# Physical adaptations

*By Louis Hayes*

**Adapt**—T*o adjust (someone or something, especially oneself) to different conditions, a new environment, etc. To fit, change, or modify to suit a new or different purpose. To make suitable to or fit for a specific use or situation. To undergo a change; become different in essence; losing one's or its original nature.*

If one's physical fitness goal is NOT to create adaptations in the human body, one not need read further. Adaptations and modifications in the human body are necessary to realize changes in physical abilities, skills, and proficiency—both positive and negative changes! I classify these adjustments to our bodies in several ways:

- On purpose, producing positive results (Engineers)
- On accident, producing positive results. (Third-World Squatters)
- On accident, producing negative results. (Running Shoe Geeks)
- On purpose, producing negative results. (Self-Destructors)

Everyone has a little of each of these four adaptations taking place in our bodies.

**Engineers**

Engineers design machines, buildings, airplanes, and contraptions of all sorts. They plan, assemble, and fix. They are outcome-driven. Engineers understand efficiency and efficacy—Does it work? And how much or little energy is required to accomplish the task?

In the fitness world, the same math and physics can be used to gauge work and power output. It is possible in many cases to actually measure how much "work" is completed during a workout session. It is a calculable number! Those with the Engineer mentality figure out the formulas and equations to maximize the return on their efforts.

Kinesiologists and advanced sports trainers ensure that athletes' efforts in the gym and at practice are not in vain. Effort without results is a waste. A shot putter does not need even mediocre aerobic capacity. A soccer player doesn't necessarily desire powerful jumping ability. An endurance

*Photo courtesy of CrossFit Watertown, Connecticut*

*Pushups done until failure can develop stamina within that movement pattern.*


*Photo courtesy of CrossFit Watertown, Connecticut*

*Carrying heavy odd objects causes adaptations necessary to get better at... well, carrying heavy odd objects.*

bicyclist barely benefits from having a huge maximum deadlift. Competitive athletes need to determine which components of physical fitness will help him/her win. They do those exercises that create those specific adaptations beneficial for play in the field, arena, or gymnasium.

Volleyball is an extremely anaerobic sport: jumps, blocks, hits. Training should mimic the needs, and cause physical adaptations that increase those above-named skills.

Certain exercises and workout formats (time duration, weight level used, intensity) cause different physical adaptations in the body. Olympic lifts such as the Snatch cause the body to become faster and more powerful. Doing lots of pushups or situps develops stamina. Sledgehammer strikes on truck tires work many of the same muscles as situps, but increase speed in the movement, rather than stamina. Heavy back squats create strong legs and core. Standing vertical jumps are in the same movement pattern as back squats, but cause the legs to move faster (speed component).

Certain aspects of fitness are neurological. Skills such as accurately shooting a firearm, shooting a free throw in basketball, or balancing on a highwire require practice and repetition. These abilities become perfected by conditioning the human neurological system. Repeated practice is not enough. What is required is accurate and precise repetition.

Fitness "Engineers" know how and what exercises and drills cause which physical and neurological adaptations in the body. In the exercise science community, there is a strong emphasis placed on goal-setting and setting up plans and workouts so the body and mind adapts to reach those goals. Engineers cause positive things on purpose.

**Third-world squatters**

Take a look at how villagers in a third world country squat to eat and work. Their heels and toes are flat on the ground. Their rear ends are low to the dirt. Their backs are virtually perpendicular.[1] This position isn't something those in the third world learned; it's something most of us in North America have "unlearned."

Watch a young child or toddler squat. It's not the same squat form as most adults. Adults lean onto their toes to compensate for a weak posterior chain. Kids still have the muscular balance that allows them to squat on their heels. This development of youngsters' posterior chains is important. There is a close relationship with the posterior chain musculature and overall flexibility, strength, balance, and agility (or physical fitness, for short).

For those who spend a great deal of time sitting in chairs and in cars, the posterior chain tends to weaken. There is an over development of the legs' quad muscles, and a neglect of the hamstrings and glutes. This is a poor adaptation that makes the body LESS capable of performing tasks and getting into and out of certain positions.

Generally speaking of course, those who can third-world squat have maintained the adaptation (or Our Creator's design) to perform well at a wide array of physical tasks, not just those in a gymnasium. Third-world squatters in many cases are doing positive things for their bodies…and by accident.

**Running shoe geeks**

Throughout history, technology has been viewed as both hero and villain. While gym shoes take the brunt of the criticism in the title of this category, there are many other pieces of technology that are lumped in alongside shoes.

I mention shoes in this category because of the current barefoot running craze.[2] There are many, both sprinters and long distance runners, who have "gone barefoot" by wearing minimalist shoes such as Vibram FiveFingers (*www.vibramfivefingers.com*) or Nike Frees (*nikerunning.nike.com*). These shoes replicate running and walking before the invention of the cushioned running shoe. The theory is simple: use your feet the way they were designed to be used, with a natural and efficient "spring" in the joints and muscles. Studies show that running barefoot with a toe-


*Photo courtesy of TJ Cooper, CrossFit East, Florida*

*Police academy recruits do dumbbell farmer's walk. Big forearms and a strong grip are the body's way of saying, "I am adapting to better use my hands to hold heavy things."*

strike (rather than heel strike) requires 5% less energy. That equates to faster times, or less fatigue!

