October 2002

"mess you up"

THE CrossFit Journal

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Aerobics and Anaerobics
Gymnastics, Weightlifting, and Sprinting

FEATURE ARTICLE:

WHAT IS FITNESS?

What Is Fitness and Who Is Fit?

Outside Magazine crowned triathlete Mark Allen "the fittest man on earth" (http://web.outsidemag.com/magazine/0297/9702fefit.html). Let's just assume for a moment that this famous six-time winner of the IronMan Triathlon is the fittest of the fit, then what title do we bestow on the decathlete Simon Poelman (http://www.decathlon2000.ee/english/legends/poelman.htm) who also possesses incredible endurance and stamina, yet crushes Mr. Allen in any comparison that includes strength, power, speed, and coordination?

Perhaps the definition of fitness doesn't include strength, speed, power, and coordination though that seems rather odd. Merriam Webster's Collegiate Dictionary defines "fitness" and being "fit" as the ability to transmit genes and being healthy. No help there. Searching the Internet for a workable, reasonable definition of fitness yields disappointingly little (http://www.google.com/search?hl=en&ie=UTF-8&oe=UTF-8&q=fitness+definition). Worse yet, the NSCA, the most respected publisher in exercise physiology, in their highly authoritative Essentials of Strength Training and Conditioning doesn't even attempt a definition.

Crossfit's Fitness

For CrossFit the specter of championing a fitness program without clearly defining what it is that the program delivers combines elements of fraud and farce. The vacuum of guiding authority has therefore necessitated that CrossFit's directors provide their own definition of fitness. That's what this issue of CrossFit Journal is about, our "fitness."

Our pondering, studying, debating about, and finally defining fitness have played a formative role in CrossFit's successes. The keys to understanding the methods and achievements of CrossFit are perfectly imbedded in our view of fitness and basic exercise science.

It will come as no surprise to most of you that our view of fitness is a contrarian view. The general public both in opinion and in media holds endurance athletes as exemplars of fitness. We do not. Our incredulity on learning of Outside's awarding a triathlete title of "fittest man on earth" becomes apparent in light of CrossFit's standards for assessing and defining fitness.

CrossFit makes use of three different standards or models for evaluating and guiding fitness. Collectively, these three standards define the CrossFit view of fitness. The first is based on the ten general physical skills widely recognized by exercise physiologists. The second standard, or model, is based on the performance of athletic tasks, while the third is based on the energy systems that drive all human action.

Each model is critical to the CrossFit concept and each has distinct utility in evaluating an athlete's overall fitness or a strength and conditioning regimen's efficacy. Before explaining in detail how each of these three perspectives works, it warrants mention that we are not attempting to demonstrate our program's legitimacy through scientific principles. We are but sharing the methods of a program whose legitimacy has been established through the

World-Class Fitness in 100 Words:

- Eat meat and vegetables, nuts and seeds, some fruit, little starch and no sugar. Keep intake to levels that will support exercise but not body fat.
- Practice and train major lifts: Deadlift, clean, squat, presses, C&J, and snatch. Similarly, master the basics of gymnastics: pull-ups, dips, rope climb, push-ups, sit-ups, presses to handstand, pirouettes, flips, splits, and holds. Bike, run, swim, row, etc, hard and fast.
- Five or six days per week mix these elements in as many combinations and patterns as creativity will allow. Routine is the enemy. Keep workouts short and intense.
- Regularly learn and play new sports.

testimony of athletes, soldiers, cops, and others whose lives or livelihoods depend on fitness.

Crossfit's First Fitness Standard

There are ten recognized general physical skills. They are cardiovascular/respiratory endurance, stamina, strength, flexibility, power, coordination, agility, balance, and accuracy. (See "General Physical Skills", pg. 4, for definitions.) You are as fit as you are competent in each of these ten skills. A regimen develops fitness to the extent that it improves each of these ten skills.

Importantly, improvements in endurance, stamina, strength, and flexibility come about through training. Training refers to activity that improves performance through a measurable organic change in the body. By contrast improvements in coordination, agility, balance, and accuracy come about through practice. Practice refers to activity that improves performance through changes in the nervous system. Power and speed are adaptations of both training and practice.

