *Not* to Sleep In

When it's chronic and a crutch. There are quite a few situations which sleeping in is beneficial for a short-term solution, but otherwise it is detrimental in the long-term. If a person is not allowing enough time for sleep during the week and sleeping late on weekends because of

tiredness, this causes disruption in all of the body systems (immune, endocrine, nervous, digestive, cardiovascular, etc.) and contributes to the risk for illness.

Sleeping in on weekends, for example, enables a person to stay up too late on weeknights and/or wake up too early without enough sleep volume. There is a time and a place for sleeping in, but when it's a cover for chronic sleep loss it is problematic. The best way to gauge how sleeping in is affecting a person is by keeping a sleep log for a few weeks. If someone is tired during the day and feeling awake at night, the circadian rhythm is being disrupted—sleeping in is a likely suspect.

Plyometrics: The Why's, The Do's, The Don't's

Plyometrics can be beneficial for both athletes and general personal training clients. On the flip side, training plyometrics without caution can also be harmful. Let's review the definition of plyometrics, who it's appropriate for and how to apply plyometric exercises safely.

What are Plyometrics?

"Plyometrics can be thought of as exercises that train the fast muscle fibers and the nerves that activate them, as well as reflexes, and include a variety of hopping, jumping, and bounding movements" (William P. Ebben)

Plyometric exercises are designed to improve speed, power, and function of the nervous system. In the definition alone one can see these exercises are meant for everyone, not just athletes. All of your clients would benefit from improvement in their power, reflexes, and a higher functioning nervous system.

I believe that occasionally trainers underestimate their client's physical ability for fear of hurting the client and implicating themselves in the process. This is reasonable and all of us do it from time to time. But, Plyometrics can be such a great addition to your client's routine if applied appropriately.

I know I am currently preaching the universal accessibility of these exercises, but they do come with their own set of prerequisites. I would never suggest a trainer put their 90-year-old client on box jumps when they are still working to easily move out of chair. However, if you have been working with someone and know that they have foundational knowledge and fitness level, why wouldn't you be giving them this challenge?

Benefits of Plyometrics for non-athletes

1) Improves coordination
2) Improves nervous system functionality
3) Supports bone and joint health
4) Greater intensity in less time, more effective training sessions
5) Stimulates metabolism 24-48 hours after a workout, supporting weight loss
6) Plyos improve strength and efficiency of fast twitch fibers, meaning greater recruitment of the body's strongest fibers during resistance training
7) Plyometric training may enhance neuromuscular function and prevent knee injuries by increasing dynamic stability
8) Improves all over fitness and boosts confidence (Everyone feels like a boss after a really tough Plyo workout!)

Because you are working one on one, it is a perfect time to introduce Plyometrics. You will be able to give them proper alignment and execution cues, watch their form and know for sure that they are performing properly.

Are Plyometrics a Cardio Workout?

Quite simply, no, they are not strict cardiovascular exercises. This is a common misunderstanding from the general public and from some fitness professionals. It's understandably confusing considering jumping and bounding exercises significantly elevate heart rate. However, the energy pathways and purpose between cardio and plyo's are different.

Plyos work off of two energy pathways, the Creatine Phosphate system and the Lactic Acid system – both of these being anaerobic. Then you have cardiovascular training which works within the aerobic system.

The main purpose of cardio training is to strengthen the muscles involved with respiration and the heart, while the main purpose of plyos is to improve power and speed. There is also a difference in muscle fibers being trained. plyos work by improving strength and efficiency of Type II fibers, while cardio leans towards recruiting Type I endurance fibers.

Supplementing your client's cardio routine with plyos can be a good idea, but not completely replacing it. There are many health benefits found in true cardio workouts that cannot be attained through plyo workouts.

You don't have to leave plyos to the athletes, boost your clients next session with some of these previously mentioned methods.

Plyometrics Do's

- At least 1-2 days between plyo training sessions
- Work with non-fatigued muscles at the beginning of session
- 50-80 total reps for beginners, up to 150 total reps for more advanced clients
- Low reps, high intensity – no more than 10 reps per set
- Sufficient rest between sets, 2-3 minutes
- Prioritize quality not quantity

Plyometrics Don't's

- High-intensity plyo circuits like Tabatas. Plyometrics are meant to be done with maximal effort and force in the least amount of time. Performing Plyos in a circuit or interval format leans more towards general conditioning and increased risk of injury
- Working on uneven surfaces, especially for beginners
- Excessively long of sessions. For the general public keep a plyo training session under 30 minutes. Plyometric training is largely neurologic, a client shouldn't be left gasping for air.

Examples of Ply Exercises

-Squat Jumps
-Box Jumps
-Star Jumps
– Depth Jumps
– Single Leg Hops
– Hop Scotch Ladder
– Tuck Jumps
– Skater Hops
-Switch Jumps

Plyometrics Programming

Now I wouldn't suggest starting a client with an entire plyometrics session. It would be best to have the first 10-15 minutes focusing on 2-3 different Plyo exercises and then finishing the remaining time with resistance training. Resistance training is an incredible counterpart to plyo training. It will prepare the muscles for the rapid impact loading of the jumps and bounds.

Another great way to incorporate plyos into your client's session is with contrast sets, a superset of back-to-back exercises with different physiological goals. The one I am currently most fond of is the Back Squat to Squat Jump. Have your client perform 8-10 Back Squats at an 85-90% RM and then immediately perform 8-10 Squat Jumps.

This pairing will trick the body, and during the jumps, the muscle fibers will fire as if they are still supporting the resistance load. Another one is Bench Press to Plyo Pushups. You would be looking at a similar structure. 8-10 Bench Press reps in an 85-90% RM range followed by 8-10 Plyo Pushups.

Supplementing your client's cardio routine with plyos can be a good idea, but not completely replacing it. There are many health benefits found in true cardio workouts that cannot be attained through Plyometrics.

Of course, if someone has a pre-existing injury or other health condition that makes plyometrics inappropriate for them then that's a different story. Otherwise, you don't have to leave plyos to athletes only–everyone can benefit.

Hand Health Strength and Flexibility Tips

Hand health is certainly a topic that personal trainers need to have a firm grasp on (pun intended). Our carpal, metacarpal, and phalange bones, ligaments, tendons, and mini-muscles *can* make our hands function at work, exercise, and play. Our hands are true marvels of system complexity and function.

- Each human hand comprises 27 bones, 27 joints, 34 muscles, over 100 ligaments and tendons, plus many blood vessels and nerves.

It comes as little surprise that hand problems, disorders, and injuries can become real as client concerns or medical issues. Many CPTs have addressed this question, "Why does my hand hurt?" Or perhaps even, "Are my fingernails supposed to be this brittle?"

- Emergency Room/Department statistics show that hand "disorders" such as lacerations, blunt force trauma, and bone breakage account for at least 5% of all ED visits in the USA per year.
- Though statistically rare in our general population, repetitive stress conditions – like carpal tunnel syndrome (CTS) – can become chronic and activity-altering, particularly for adult, white women in certain professions. Covered health plan co-payments, and/or out-of-pocket expenses to mitigate CTS can be notable. If surgery is chosen for CTS treatment, the total cost is about $7,000.
- Half of adult Americans experience the wear and tear version of arthritis called osteoarthritis(OA), with a notable percentage that become chronic.

Hand and fingernail features may be manifests of unhealthy, yet treatable internal conditions. Granted, professional trainers are (usually) not medical diagnosticians, or physical therapists. Yet a CPT's awareness of common hand disorders and notice of visual cues for fingernails and joints can help clients pursue active and pain-free activities of daily life (ADL).

- First, this handy article mentions prudent awareness and safety matters for CPTs and their clients with regard to hand health.
- Second, a review of visual cues of cutaneous surfaces and joints is made for professional advice to clients about nutrition and general health.

- Third, repetitive stress injuries and Carpal Tunnel Syndrome (CTS) realities are cited, along with arthritis, and tendinitis.
- And fourth, useful strength and flexibility exercises for client's hands are cited before this article's summary with key takeaways.

Potential Hand Injuries and Safety

Though it may seem counterintuitive, elite and high-performance athletes suffer more injuries than do weekend warriors and recreational athletes. Complacency can be a factor around heavy weights and apparatus, perhaps like a close encounter at a bench press rack and barbell interface. But more than likely, the risk goes up as opportunity does—the more you work out, the more chances for an injury you create. Those who perform dynamic front squats for hypertrophy and strength naturally experience more strain on the forearms, wrists, and hands.

