

NORTHEAST PERSONAL TRAINING CERTIFICATION

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Northeast Personal Trainer Certification

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ACKNOWLEDGEMENTS

I would like to thank SCW. Exercise Etc. and IDEA for preparing me to guide my students on their first step towards a personal training career. Our goal is to point candidates to continued success in their plans to become certified through the American Council on Exercise (ACE), the American College of Sports Medicine (ACSM), and/or as a Certified Strength and Conditioning Specialist (CSCS).

Course Description:

The Northeast Personal Training Certification is a combination of academic study with the latest practical research. This course is a comprehensive program designed to provide you with all of the skills required to become a personal trainer. Learn cutting-edge information on exercise science, flexibility, resistance training, nutrition, mind/body exercises, and cardio workouts. Experience sports performance enhancement drills and program development techniques. To become a Certified Personal Trainer, you must receive a passing score on the written and practical exam following your course of study. Retesting options are available.



INTRO

Your client's high school P.E. teacher taught her to hate push-ups and sit ups, and running was punishment. So, now you are her personal trainer and you want to make exercise fun.

You can change your client's life. Here's how. You coach your client through her workouts. You chat with her during her warm up on the treadmill. Then you pace her through her strength training and cardiovascular workouts. But that's not all. You advise your client on her eating, sleeping and stress management.

YOU ARE A PERSONAL TRAINER

Motivator: The Jack LaLanne of exercise physiology won't help your clients reach their fitness goals unless he is also the Tony Robbins of motivation.

Human: You might think your client would benefit from the drill approach. That commandant style wears thin after about a week. Be a trainer who is informed, genuine and warm.

Communicator/Teacher: If you are a dictator, my-way-or-the-highway personal trainer, you can do better. Listen to your client's goals and effectively teach her how to reach them.

Professional: Is "hurry up and wait" a part of your way of teaching? Do you finish with a client, change your clothes in a flurry, and apologize profusely to your next client because you are in the middle of your "leg day" workout.

Think of yourself as a school teacher. Eventually, your client doesn't need you. Good personal trainers wean clients toward personal responsibility. They teach clients to work out safely and effectively. A "check-up" is advisable from time to time to tweak their form and to upgrade their program. Unless you are a baby sitter or a paid conversationalist, however, personal training is a short-term arrangement.

PREFACE

Northeast Personal Training teaches you:

Training techniques to improve your client's fitness performance.

The risks and injuries associated with your client's sport/fitness.

Prevention and treatment of your client's fitness related injuries.

Eating programs to fuel your client's muscles.

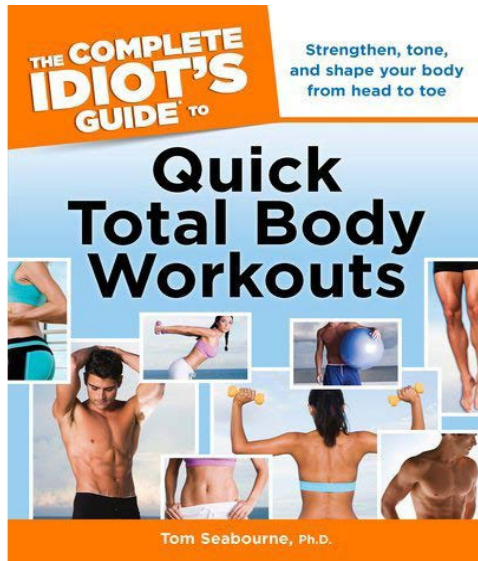
Flexibility and cardiovascular training workouts.

Strength training to speed metabolism and gain muscle.

Mind/Body strategies for motivation and exercise adherence.

Programming for peak athletic performance.

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USING THE P.T. STUDY GUIDE

There are many ways to use this guide. Scan a few pages here and there, read it from A to Z, or even memorize and recite the entire text aloud. It works well as a reference aide!

Cover-To-Cover: Read every page of the *Personal Training Manual* and you will find yourself to be the most popular personal trainer in your neighborhood. Newfound buddies will ask you to treat their plantar fasciitis or they will quiz you on the pros and cons of whether they should wear a knee brace. Be careful! Although your brain will be as full as a medical encyclopedia, for liability reasons, always suggest your friends and clients consult their physicians before using your exercise program.

Read What You Need: The method is simple. Choose your favorite section of the *Personal Training manual*. Begin reading, but set your alarm to buzz at twenty minutes intervals. No matter how engrossed you are in the book, stand up for two minutes between every twenty-minute reading session, and physically perform one of the programs you just read about. Then sit yourself back down and flip through more pages until another topic excites you. Repeat this cycle until your brain is full and your body is a role model for your clients.

Your Responsibility: It's fundamental, primary, and paramount that each future personal trainer certified through this course develops a basic, functional understanding of kinesiology and anatomy. While we do not spend time in this course memorizing topics like joint actions, for example, such as the "biceps do elbow flexion," it's important to realize that this is your responsibility as a personal trainer. The videos and website "exercise" section contain general information such as bones, muscles, and other useful information that only will enhance your success in this certification.

Study Guide Organization

This guide has several different sections and a glossary. Feel free to pinball from part to part at your leisure. No section depends on another. If you are interested in

knee problems, you may shy away from the stretching section. You might be surprised to discover that if your client needs to improve her hamstring flexibility, and she performs the hamstring stretches you suggest, her back pains suddenly disappear. And guess on who is the hero?

Simple, step-by-step drills, exercises, and techniques will provide your client with THE EDGE. If your client uses these strategies to become stronger, fitter, have more coordination, endurance, and flexibility then she will improve her health and performance. Your client is an athlete, treat her as one.

NORTHEAST P.T. TEST INFO:

The written examination will consist of multiple-choice and true-false questions. Certification candidates must achieve a passing score of 85%.

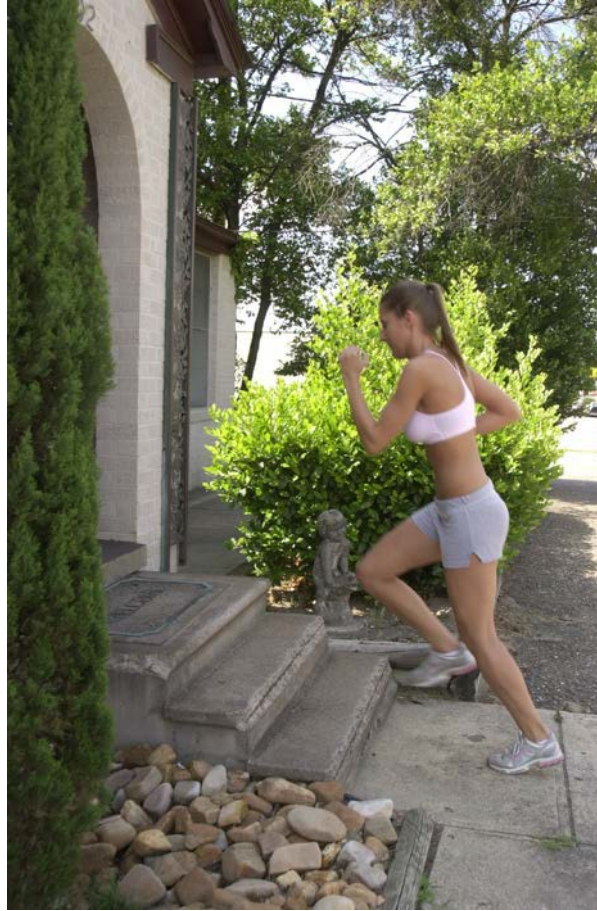
The written examination covers all materials contained in the videos, power point presentations, "Exercise" section, Dr. Tom's blogs, and this study guide. It requires that you have a general understanding of the practical skills and theoretical material for teaching exercise technique.

The details of the practical exam are explained onsite unless you are taking the course online. The online practical exam requires that you send us a video of you "showing-telling-doing" three exercise routines.

Examinees attending a certification program who do not pass the written and/or practical examination will have retest options available.

RETESTING

Northeast will attempt to accommodate those individuals who do not pass the written and/or practical examinations who wish to retest. Candidates can retest the written and/or practical examination for Northeast Certifications program within 60 days of originally participating in the certification program. Our primary goal is that certification candidates are successful in this learning process. Therefore, it is our sincere desire to make this testing process successful for everyone. We will attempt to accommodate special needs and learning disabilities to the best of our abilities. Please call us in advance of the certification program at 903-575-8914 to discuss any special arrangements that you may require, or inform your instructor.



NOW WE BEGIN.....

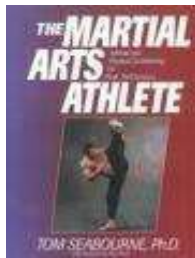
Change the way your client moves and thinks. Take normal activities in and out of the gym, and transform them into flab-burning fun. The videos and study guide will provide you with recipes to follow. At the same time, your client will learn what to eat to fuel her muscles and starve fat cells.