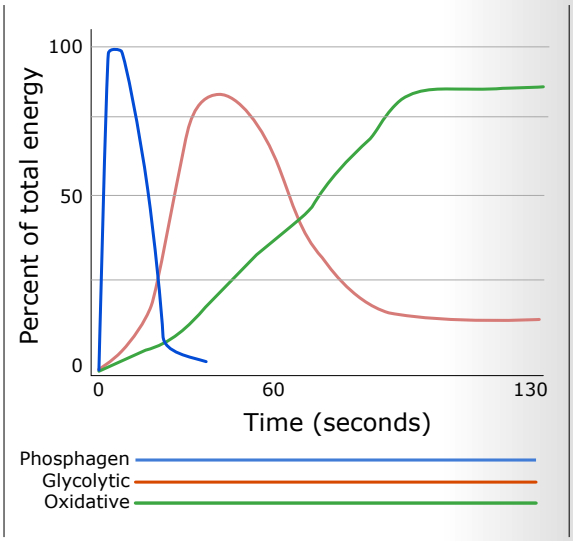
Crossfit's Second Fitness Standard

The essence of this model is the view that fitness is about performing well at any and every task imaginable. Picture a hopper loaded with an infinite number of physical challenges where no selective mechanism is operative, and being asked to perform fetes randomly drawn from the hopper. This model suggests that your fitness can be measured by your capacity to perform well at these tasks in relation to other individuals.

The implication here is that fitness requires an ability to perform well at all tasks, even unfamiliar tasks, tasks combined in infinitely varying combinations. In practice this encourages the athlete to disinvest in any set notions of sets, rest periods, reps, exercises, order of exercises, routines, periodization, etc. Nature frequently provides largely unforeseeable challenges; train for that by striving to keep the training stimulus broad and constantly varied.

Crossfit's Third Fitness Standard

There are three metabolic pathways that provide the energy for all human action. These "metabolic engines" are known as the phosphagen pathway, the glycolytic pathway, and the oxidative pathway. The first, the phosphagen, dominates the highest-powered activities, those that last less than about ten seconds. The second pathway, the glycolytic, dominates moderate-powered activities, those that last up to several minutes. The third pathway, the oxidative, dominates low-powered activities, those that last in excess of several minutes. Here's an excellent reference for additional information: http://predator.pnb.uconn.edu/beta/virtualtemp/muscle/exercise-folder/muscle.html

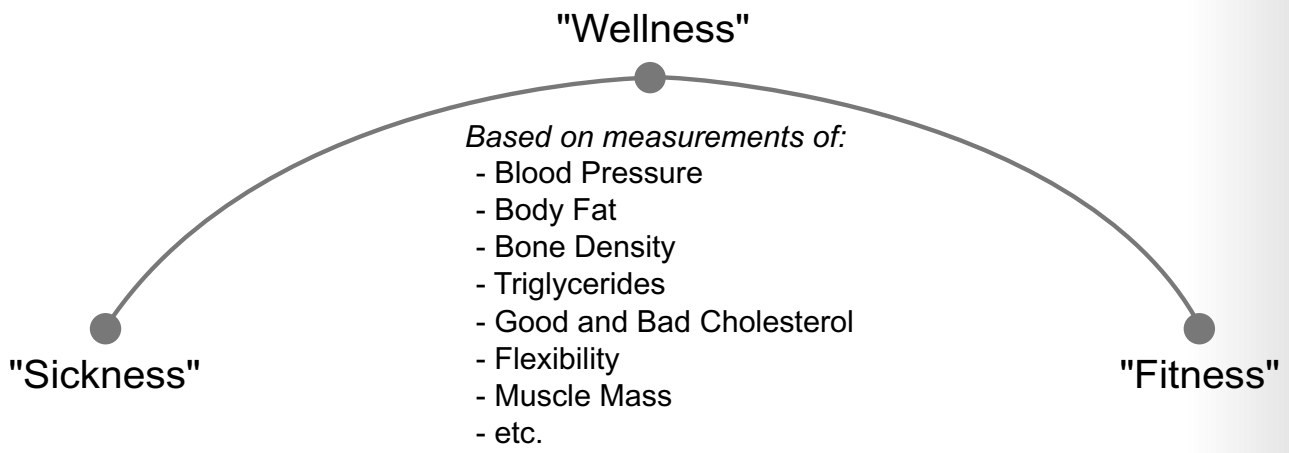


Total fitness, the fitness that CrossFit promotes and develops, requires competency and training in each of these three pathways or engines. Balancing the effects of these three pathways largely determines the how and why of the metabolic conditioning or "cardio" that we do at CrossFit.

Favoring one or two to the exclusion of the others and not recognizing the impact of excessive training in the oxidative pathway are arguably the two most common faults in fitness training. More on that later.

Common Ground

The motivation for the three standards is simply to ensure the broadest and most general fitness possible. Our first model evaluates our efforts against a full range of general physical adaptations, in the second the focus is on breadth and depth of performance, with the third the measure is time, power and consequently energy systems. It should be fairly clear that the fitness that CrossFit advocates and develops is deliberately broad, general, and inclusive. Our specialty is not specializing. Combat, survival, many sports, and life reward this kind of fitness and, on average, punish the specialist.



Our assumption is that if everything we can measure about health will conform to this continuum then it seems that sickness, wellness, and fitness are different measures of a single quality: health.