Is a client's forearm discomfort muscular inflammation or tendinitis? Is a wrist pain from overuse, a fall or hard landing sprained or fractured? Seemingly minor hand or wrist injuries *need to be taken seriously*. A hand, wrist, or thumb fracture could be a thin crack, a shattered digit, or a crushed bone.

The encouraging message for clients is that *proper* healing and alignment should allow ~~ADLs~~ (activities of daily life) to continue. If habilitation is ignored or delayed, the client's ability to perform everyday activities, such as typing, writing, or buttoning a shirt, is challenged. Early treatment will also help minimize pain and stiffness from arthritis, tendinitis, a cyst, sprain, or breaks.

Cutaneous Clues

Select cutaneous, or skin, observations are made for awareness, rather than to sound medical alarms. Not every nail discoloration is linked to internal problems. Not every dry patch on a hand is pre-cancerous. Itchy, flaking, and crusting patches of skin may be dermatitis caused by dehydration or a micronutrient deficiency as you will soon read.

Backs of one's hands are common areas for pre-cancerous abnormalities which may be colored red, tan, pink, brown or silvery. These pre-cancerous conditions are called actinic keratoses (AK), which may be up to an inch in diameter as flat, raised, crusty, or bumpy shapes. According to the Skin Cancer Association, about *1/6th* of all Americans have single or multiple AKs. The key point is that *some* AKs may evolve into squamous cell cancers (SCC). Early recognition and proactive treatment are encouraged.

Knuckles can reflect prior joint damage, or current osteoarthritis (OA) features of swelling and abnormal alignment.

Nailing It

You do not need to be a medical professional to observe certain nail changes that suggest internal health problems in the liver, lungs, or heart. Both fingernails (when unpolished) and toenails reveal clues about overall health or unhealthy conditions.

Colored, rough, or rippled/ridged/pitted fingernails

First, you have probably seen unattractive, yellow-discolored, and thick "old person" nails as symptoms of topical and/or internal fungal infection. These are notable symptoms, as non-prescription treatments may *not* work over time. Oral antifungal drugs, application of medicated nail polish or cream, or nail removal may be needed in tough cases.

- In *rare* cases, yellow nails can indicate a more serious condition such as severe thyroid disease, lung disease, diabetes or psoriasis.

Then, white nails, or leukonychia, are partially or completely white in color. That abnormal white color *could* be the result of trauma, anemia, dietary deficiencies, heart or kidney disease, or even poisoning.

Nails with a bluish tint *may* mean the body isn't getting enough oxygen. This could indicate a lung problem, such as emphysema. Some heart problems can be associated with bluish nails.

Dry, brittle nails that frequently crack or split have been linked to thyroid disease. Nail-cracking or splitting,when combined with that yellowish nail hue is more likely due to a fungal infection.

If a nail surface is rippled or pitted, this may be an early sign of psoriasis or arthritis. These common discolorations can be reddish-brown.

Puffy nail folds can result from exposure to irritants or allergens. They can also be caused by Candida fungus or other infections. Topical steroids may help dispatch the puffy folds, known as chronic paronychia.

Longitudinal dark streaks, also called *hyperpigmentation* or *melanonychia*, are caused by inflammatory skin diseases or possibly vitamin deficiencies. One important query is: *how adequate is a client's nutrition for vitamin and mineral micronutrients?*

Micronutrient deficiency?

The same micronutrients needed for bone health and good collagen are needed for the nail and cutaneous regions of your hands and feet. Brittle fingernails *may* suggest a dietary collagen deficiency. Vertical ridges on fingernails, as shown in this image, may suggest a similar deficiency of absorbed calcium (with related Vitamin D levels to also be evaluated by a medical professional.)

Note: If cutaneous signs of malnutrition appear, those deficiencies may have been growing for weeks (water-soluble vitamins) to months for fat-soluble vitamins and vitamin B12. A B12 deficiency may be suggested by brown-gray discoloration of the nails.

Discoloration may also be linked to a biotin (Vitamin B-7) deficiency. If a client's Vitamin C level is inadequate, red spots or vertical lines may appear in 1 or more fingernail beds, known as splinter hemorrhage. Iron deficiency may lead to vertically-split fingernails.

Nail appearances can relate to another factor than nutrition. Be aware of rough edges and short nails, perhaps bitten ones, that could suggest a client is in mental distress or experiencing anxiety.

Arthritis

The Greek word *arthron* means joint. In Middle English, the word arthritis evolved to represent joint inflammation. Pain results when cartilage (which is a part of the body that does not regenerate) thins and wears down. Though osteoarthritis (OA) is more common in older clients, young clients may prematurely experience OA from sports, work injuries, or misaligned joints. Arthritic hand conditions are often observed near the wrists, the basilar joint connecting the thumb to the wrist, fingertips, and finger knuckles.

Here is a cautionary catch-22 when working with arthritic clients… Overloading the wrist or hand joints may advance OA symptoms over time. Yet physical motion as lotion can prevent, and/or improve many arthritic conditions.

The Arthritis Foundation states, "In fact, exercise is considered the most effective, *non-drug* treatment for reducing pain and improving movement in patients with osteoarthritis."

Hand Cysts

Ganglion cysts are fluid-filled lumps that may occur near joints. These lumps are more common among athletes, like gymnasts, between 15–40 years of age. For some reason, women may experience them more than men. Some of these cysts, which could be pea-sized or as big as a golf ball, may endure for a few months. The exact causes of ganglion cyst formation are unknown. But if they are not painful and do not interfere with activity, medical intervention may be avoided as many disappear on their own.

Pops or Cracks?

With multiple "belt and pulley" demands, wrist sprains and bone fractures are notable trauma injuries. One NIH report from 2017 macro-data stated that hand and wrist fractures occur in about 2 per 1,000 individuals annually. That is about 700,000 hand or wrist fractures in the USA each year.

The Hand and Wrist Institute advises that sprains and fractures may be hard to differentiate for sufferers and first responders.

"Swelling in the wrist, bruising, pain when moving, and weakness are all present in both injuries…both fractures and sprains are associated with sharp pain during movement and dull pain when stable…of the eight small (carpal) in each wrist – the most commonly fractured is the *scaphoid*, which rarely causes any noticeable wrist crookedness. To this end, these fractures are often misdiagnosed as wrist sprains…Only a medical provider can make a definitive diagnosis and set the proper treatment path."

This Institute does advise of these probable differences between ligament strains/sprains and bone breaks:

- Though painful, a strained or sprained extremity can maintain its normal range of motion
- Wrist sprains are signaled by a "popping" noise.
- Fractures are often accompanied by a crack, and movement after the injury may make a small grinding or crunching sound.

Persistence or pain, ROM limits, or swelling for about 2 days means that it is time to visit an MD.

Motion Can be Lotion

This platitude is an underlying truth for the many subsystems in the human hands and wrists. Further, grip strength is now considered to be "an indispensable biomarker." A 2019 paper in

the Clinical Interventions in Aging states, "…patients with weak grip strength more likely to be admitted to the hospital, they are more likely to experience complications while there. "

COVID patients who had strong grip strength were far less likely to go to the ICU or to die. Yes, a stronger grip means a lower risk of cardiovascular disease!

Strength and stretching/flexibility exercises for hands and wrists abound. CPTs should assuredly include tailored hand, wrist, and forearm exercises in their clients' workout periodizations. Hand, wrist, and forearm exercises are so important that clients can and should perform them daily.

What is a strong grip? Age- and gender-dependent measures should be factored into CPT assessments at regular intervals:

Dynamometer makers provide weak, normal, and strong values of grip strength for age-bracketed women and men:

- A middle-aged woman (40 y/o) should pinch the dynamometer to a maximum impulse of 33 kilograms to have a strong grip.
- A middle-aged man (40 y/o) should pinch the dynamometer to a maximum impulse of 55 kilograms to have a strong grip.

A wrist stretch in the sagittal body plane, as pictured here, is a quick dynamic warmup for activities like weightlifting, rowing, tennis, and golf that place demands on those many muscles, bones, tendons, and ligaments of the hands and wrists. Stretching the hand and wrist in all three body planes is encouraged.

Getting a Grip

This image shows four affordable tools that help clients and CPTS maintain their grip and hand strength. The hand-held dynamometer is an invaluable tool for measuring hand and grip

strength. Clients appreciate the firm and strong handshake of CPTs, when contact is permissible!