Start a mind/body journey to help your client reach her goals. Weave together a sensible eating plan, do-able activity, and the mental strategies your client will need to reach her genetic potential. Start off easy, and then as your client gets fitter and stronger, keep your client's workout challenging and productive.

Maybe you never thought of yourself as a physiologist or diagnostician. But *Personal Training* helps you to recognize your client's common fitness injuries and how to treat them. You will learn just enough about anatomy and first aid so you won't be confused. You will amaze your clients with your knowledge about the shoulder, knee, back, and abs. But no matter what, always remember to tell your client to consult her physician.

Have you harbored a secret desire to phone the American Red Cross, to find out the percentage of heart attack victims who are actually revived by CPR? Or would you be

curious to know what percent fat you're allowed to eat on the Pritikin Diet? The bad news is, the answer to both of these questions is roughly fifteen percent. Maybe the Pritikin Diet IS too stringent for your average client. But mind/body strategies will benefit your client no matter what her fitness goal. Teach your client to relax, focus, and be her best in any situation she can imagine. But take a guess what the #1 fitness goal most of your clients will ask for - LOSE WEIGHT!



GO TO: www.ntcc.edu/personaltraining

CLICK ON "EXERCISES"

YOU WILL BE DIRECTED TO A FULL-BODY FRONT AND BACK ANATOMY CHART

USE YOUR CURSOR TO CLICK ON A MUSCLE GROUP

THERE YOU WILL BE ABLE TO LEARN HOW TO TRAIN EACH MUSCLE GROUP IN EVEN GREATER DETAIL THAN THE CHART BELOW

Sample Exercises and Basic EXERCISE SCIENCE

<u>Exercise</u>	<u>Muscle Group and Joint Actions</u>	<u>Execution and Alignment</u>
Squat	Quadriceps, hamstrings and gluteals. Hip flexion and Knee extension	Feet wider than shoulders Abdominals contracted Squat down Knees do not pass the toes Knees do not flex beyond 90 degrees Weight stays on the heels
Lunge	Quadriceps,	Start in split lunge position

	Hamstring and Gluteals Hip flexion and Knee extension	Lunge straight down Front knee stays over ankle Back knee stays under the hip
Standing and Hip extension Prone leg Extensions and Curls	and knee flexion Hamstrings and Gluteals	Stand in proper standing alignment, keep the supporting knee soft Raise leg behind being sure Not to arch the back Bend the knee by curling Heel toward the buttocks Or, lie face down in prone Position Perform slight posterior Pelvis tilt to insure neutral Spinal alignment
Front raises	Deltoids Shoulder joint Flexion	Stand in proper standing alignment w/ knees soft Keep elbows slightly bent Raise to shoulder level
Lateral raises	Deltoids Shoulder joint Abduction	Same as above Raise arms out to side
Bicep curls	Bicep Elbow flexion	Stand in proper standing alignment w/ knees soft Hold elbows close to body And curl hands toward Shoulders
Tricep Extensions	Triceps Elbow extension	Stand in proper standing alignment w/ knees soft Raise arms overhead Bend elbows and place Them close to the temples
Rows	Trapezius, Rhomboids and	Stand in split lunge position and flex forward at the hips

	Latissimus Dorsi Shoulder girdle Shoulder joint Extension	Adduction	For trapezius, lift the elbows up and out by pulling the shoulder blades together toward the spine For Latissimus Dorsi, pull the Arms toward the body Keeping the elbows close To the body and palms Facing each other Can also be done while Kneeling and on unilaterally On hands and knees
Push-ups	Pectorals and Triceps Shoulder girdle Abduction Elbow extension		On hands and knees or hands and toes Abdominals contracted Head in line w/ spine Lower body down and up
Abdominal Curls	Rectus abdominus Internal and external Obliques Spinal flexion Spinal rotation		Lie on back w/ spine in neutral alignment Curl up to center, lifting The shoulder blades off The floor and slowly lower For the obliques, rotate the Spine by lifting shoulder Toward opposite knee
Prone Extension	Erector spinae Spinal extension		In the prone position, lift head and one or both Arms off the floor by Extending the spine. Can Also lift one leg at a time

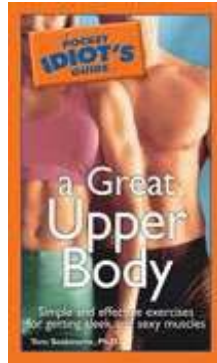
Summary: The Shoulder and the Shoulder Girdle

Shoulder

anterior deltoid	middle deltoid	posterior deltoid
shoulder flexion	arm abduction	shoulder extension

Shoulder Girdle: the Scapulae

upper trapezius	mid trap. & rhomboids	lower trap.	anterior serratus
elevation	adduction/retraction	depression	abduction/protraction



LOSING FAT, NOT MUSCLE

No doubt your client has dabbled in the so-called magic bullets of weight loss. From infomercial products to the latest diet fads, she has probably sampled them all. By now she realizes that quick weight loss causes quicker weight gain; and that losing weight is really about progress and not perfection.

It is dinnertime and decision time. Should she check the refrigerator and throw something together, or follow a recipe? Toss whatever into a bowl and stir, or go for a sure thing? It is the same question with losing fat. The ingredients are weight training, cardio and eating. You know the mix. You read all of the magazines, but the information changes. You assumed your client was on the right program, but the pounds remain. "Those who say they will work out later in the day find other things to do", says Karen West, Fitness Director for the Santa Clarita Athletic Clubs in California. So make it happen at dawn. Have your client sound her alarm 35 minutes early and follow these 10 steps to a smaller waistline:

1. Her alarm sounds.
2. She hits the snooze button, lies back and imagines her workout.
3. Next the obligatory morning visit to the restroom.
4. She gets dressed in workout clothes that she set out the night before.
5. Ready to warm up.
6. Monday, Thursday and Sunday strength train (see *Strength Training*).
7. Tuesday, Friday and the following Monday cardio (see *Interval Training*).
8. She rewards herself with a hearty breakfast.
9. Time for a shower.
10. Seize the day.

METABOLIC RATE

"Between the ages of 30 and 70, your client's fat free mass (muscle) declines by about 40%" according to Len Kravitz, Ph.D., assistant professor of exercise science at the University of New Mexico in Albuquerque. Muscle loss is thought to be the single most important reason your client stores more fat as she ages. The loss of muscle and resulting metabolic slow down makes her susceptible to gaining fat.

Each pound of muscle burns approximately nine calories a day. "A loss of just ½ pound of muscle (25 calories expended daily), could theoretically cause your client to gain 2.6 pounds of fat in a year" warns Jeannie Patton, MS exercise physiologist based in Cleveland, OH. Ten years later she looks in the mirror and sees herself 26 pounds heavier. In 20 years, she added 52 pounds to her frame. And in 30 years, she could be a whopping 78 pounds fatter without eating additional calories, says Patton.

Several metabolic factors determine your client's caloric expenditure. If she is taller, she burns more calories than a shorter person does. The harder she works out the more calories she fries. If it is extremely cold or hot, her body uses extra calories to maintain normal temperature. And "if she is fit, she fritters away more calories than a

sedentary person does”, says Patton.

“There is no better way to increase your metabolism” than lifting weights says Dan Kosich, president of EXERFIT Lifestyle Consulting in Denver, CO. If your client decides to weight train at home she needs a bench and several sets of dumbbells. A mirror can help her keep her form, and music may provide motivation.

RESISTANCE TRAINING

To learn the exercises and get your client accustomed to the weights, have her do a full-body workout every third day. Have her perform one set of 10 reps for each muscle group at a weight she can comfortably handle for all 10 reps.

Tips on Resistance Training

- 1. Perform each exercise through the full range of motion.*
- 2. Exhale on the exertion phase of each movement.*
- 3. Relax muscle groups that are not involved in the lift.*
- 4. Perform each exercise with neutral spine in alignment with the rest of the body.*
- 5. Move mindfully and slowly, never jerking or bouncing the weight.*

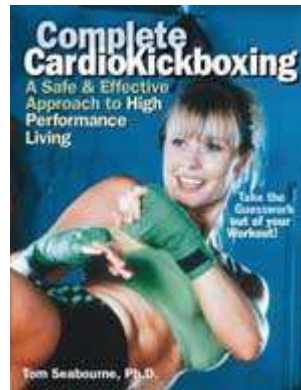
INTERVALS

Interval training should refer to the manipulation of exercise intensity. **Anaerobic interval** training involves the manipulation of exercise intensity that fuses **anaerobic** bouts of energy with **aerobic** recovery periods of easier intensity. Unfortunately, **interval** training is often misquoted and confused with circuit training. Circuit training involves the manipulation of modes, or types of exercise.

“For your client to receive the greatest value from her training, she should strive to become as fit as she can, so she burns more calories from fat at rest, and utilizes more storage fat during her training” recommends Scott Cole, co-author of *Athletic Abs* (Human Kinetics).