Sickness, Wellness, and Fitness

There is another aspect to the CrossFit brand of fitness that is of great interest and immense value to us. We have observed that nearly every measurable value of health can be placed on a continuum that ranges from sickness to wellness to fitness. See table above. Though tougher to measure, we would even add mental health to this observation. Depression is clearly mitigated by proper diet and exercise, i.e., genuine fitness.

For example, a blood pressure of 160/95 is pathological, 120/70 is normal or healthy, and 105/55 is consistent with an athlete's blood pressure; a body fat of 40% is pathological, 20% is normal or healthy, and 10% is fit. We observe a similar ordering for bone density, triglycerides, muscle mass, flexibility, HDL or "good cholesterol", resting heart rate, and dozens of other common measures of health. Many authorities (e.g. Mel Siff, the NSCA) make a clear distinction between health and fitness. Frequently they cite studies that suggest that the fit may not be health protected. A close look at the supporting evidence invariably reveals the studied group is endurance athletes and, we suspect, endurance athletes on a dangerous fad diet (high carb, low fat, low protein).

Done right, fitness provides a great margin of protection against the ravages of time and disease. Where you find otherwise examine the fitness protocol, especially diet. Fitness is and should be "super-wellness." Sickness, wellness, and fitness are measures of the same entity. A fitness regimen that doesn't support health is not CrossFit.

(As a note of interest, Mel Siff PhD, whom we often respect and admire, holds his atherosclerotic disease and subsequent heart attack as anecdotal evidence of the contention that fitness and health are not necessarily linked because of his regular training and "good diet". When we researched his dietary recommendations we discovered that he advocates a diet ideally structured for causing heart disease – low fat/high carb. Siff has fallen victim to junk science!)

Implementation

Our fitness, being "CrossFit", comes through molding men and women that are equal parts gymnast, Olympic weightlifter, and multi-modal sprinter or "sprintathlete." Develop the capacity of a novice 800-meter track athlete, gymnast, and weightlifter and you'll be fitter than any world-class runner, gymnast, or weightlifter. Let's look at how CrossFit incorporates metabolic conditioning ("cardio"), gymnastics, and weightlifting to forge the world's fittest men and women.

Metabolic Conditioning, or "Cardio"

Biking, running, swimming, rowing, speed skating, and cross-country skiing are collectively known as "metabolic conditioning." In the common vernacular they are referred to as "cardio." CrossFit's third fitness standard, the one that deals with metabolic pathways,

GENERAL PHYSICAL SKILLS

If your goal is optimum physical competence then all the general physical skills must be considered:

1. Cardiovascular/respiratory endurance - The ability of body systems to gather, process, and deliver oxygen.

2. Stamina - The ability of body systems to process, deliver, store, and utilize energy.

3. Strength - The ability of a muscular unit, or combination of muscular units, to apply force.

4. Flexibility - the ability to maximize the range of motion at a given joint.

5. Power - The ability of a muscular unit, or combination of muscular units, to apply maximum force in minimum time.

6. Speed - The ability to minimize the time cycle of a repeated movement.

7. Coordination - The ability to combine several distinct movement patterns into a singular distinct movement.

8. Agility - The ability to minimize transition time from one movement pattern to another.

9. Balance - The ability to control the placement of the bodies center of gravity in relation to its support base.

10. Accuracy - The ability to control movement in a given direction or at a given intensity.

(*Ed. - Thanks to Jim Crawley and Bruce Evans of Dynamax, www.medicineballs.com*)

contains the seeds of the CrossFit "cardio" prescription. To understand the CrossFit approach to "cardio" we need first to briefly cover the nature and interaction of the three major pathways.

Of the three metabolic pathways the first two, the phosphagen and the glycolytic, are "anaerobic" and the third, the oxidative, is "aerobic." We needn't belabor the biochemical significance of aerobic and anaerobic systems; suffice it to say that the nature and interaction of anaerobic exercise and aerobic exercise is vital to understanding conditioning. Just remember that efforts at moderate to high power and lasting less than several minutes are anaerobic and efforts at low power and lasting in excess of several minutes are aerobic. As an example the sprints at 100, 200, 400, and 800 meters are largely anaerobic and events like 1,500 meters, the mile, 2,000 meters, and 3,000 meters are largely aerobic.

Aerobic training benefits cardiovascular function and decreases body fat – all good. Aerobic conditioning allows us to engage in low power extended efforts efficiently (cardio/respiratory endurance and stamina). This is critical to many sports. Athletes engaged in sports or training where a preponderance of the training load is spent in aerobic efforts witness decreases in muscle mass, strength, speed, and power. It is not uncommon to find marathoners with a vertical leap of only several inches! Furthermore, aerobic activity has a pronounced tendency to decrease anaerobic capacity. This does not bode well for most athletes or those interested in elite fitness.