The circular rubber device with finger holes and a central ball is wonderful for both the flexion and extension of fingers which contribute to grip strength. Again, the muscle rotations with this tool should be done in up and down, side-to-side, and twisting planes of motion.

The smaller “pinch grip” strength device at lower right of the image is portable for gym, home, and travel usage. Likewise, the small, five-circle rubber device at the lower left is a simple extensor for finger motion as lotion. Rest assured that these simple devices *do* matter!

Bodyweight Exercises

When clients are assessed as ready for “built-in” hand and forearm challenges, fingertip push-ups, pull-ups or chin-ups holding a towel, and progressive work with heavier weights contribute to general hand, wrist, and forearm capacity and strength. A client is only as functionally strong as her or his weakest link. Strong hands and wrists can be valuable assets as links for many kinetic exercises and ADLs.

Opening a jar, lifting a heavy suitcase, climbing a rock wall and enduring hangs from a pullup bar are just some activities for which superior grip means superior results.

Summary for Healthy Hands

Frequent hand/wrist pain should not be ignored. Even occasional pain can be a symptom of a serious cause. Be on alert if a client has:

- a current or recent injury
- has done excessively repetitive tasks
- used poor hand positions for common tasks
- tendinitis in the wrist, hands or fingers may have evolved

Ignoring the inflamed symptom may make it worse. A client could lose the ability to perform everyday tasks.

Though nail changes accompany many conditions, these changes are *rarely* a first sign. And many nail abnormalities are harmless — not everyone with white nails has hepatitis. When a question arises, encourage a client to see a doctor or a dermatologist.

A client's top way to avoid OA, and/or to live with OA is to ensure proper nutrition for strong bones; pursue relatively slow, gentle movements; and optimize low-impact exercises.

With strong tiny hand and forearm muscles, plus supple and lengthened connective tissues, a client can safely perform demanding tasks and exercises. Getting a grip on a pullup bar, heavy barbell, or hand-held dynamometer is a very strong and flexible effort for general fitness.

Training Menopausal Women with Expertise: A Guide for Certified Personal Trainers

As personal trainers, we encounter a wide range of clients, each presenting unique challenges and opportunities, including menopausal women. This is a particularly important demographic that deserves serious attention and understanding. The transformative period of peri-menopause and menopause in a woman's life is characterized by significant physiological changes that can impact not only their health but also their fitness goals and training. Here we discuss the specific needs of menopausal women within the context of personal training.

What are Peri-Menopause and Menopause?

The first thing to understand is the science of menopause. Menopause marks the end of a woman's menstrual cycle and is typically diagnosed after a woman has gone 12 months without a menstrual period. Peri-menopause is the transitional period leading up to menopause, usually occurring several years, sometimes a decade, beforehand. Hormonal changes during this period can cause various physical and emotional symptoms, such as hot flashes, night sweats, mood swings, and weight gain.

A significant shift in hormonal balance, primarily a decrease in estrogen, affects muscle mass, bone density, metabolism, and cardiovascular health. This underscores the critical role of a tailored fitness regimen in managing these changes effectively and enhancing a woman's quality of life.

Strength Training Menopausal Women

Strength training is paramount for everyone, but especially women in this demographic. With the decline in estrogen levels, women become more susceptible to osteoporosis. Weight-bearing and resistance exercises can help increase bone density, mitigate muscle loss, and

boost metabolism. These exercises should focus on major muscle groups and incorporate functional movements to help with everyday activities.

Cardiovascular Fitness

The risk of cardiovascular disease also increases after menopause. Regular cardiovascular exercise is a must, but the type and intensity may need to be adjusted. High-intensity interval training (HIIT) can be an efficient method to improve cardiovascular health and manage weight, but be mindful of the client's current fitness level and potential joint issues. Lower-impact cardio activities, such as swimming, cycling, or brisk walking, may be more suitable for some women. Just don't feed into a client's misconception that vigorous daily cardio without weight training is the way to curtail her weight; it should not be the star of the show.

Flexibility and Balance

Joint stiffness and decreased flexibility can be common issues during peri-menopause and menopause. Integrating flexibility and balance exercises into the training program can alleviate these issues and prevent injuries. Yoga and Pilates are excellent choices that promote flexibility, core strength, and balance.

Mental Health

Never underestimate the power of exercise in supporting mental health. Many women experience increased stress, anxiety, and depressive symptoms during this period. Regular physical activity can help improve mood and sleep, reducing these symptoms. Offering sessions that integrate mindfulness, like yoga or tai chi, can provide an added layer of mental health support.

Nutrition

While not all personal trainers are nutritionists or are permitted to create meal plans, having a basic understanding of nutritional needs during this period is more than beneficial. Weight gain is common during menopause due to slowed metabolism and changes in body composition. A diet high in lean protein, fruits, vegetables, and whole grains, along with regular exercise, can help manage weight and promote overall health.

Individual Approach to Training Menopausal Women

Remember, menopause affects every woman differently. Stay flexible in your approach, continuously monitor your client's comfort and progress, and adjust the training program accordingly. Always encourage open communication. Let your clients know that what they're experiencing is normal and that they're not alone.

Understanding the unique needs and challenges of peri-menopausal and menopausal women allows us, as personal trainers, to provide supportive and effective training regimes.

By tailoring workouts to manage the physical changes and challenges that arise during this phase, we can ensure our clients stay active, healthy, and strong, and continue to enjoy an excellent quality of life.

Training peri-menopausal and menopausal women may require a shift in focus, but the core of our profession remains the same: promoting fitness and well-being for every stage of life.

Hormesis: The Phenomenon that Promises Personal Training Success 100% of the Time

Personal trainers are much more than just rep-counters. We are tasked with helping motivate people to become healthier and to adopt lifestyles that improve their quality of life. It would be foolish to leave psychological and behavioral variables out of this endeavor. Hormesis is one of those variables that most trainers may never have heard of, but the influence of which affects our clients 100% of the time. Let's break it down.

What is Hormesis?

Hormesis means obtaining the beneficial effects of mild stress on the human body over time. The technical definition is that hormesis is a dose-response phenomenon. It's characterized by *low-dose stimulation* and *high-dose inhibition*.

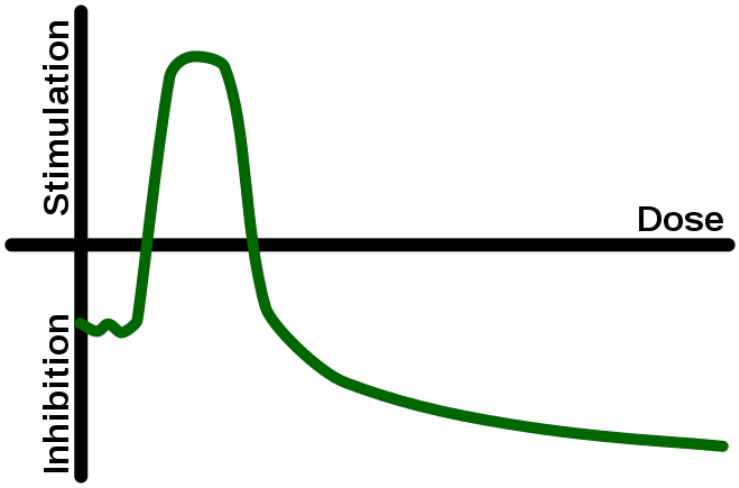
Hormesis can positively impact aging and longevity and athletic performance if leveraged properly. It has been recognized as representing overcompensation for mild environmental stress.

How can Personal Trainers Leverage Hormesis?

Personal trainers can leverage hormesis directly with client exercise programming. Utilizing the concept of hormesis can put an athlete in the *hormetic* zone, whereby the biological response to low exposure to environmental stress (in this case, training) is generally favorable to the human body. This means, subjecting your clients to too much too soon is likely to have the opposite effect on not only their exercise success but also on their desire to continue.

What are Examples of Hormesis?

The concept of hormesis can be leveraged in *ischemic preconditioning* (IPC). This allows an



adaptive response of cells and organisms to moderate intermittent (rather than constant, unyielding) stress. Ischemic preconditioning is an experimental technique for producing resistance to the ischemia, or the loss of blood supply, and thereby oxygen, to a variety of tissues in the human body. For example, IPC in the heart is where repeated short episodes of ischemia protect the myocardium against a future ischaemic insult. In other words, research shows that, generally speaking, an aged adult with a history of heart attacks is more likely to survive a heart attack than a younger, healthy adult. Surprising, right?