“To get fit, improve your client’s sports performance and accelerate fat loss try interval training,” suggests Joseph Signorile, Ph.D., assistant professor of exercise science at the University of Miami in Florida. “Your client can burn more calories in a shorter period and it’s more fun than pounding the pavement” he says. Interval training is interspersing work-efforts with recovery cycles. Have your client start slow and progress gradually to prevent injury. If she becomes injured she can’t train. And if she can’t train, she can’t lose the weight.

Your client can interval train on a bike, stationary cycle, stair climbing machine, heavy bag, treadmill, or walking/jogging around her own backyard. All she needs is a pair of running or cross-training shoes, her exercise machine of choice (not required), her body, and a timepiece. Have her do intervals every third day. For example, Tuesday, Friday, and Monday. Why? Because she is working hard and her body needs to recover, contends Karen West, who has been in the fitness industry for 17 years and is certified by the American College of Sports Medicine.



WORKOUT PROGRAM (1)

Weeks 1-5 Speedwork

After a five-minute warm-up, have your client do a 15-second work interval at an intensity where she is huffing and puffing. Take 45 seconds for her to recover at a “walking pace”. Continue this cycle until you she has accomplished 12 work intervals and 12 recovery intervals (or 12 minutes of training). Now she can cool down with five minutes at an easy pace. Take a few moments for her to stretch, and don’t forget to remind her to eat breakfast.

Each week, have your client add two cycles to her training. By week five she should be doing 20 work intervals and 20 recovery intervals. Be sure she cools down and stretches.

Workout Program (2)

Weeks 6-7: Pyramids

You may have heard of pyramid training with weights. For more information, consult chapters 10 and 11 of Effective Strength Training. Try to “pyramid” your client’s intervals. After her five-minute warm up, have her perform fast-paced intervals followed by 15-second active recovery periods. Begin with a 15-second effort interval. Recover. Gear up for a 30-second effort interval. Recover. Next focus on a 45-second effort. Recover. Now power through a full-minute gut-busting interval! Recover. Come down the pyramid with a 45-second effort interval. Recover. Next, 30-seconds of effort. Recover. Finally her last 15 seconds; ask her to give it all she’s got. Recover for 15 seconds. Done! Cool down, stretch, shower, and eat.

Workout Program (3)

Weeks 8 and beyond: Speedplay

Begin with her warm-up. She picks up her speed. Faster! Then she slows down. Ask her to pick up the pace when she is ready. Tell her to listen to her body. Don’t push her too hard. Ask her to enjoy it. When 30 minutes is up, ask her to cool down, stretch, shower and eat.

EAT TO LOSE

“It is better to be disciplined about your eating than fanatical,” says Pam Neff, RD,

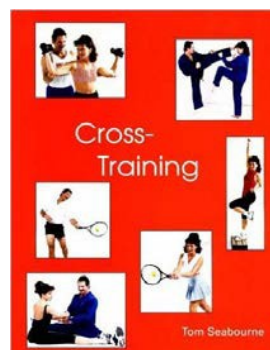
and Director of the Weight Management Center at the Internal Medicine Outpatient Clinic in Dallas, TX. Fueling your muscle is a major part of your weight loss. What you eat today and tomorrow will benefit your workouts the next day, and the next. “You may burn between 300 - 500 calories per workout”, says Andre Houle, the co-owner of INSHAPE AT ANDRE’S in San Francisco, CA. Therefore, be sure your client is consuming enough food to maintain her hard-earned muscle. “Your workouts are more productive when you stoke your muscles with carbohydrates and protein”, says Ed Burke, director of the exercise science program at the University of Colorado at Colorado Springs. By the term “stoke your muscles,” he means “fuel.” Balancing your meals energizes your workouts. Choose morsels that feed your muscle, like nutrient-rich foods instead of nutrient-lacking foods. Eat and drink just enough to satisfy.

“People should experiment to find what works best for them and their particular lifestyle. However, I believe that everyone should eat a minimum of 3 meals a day, as this helps boost metabolic rate and minimizes large surges in insulin and incoming fuels” says Sandra Woodruff, RD, based in Tallahassee, FL. Use a variety of mid-meal snacks to fill in the gaps.

Your client should eat a combination of carbohydrates (starches and vegetables) and protein (lean meat, fish or dairy) at each meal. How much carbohydrates and protein? Nancy Clark recommends “about 60% of your calories from carbohydrates, about 15% from protein, and about 25% (maximum) from fat for most people.

“Consume supplements in addition to, not in replacement of a well balanced eating program”, says Ginger Patterson, Ph.D., RD, Nutrition Supervisor for Lee Memorial Hospital in Fort Myers, FL. A mid-morning meal-replacement shake helps stabilize your blood sugar so you will not be ravenous at lunch. Keep your client on a tolerable eating and exercise program all of the time rather than depriving her and then watching her do a food fling. Supplements should only be recommended by Registered Dietitians, however, and should not be specifically advocated by personal trainers.

“Weight training, intervals and eating correctly is a multi-level process that your client can enjoy without cluttering her life with deprivation diets, mysterious physique-enhancing supplements, and panicked scale-watching bouts of depression” says Cole. With all of that negativity behind her, she can begin to feel and inherently understand the benefits of healthy eating and exercise. Fear based fitness has no place in her program.



TECHNICAL JARGON INTERPRETED INTO CLIENT SPEAK

**A muscle cell weighs more than a fat cell, but a fat cell is almost five times larger than a muscle cell.*

**Train according to your “perceived exertion”. Perceived exertion is a measure of how hard you are training based on how you feel.*

**Excess Post Exercise Oxygen Consumption (EPOC) is the afterburn – the amount of calories your body continues to burn after you have completed your workout.*

**Choose the upper body routine that works for you. Push one day, pull the next. Or, try chest, back and shoulders one day and arms the next day. When you stop making progress, it's time to change your program.*

**Do not stretch your working muscles vigorously between sets. Instead, use that time to mentally prepare for your next set.*

**Fast twitch, type IIB fibers are white, powerful, and larger than the slow twitch type I, red endurance fibers.*

**Balancing the size and strength between your thighs and hamstrings not only keeps your legs looking great but it protects the stability of your knees.*

**Firm those buns all day long. Whenever you are about to sit, stand, stoop, or bend down, lead with your buns and keep your back straight.*

**Lifting weights tightens, trims and firms muscle. And no worries of developing "a big butt". If you train properly, you actually lose inches.*

**Partner training is great for your motivation. Choose a reliable partner.*

**When someone watches you work out, it gives you extra pep to get a couple of extra reps. Be careful not to lose your form.*

**Just by thinking about doing your leg workout your heart rate may increase by as much as 50 percent.*

**Visuo-motor behavior rehearsal (VMBR) is a combination of using relaxation and imagery to improve athletic performance.*

**Pause at the bottom of each rep when you do squats, lunges, and dead lifts and you will recruit more muscle fibers from your buns.*

**Basal metabolic rate (BMR) is the number of calories your body burns at rest. About 25 percent of your BMR is based on how much muscle you have.*

**Everybody is different concerning how far they can safely descend for squats, lunges and dead lifts. It depends on limb and torso length and flexibility.*

**Your gluteus maximus (glutes) refers to your buns while your quadriceps (quads) are the four large muscles on the front of your thigh.*

**Train your thighs and hamstrings equally to prevent a muscle imbalance which could cause a knee injury.*

**Resistance training is the best tool to reshape your buns and thighs. Cardio is second best.*

**The side of your hips (saddlebags) known as your gluteus medius balances your movement when you walk or do lunges and squats.*

**Between sets of leg exercises stand up and move around occasionally get the kinks out and to speed the circulation in your lower body.*

**Your thighs are actually named quadriceps because they are made up of four muscles in the front of your leg.*

**Train both your fast and slow twitch thigh and bun muscles in the same week by doing 10-12 reps one workout with lighter weight, and doing six to eight reps on your next workout with heavier weight.*

**Training your legs with weights is a full body exercise because many muscles in your upper body are used to stabilize your movement.*

**Keeping your back straight really means maintaining a natural curve in your lower back. This keeps your spinal disks healthy and prevents injury.*

**You may do easy activity and cardio every day. But weight training should be limited to twice a week per muscle group.*

**Be careful not to develop an overuse injury. One of the greatest predictors of an acute injury is if you are suffering from a current injury.*

**Breathe from your belly (diaphragm). You can get more air into your lungs if you belly-breathe.*

**Static stretching means to hold your stretch. Hold your stretch for between 15-30 seconds to combat the stretch reflex.*

**If you improve your VO2max. you burn more total calories even at rest. Your VO2max. is how much oxygen your muscles use per minute during exercise.*

**Never work out a sore muscle. Your muscles need to repair themselves during your rest days. If they don't get enough rest they will constantly be in a broken down state.*

**Most people think lactic acid is "the burn" you feel in your muscles during your workout. The burn is actually caused by hydrogen ions that increase the acidity in your blood.*



I. MINDING YOUR BODY: MENTAL PREPARATION

Activation

Take a good, hard look at your client. Do you consider her an athlete? Although her athleticism may be hidden under layers of fat or unused muscle, she is an athlete nonetheless. Your client may not be Olympic caliber, but treat her like a future Olympian. An Olympic athlete warms-up, works out, cools down and stretches just like your client. She improves her strength, flexibility, and endurance. An Olympian takes her training seriously. She mentally prepares for her training and your client should too! An Olympic lifter or sprinter is totally focused on his goals. He does not waste energy contracting muscles unnecessarily. It is the same with your client. When he is hoisting weights or sprinting intervals on the treadmill, he should contract only the muscles needed for lifting or sprinting.