Anaerobic activity also benefits cardiovascular function and decreases body fat! In fact, anaerobic exercise is superior to aerobic exercise for fat loss! (http://www.cbass.com/FATBURN.HTM) Anaerobic activity is, however, unique in its capacity to dramatically improve power, speed, strength, and muscle mass. Anaerobic conditioning allows us to exert tremendous forces over brief time intervals. One aspect of anaerobic conditioning that bears great consideration is that anaerobic conditioning will not adversely affect aerobic capacity. In fact, properly structured, anaerobic activity can be used to develop a very high level of aerobic fitness without the muscle wasting consistent with high volumes of aerobic exercise!! The method by which we use anaerobic efforts to develop aerobic conditioning is "interval training."

Basketball, football, gymnastics, boxing, track events under one mile, soccer, swimming events under 400 meters, volleyball, wrestling, and weightlifting are all sports that require the vast majority of training time spent in anaerobic activity. Long distance and ultra endurance running, cross country skiing, and 1500+ meter swimming are all sports that require aerobic training at levels that produce results unacceptable to other athletes or the individual concerned with total conditioning and optimal health.

We strongly recommend that you attend a track meet of nationally or internationally competitive athletes. Pay close attention to the physiques of the athletes competing at 100, 200, 400, 800 meters, and the milers. The difference you're sure to notice is a direct result of training at those distances.

Interval Training

The key to developing the cardiovascular system without an unacceptable loss of strength, speed, and power is interval training. Interval training mixes bouts of work and rest in timed intervals. Figure 3 (pg. 5) gives guidelines for interval training. We can control the dominant metabolic pathway conditioned by varying the duration of the work and rest interval and number of repetitions. Note that the phosphagen pathway is the dominant pathway in intervals of 10-30 seconds of work followed

by rest of 30-90 seconds (load:recovery 1:3) repeated 25-30 times. The glycolytic pathway is the dominant pathway in intervals of 30-120 seconds work followed by rest of 60-240 seconds (load: recovery 1:2) repeated 10-20 times. And finally, the oxidative pathway is the dominant pathway in intervals of 120-300 seconds work followed by rest of 120-300 seconds (load:recovery 1:1). The bulk of metabolic training should be interval training.

Interval training need not be so structured or formal. One example would be to sprint between one set of telephone poles and jog between the next set alternating in this manner for the duration of a run.

	Sprint	*Mid-Distance*	*Distance*
Primary Energy System	Phophagen	Glycolytic	Oxidative
Duration of work (in seconds)	10 - 30	30 - 120	120 - 300
Duration of recovery (in seconds)	30 - 90	60 - 240	120 - 300
Load:Recovery ratio	1 : 3	1 : 2	1 : 1
Repetitions	25 - 30	10 - 20	3 - 5

Figure 3.

One example of an interval that CrossFit makes regular use of is the Tabata Interval, which is 20 seconds of work followed by 10 seconds of rest repeated six to eight times (http://www.cbass.com/INTERVAL.HTM). Dr. Izumi Tabata published research that demonstrated that this interval protocol produced remarkable increases in both anaerobic and aerobic capacity.

It is highly desirable to regularly experiment with interval patterns of varying combinations of rest, work, and repetitions.

One of the best Internet resources on interval training comes from Dr. Stephen Seiler (http://home.hia.no/~stephens/interval.htm). This article on interval training and another on the time course of training adaptations (http://home.hia.no/~stephens/timecors.htm) contain the seeds of CrossFit's heavy reliance on interval training. The article on the time course of training adaptations explains that there are three waves of adaptation to endurance training. The first wave is increased maximal oxygen consumption. The second is increased lactate threshold. The third is increased efficiency. In the CrossFit concept we are interested in maximizing first wave adaptations and procuring the second systemically through multiple modalities, including weight training, and avoiding completely third wave adaptations. Second and third wave adaptations are highly specific to the activity in which they are developed and are detrimental to the broad fitness that we advocate and develop. A clear understanding of this material has prompted us to advocate regular high intensity training in as many training modalities as possible through largely anaerobic efforts and intervals while deliberately and specifically avoiding the efficiency that accompanies mastery of a single modality. It is at first ironic that this is our interpretation of Dr. Seiler's work for it was not his intention, but when our quest of optimal physical competence is viewed in light of Dr. Seiler's more specific aim of maximizing endurance performance our interpretation is powerful.

Dr. Seiler's work, incidentally, makes clear the fallacy of assuming that endurance work is of greater benefit to the cardiovascular system than higher intensity interval work. This is very important: with interval training we get all of the cardiovascular benefit of endurance work without the attendant loss of strength, speed, and power.