This is because, over time, the aged adult with a history of heart attacks' heart has adapted several pathways to allow blood flow to compensate for a blocked artery. On the other hand, a healthy adult heart hasn't. So, when a healthy adult heart experiences a heart attack for the first time, it's a huge shock and the heart has to create the compensation for the first time.

Hormesis and Exercise

In exercise, as personal trainers we know that exercise selection and prescription are very important to help our clients get the results they're looking for without injuring them. Too much weight is no good. Too many repetitions without having proper muscular endurance is no good. We have to build clients up. We all know we can't just put them on a treadmill at a 9-10 speed with a 5 incline the first week they come to work with us. But, if we tax the body *slightly*

more than last time every time, the body will rebuild and return back stronger (unless there's some sort of underlying medical condition).

Another way this is described is through Arndt Shulz Law (used primarily in the field of Medicine). This law states that a minimal dose of a drug stimulates, a medium dose inhibits, and a large dose destroys cellular activity. For example, if too high of a dose of medication is given it can harm the person. If it's too little, it will not have the therapeutic effect we want.

As health and fitness coaches, want to prevent injuring our clients or exasperating existing ones. But, we do need to challenge our clients and push them outside of their comfort zone, so there will always be some level of risk. If we do our initial assessment and documentation correctly, our clients will be aware of this risk.

Hormesis and Nutrition

Fasting can be very beneficial in a certain amount for certain people. For example, if an athlete is doing proper intermittent fasting, the body will go into repair mode, diverting resources from digestion to cellular repair. This process makes the body stronger and decreases oxidative stress. But if an athlete fasts for *too* long, the human body starts taking up muscle and organ tissue to fuel metabolic function. This has deleterious effects such as atrophy, catabolism, pulling minerals from bones, confused thinking, poor executive functioning, etc.

In contrast, eating too much of anything, even if it's perceived as "healthy" can be toxic as well. For example, if an athlete is sensitive to oxalates and consumes too many almonds or spinach (which are rich in oxalates) it can result in arthritis and other unexpected pain conditions. If the athlete already has arthritis or pain, a high-oxalate diet can make it flare up.

The goal with hormesis is to find the optimal training zone for a client with regard to diet and exercise. While we are not registered dieticians or nutritionists, we can coach and educate our clients on nutrition and eating a balanced diet while also guiding their exercise programming.

Eating To Reduce Hypertension: Plant-Based, DASH, or Very Low Carb Meal Plans?

Adults living with high blood pressure (a reading higher than 140/90 mm Hg) often present with a host of comorbidities, most often pre-diabetes/type 2 diabetes, high levels of LDL cholesterol, and obesity. Such conditions render these individuals more vulnerable to such serious health complications as stroke, kidney disease, and cardiac issues. Sadly, this dynamic affects as much as 40-50% of the population in the United States. Eating specific diets to reduce hypertension is often the first recommendation offered by medical providers.

Personal trainers with a background in nutrition/health coaching often help steer clients towards healthier meal plans to support their workouts, especially in light of the prevalence of the aforementioned medical conditions. Studies currently underway point to three very viable options, which we shall discuss in this article: plant-based diets, very low carbohydrate diets, and the trusty *DASH* Diet recommended to reduce hypertension.

Limiting Salt via DASH

The *DASH* diet (Dietary Approaches to Stop Hypertension) emerged as a healthy meal plan specially formatted by the American Heart Association to prevent or reduce hypertension. High blood pressure and high LDL cholesterol levels represent two of the most serious risk factors for heart disease and stroke.

This meal plan encourages eating foods rich in potassium, calcium, and magnesium, while limiting foods containing high amounts of sodium and sugar, such as vegetables, fruits, whole grains, fish, poultry, beans, and nuts.

While curbing salt consumption to 2,300 mg/day (the amount found in a mere teaspoon of table salt), the *DASH* diet also limits fatty meats and full-fat dairy products*, with the intention of reducing serum cholesterol levels.

The American Heart Association's reasoning for allowing the consumption of meat and dairy when adopting the DASH diet is *palatability*. They felt that the general public would not be willing to accept a vegetarian diet without specifically allowing for some meat and dairy consumption. Including these food groups will also supply additional calcium and protein. No distinction is made between organic and non-organic, grain-fed or grass-fed origins but research indicates there may be a significant difference on health outcomes.

**It's worth noting that dairy products are often not easily digested and are the leading source of saturated fat in the diet. Late in childhood or early adulthood, most people lose the enzymes (lactase) that digest the lactose sugar in milk and other dairy products. This is why we have the term lactose-intolerant. It is not a disease but a human condition.*

Understanding "Plant-Based" Diets

Studies dating back to the 1920's report a correlation between the rise in blood pressure and an increase in the consumption of meat and dairy. We often use the term "plant-based" to indiscriminately describe a healthy lifestyle centralizing vegetable consumption, yet not making them the exclusive source of energy, as in vegan and vegetarian diets.

A plant-based diet refers to *decreasing* the consumption of meat/fully-fat dairy while *increasing* the consumption of fruits, vegetables, whole grains, and legumes. Any movement on the scale of plant-based eating will increase health by lowering the risks of heart disease via decreasing hypertension/high blood pressure and high cholesterol.

Dan Buettner, an explorer, National Geographic Fellow, award-winning journalist and New York Times bestselling author, discovered the five places in the world – dubbed blue zones – where people live the longest, healthiest lives. He found that these populations accomplished long-term vitality by avoiding junk food and consuming more fruits, vegetables, and whole grains.

Buettner identified the following regions:

1. Okinawa, Japan
2. Sardinia, Italy
3. Nicoya, Costa Rica
4. Ikaria, Greece
5. Loma Linda, California

A study published in the *Journal of the American Heart Association* compared four dietary patterns among middle-aged adults and tracked mortality rates. Results indicated that healthful, plant-based diets (those high in nutrient-dense plant foods and low in refined carbs and animal foods) tracked consistently with a decreased risk of cardiovascular disease.

In another study of 89,000 people managing hypertension, *those who ate a meat-free diet were able to reduce hypertension by 55%* but those who ate a *meat-free, dairy-free, egg-free diet lowered their blood pressure by 75%.*

Very Low-Carbohydrate Consumption to Reduce Hypertension

The value of plant-based diets in reducing hypertension is only valid when compared to other approaches. Is it the best approach for controlling hypertension?

A new study, the results of which appeared in *Annals of Family Medicine*, compared a very low-carbohydrate diet to the *DASH* diet for adults with hypertension, type 2 diabetes, and/or obesity. While both interventions led to improvements in HbA1c (a marker for diabetes), systolic blood pressure, and body weight, the subjects on the low-carb group showed substantially greater improvements.

The study involved 94 adults. Those assigned to a very low-carb diet (VLC) attempted to keep intake below 50 grams of non-fiber carbs per day. The *DASH* diet participants limited sodium

intake to less than 2,300 mg/day, and fat intake to no more than 30% of daily calories. Of course, both groups could consume ample amounts of fruits, lean meats/low-fat dairy, vegetables, and whole grains.

Over a 4-month period, the VLC diet resulted in greater improvements not only in systolic blood pressure, but also glycemic control and weight, than the *DASH* diet. Reducing refined carbohydrates may be a good recommendation to reduce hypertension.

What about Paleo?

The Paleo diet, a popular diet based on the types of foods presumed to have been consumed by early humans. It mainly consists of meat, fish, vegetables, and fruit. It excludes dairy, grain, and processed foods. This is not a diet generally recommended for someone managing hypertension/high blood pressure.

A study published in the *European Journal of Clinical Nutrition* indicated that the Paleo diet increased TMAO (Trimethylamine N-oxide: small colorless amine oxide generated by choline, betaine, and carnitine by gut microbial metabolism) levels which are associated with heart disease. The paleo subjects had an increase in cholesterol, fat, and saturated fats which increased the amount of gut bacteria species linked to heart disease and inflammation.

This study on the Paleo diet does include vegetables and fruits. However, if the subjects were consuming higher quantities of fruits and vegetables it would likely balance out the gut bacteria. A more plant-based Paleo diet approach may actually reduce the increased heart disease risk observed in this study.