Learning to relax may be the single most important lesson your client can accomplish (Weinberg, Seabourne, & Jackson, 1981). She already knows how to lie down on a cozy couch and watch television in a stupor, but this is not the type of relaxation we are referring to. Relaxation is recognizing his muscles are tense and spontaneously allowing them to relax (Jones & Hardy, 1989).

Your client may perceive herself to be an expert in relaxation—or at least he thinks she is. You notice her face and neck muscles are contracted during a bench press and you suggest she relax, but her muscles remain stiff. When she attempts to relax, she is unsuccessful because she is trying too hard (Murphy, Woolfolk, & Budney, 1988).

Here are some cues to help your client to relax:

- Ask her to breathe slowly from her belly.
- Suggest she repeat calming words to herself such as “relax”.
- Remind her to focus on the proper cues for her activity.
- Tell her to slow down. There is no rush.

Relaxation is, well...relaxing, but there are times your client needs to get pumped up. In the Sydney Olympics, shot putters and weight lifters growled and snarled before, during and after their events. *Activation* is the act of getting excited, psyched and mentally prepared. Activation is synonymous with the sports- psychology term *arousal*. Activation is not anxiety. Although anxiety involves increased arousal, anxiety grows from worry and negative thoughts and feelings (Morgan & Pollack, 1977).

To increase your client's activation:

- Be sure he warms up.
- Suggest that he increase his breathing cadence.
- Tell him to focus on speed and power instead of feeling tired.
- Allow him listen to his favorite music.
- Ask him to imagine himself as fast and explosive.
- Have him pretend he has a crowd watching and draw energy from it.

If your client is too excited or too bored, he will not enjoy his best workout. The jitters (over-activation) cause him to lose focus. Or, you may catch him reclining on the decline bench sneaking a quick nap (under-activation). The key to a killer workout is finding his optimum level of activation (Jones & Hardy, 1989). Generally, higher activation leads to better performance on strength and anaerobic endurance tasks, especially if he is confident in his performance. This is not true for everyone, however, so you must experiment to find the activation level that works for each client (Rotella, Gansneder, Ojala, & Billing, 1980). Now that we agree your client's mind affects his body, convince him to spend just one-minute each session brain training. Introduce sports psychology techniques gradually. Mind/body training does not require incense and candles. Below is a step-by-step program to teach your client to relax and focus. Each lesson requires just a single minute of his precious workout time.

MINDING YOUR BODY TRAINING PROGRAM -1-

Day 1: Before jumping on the treadmill, teach your client a breathing strategy to make the transition from work to workout. Tell her to place her right hand on her chest and her left hand on her abdominals. When she breathes, only her left hand should move. Advise your client to take this diaphragmatic breathing technique with her onto the treadmill and into the weight room to enhance oxygen uptake and help her to relax. (This one-minute breathing technique teaches your client to relax on the treadmill or in a board meeting.)

Day 2: Ask your client to close her eyes and focus on her diaphragmatic breath. This time, whenever any distracting thoughts enter her mind (e.g. what am I having for dinner) tell her to let those thoughts enter one ear and exit the other. Continue for one-minute. (This exercise helps your client to focus on the proper cues for her best workout.)

Day 3: Ask your client to monitor her exhalations. Every time she exhales, suggest she verbalize the word “relax”. If anybody is watching, she can whisper “relax” under her breath (ventriloquist style). Continue this exercise for 1 minute. If she were pressing a barbell, she might replace the word relax with “control” or “power”. (This self-statement helps your client connect purpose to action.)

How many times have you watched a weekend warrior (not your client of course) train his neck extensors on the bench press? He is straining so hard to extend his elbows that the back of his head creates a semi-permanent indentation on the bench pad, and he wonders why his neck hurts the next day.

Progressive relaxation is one solution to prevent your client from contracting unnecessary muscles during his lift. Progressive relaxation teaches your client the difference between tension and relaxation (Weinberg, Seabourne, & Jackson, 1983). Progressively contracting and relaxing certain muscle groups helps your client to control muscle tension. This strategy works both in and out of the gym. During progressive relaxation, he contracts and relaxes muscle groups separately. With practice, he contracts a specific muscle group or combines groups so he can contract a certain body part or relax his whole body at once. When he can do this, he will be better able to recruit the proper muscle groups for any fitness activity (Seabourne, Weinberg, and Jackson, 1985).

Day 4: Pretend you are about to punch your client in the stomach. Watch his abdominals contract. Ask your client to maintain this contracted posture throughout his workout and for the rest of the day.

Day 5: Ask your client to shrug his shoulders toward his ears. Teach him to release his trapezius and to keep his scapula depressed. Suggest that he contract and relax muscle groups until he can feel the difference between tension and relaxation, and understand the difference between the shoulder and shoulder girdle movement.

Day 6: Have your client sit in a comfortable chair. Ask her to close her eyes and breathe from her diaphragm. Suggest that she press your feet into the floor to the count of “one, two, and three, relax.” Ask if she can feel the difference between tension and relaxation. Tell her to press her knees together, one, two, and three, relax. Can she feel the difference between tension and relaxation? Suggest that she contract her abdominal muscles by pressing her lower back into the chair, one, two, and three, relax. Prompt her to notice the different feeling between a contracted and a relaxed muscle. Ask your client to shrug her shoulders up toward her ears: “one, two, and three, relax.” Remind her to notice if she can feel the difference between tension and relaxation. Finally, have her retract and depress her scapula, one, two, and three, relax. (This exercise teaches your client to maintain extended posture by differentiating between contracted and relaxed muscles.)

FOCUS LIKE A LASER

Take your dog for a walk. Hold tightly to the leash as you spot a cat in the distance. While holding the leash, let your dog run! Do not worry about how fast or where your dog

is running but be mindful of its motivation level! Observe how focused your dog is. This is pure unadulterated concentration. It may be for just a brief moment, but it is intense and true. Your dog has a will to achieve its goal at all costs. Although your dog did not set a long-term goal, its focus was all encompassing.

Let us not forget the other end of your dog's pursuit either, the cat. I am sure that cat did not just stand there and let you and Fido run at it at full gallop. The cat reacted instinctively to get out of there either by running away or by taking a ninety-degree turn up a tree. Animals, if we pay attention to their movements, can be wonderful inspirations to greater levels of concentration. Your clients are much more intelligent than your dog. Teach them to attain its single-minded focus.

Your clients are constantly bombarded by an endless array of internal and external stimuli. These include thoughts, emotions, and people like you badgering them about their form. With all of these distractions, it is difficult for them to focus on their workout. Teach your clients to be mindful of what is important, and discard the irrelevant. They should selectively attend to relevant stimuli and let the rest go in one ear and out the other (Privette, 1981).

Some personal trainers crank up the music so clients are distracted from discomfort. They entice their charges to ignore their bodies. This is called *disassociation* (Morgan & Pollack, 1977). Every once in a while, an insightful trainer turns off the music. The client listens to his body instead of chaos. At this point, there is nothing to dull his sensations. This client is mindful of his movement without distraction. He is *associating* with his body (Morgan & Pollack, 1977). Teach your client to control his focus and hone his concentration like a laser.

Here are some ways to improve your client's focus:

- Help your client to change negative feelings and thoughts that distract from his goals (e.g. if he says he is too tired to work out, take him through a guided imagery session of his workout and let him warm up. If he still feels too tired, tell him to take the day off.)
- Ask your client to stay in the present. If something goes wrong, he should note it, adjust, and then go on (e.g. if he misses a lift tell him he will get it next time).
- Remind him to associate with his workout by using key words such as "smooth", "control", or "power."
- Suggest that he add a ritual or consistent routine to his regimen. For example, before his bench press he checks the amount of weight on the bar. Then he sits on the bench and adjusts his feet. After reclining on the bench he adjusts his hands on the bar. His final ritual includes an inhalation and simultaneous scapular retraction before attempting the lift.
- When he is tired, remind him to be especially vigilant to minimize lapses in his concentration to prevent injury.
- Activation is very important. Tell him to be careful of over- or under-activation.