Gymnastics

Our use of the term "gymnastics" not only includes the traditional competitive sport that we've seen on TV but all activities like climbing, yoga, calisthenics, and dance where the aim is body control. It is within this realm of activities that we can develop extraordinary strength (especially upper body and trunk), flexibility, coordination, balance, agility, and accuracy. In fact, the traditional gymnast has no peer in terms of development of these skills.

CrossFit uses short parallel bars, mats, still rings, pull-up and dip bars, and a climbing rope to implement our gymnastics training. (See CrossFit Journal, September 2002, "The Garage Gym" for recommended equipment and vendors.)

The starting place for gymnastic competency lies with the well-known calisthenic movements: pull-ups, push-ups, dips, and rope climb. These movements need to form the core of your upper body strength work. Set goals for achieving benchmarks like 20, 25, and 30 pull-ups; 50, 75, and 100 push-ups; 20, 30, 40, and 50 dips; 1, 2, 3, 4, and 5 consecutive trips up the rope without any use of

the feet or legs.

At fifteen pull-ups and dips each it is time to start working regularly on a "muscle-up." The muscle-up is moving from a hanging position below the rings to a supported position, arms extended, above the rings. It is a combination movement containing both a pull-up and a dip. Far from a contrivance the muscle-up is hugely functional. With a muscle-up you'll be able to surmount any object on which you can get a finger hold – if you can touch it you can get up on it. The value here for survival, police, fire fighter, and military use is impossible to overstate. We will in future issues be covering the details of this great movement. The key to developing the muscle-up is pull-ups and dips.

While developing your upper body strength with the pull-ups, push-ups, dips, and rope climb, a large measure of balance and accuracy can be developed through mastering the handstand. Start with a headstand against the wall if you need to. Once reasonably comfortable with the inverted position of the headstand you can practice kicking up to the handstand again against a wall. Later take the handstand to the short parallel bars or parallettes (http://www.american-gymnast.com/technically_correct/paralletteguide/titlepage.html) without the benefit of the wall. After you can hold a handstand for several minutes without benefit of the wall or a spotter it is time to develop a pirouette. A pirouette is lifting one arm and turning on the supporting arm 90 degrees to regain the handstand then repeating this with alternate arms until you've turned 180 degrees. This skill needs to be practiced until it can be done with little chance of falling from the handstand. Work in intervals of 90 degrees as benchmarks of your growth – 90, 180, 270, 360, 450, 540, 630, and finally 720 degrees.

Our use of the term "gymnastics" includes all activities where the aim is body control.

Walking on the hands is another fantastic tool for developing both the handstand and balance and accuracy. A football field or sidewalk is an excellent place to practice and measure your progress. You want to be able to walk 100 yards in the handstand without falling.

Competency in the handstand readies the athlete for handstand presses. There is a family of presses that range from relatively easy, ones that any beginning gymnast can perform to ones so difficult that only the best gymnasts competing at national levels can perform. Their hierarchy of difficulty is bent arm/bent body (hip)/bent leg; straight arm/bent body/bent leg; straight arm/bent body/straight leg, bent arm/straight body/straight leg, and finally the monster: straight arm/straight body/straight leg. It is not unusual to take ten years to get these five presses!

The trunk flexion work in gymnastics is beyond anything you'll see anywhere else. Even the beginning gymnastic trunk movements cripple bodybuilders, weightlifters, and martial artists. In a future issue of CFJ (CrossFit Journal) we'll cover in great detail many of the better trunk/ab exercises, but until then the basic sit-up and "L" hold are the staples. The "L" hold is nothing more than holding your trunk straight, supported by locked arms, hands on bench, floor, or parallel bars, and hips at 90 degrees with legs straight held out in front of you. You want to work towards a three minute hold in benchmark increments of 30 seconds – 30, 60, 90, 120, 150, and 180 seconds. When you can hold an "L" for three minutes all your old ab work will be silly easy.

We recommend Bob Anderson's Stretching. This is a simple no nonsense approach to flexibility. The science of stretching is weakly developed and many athletes like gymnasts who demonstrate great flexibility receive no formal instruction. Just do it. Generally, you want to stretch in a warm-up to establish safe, effective range of motion for the ensuing activity and stretch during cool down to improve flexibility.

There's a lot of material to work with here. We highly recommend an adult gymnastics program if there is one in your area. Our friends at www.drillsandskills.com have a gymnastics-conditioning page with enough material to keep you busy for years (http://www.drillsandskills.com/skills/cond). This is among our favorite fitness sites.

Every workout should contain regular gymnastic/calisthenic movements that you've mastered and other elements under development. Much of the rudiments of gymnastics come only with great effort and frustration – that's O.K. The return is unprecedented and the most frustrating elements are most beneficial -long before you've developed even a modicum of competency.