A meta-analysis looked at the effects of a paleo diet on heart disease risk. It determined that many risk factors were indeed reduced such as body weight, waist circumference, body fat %, total and LDL cholesterol, tryglycerides, even C-reactive protein (a marker of inflammation), and an increase in HDL.

However, the authors qualify these findings by stating that a "sensitivity analysis revealed that the overall effects of a PD on lipid profile, systolic blood pressure, and circulating CRP concentrations were sensitive to removing some studies and to the correlation coefficients, hence the results must be interpreted with caution."

Better studies are needed to draw more definitive conclusions on whether a paleo diet is effective to reduce hypertension.

Medication versus Lifestyle to Reduce Hypertension

An INTERHEART study showed that diet, exercise, and smoking accounted for more than 90% of the proportion of the risk of having a heart attack. Men who made healthy lifestyle changes over time reduced their risk of a heart attack by 90% while women who made healthy lifestyle changes over time reduced their risk of heart attack by 92%.

Interestingly, solely relying upon medication to manage or reduce hypertension/ heart disease only reduced the risk by 20%-30%. But there is synergy when lifestyle changes are coupled with medication. Harvard Health Professionals' follow-up study reported that individuals on medication and making healthy lifestyle adjustments further decreased their risk of suffering a heart attack by 78%.

Fitness and Nutrition Coaches

The ideal health and wellness of an individual will vary from person to person. Although people may struggle with similar circumstances, they may differ in how they choose to manage those circumstances. Whether utilizing the *DASH* diet, designing an easily-sustainable plant-based diet based, or restricting carbohydrate consumption (or some combination thereof), it is clear that what we eat has a tremendous impact on health and the ability to reduce hypertension.

We rely on food for comfort and routine, for communing and celebrating. When a client requires a complete meal plan overhaul following a medical diagnosis. it may feel like their whole world suddenly turned upside down. Knowing such a journey can prove daunting at best, we can best help clients by introducing them to the multitude of tasty food options available within the confines of their chosen diet approach and ease them into the process of change one successful step at a time.

Personal trainers can shift a client's mindset from one of food deprivation and fear to one of abundance. Over time, the results will speak for themselves.

How to Check a Personal Training Client's Pulse During Exercise

A personal trainer has many variables to assess, manage, and modify during even a single personal training session. The three most ubiquitous variables with regard to exercise are frequency, duration, and intensity. The first two are well, pretty straightforward. But what is the best way to gauge intensity, especially when we have to differentiate between aerobic and anaerobic efforts? Taking a client's pulse is a basic skill that a trainer should know for gauging intensity.

Some people prefer to judge intensity by signs such as how hard they breathe (by means of a talk test), or noticing how much they perspire. Unfortunately, neither method is the best means of gauging true aerobic intensity levels. A more accurate way to determine the intensity of aerobic exercise is to measure the pulse. This is because a person's pulse is a reflection of how hard his or her heart is working. The heart rate, in turn, determines oxygen uptake level: The higher the level, the greater the oxygen uptake.

There are two main ways in which someone can take his or her own pulse: using the fingers placed over a pulse point and counting, or using an electronic device to do most of the work.

The 'Hands-on' (Manual) Method of Taking a Pulse

Using the manual method employs a combination of tactile sensation and some basic math to arrive at an approximate measurement of the pulse: Once your fingers find a pulse, count the number of beats you feel within the span of a single minute. It's possible to estimate the per-minute rate by counting for 10 seconds and multiplying this figure by 6, (or by counting over 15 seconds and multiplying by 4, or over 30 seconds and doubling the result).

A pulse can be noticed anywhere an artery is near the surface of the body, but the two points most commonly used to take the pulse are on the neck and on the wrist.

- Carotid Pulse (neck) – To take the heart rate at the neck, place your index and middle fingers on either side of the neck (being careful not to press too hard) at about the same level as the Adam's apple, and then count the number of beats for a minute. Putting too much pressure on the carotid artery slows the heart rate almost instantly, resulting in an inaccurate measurement.
- Radial Pulse (wrist) – This method uses the radial artery at the base of the wrist. Place your index and middle fingers together on the other wrist, about 1/2 inch on the inside of the joint in line with the index finger. Use your index and middle fingers (not the thumb—it is supplied with its own artery), and then count the number of beats in your chosen timeframe.

Ultimately, both methods involve the use of technology – a watch or clock needs tp be used for an objective and accurate measure of time.

Pulse Taking Limitations

These manual techniques of taking the pulse, while quite handy (no pun intended), do have some inherent limitations. A primary issue is that in order to obtain an accurate measurement, it is necessary to stop exercising. Practice helps, but until one becomes proficient at obtaining a quick measurement, it is to be expected that the pulse will start to drop quickly. This factor alone will often produce an inaccurate measurement.

To complicate matters, in the case of the palpation of the carotid artery, the sudden slowing of heart rate can lead to dizziness, fainting, or in some cases, irregularities in heart rhythm.

For obvious reasons, electronic heart rate monitors have been designed to get around these issues and as a result, if used and worn correctly, they can yield much more accurate results.

The Body Electric: Electronic Heart Rate Monitoring

An electronic heart rate monitor uses a different means of measuring heart rate, mimicking the function of an electrocardiogram. A typical set-up consists of a strap worn on the chest, and a wristwatch such as many models made by ~~Polar~~. The strap has two small electrodes that detect the equivalent of the "R" wave on an electrocardiogram (ECG). This R-wave represents the contraction of the heart, or "systole" phase, and the measurement isn't affected by body movement.

This measurement is transmitted to the wristwatch, which displays the information on its face. Some monitors are capable of recording heart rate changes over short time periods, and can record changes in heart rate to allow for later review or storage on an external computer. The data can be used to calculate calories burned, time elapsed in a target zone, and maximum oxygen intake, among other related measurements.

But portable electronic heart rate monitors are not without their own set of issues, either.

If the chest strap isn't worn properly, it can cause inaccurate or no readings. In addition, many heart rate monitors require at least some perspiration to be present between the chest strap and the skin for best conductivity. A quick solution is to apply a small amount of lotion, water, or conductive gel until the amount of perspiration is sufficient to create good contact.

Final Thoughts

Taking a pulse efficiently and accurately can take practice and patience. Practice on yourself or a friend or family member at rest and while exercising if you do not feel confident doing so on a client right away. Also, no harm in being forthright with your clients: “I’m new to the pulse-taking technique so bear with me.”

Of course, most of our clients today are adorned with their own heart rate monitors in watch or Fitbit form, and may possibly save you the trouble. However, bear in mind these are not always accurate and reliable, so it may still behoove you to get a manual reading and compare it to the watch or heart rate monitor data.

How Generative AI Can Help Personal Trainers: The Pros and Cons of Artificial Intelligence

Personal training can be a challenging profession, requiring an individual to meet the needs of numerous clients, work early and/or long hours, and oversee business operations; so, if generative AI (artificial intelligence) could help you run your business – would you be interested?

What is Generative Artificial Intelligence (AI)?

Generative AI is a rapidly advancing set of technologies that can assist individuals with a variety of tasks. These tools are able to receive inputs from users and respond by answering questions, offering explanations, crafting text, making suggestions, and engaging in conversations, while some can even create visuals!

How do these machines perform such functions? Significant improvements in computing power and creative AI design over the past few decades have allowed for the development of one type of generative AI called a large language model (LLM).

An LLM processes vast amounts of data in order to effectively predict an appropriate series of words for a particular situation. By utilizing statistics, pattern recognition, and both self- and semi-supervised learning to analyze immense quantities of texts, LLM-based AIs can become impressively useful at undertaking certain tasks.[1]

For instance, LLM-based AIs are able to vastly improve the quality of speech recognition tools by recognizing and actively correcting inaccurately recorded words.

One such tool that has gained prominence in the public sphere is ChatGPT, where GPT stands for “Generative Pre-trained transformer”. Developed by the company, OpenAI, ChatGPT version 3.5 is currently available to the public with only the creation of a user account required. Let’s

examine several ways in which a generative AI, such as ChatGPT-3.5, can currently assist personal trainers in facets of their work.

How AI Can Help a Personal Trainer

Although much of the work that personal trainers do involves the hands-on facilitation of activities, there are elements within the vocation where ideas and concepts need to be developed and communicated. Three specific use cases will be evaluated here, but numerous other potential topics of interest certainly exist.