Imagery is a mental technique that programs your client's mind to focus by using his senses to create or recreate an experience (Hardy & Callow, 1999). When your client imagines himself performing a bench press he is using imagery. Imagery helps your client to rehearse lifts, prepare for his run or strategize how to handle an unexpected event (e.g. someone else is using his favorite bench press). Imagery can lower your client's anxiety

and increases his self-confidence (Bakker, Boschker & Chung, 1996).

There are two types of imagery – **external** and **internal**. Your client is performing *external imagery* if he visualizes an image of himself training as if watching his activity on a television screen. *Internal imagery* is having your client picture himself performing from his own perspective with as many of his senses as possible. Internal imagery is more effective than external imagery for improving physical performance (Hardy & Callow, 1999). He should always imagine himself performing well. This will boost his confidence and improve his performance. Your client can practice imagery for as little as three seconds, three minutes, or as long as three hours. Imagery improves with training (Weinberg, Seabourne and Jackson, 1982).

If your client has difficulty performing imagery have him try the following:

- Tell him to practice thinking in pictures (e.g. imagine grabbing the cold steel bar and hear the clang of the weights on his bench press).
- Ask him to look at photos or videos prior to using imagery to stimulate his practice of imaging (e.g. a photo of the perfect bench press).
- Suggest he practice imagery in a quiet, relaxed, and calm environment.
- Remind him to visualize in full color and detail. Let his emotions become involved.
- Explain to your client that he should practice imagery regularly. Imagery is a skill that improves with practice.
- Show your client some of the studies that prove imagery works. If he believes in imagery, the placebo effect is quite a powerful tool.
- Cue your client to create as crystal clear of a mental picture as possible during imagery.
- Prompt your client to stay relaxed and focused on the proper cues when practicing imagery. Negative imagery (visualizing yourself missing a lift) can actually impede your clients' performance (Rotella, Gansneder, Ojala, & Billing, 1980).

Day 7: Ask your client to close her eyes and breathe from her diaphragm. Suggest that she perform a 30-second full-body progressive relaxation exercise on her own. Then instruct her to visualize a triangle for 30-seconds. (This is your client's first step to learning and performing imagery.)

Day 8: Ask your client to close her eyes and breathe from her diaphragm. Ask her to perform a 30-second full-body progressive relaxation exercise, then ask her to visualize herself weight training as if she were watching herself on television. Tell her to hold this scene in her mind for 30-seconds and then relax. (This exercise teaches your client how to use external imagery.)

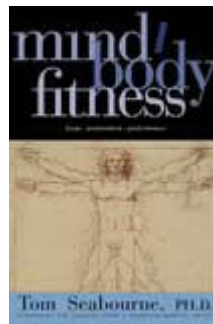
Day 9: Ask your client to close her eyes and breathe from her diaphragm. Ask her to perform a 30-second full-body progressive relaxation exercise. Have her visualize herself as if she were actually pedaling a bike for 30-seconds along a path next to a beach. Allow her to see, feel, and experience every imaginary pedal stroke with as many senses as possible. Suggest she feel the breeze, hear the waves, smell the salt air. Prompt her to see as crystal clear of an image of herself as possible. Ask her the color of her shoes. (This exercise teaches your client to create vivid and controllable internal imagery.)

Day 10: Ask your client to sit comfortably in a chair and close her eyes. She should breathe from her diaphragm and do a 30-second full-body progressive relaxation exercise. Ask her to take another 30 seconds to imagine doing one exercise in her weight training routine. Tell her that focus and activation are very important. She should pay attention to over- or under-activation. Prompt her to visualize herself at the perfect level of activation. (This exercise teaches your client to control her activation level during external imagery.)

Day 11: Ask your client to sit comfortably in a chair and close her eyes. She should breathe from her diaphragm and do a 30-second full-body progressive relaxation exercise. Ask her to take 30 seconds to imagine doing one exercise in her weight training routine. This time have her use as many senses as possible. She should feel the steel bar, hear the clang of the weights, and see the bar moving in a full, deliberate range of motion. Allow her time to develop a vivid and controllable image of her exercise. Remind her to remain at the optimum level of activation for a peak strength-training workout. (This exercise teaches your client to remain at the optimum level of activation during internal imagery.)

What makes focus a challenge is that your mind tends to shift to new stimuli. This was a survival instinct because your ancestors had to keep one eye open for an attack at all times according to Scott Cole, international fitness presenter based in Palm Springs, CA. Learn to control your focus and hone your concentration.

Day 12: Ask your client to sit comfortably in a chair and close her eyes. She should breathe from her diaphragm and do a 30-second full-body progressive relaxation exercise. Suggest that she take 30 seconds to imagine doing one exercise in her weight training routine. Remind her to make the imagery seem as realistic as possible by including all of her senses. Prompt her to visualize in full color and detail. Let her emotions become involved (e.g. I lifted five more pounds than I ever have!). And teach her to constantly be mindful of her level of activation. (This exercise helps your client associate by integrating activation, internal imagery, and emotional control into her exercise program).



FLOW = ACTIVATION + CONCENTRATION

Mihalyi Csikszentmihalyi is the father of the principle of *flow*. In his book *Flow=The Psychology of Optimal Experience* (Harper and Row, 1990) Csikszentmihalyi describes

“flow” as feeling activated, focused, jazzed, pumped up, ready, alert, and mindful. Flow is also undistracted attention. Although this might seem impossible, it is not. Real focus is effortless. Some call it “the zone” or “being absorbed in the present”. Flow is all of the feelings and attitudes your client associates with his best workouts. Flow feels right. When your client is in flow, he knows this is the place to be. When he is out of it, he wants to climb back in. Once your client understands the characteristics of flow, the easier it will be for him to relive it.

Day 13: Ask your client to move through her workout with a mindful focus. That means when she is lifting weights she is concentrating on muscle recruitment and her range of motion. If she is on the treadmill, her attention is drawn to her stride length, breath rate or cadence. She feels in control and self-confident. There is no competition. (This exercise teaches your client to “flow” through an entire workout.)

Day 14: Ask your client to move through her workout and manipulate her emotions to pump up or relax according to the nature of the activity (e.g. she should be highly activated while weight training and relaxed while stretching). Your client should feel challenged but not overwhelmed. (This exercise teaches your client to adjust her activation level and emotions to remain in a state of “flow”.)

Day 15: Ask your client to move through her entire workout with a sense of balance, flexibility, and control. Tell her that her body can handle any physical effort. Although things may not go as planned she can handle any unexpected glitches or emergencies. She will handle success and failure the same. Overreaction is not an option. She will remain confident no matter what. (This exercise teaches your client to put all aspects of activation and focus into her workout. She is striving for “flow-motion.”)

Learning to “flow” is a skill that gets better with practice. Individualize your client’s activation and focus to his workout and continue to improve his ability to “flow”. Use activation and focus strategies during the warm-up, workout and cool-down segments of his personal training session:

- Help your client to adjust his activation level so he is not bored or agitated.
- Remind your client to actively focus on the proper cues for the workout.
- Teach your client to possess a non-competitive attitude so he is focused on the task and not worried about winning or losing.
- Watch that your client doesn’t try too hard. Allow your client to expend effort that increases, not decreases his energy.
- Cue your client to exist in the moment. Your client should not be worrying about the past or wondering what the future holds.
- Suggest that your client not judge his workout.
- Teach your client to focus on his breath. His breath may be the focal point of his training.
- Use the mirror to adjust your client’s posture. Are his shoulders back? Is his spine neutral, and is his chest open during his entire activity? Here are other cues: *Are her knees tracking over her toes, not beyond? Is her head up? Is her spine extended? Are her shoulders and arms functioning with resilient strength?*

When your client is relaxed and focused, flow will follow. Flow requires a constant state of mindfulness and a continuous sense of self-reflection. Once your client knows the GUIDELINES he can summon flow at will. It is a conscious movement that can be reached by everyone. The following checklist can help your client to achieve flow during his workout:

- Help your client to regulate his activation level. He should strive not to be too excited, bored, or tired.
- Remind your client to use his sense of humor every chance he gets.
- Suggest your client keep his mind on his individual focus of attention (e.g. the range of motion of the weights).
- Ask that your client use his emotions to help pump up or relax.
- Tell your client to cultivate a sense of kinesthetic balance. That is, he should remain in control during every phase of his workout.
- Empower your client to feel strong and know that his body can handle any physical effort.
- Suggest your client be flexible, understanding that the workout may not go exactly as planned.
- Help your client to handle success and failure the same. Whether you make a lift or not, overreaction is not an option.
- Support your client and help him to remain confident no matter what the challenge.

COGNITIVE TRAINING PROGRAM -2-

Have you ever tried to meditate while stair climbing? New research suggests you can do both. Meditation will help your client's stair climbing and stair climbing can be a great time for your client to meditate.