Weightlifting

"Weightlifting" as opposed to "weight lifting", two words, and "weight training" refers to the Olympic sport, which includes the "clean and jerk" and the "snatch." Olympic weightlifting, as it is often referred to, develops strength (especially in the hips), speed, and power like no other training modality. It is little known that successful weightlifting requires substantial flexibility. Olympic weightlifters are as flexible as any athletes.

The benefits of Olympic weightlifting don't end with strength, speed, power, and flexibility. The clean and jerk and the snatch both develop coordination, agility, accuracy, and balance and to no small degree. Both of these lifts are as nuanced and challenging as any movement in all of sport. Moderate competency in the Olympic lifts confers added prowess to any sport.

Fit or Grotesque?

The Olympic lifts are based on the deadlift, clean, squat, and jerk. These movements are the starting point for any serious weight-training program. In fact they should serve as the core of your resistance training throughout your life.

Why the deadlift, clean, squat, and jerk? Because these movements elicit a profound neurodendocrine response. That is, they alter you hormonally and neurologically. The changes that occur through these movements are essential to athletic development. Most of the development that occurs as a result of exercise is systemic and a direct result of hormonal and neurological changes.

Curls, lateral raises, leg extensions, leg curls, flyes and other body building movements have no place in a serious strength and conditioning program primarily because they have a blunted neuroendocrine response. A distinctive feature of these relatively worthless movements is that they have no functional analog in everyday life and they work only one joint at a time. Compare this to the deadlift, clean, squat, and jerk which are functional and multi-joint movements.

Start your weightlifting career with the deadlift, clean, squat, and jerk then introduce the "clean and jerk" and snatch. There are many excellent sources for learning the deadlift, clean, squat, and jerk but for the clean and jerk and the snatch we know of only one outstanding source and that is a couple of videotapes produced by World Class Coaching LLC (http://www.worldclasscoachingllc.com/) These tapes are not only the best instruction available anywhere they are as good as any instructional tape we've seen on any subject. Much of the material on the tapes, both in terms of pedagogy and technical understanding, is unique to the producers. You need both tapes, "The Snatch" and "The Clean and Jerk."

Much of the best weight training material on the Internet is found on "powerlifting" sites. Powerlifting is the sport of three lifts: the bench press, squat, and deadlift. Powerlifting is a superb start to a lifting program followed later by the more dynamic clean and the jerk and finally the "clean & jerk" and the "snatch".

The movements that we are recommending are very demanding and very athletic. As a result they've kept athletes interested and intrigued where the typical fare offered in most gyms (bodybuilding movements) typically bores athletes to distraction. Weightlifting is sport; weight training is not.

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For subscription information go to: http://www.crossfit.com/shop/enter.html, or

Throwing

Our weight training program includes not only weightlifting and powerlifting but also throwing work with medicine balls. The medicine ball work we favor provides both physical training and general movement practice. We are huge fans of the Dynamax medicine ball (www.medicineballs.com) and the throwing exercises elaborated in the Dynamax training manual that comes with their balls. The medicine ball drills add another potent stimulus for strength, power, speed, coordination, agility, balance, and accuracy.

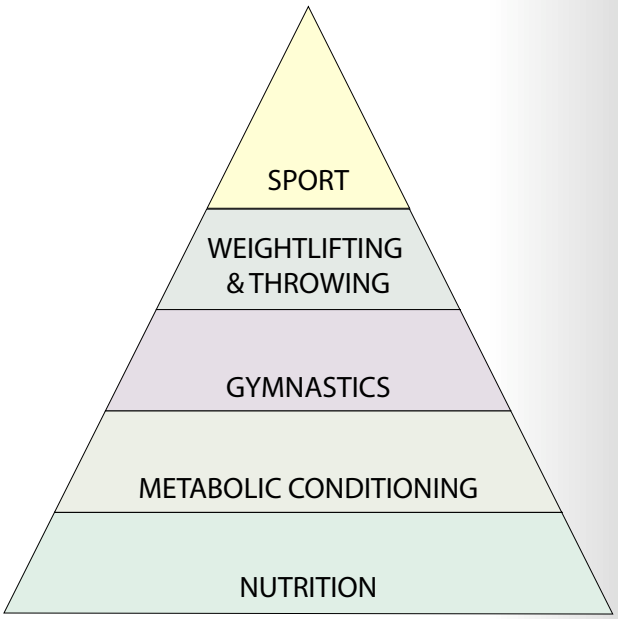
There is a medicine ball game known as Hoover Ball. It is played with an eight-foot volleyball net and scored like tennis. This game burns three times more calories than tennis and is great fun. The history and rules of Hoover Ball are available from the Internet (http://www.hooverassoc.org/hooverballrules.htm).