Case Study #1: Workout for Beginning Weightlifter

Whether you are just starting out or have been training clients for decades, crafting a customized workout plan from nothing can take a chunk of time. There are hundreds of beneficial exercises to draw on, millions of ways to organize and group those movements, and dozens of other factors to consider. Quickly composing a specific and effective plan when infinite possibilities exist may be daunting.

This situation provides the first-use case for generative AI – as detailed in Case Study #1 – outlining a workout plan. ChatGPT-3.5 was given the prompt, “Write a workout for a beginning weight lifter. Group exercises into three sets of three activities featuring one lower body movement, one upper body movement, and one core activity”. (Full responses to all case studies are provided at the end of the article.)

Over just a few seconds the generative AI does an excellent job of following the specifications provided and suggesting accurately classified exercises. The additional commentary provided may also be useful, as it could provide technical reminders that trainers could use with their clients.

Where the generative AI falls short is its arbitrary repetition counts, as well as any lack of applicable weight values. Clearly, generative AI is not ready to fully replace personal trainers just yet! Adding further specifications and/or restrictions to the original prompt can help refine the AI's response to be even more applicable.

In summary, generative AI rapidly builds a workout outline for the trainer to build upon with their expertise, experience, and personal relationship with the client.

Case Study #2

Hands-on facilitation of training is not the only activity involved in running a business. Personal trainers who want to be financially successful will need to build out a clientele. Making individuals feel welcome is a great way to establish rapport and begin cultivating a positive relationship. Hence, ChatGPT-3.5 was given the prompt, "Write a brief email welcoming a new client to a personal training business".

The generative AI rapidly returns a kind and supportive, albeit generic, email. While there will certainly be personalization and editing needed, working with a pre-written draft almost assuredly saves the user valuable time.

Another upside is that the AI generally excels at using proper grammar and preventing unfortunate typos that could negatively influence clients' opinions of you. In fact, AI can be used as a highly proficient proofreading tool for human-composed text. Considering that the prompt in this case was not overly specific, including additional message criteria may yield a superior product.

(Note: AI software such as Grammarly can also be installed to double-check grammar, spelling, and usage for all of your written work)

Case Study #3

The final case study plunges fully into the operational side of training, using generative AI to compose a legal document. Liability and litigation protection are critical pieces for the success of a business establishment, as accidents can and do happen. As such, ChatGPT-3.5 was given the prompt, “Construct an informed consent waiver document for an individual to participate in a personal training program”. The AI response addresses many areas of liability, providing the trainer with an operative first draft. While all legal documents should be carefully reviewed by an expert, being able to rapidly produce an outline to build on is invaluable in terms of time and effort.

Key Considerations When Utilizing Generative AI

Generative AI tools are NOT:[2]

- Infallible. All produced responses should be carefully reviewed and checked against sources of truth and one’s own knowledge for accuracy, relevance, and applicability.
- Magic. Replies may vary widely in usefulness when utilizing generative AI in relation to the strength and specificity of the prompt, among other elements.
- Impartial. As the generative AI tool produces outputs based only on the data and information stored in its system, it is entirely possible that biases will exist if they are present in the machine’s environment.
- Research. These machines do not collect, analyze, and interpret data in order to construct new knowledge. Rather, content is returned based on existing material. As any given output is not original, nor fully unique, the use of generative AI should be noted/cited in appropriate settings.
- Human. A skilled, well-educated, and experienced trainer will be far more capable of interacting with clients, understanding their precise needs, and helping them reach their goals than the use of generative AI alone ever could.

Gym Etiquette 101: What Personal Trainers Should Teach Their Clients.

Gym etiquette plays an important role in any gym, and personal trainers have an obligation to relay certain concepts to our newest clients. Adhering to an etiquette is what makes someone "fit in" or, at least, look or feel like they know what they're doing and understand how to respect others in the same forum.

Whether we train our clients in a gym, in their home, or even outdoors, we can help them understand and grasp the etiquette for the times they may exercise in a gym or some type of communal exercise setting. Even if they aren't a member of a gym while you're working with them, chances are they will eventually find themselves in a situation where such etiquette will come in handy. If they're comfortable knowing what to do and what not to do, they're more apt to continue working out in the gym.

While most rules of gym etiquette are pretty basic, they aren't always obvious to many gym-goers, especially newbies. Some of the rules are written and displayed in gyms (like no spitting, no cameras, etc.), while some are unwritten rules, we all just need to know. I surveyed people across the country and a few overseas to find out the top 15 complaints at a gym. I call them #gymfails. Most likely you have seen some of these complaints in action or may have even committed one or two of these gym transgressions:

1. Not wiping down equipment (this was the biggest complaint by a landslide)
2. Lifting and caveman-type grunting
3. Not re-racking weights
4. Talking on the phone while using equipment
5. Watching other people exercise
6. Leaving wet towels in the locker room/sauna
7. Walking into classes late
8. People talking to you while exercising

9. Provocative dressing
10. Hogging equipment
11. Cocky strutting
12. People who stink
13. Those trying to find a “hook-up”
14. Germs brought into the gym
15. Slamming weights down to get noticed

Let’s break down the most basic and preventable complaints and advise our fitness clients accordingly.

Keeping Germs at Bay

Wipe down equipment before and after use. Most gyms provide sanitizing spray, disposable towels, and/or wipes. Use them to protect yourself before using equipment. Protect others by wiping them down after workouts. Even if you’re not ill, no one wants to come in contact with your sweat.

If you’re sick, stay home. Perhaps the most etiquette-y rule in gym etiquette. Get better before returning to the gym with spreadable germs that could infect others. There’s no reason to push the immune system either, so wait and heal at home. The gym can wait. Even if you’re not sick, avoid touching your eyes, nose, and mouth while in the gym. This will prevent you from infecting yourself with whatever is out there or spreading your own germs around.

Consider wearing exercise gloves. Gloves can help with gripping weights, kettlebells and bars. They help ward off calluses too. Plus, wearing a pair of gloves offers an extra layer of protection between your skin and the germs that might be floating around. The gloves also serve as a reminder to not touch your face.

Wash your hands. It’s good hygiene and a big defense in the war on germs.

Bring your own supplies when applicable or possible. This might include mats, straps, gloves, etc.

Keep sweat confined to the sweat-er. Perspiring is our body's built-in cooling mechanism and for many, breaking a sweat is an end-goal during exercise (though definitely not an indication of fitness or even a good workout!). It keeps our temperature in check working on an automatic internal thermostat. While we all have sweat glands and pores for releasing sweat, some people sweat more than others.

Whether it's a little or a lot, sweat shouldn't be passed on to others. Caution clients to be aware of any sweat that drips on equipment or on the floor; it needs to be wiped up. Also, to prevent sweat from slinging on others, it's helpful to keep long hair tied back in some way. Bring a towel from home to wipe up dripping sweat. "Super sweat-ers" might consider the old-school sweat wristbands and headbands to absorb sweat. They work!

Aside from keeping things sanitary for ourselves and others, there are some other ways to be considerate in the gym world.

Be Mindful of Others

Be mindful that you are not at home and should not be using your device as if you are. If you're going to take a phone call, engage in a texting conversation, or check the latest social media posts on your phone, don't use the bench or exercise machines as a seat. Take it outside and let others use the equipment for exercising. Or better yet, put your phone on airplane mode while in the gym to minimize distractions.

When taking selfies or recording your next PR, be considerate of others. Don't block their workouts or be loud and distracting for your own benefit.

Read body language (which in a gym setting may include simply wearing headphones!) before striking up a lengthy conversation, or any conversation. Many gym rats don't like to be interrupted during their workouts.

Maintain your space and distance between others. It's impolite and against gym etiquette to stand and stare at someone while waiting for a piece of equipment to become available. Go find something else to do until the machine/equipment is available. It goes without saying, never ever touch someone without permission (unless, of course, they are having a physical emergency)

Dress Appropriately

While your attire decisions don't always fall under gym etiquette rules wearing the right workout clothing really should have little to do with making a fashion statement and everything to do with purpose. Although looking good is important too, here are some things to consider with the functional part of clothing:

- Wicking fabric helps keep sweat off the skin and dries quickly.
- Baggy clothes can get caught on equipment. It's also hard to monitor or correct form if the clothes are too big.
- Jewelry can be easily broken and might get caught on equipment. Wear jewelry sparingly, if at all, including engagement rings. (Consider silicone wedding bands* if you want to convey your status)

Wearing anything other than workout shoes has the potential for injury. High heels (yes, I've seen it), boots, and dress shoes are not going to be safe for exercise. Many facilities have rules against going barefoot in the gym, so inquire before unshodding. There are benefits and risks to training barefoot in this setting; use extreme caution.