One of the foremost researchers in mind/body strategies, Herbert Benson, a Harvard cardiologist and author of *The Wellness Book* (Simon & Schuster, 1993) has several suggestions for how to practice this mindful strategy while you are stair climbing. It can, of course, be modified for use with any rhythmic aerobic endeavor. Benson suggests using a guided imagery strategy similar to the one presented below:

Begin your stair climbing by selecting your program setting for 20 minutes at a steady cadence. Concentrate on your breathing. Breathe deeply from your diaphragm. Feel your rib cage and abdomen expand with each breath. Count your steps on each inhalation and exhalation. Focus only on the relationship between your steps and your breath. Feel your feet press into the platform. Continue to focus on the rhythm of your breath. Allow your awareness to sink into your gluteals and hips. Enjoy the power of each step and notice how your breath energizes each footfall. Bring your attention to a spot a few inches below your navel. Each step begins and ends here. Close your eyes. See yourself climbing each step with confidence and control and then tell yourself how good you feel.

Now, as your client practices these techniques, she will experience various levels of fatigue. Know that she can beat fatigue and discomfort (not joint pain, lactate and the hydrogen ion burn). Go with it. Pushing herself through discomfort will lead her to her

goal. As she increases her stepping speed, she should expect an increase in discomfort. An increase in the burn is a signal she is nearing the finish line. Teach her to be objective about the burn and fatigue. Allow her to observe it; and eventually enjoy it.



II. FULL STRENGTH

Strength training must be an integral part of any fitness program in order to achieve total-body health and fitness. Your client can dramatically improve the way she looks, feels, and performs just by resistance training. “Strength” can be thought of as a muscle’s ability to move a specified amount of weight in a contraction.

Training with weights or tubes improves her outward appearance and has far-reaching effects on her training. She can sculpt her body and improve her confidence and health. When she adds strength training to her workouts, she will improve her cardiovascular fitness, muscular strength and endurance, body composition, and flexibility. Resistance training is her secret weapon for total fitness!

If she only has time for one form of exercise to round out her fitness, weight training is the single best activity she can do for her body. Resistance training increases your clients bone density therefore decreasing her chances for osteoporosis. She will be stronger to rise from her chair. Maintaining muscle speeds up your client’s metabolism and increases the good HDL cholesterol. More muscle helps raise her aerobic capacity and prevent type II diabetes because additional muscle uses more oxygen, and takes up extra sugar. Your client may or may not want to grow slabs of muscle like Arnold Schwarzenegger, but she can add to whatever muscle she has. Your client should begin strength training slowly. Fortunately, if she lifted weights previously, there is anecdotal evidence of muscle “memory.” Muscle memory implies that if you were muscular, it will be easier to restore. Specifically, you may have lifted weights in high school but not touched a weight since. You will increase your muscle sooner than someone who had never trained with weights will.

Your client may be forced to curtail her weight training due to an emergency or priority. She should not quit altogether, however. It is easier to maintain muscle than to regain it. And motivation to begin again may not come easy. A week's vacation is acceptable, but taking a month off means starting over. A prolonged break can lead to bone and muscle loss equivalent to several years of aging. "Use it or lose it" is a true phenomenon.

Lifting weights correctly never injured anyone. Problems arise when enthusiastic lifters try to hoist too much too soon. It is not how much weight you lift; it is how you lift the weight. Proper form is essential. Indeed, experienced lifters are not immune to injury. Lack of concentration, lackadaisical spotters, or equipment failure may contribute to injury.

SOMATOTYPES...

A **mesomorphic** body type like Van Damme is one with well-defined muscles on the trunk and limbs. These folks are broader in the shoulders and hips and narrower at the waist. They have a high muscle to fat ratio and look fit even without weight training. Mesomorphs who lift weights notice a dramatic increase in strength and muscle mass.

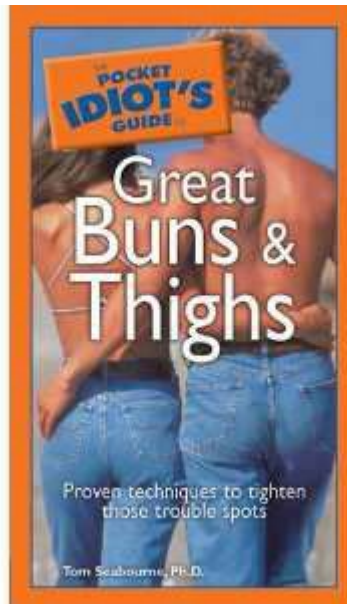
An **endomorph** body type is rounder, softer, and pear shaped. These folks appear to be aspiring sumo wrestlers. There is more fat surrounding their gluteals and thighs. Their muscles are not well-defined and they have a higher fat to muscle ratio. Resistance training helps with fat loss, but you must be patient. Tubing or weight training programs should focus on upper body development to balance endomorph's larger hip proportions.

An **ectomorphic** body type would look like Bruce Lee without muscles. Their bodies are long and rectangular, flat chested, slender in the hips, with no defined waist. Ectomorphs have poor muscle development with relatively low body weight. This body type has difficulty retaining muscle. Ectomorphs must take in enough calories to balance their fitness training caloric expenditure.

Many times, individuals exhibit a few characteristics from each category. No matter which body type your client possesses, she will harvest the rewards of strength training—a leaner and stronger body. She will see the improvement in her outward appearance, but more importantly, she will also *feel* the difference.

It's no secret that a stronger body will improve performance. Resistance training, specifically, will bring your clients overall fitness skills to a new level. Resistance trained men and women generally have better reaction times, increased flexibility, endurance, and leaner body mass than non-lifters. This makes everything easier.

The American College of Sports Medicine (ACSM) recommends that strength training be an integral part of an adult fitness program. This is because weight training does not just produce cosmetic benefits, but delivers results your client can feel as well as see.



Among others, you can look forward to the following improvements in your client's health:

- Lower blood pressure.
- Increase in food transit time through the colon to combat some types of cancer.
- Increased bone density, thereby decreasing your chance for osteoporosis.
- An increase in good HDL cholesterol.
- More muscle helps prevent type II diabetes because additional muscle uses more oxygen, and takes up extra sugar. Lower blood sugar levels are important for the prevention of type II diabetes.

RESISTANCE TRAINING – HOW IT WORKS

Strength training increases the size and number of the contractile proteins within your muscle fibers. Each muscle fiber is like an elongated cylinder that generally extends the length of the muscle. Beneath the cell membrane or sarcolemma are the numerous thread-like structures that contain the contractile proteins of muscle. The thicker, darker, filaments are composed of myosin and the thinner, lighter filaments are composed of actin. Actin and myosin grow and proliferate. This in turn increases the size of the muscle fiber and its cross sectional area. The motor neuron that transmits the electrical charge to the muscle has a distribution of mainly sodium ions located outside the neuron and potassium ions predominantly located inside the nerve giving the inside of the cell a less positive charge compared to the outside of the cell.

The axon that carries the impulse to muscles is blanketed with a lipid cover called a myelin sheath. Since neurons are composed of many nerve fibers, one function of this myelin sheath is to insulate impulses traveling along the same neuron.

It takes more than 16 “workouts” (defined below) to produce significant muscle fiber hypertrophy. The size and strength of connective tissue is increased which includes ligaments and tendons. There is an increase in the sarcoplasm (muscle cell fluid). High intensity strength training also increases bone mass and bone density. Your client can enhance her muscular endurance by doing repetitions with resistance. The first phase of her improvement is due to neurological efficiency. She learns to

recruit muscle fibers.

The second phase of your client's development is from strengthened connective tissue. Tendons and ligaments support her newfound muscle.

ARE YOU TYPE 1 OR TYPE 2 DOMINANT?

The number of muscle fibers and type (fast twitch or slow twitch) in your body was determined during the 2nd trimester of your mother's pregnancy. Each of your muscle fibers is composed of 75 percent water, 20 percent protein, 5 percent phosphates, calcium, magnesium, sodium, potassium, chloride, fats, carbohydrates, and amino acids. You have 430 voluntary muscles, which represents 40 to 50 percent of your body weight. Skeletal muscle is the largest single tissue in your body.

You have two basic types of muscle fibers. Your postural muscles are Type I, endurance, red, and are considered slow twitch muscles. Type I fibers are recruited first during your strength and speed work and are capable of less force but can help you perform more repetitions (reps.) and last longer. Type I fibers utilize oxygen which means they are aerobic in nature. They are smaller and contain less glycogen than Type II fibers but their myoglobin content is high.

Type II, fast twitch fibers are recruited for fast, powerful moves. There are two subclasses of Type II fibers. Type II a-intermediate fibers are somewhat oxidative. They use a combination of the aerobic and glycogen systems. These are recruited after Type I fibers. Type II a-intermediate fibers are fast twitch with moderate myoglobin content, capillary density, force production and endurance. If you performed 8 hard reps. on the bench press, the first several reps. utilized primarily Type I fibers. Next Type II a-intermediate fibers assisted. And finally, when you were pushing out that last rep., Type II-b non-oxidative fibers were employed.