Nutrition

Nutrition plays a critical role in your fitness. Proper nutrition can amplify or diminish the effect of your training efforts. Effective nutrition is moderate in protein, carbohydrate, and fat. Forget about the fad high carbohydrate, low fat, and low protein diet. 70% carbohydrate, 20% protein, and 10% fat may work for your rabbit, but it won't do anything for you except increase your risk of cancer, diabetes, and heart disease or leave you weak and sickly. Balanced macronutrient and healthy nutrition looks more like 40% carbohydrate, 30 % protein, and 30% fat. Dr. Barry Sears' Zone Diet (http://www.drsears.com/) still offers the greatest precision, efficacy, and health benefit of any clearly defined protocol. The Zone diet does an adequate job of jointly managing issues of blood glucose control, proper macronutrient proportion, and caloric restriction the three pillars of sound nutrition whether your concern is athletic performance, disease prevention and longevity, or body composition. We recommend that every one read Dr. Sears book Enter the Zone. We will cover nutrition in great detail in an upcoming issue of the CFJ.

Sport

Sport plays a wonderful role in fitness. Sport is the application of fitness in a fantastic atmosphere of competition and mastery. Training efforts typically include relatively predictable repetitive movements and provide limited opportunity for the essential combination of our ten general physical skills. It is, after all, the combined expression, or application, of the ten general skills that is our motivation for their development in the first place. Sports and games like soccer, martial arts, baseball, and basketball in contrast to our training workouts have more varied and less predictable movements. But, where sports develop and require all ten general skills simultaneously, they do so slowly compared to our strength and conditioning regimen. Sport is better, in our view, at expression and testing of skills than it is at developing these same skills. Both expression and development are crucial to our fitness. Sport in many respects more closely mimics the demands of nature than does our training. We encourage and expect our athletes to engage in regular sports efforts in addition to all of their strength and conditioning work.



A Theoretical Heirarchy of Development

A theoretical hierarchy exists for the development of an athlete. It starts with nutrition and moves to metabolic conditioning, gymnastics, weightlifting, and finally sport. This hierarchy largely reflects foundational dependence, skill, and to some degree, time ordering of development. The logical flow is from molecular foundations, cardiovascular sufficiency, body control, external object control, and ultimately mastery and application. This model has greatest utility in analyzing athletes' shortcomings or difficulties.

We don't deliberately order these components but nature will. If you have a deficiency at any level of "the pyramid" the components above will suffer.

Integration

".... strive to blur distinctions between "cardio" and strength training. Nature has no regard for this distinction."

Every regimen, every routine contains within its structure a blueprint for its deficiency. If you only work your weight training at low reps you won't develop the localized muscular endurance that you might have otherwise. If you work high reps exclusively you won't build the same strength or power that you would have at low rep. There are advantages and disadvantages to working out slowly, quickly, high weight, low weight, "cardio" before, cardio after, etc.

For the fitness that we are pursuing, every parameter within your control needs to be modulated to broaden the stimulus as much as possible. Your body will only respond to an unaccustomed stressor; routine is the enemy of progress and broad adaptation. Don't subscribe to high reps, or low reps, or long rests, or short rests, but strive for variance (http://www.cbass.com/EvolutionaryFitness.htm).

So then, what are we to do? Work on becoming a better weight-lifter, stronger-better gymnast, and faster rower, runner, swimmer, cyclist is the answer. There are an infinite number of regimens that will deliver the goods.

Strong, lean, capable across a broad range of athletic activities - Eva Twardokens, U.S. Olympic Ski Champion

Generally, we have found that three days on and one day off allows for a maximum sustainability at maximum intensities. One of our favorite workout patterns is to warm-up and then perform three to five sets of three to five reps of a fundamental lift at a moderately comfortable pace followed by a ten-minute circuit of gymnastics elements at a blistering pace and finally finish with two to ten minutes of high intensity metabolic conditioning. There is nothing sacred in this pattern. The magic is in the movements not the routine. Be creative.

Another favorite is to blend elements of gymnastics and weightlifting in couplets that combine to a dramatic metabolic challenge. An example would be to perform five reps of a moderately heavy back squat followed immediately by a set of max reps pull-ups repeated three to five times.

On other occasions we'll take five or six elements balanced between weightlifting, metabolic conditioning, and gymnastics and combine them in a single circuit that we blow through three times without a break.

We can create routines like this forever. In fact our archives (http://www.crossfit.com/misc/arc.html) contain four or five hundred daily workouts consciously mixed and varied in this manner. Perusing them will give you an idea of how we mix and modulate our key elements.