Proponents of barefoot running claim that by using the feet in their natural condition, chronic running problems with ankles, knees, and hips disappear. While it seems as though most of these claims are merely anecdotal, I have experienced the same disappearance of pain and inflammation after runs.

It is possible that the over-cushioning of shoes' heels has caused runners to transition to an unhealthy gait or stride—one that violates nature.[3] Running shoe geeks may in fact be doing harm to their joints and connective tissues by relying on technology.

Now consider police and military duty boots. They are designed to support the foot and ankle during sudden dynamic movements in unknown terrain. However, if all one wears is overly-supportive footwear, the foot's natural support system isn't being strengthened the way it should. My advice: *Wear boots in the field. Go barefoot in the gym!*

One other piece of protective technology I'll include here is the weightlifting belt. The wide weightlifting belt is seen in health clubs everywhere. People of all shapes and sizes cinch them up around their waists during not only deadlifts and squats, but all sorts of movements. The theory: protect the lower back and abdominals during near-maximal lifts. This sounds like good advice. But I'd like to take another view at it. How about this: protect certain muscles from being injured, or used, or strengthened during training, so when those same muscles are asked to perform out in the field or in real life… they are so weak and unconditioned, they get seriously injured or strained. Question: do we overprotect certain muscles, joints, and body parts during training, only to expose them nakedly to even harsher stressors in reality?

Sometimes technology causes a worse condition than that which it was designed to cure. Running Shoe Geeks (and their likes) might be inadvertently causing negative results.

**Self-destructors**

For brevity's sake, I'll ignore that anyone (Self-Destructors) would purposely act, or fail to act, with an intended goal (or at least knowledgeable of the probable outcome) of realizing negative results. However…. Certain workout plans and exercises yield the potential for negative results. Many are known, yet we ignore the warnings.

Take the bench press. In and of itself, the bench press is not bad. It develops the chest musculature, along with other "pushers." But frequently the pectorals and front nodes of the shoulders become overdeveloped in relation to the back muscles and the rear shoulder nodes. This imbalance is a breeding ground for inflexibility and injury.

If there are known risks and dangers from certain behaviors, yet we continue to partake, maybe we have a bit of Self-destructor in us.

**Conclusion**

So where does this take us? First off, we must realize that every action causes a reaction. Secondly, our bodies are constantly adapting to our environment and our experiences. Thirdly, we have to admit we can't possibly control or foretell everything. Greek philosopher Heraclitus said, *"No man ever steps in the same river twice, for it's not the same river and he's not the same man."*

During exercise and physical training, our bodies adapt. Some questions need to be answered: **What adaptation are we looking to gain?** Are we trying to get stronger? Jump higher? Throw further? Punch harder? Run longer? **What sorts of training or practice are we using to cause those adaptations?** Full-body strength training? Plyometrics? Aerobics? Anaerobics? **What is our everyday lifestyle saying to our bodies about adaptation?** Lack of activity? Over drinking? Over eating? Lack of sleep?

Photo courtesy of Team Magdziasz

*StrongMan training is becoming very popular. Truck tire flips are a staple exercise. The body adapts well to these awkward movements that are rarely mimicked in traditional gym training.*

Let's be sure our lifestyles and activities are causing positive adaptations in our bodies and minds. Make small changes, and you might see huge results. Analyze your lifestyle now!

Photo courtesy of MotorCity CrossFit, Michigan

*Sledgehammer strikes are a plyometric abdominal workout. The lightning-quick contraction develops speed and power in the trunk flexors.*

I leave you with the words of English theologian Brooke Foss Westcott: "Great occasions do not make heroes or cowards; they simply unveil them to the eyes of men. Silently and imperceptibly, as we wake or sleep, we grow strong or weak; and at last some crisis shows what we have become."

NOTE: Trinity Training Group is promoting a two-month fitness, health, and wellness campaign called THE HARD ROUTINE. It begins October 1st, 2010. Please visit the blog to learn about it, and how you can join! It's totally free, and up to you how committed you want to be during the campaign.

**Resources**

[1]Weller, Craig, "Third World Squat," *www.tnation.com*.

[2]Lieberman, Daniel, "Biomechanics of Foot Strikes and Applications to Running Barefoot or in Minimal Footwear," *www.barefootrunning.fas.harvard.edu*.

[3]Burfoot, Amby, "Barefoot Running: Two Sides of a Very Hot Topic," Runner'sWorld, Feb 2010. *http://www.runnersworld.com/article/0,7120,s6-238-267-13401-3-1X2-3,00.html*.

**About the author**

Louis Hayes is a Police Officer for the Hinsdale IL Police Department, where his responsibilities include coordinating the in-house Physical Fitness and Wellness Program and teaching various use of force disciplines. He is currently assigned to the FIAT SWAT Taskforce as a Team Leader and trainer. Lou sits on the Board of Directors for the Illinois Tactical Officers Association and is a member of ILEETA and IALEFI. He contributes to a for-the-good-of-mankind fitness blog called the Trinity Training Group at *http://trinitytraining.blogspot.com*. Lou opts for barefoot training, has given up bench pressing, but still eats way too much ice cream before bed. He can be reached at *Louis.Hayes@comcast.net.*