Type II-b fibers are non-oxidative (not aerobic). They are stronger and provide more force, but they fatigue quickly. Type II-b fibers are anaerobic with a high glycogen content and fast twitch rate. They have few capillaries and low endurance but a high power output for explosive attacks.

PRACTICAL TOPICAL STRENGTH TRAINING TIPS

**There are three basic body types – endomorph, ectomorph, and mesomorph. Although you cannot change the shape of your client's muscles, sculpt them to create the best shaped upper body her genetic potential will allow.*

**Spend more time focusing her training on her major muscle groups (chest, back and shoulders) instead of worrying about her arms. When she trains her large muscle groups, her arms are working too.*

**Your client has four rotator cuff muscles that attach from his shoulder to his upper arm bone. They are his supraspinatus, infraspinatus, teres minor, and subscapularis.*

**If a muscle becomes too large, stop training it. If a muscle is not used it atrophies. Use it or lose it.*

**No muscle is as hard to train as your client's back. Get him in front of a double-mirror and have him check out his form so he can make the mind to muscle connection.*

**Your client should feel energized and revitalized after his workout. If he feels sluggish and tired, he did too much.*

**If your client strains a muscle in his arm or leg, don't forget to tell him about the 75% of his body that is looking forward to the workout.*

***"Abstinence violation" is psycho-babble that means when your client misses a workout or falls off the wagon of his eating program he decides to give up and throw in the towel.*

**A full range of motion means to stretch each muscle group to 1.2 times its normal resting length on each rep.*

**Isometric exercise is where the muscles flex, but there is no movement. Isotonic exercise takes the through a full range of motion. Full range of motion is best to develop the entire muscle.*

**To preserve the shoulder joint, do all exercises in front of the neck instead of behind the neck.*

**There are no good or bad exercises. Some are better than others. Choose those that train the body without creating aches and pains.*

**The pectoralis major and pec minor muscles are the muscles of the chest. They may be toned and tightened from several different angles.*

**Any movement where the elbow is flexed in a pulling motion trains the biceps. Any movement that extends your elbows works the triceps.*

**If your client has a twinge of discomfort as he moves through any exercise, find a different range of motion to prevent pain and possible injury.*

**Be careful not to fully extend the elbows or knees on any exercise as that takes the resistance off the muscles and puts pressure on the joints.*

**The triceps consist of three muscles in the back of the upper arm. These muscles are used to extend the elbow for pushing movements.*

**Tell your client not to baby himself during office workouts. The muscles don't know whether stimulation comes from a weight machine or pressing against the back of the chair.*

**Performing just one set of an exercise is 80 percent as beneficial as doing three sets.*

**The latissimus dorsi is the upper back muscle. There is no truth to the myth that if your client uses an extra-wide grip it widens her upper back even more.*

**Strong muscles take over for weak or injured ones. Do not let your client neglect her weaker muscles. She must use them or you will lose them.*

**Your client loses adipose tissue (fat) systemically. That is, she cannot lose fat on the back of her arm by working the triceps.*

**Stretch after the workout, not between sets of exercises. Stretching between sets makes you weaker for your next set.*

**Hold the stretch instead of bouncing. Bouncing through the stretches may cause micro tears in the muscles damaging the fibers.*



MUSCLE & METABOLISM

Your muscles need glycogen, ATP, and innervation to become active. A stimulus to a motor unit contracts your muscles on an all-or-none principle. A muscle fiber will contract all the way, or not at all. One motor neuron may innervate 1000 muscle fibers in your quadriceps to execute a leg extension, while another motor neuron may activate only 10 muscle fibers to blink your eye. Muscle takes up less space than fat. One pound of fat bulges 18 percent more than a pound of muscle. Fat occupies 1.1 liters per pound while muscle requires just .9 liters per pound. Studies show that resistance training offsets any gains in circumference by losing fat as long as your client does not increase fat stores by wolfing down extra calories.

Strength training increases the frequency with which motor neurons are recruited and fired. Your golgi tendon organ senses an extreme stretch to a muscle. When your muscle is stretched to the point where the load you are trying to lift may be too heavy to handle, your golgi tendon organ forces your muscle to relax to prevent injury. The more you train with resistance, the less your golgi tendon organ kicks in. Some clients override their golgi tendon organs while yelling and screaming to hoist the weight up.

Weight training should be performed according to ACSM guidelines:

1. Upright rows for your trapezius: Raise the weight no higher than 60 degrees to avoid stress on the shoulder.
2. Supine (on your back) chest flies for your pectorals: Do not let your elbows break the frontal plane (go below parallel) to avoid stress on the static stabilizers of the shoulder (ligaments and connective tissue) as well as the dynamic stabilizers (rotator cuff muscles).
3. Avoid behind the neck lat pull downs for your Latissimus Dorsi: Your shoulders are at a high risk for injury when your arms are abducted (pulled away from your body) and externally rotated (pulled back) as in the behind the neck lat pull down. The front (in front of your head) pull down is much safer with no sacrifice to muscle involvement. The front pull down also avoids the possibility of damage to your cervical vertebrae.
4. Deep Squats and lunges for your quadriceps and hamstrings: The risk is to your knees if you squat below 90 degrees, if your toes are not aligned with your knees, or if the weight you are lifting is too heavy.

THE WARM-UP

Exercise physiologists and others who study exercise's effects on the human body agree that warming up is a crucial component in exercise. The science behind this is indisputable—warm bodies simply move better than cold ones do. The science behind this gets a little technical, but it's worth getting to know, especially if your client is not good about warming up now. If anything's going to convert him, this stuff should.

It's common knowledge that activity boosts the blood flow to the muscles, and that oxygenated muscles are more pliable and less likely to get injured.

But even more important, increased blood flow helps eliminate exercise-induced waste products—in particular, lactic acid—from working muscles. Hydrogen ions and the buffer lactate is what makes muscles burn, and the discomfort is what makes people want to quit exercising before they're truly tired. Minimizing lactate results in longer and more productive workouts.

Even when your client doesn't warm up first, the increased blood flow during his exercise program will remove some of these waste products. However, when he doesn't ease into exercise, he's starting at a deficit, and his body has to work harder to do it. It's kind of like starting an engine on a cold morning. You can drive off right away and your car will run okay, but it will run better if you give it minute or two to warm up.

In a study of 12 women published in *Medicine & Science in Sports & Exercise*, researchers reported that warming up before exercise resulted in significantly less hydrogen ion and lactic acid buildup. The results came from studies conducted on 12 women; six actively warmed up before exercise, the others did not.

It's not the worst thing in the world if your client skips a warm up every so often, or if he warms up for less time than he should occasionally. However, the effects of not warming

up are somewhat cumulative, so it's a good idea not to skip this step very often. Your client's muscles won't be as effective at removing waste products as they could be, and his workouts won't be as efficient as they could be. Plus, he'll be at increased risk for injuries.

If your client doesn't have a lot of time to exercise, why would he want to waste it by exercising less efficiently than he could? If your client has to make a choice between warming up and working out, warming up is definitely the better choice.

Warming up provides another important benefit in that it helps your client mentally prepare for the intensity of her workout. She gets pumped up and her attention is focused properly.

A good warm up also improves the nerve connections between the brain and the muscles. Muscle contractions speed up, which makes more efficient.

HOW TO WARM UP

A typical warm-up involves a combination of light exercises that gradually increase until reaching a specific intensity.

There are lots of different ways to warm up. Your client can jog, ride a stationary bike—really anything that gets the heart rate up and the blood flowing will work. That said, experts recommend matching the warm up to the workout for maximum effectiveness. So, for example, if your client is on her way to do a leg workout, she will want to choose a warm up that primarily focuses on the leg muscles such as stationary cycling.

Higher body temperature adds to the benefit of your client's entire workout. It accelerates the rate of all of the bodily processes, speeds metabolism, and improves fat burning.

Regardless of the type of warm up your client does, keeping the following points in mind will make it a good one:

*Don't rush through the warm up; evaluate how muscles feel. If there is any discomfort on any exercise modify it or skip it all together.

*Warm up before you stretch. Never stretch a cold muscle. The warm up prepares the body for activity and prevents injury. Stretching a cold muscle may cause injury. Similar to taking a piece of steak out of the freezer; if you try to bend it, it breaks.

*Warm up longer on cold days. On warm days, your client may be surprised how quickly her body is ready for action. On cool days it may take twice as long to be ready to rumble.

The purpose of the warm up is to get the body temperature up. Don't confuse the warm up with stretching. Be sure that your client is actively moving during your warm up.