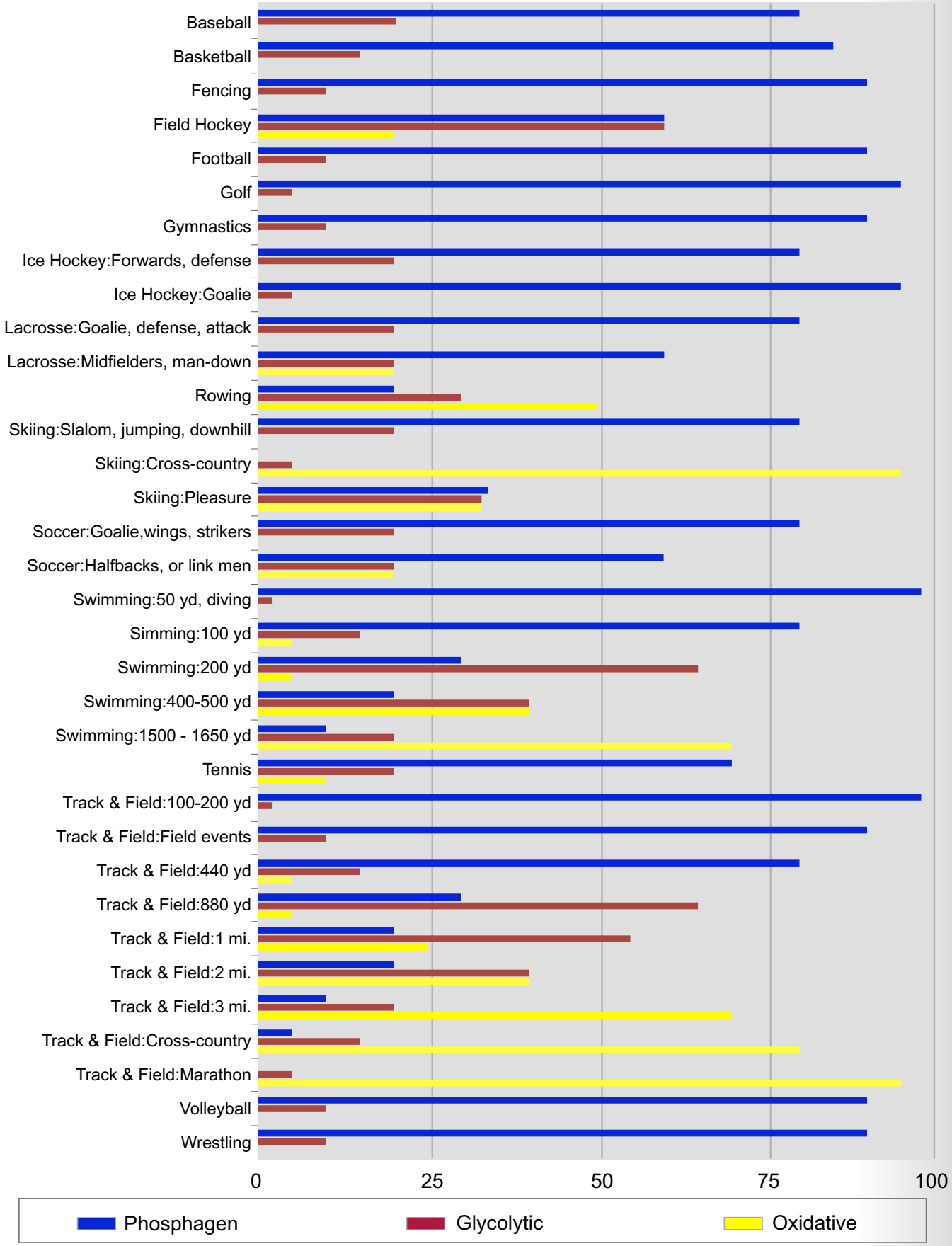
We've not mentioned here our penchant for jumping, kettlebells, odd object lifting, and obstacle course work. The recurring theme of functionality and variety clearly suggest the need and validity for their inclusion though.

Finally, strive to blur distinctions between "cardio" and strength training. Nature has no regard for this distinction or any other, including our ten physical adaptations. We'll use weights and plyometrics training to elicit a metabolic response and sprinting to improve strength.

Scalability and Applicability

The question regularly arises as to the applicability of a regimen like CrossFit's to older and deconditioned or detrained populations. The needs of an Olympic athlete and our grandparents differ by degree not kind. One is looking for functional dominance the other for functional competence. Competence and dominance manifest through identical physiological mechanisms.

We've used our same routines for elderly individuals with heart disease and cage fighters one month out from televised bouts. We scale load and intensity; we don't change programs.

We get requests from athletes from every sport looking for a strength and conditioning program for their sport. Firemen, soccer players, triathletes, boxers, and surfers all want programs that conform to the specificity of their needs. While admitting that there are surely needs specific to any sport, the bulk of sport specific training has been ridiculously ineffective. The need for specificity is nearly completely met by regular practice and training within the sport not in the strength and conditioning environment. Our terrorist hunters, skiers, mountain bikers and housewives have found their best fitness from the same regimen.

Typical Percentage of Training Time Spent in Each Pathway for Various Sports