If in doubt, it is best to do your research and locate a gym that aligns with your particular training preferences. That way you can be confident that when you turn up, you are bringing the right clothing and accessories with you to adhere to on-site policies.

Re-rack Weights

Encourage clients to return equipment to where they got it. Re-rack weights and hang any mats used. Return the balance balls, kettlebells, med balls, bands…*all of it*. First, it's common courtesy but also helps keep the gym floor clear of items lying around where others might trip on them. Putting things back where they belong keeps the weights and equipment organized for others to use.

Curb the Noise

Dropping weights for attention is annoying. Sometimes, it's necessary and sometimes, it just happens. Discourage clients from doing it as a way to get noticed.

Grunt if you must, but not as a means to be heard. Sure, we have loud exhales, an occasional gasp, and a grunt at times. But showing off with explosive grunts will only single the grunter out as a grunter. No bragging rights with that, but perhaps plenty of eye-rolls.

Don't play music out loud. Headphones/earbuds are a must. We all have personal preferences and music tastes. Although some gyms play music, no one wants to have someone else's music blaring during their workouts.

Refresher Course

Exercise junkies who frequent gyms probably know most of the gym etiquette rules. But, it's easy to slip up and forget to wipe down equipment, return equipment, etc. Maybe a little refresher read is all that's needed.

Or, maybe a client knows nothing about how to act in a gym. Why is it important for our clients to follow gym etiquette?

Ultimately, our training teaches clients ways to exercise and how to be fit. We teach them proper form, how to vary workouts using different muscle groups, how to use cardio, strength training techniques, functional ways to work out, mobility, and stretching. The list goes on.

With our guidance, and in a perfect world, our clients adopt a healthy lifestyle to carry them through the rest of their lives. Having a gym to go to and a place to fit in can keep them on track when they aren't working with a trainer. Our efforts as trainers to show them how to get along in the gym rat world and applying proper gym etiquette might just be what sustains them for years ahead.

Alternative Lower Back Squat Exercises to Try: Give the Low Back a Break

Do you or your personal training clients love training heavy back squats for strength, but feel the need to give the low back a break? Do you know how to make exercise programming adjustments for the squat when navigating low back pain? Often making one or two adjustments to training can make a significant difference. In this article, we'll explore why these lower back squat exercises and variable modifications can help your client train the squat while giving their lower back some relief. Try the lower back squat exercises below to keep your client on track and reduce injury likelihood!

- Squat variations that position the load more in front of the body or onto the hips, such as goblet squats, landmine squats, safety bar squats, barbell front squats, and belt squats
- Single-leg squat variations that inherently lower the training load placed on the lower back, such as Bulgarian split squats and other split squat variations

When it comes to low back pain or getting back into training after a low back injury, altering the following two training variables can minimize discomfort.

- Move the position of the training load to forward positions to reduce low back muscle activation
- Reduce training load

Lower Back Squat Exercises that Reposition the Load

The first important variable to consider during leg day is the load position of the squat. Research suggests that as the load position moves further back (posterior), the lower back muscles (erector spinae) have to work harder, potentially contributing to pain.

Additionally, a more posterior load position can cause excessive arching of the lower back, leading to discomfort. It is important to note that it is not inherently *bad* for the lower back

muscles to work hard. However, there are specific situations where giving these muscles a break by incorporating more protective lower back exercises is an important temporary goal.

If you experience low back pain during posterior-loaded squat variations like the low bar or high bar back squat, it may be worth trying a different load position. Here are a few squat variations to consider:

- Belt squat
- Safety bar squat
- Front squat (barbell, landmine, dumbbell, or kettlebell)

The *belt squat* involves placing the load on the hips using a belt strap with the weight attached, allowing for a more upright torso and reducing the demand on the low back muscles (Layer et al, 2018). However, it's important to note that there may be *less* glute activation with this exercise, while the emphasis is shifted to the quads (Joseph et al, 2020). To compensate, you can incorporate additional glute-focused exercises into your routine, such as the hip thrust.

The *safety bar squat* and *front squat* are both known for promoting an upright torso and reducing the overall load lifted compared to back squat variations (Krzyszkowski and Kipp, 2020). This results in less lordosis, or arching of the back (anterior pelvic tilt), and less strain on the lower back muscles (erector spinae) compared to back squat variations (Park et al, 2022).

While the overall load lifted may be lower compared to back squats, studies have shown that these alternative lower back squat exercises provide comparable muscle activation (Gullet et al, 2009). This means you don't have to worry about losing out on gains while training these squat variations.

Reduce Training Load

Load is another important exercise variable to consider when the temporary goal is to give the lower back a break. As mentioned above, more forward-positioned loads on the body tend to

result in overall less load being able to lift. Another way to reduce the overall load through the lower back is to train single leg (unilateral) variations of the squat exercise (Eliassen et al, 2018).

Eliassen et al suggest using unilateral squat variations "rather than bilateral squats for people with low back pain" (2018). Here are some single-leg variations of the squat that reduce the overall load on the low back (Deforest et al, 2014):

- Bulgarian Split Squat or Rear Foot Elevated Split Squat
- Split Squat variations

The Bulgarian split squat has been shown in research to have clear differences in the kinetics and kinematics compared to the back squat which could be advantageous to reducing demands on the lower back (Mackey & Riemann, 2021), making it a great alternative lower back squat exercise. These findings include:

- Higher glute activation
- Higher ratio of hamstring to quadriceps activation
- Higher hip dominance
- Fewer knee forces
- More upright trunk (Deforest et al, 2014)

When Alternative Lower Back Exercises Squats Are Best

To summarize, if your client is dealing with low back pain or soreness, or prone to straining their lower back while squatting, consider incorporating more protective lower back squat exercises like front-loaded squats or unilateral squats into their training routine. These squat variations will help reduce the low back muscle demands and lower the overall load lifted. Furthermore, they will allow your personal training clients to continue reaping the benefits of squatting while giving their lower back muscles the opportunity to recover.

SELF-TEST

1. A shift in sleeping patterns will impact which of the following physiological functions?
    a. Digestion
    b. Heart Rate
    c. Liver Function
    d. All of these are impacted

2. If your client's sleep schedule has been out of their routine, then which hormone is most impacted?
    a. Dopamine
    b. Serotonin
    c. Melatonin
    d. All of these are equally impacted

3. Which of the following is the best way to encourage your client to gauge and review their sleep patterns?
    a. Recommend that they keep a sleep log for a few weeks
    b. Ask them to download a sleep app
    c. Prescribe them a sleep apnea machine
    d. Suggest that they do oxygen infusions before bed

4. Plyometrics can be thought of as _____.
    a. exercises that train the slow twitch muscle fibers to react faster
    b. exercises that train the fast muscle fibers and the nerves that activate them
    c. stretches that reactivate the muscle spindles to improve flexibility
    d. a way of coaching a team sport or activity that emphasizes endurance

5. Plyometric exercises are designed to:
    a. improve agility, flexibility and function of the cardiovascular system
    b. engage the slow twitch muscle fibers for improved reaction times
    c. improve speed, power, and function of the nervous system
    d. all of the above are outcomes of plyometric training

6. Plyometric Training stimulates:
    a. metabolism 24-48 hours after a workout, supporting weight loss
    b. flexibility and stretch capacity right before a workout
    c. slow twitch muscle fibers to fire faster and stronger
    d. appetite cessation for approximately 72 hours after a workout

7. Plyos work off of two energy pathways, they are:
    a. Cardiovascular system and Nervous system
    b. Aerobic energy and Creatine Phosphate
    c. Creatine Phosphate system and Lactic Acid system
    d. Lactic Acid system and Cardiovascular system

8. Plyos work by improving strength and efficiency of which fiber type?
    a. Type I
    b. Type II

9. Which of the following is a Plyometric 'Do':
    a. Perform plyos in a circuit or interval format
    b. Rest between sets between 15-30 seconds
    c. Low reps, high intensity – no more than 10 reps per set
    d. All of the above are Plyo 'Do's'

10. Each human hand comprises over 100 ligaments and tendons.
    a. True
    b. False

11. If a nail surface is rippled or pitted, this may be an early sign of:
    a. Liver disease
    b. Arthritis
    c. Poor oxygenation
    d. Clogging arteries

12. A wrist stretch in the transverse body plane is a quick static warmup for activities like weightlifting, rowing, tennis, and golf that place demands on those many muscles, bones, tendons, and ligaments of the hands and wrists.
    a. True
    b. False

13. Menopause is typically diagnosed after a woman has gone how long without a menstrual period?
    a. 3 months
    b. 12 months
    c. 2 years
    d. None of these as menopause does not necessarily mean that there is no longer a menstrual cycle

14. Peri-menopause is identified as which of the following:
    a. the transitional period leading up to menopause, usually occurring several years, sometimes a decade, beforehand.
    b. the period of time after menopause occurs whereby the symptoms and hormonal imbalances are now a normal condition of the state of menopause and the body is no longer experiences transitional symptoms
    c. the middle stages of menopause whereby the symptoms of are at their peak and causing distress to the body as it attempts to regulate and correct for hormonal imbalances
    d. None of these are accurate descriptions of menopause

15. With the decline in estrogen levels, women become more susceptible to:
    a. hot flashes
    b. osteoporosis
    c. night sweats
    d. all of these are symptoms of decreased estrogen levels

16. Hormesis means:
    a. Being in a balanced hormonal state
    b. Gathering of symptomatic stress in one area of the body
    c. Obtaining the beneficial effects of mild stress on the human body over time
    d. Studying of the stress effects of fight/fight responses on hormone balances

17. Hormesis is characterized as a:
    a. dose-response phenomenon
    b. low-dose stimulation
    c. high-dose inhibition
    d. All of these are characteristics of hormesis

18. Generally speaking, when considering hormesis, an aged adult with a history of heart attacks is more likely to survive a heart attack than a younger, healthy adult.
    a. True
    b. False

19. The 'Arndt Shulz Law' (used primarily in the field of Medicine), states which of the following?
    a. a no-dose philosophy should always be the way in which a physician approaches a patient, never the administration of drugs/medications is better than even the lowest dose.
    b. a minimal dose of a drug stimulates, a medium dose inhibits, and a large dose destroys cellular activity.
    c. a maximal does of the respective drug should be administered in order to prepare the body for the tapering effects of the medication.
    d. A dose of medication that is too low will actually cause more harm than a maximal does of medication because max dosing provides for the therapeutic effect we want.

20. Intermittent fasting can make the body stronger; however, if fasting occurs for too long then:
    a. the body starts taking up digestive tissue for fuel
    b. the body starts taking up muscle tissue for fuel
    c. the body's muscle mass will start to increase
    d. the body's digestive tract will start to atrophy

21. Which of the following is considered to be a high blood pressure reading?
    a. Lower than 120/80 mmHg
    b. Lower than 140/90 mmHg
    c. Higher than 140/90 mmHg
    d. Higher than 120/80 mmHg

22. The *DASH* diet acronym stands for:
    a. Developed Approaches to Stifel Hunger
    b. Developing Appetite for Safe Hunger Habits
    c. Dietary Allowances for Satiety and Homeostasis
    d. Dietary Approaches to Stop Hypertension

23. The American Heart Association to prevent or reduce hypertension. Which of the following are the two most serious risk factors for heart disease and stroke?
    a. High blood pressure and high LDL cholesterol levels
    b. Low blood pressure and high LDL cholesterol levels
    c. High blood pressure and high HDL cholesterol levels
    d. Low blood pressure and low HDL cholesterol levels

24. Geographic ‘Blue Zones’ are:
    a. Areas in the world where the temperature is coldest
    b. Areas of the world where the temperature is the most conducive to comfortable living
    c. Areas of the world where people live the longest, healthiest lives
    d. Areas of the world where people live the shortest, unhealthiest lives

25. Which of these is considered a geographic ‘Blue Zone’?
    a. Okinawa, Japan
    b. Loma Linda, California
    c. Both of these
    d. Neither of these

26. The Paleo diet can be summed up best by:
    a. diet based on carnivorous eating of only meats
    b. diet based on the needs of someone managing high blood pressure
    c. diet based on the types of foods that are only grown in a field
    d. diet based on the types of foods presumed to have been consumed by early humans

27. Which of the following is among the most valuable as it relates to exercise?
    a. Frequency
    b. Duration
    c. Intensity
    d. All of these, together, are as valuable to the outcome of exercise

28. What is a ‘talk test’?
    a. A way to judge the impact of someone’s words on exercise goals
    b. A method used to gauge the intensity of exercise
    c. A type of test for nonverbal communication
    d. A pass or fail test that looks at purpose driven communication

29. Using pulse rate is the most effective way to:
    a. Gauge the correct timing of an exercise
    b. Test for fabrications of the truth
    c. Assess for correctness of training frequency
    d. Determine the aerobic intensity of an exercise

30. The heart rate, in turn, determines oxygen uptake level: The higher the level, the greater the oxygen uptake.
    a. True
    b. False

31. An electronic heart rate monitor mimics the function of a/n/:
    a. Electromyography
    b. CT Scan
    c. Electrocardiogram
    d. Lipid Profile

32. Heart rate monitors require a completely dry surface between the skin and the chest strap; so it is important to remove sweat and/or lotion from the contact site prior to taking a reading
    a. True
    b. False

33. Significant improvements in computing power and creative AI design over the past few decades have allowed for the development of one type of generative AI called:
    a. AIL, Artificially Intelligent Language
    b. LLM, Large Language Model
    c. MLM, Minimal Language Model
    d. VLI, Vast Language Intelligence

34. A large language model AI:
    a. processes vast amounts of data in order to effectively predict an appropriate series of words for a particular situation.
    b. translates between all languages in order to communicate between geographically varying language in order to contextually comprehend meaning.
    c. uses contextual cues between languages to alter meanings based on phrases and/or synonymous content that may be distorted in translation.
    d. is a coding technique used by technicians to process situational language that may be used in an effort to disrupt or distort meanings of words or phrases.

35. How can generative AI assist a personal trainer:
    a. Create a training program based on trainer input of client goals
    b. Assist in the development of business email messaging
    c. Development of legal documents such as informed consent or liability documents
    d. All or none of these as Generative AI is a resource that can be used to assist in the above areas but cannot replace the trainer in any or all of these areas.

36. Which of the following are among the top 15 complaints by gym go-ers with regard to basic gym etiquette?
    a. Not re-wracking weights
    b. Excessive noise when grunting and slamming weights
    c. Watching others workout
    d. All of these made the top 15 complaints for most annoying

37. If in doubt about gym etiquette:
    a. do your research and locate a gym that aligns with your particular training preferences.
    b. do you. Who cares if you are being annoying to others, that's their problem.

38. Why is it important for our clients to follow gym etiquette?
    a. So that they can get the most out of the time they are in the gym
    b. So that there are no distractions from the ultimate goals of fitness
    c. So that they can be prepared for what other seasoned gym go-ers expect in terms of etiquette in a gym environment
    d. For all of these reasons, it is important that we discuss the do's and don't's of gym etiquette with our clients.

39. Which of the following squat variation loads more of the front of the body onto the hips?
    a. Goblet squat
    b. Bulgarian squat
    c. Split squat
    d. All of these

40. Which squat is known for promoting an upright torso and reducing the overall load?
    a. Safety bar squat
    b. Landmind squat
    c. Barbell squat
    d. All of these

41. Use unilateral squat variations rather than bilateral squats for people with low back pain.
    a. True
    b. False

42. If your client is dealing with lower back pain while squatting, consider more protective lower back squat exercises, like:
    a. Goblet and Bulgarian squats
    b. Unilateral and Front-loaded squats
    c. Front-loaded and Back-loaded squats
    d. Back-loaded and Unilateral squats

SIDE 1

○ RESCORE ○ MARK ✓ ○ TOTAL ONLY/BOTH SIDES

Trans-Optic® forms by NCS Pearson MM19641-2 654321

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KEY ITEM COUNT

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1 FEED THIS DIRECTION

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MARKING INSTRUCTIONS

Use a No. 2 Pencil

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Fill circle completely

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Erase cleanly

SCORE		# CORRECT
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RESCORE		# CORRECT
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ROSTER NUMBER		SCORE
		RESCORE

NAME _____

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PERIOD _____ DATE _____

TEST ANSWER SHEET B
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