GIVE THESE TIP-SHEETS TO YOUR CLIENT TO KEEP HER TRAINING

**Don't just start working out. Get on a program you believe in. This will increase your motivation and provide you with confidence to stick with your workout to deliver the results you desire.*

**Although you may have given up on working out in the past, this program is doable. You don't have to pick one form of exercise and plod through it for the rest of your life. Any exercise that gets you off the couch is fine. Schedule your meals and workout into your day.*

**The best time to work out is when it consistently fits into your schedule. Working out in the morning is a great way to start your day. It's an energizing way to stimulate your metabolism and there is less chance that your workout will be interrupted.*

**Scheduling your workout for later in the evening may be a disaster. Putting off your training until after dinner usually means that it won't get done. Before you know it you will feel sleepy and it's bedtime.*

**Schedule your workout for an exact time on each workout day. Do not deviate from this schedule no matter what.*

**Be honest. In the past, when you missed workouts or quit programs it was partly because you were lazy. This program will help you to figure out what works for you when it comes to staying motivated for longer than a week or two.*

**To get started, your favorite 30 minute easy daily activity plus a couple of days of toning and stretching is all you need. Keep your workouts balanced and progressing. This will keep you motivated.*

**A combination of your eating program and training is your blueprint for a tight toned body. But you have to get started. First thing tomorrow morning, schedule your workout.*

**Take a minute and think about what you would look like in a bathing suit after a couple months of working out. It will feel great to have an upper body you can be proud of. Pull your shoulders back and sit up tall knowing that your shapely shoulders are just around the corner. Don't just read this sentence. Create a detailed mental picture of your defined new body.*

**But be careful, an overzealous training schedule might be the last thing you need. Start slow and progress gradually. Choose activities you love.*

**Create workouts that aren't workouts. Any easy activity counts toward your exercise time. Moving around feels good and getting up and out the door gives you a break from your normal routine.*

**The back of your arms won't stop waving after one work out but you will feel so much better about yourself. Your energy level will increase and you will catch yourself glancing into the mirror to check out your arms.*

**The fat around your upper back doesn't know whether you are walking or skating. And your chest muscles will firm up whether you use free weights or exercise bands.*

**If you hate the thought of "working" out go out and play with your kids or have fun with a sport. Push your kids on swings, play volleyball or tennis. Different activities keep your exercise program balanced. Try new things to keep your fitness moving forward.*

**Use muscles you haven't used before. Challenge your coordination with one-legged exercises. Try playing a game of catch with your other hand.*

**Make your eating program and workouts a habit. Do not miss any meals or workouts for your first month. Clear your schedule to be sure of no conflicts.*

**If you dread exercise and eating properly, tell yourself you can quit after a month. Reward yourself after each successful day of eating and exercise with massages, manicures, or clothing.*

**After you have been working out for awhile, instead of choosing the best "calorie burner", ask your body how the new workout makes you feel.*

**People who stick with their workout programs are not more disciplined than you. They simply found a program that they look forward to doing.*

**Joining a gym isn't required, but it sure helps. Sign up for a long-term membership so that you will be wasting your hard-earned money if you don't go.*

**You will make new friends at the gym. Choose a friend as a training partner. Meet your partner at a specific time to work out.*

**Training with like-minded people is motivating, and a bit of healthy competition is fun. The feeling of driving home from the gym with a lifted chest, toned arms, and a V-back can't be beat.*

**Fifty percent of those who begin an exercise program quit within the first six months because of lack of time, injury, negative emotions, poor social support, or low motivation. You can be the successful fifty percent who face these adversities and overcome them.*

**Most people start working out too hard or not hard enough. If you can only endure for five minutes, so be it. Add two minutes a week until you are training for 30 minutes.*

**You don't have to work out at your target heart rate five days a week and eat like a health nut. Re-evaluate your goals so that your exercise is specific to what you really want.*

**If you don't have much time to workout, break up your program into manageable parts. A full ½ hour may be out of the question so separate your workout into three five minute segments.*

**Alternate five minute bouts of easy activity with five minutes of upper body-isolation or even five minutes of a different form of easy activity.*

**Segmenting your workout into small chunks is fun and gives you great results in a short period of time.*

**Stay cool no matter what. If something goes wrong during your workout, note it, adjust, and then go on (e.g. if you don't get to all of your exercises tell yourself you will get to them next time).*

**Even your best-laid plans may go awry. A phone call five minutes before your workout, or an unexpected trip out of town can ruin your schedule.*

**Have a back up plan. Re-schedule your activity, or take an exercise band in your suitcase for your out of town workout.*

**Change negative feelings and thoughts that distract from your goal. Mentally prepare for an unexpected event. If the phone rings during your home work out, let the answering machine pick it up. Make fitness a priority in your life and you will have a firm and tight upper body before you know it.*

**If you strain a muscle, see your physician and ask if there is a way to work around the problem. Be open to doing different activities outside of your usual regimen.*

**Add a ritual or consistent routine.*

Before biceps curls, set your feet, bring your elbows in close, shoulders back, chest out, take a deep breath and begin your first rep.

**Don't rush through your workout. How many times have you seen gym-rats (not you of course) using their backs to swing the weights up, instead of using good form? They strain their muscles so bad they can't work out for a month.*

**Try this strategy to work the proper muscles and stay safe: Begin by sitting with perfect posture. Squeeze your hands into fists, relax. Bring your shoulders toward your ears, relax. Press your heels into the floor, relax. Press your lower back into the chair, relax.*

**This teaches you to be aware of your muscles while you are training them. Then when*

you are doing your upper body exercises, you will notice if you are unnecessarily straining other muscles.

**Eating rituals are important too. Schedule meals in advance and sit down to all of your meals. Be consistent. Discipline is a skill that improves with practice.*

**Imagine performing the bench press. Pretend you are lying on your back on the bench. Pull your shoulder blades together, your feet firmly planted on the floor, and grab the steel bar. Feel your chest muscles flexing as you take the bar off of the rack and lower it toward your chest. Congratulations. You actually created a mind-to-muscle connection.*

**Watch a mental movie of yourself training. All elite athletes do this. Seeing your workout before you do it is not hocus pocus; it makes your upper body workout easier and more effective. Imagine you are in the cafeteria line. What foods will you choose?*

**Place your right hand on your left upper arm. Feel the definition. Imagine yourself doing a biceps curl. Feel the imaginary flexing of your arm muscles. The more you practice in your head, the more ripped and toned your arms will become.*

**Visualize your body*

You want to have firm arms and a streamlined back. Imagine what you will look like after a month on the program. If you think you are too tired to work out, begin your warm up. If you still feel tired, go for an easy stroll instead of doing your full-blown power walk.

**Picture the training it will take to look good in your swimsuit. When you visualize yourself training, nervous impulses are sent down pathways to stimulate muscle fibers. So you're actually getting a workout just thinking about your well-defined upper body.*

**No incense and candles to a sleek body.*

Keep your eating and exercise program doable. It is better to be consistent and steady than to be perfect for a week and then quit.

**Plan for lapses and relapses. Too many people fall off the wagon and then give up. Lapses are part of this program. Cheat meals, and an occasional week off from exercise are not only acceptable they are required.*

**Skip a workout on purpose. The next day get right back on the wagon. Falling off the wagon is no big deal.*

**Obsessing about exercise is worse than not exercising at all. If you feel as if you can't miss a day, you may be setting yourself up for an overuse injury.*

**Your muscles need to rest and rejuvenate at least one day each week. Your mind needs a day off too. Giving yourself a mental break prevents burn-out and makes you*

more likely to stick to your long-term exercise program.

**No matter your intentions, it's not IF you miss a workout, it's when. You are not perfect in other areas of your life, your workouts won't be perfect either. And a day off may be just what you need to attack your workout the next day.*

**Keeping a log of your workouts can help prevent overtraining or under training. Writing down how long you walked or how much weight you lifted is objective evidence that you are making progress.*

**Self Talk*

If you do not make fitness a priority all you have to look forward to is being out of shape and in poor health.

**Daydream about your goals and you'll get them. Self-talk such as "My arms are becoming defined" raise your enthusiasm. Use your sense of humor every chance you get. Keep your mind on your workout. Use emotions to pump up or relax. Feel strong and know that your body can handle the physical effort. Remain confident no matter what.*

**Integration*

During your easy activity workouts, let your mind wander. Your most creative ideas come to you when you're doing a repetitive activity that doesn't require your full concentration. But don't set out to cure cancer. Use your easy activity time to answer less pressing questions so your workouts don't become work.

**Use your favorite tunes to pump up your efforts. Listen to whatever music gets you in the mood to move. Burn your own CD's of motivating rhythms alternating fast and slow beats to coincide with the intensity of your workouts.*

**Another popular motivational training tool to measure your exercise progression is a heart rate monitor (HRM). Use a HRM to figure out if you are working out too hard or too easy. They are easy to use and are more accurate than taking your pulse from the neck or wrist. Just as your antique personal computer cost a fortune, early HRM's were pricey. Today you can pick one up for less than what you would pay for dinner and a movie.*

**You may be the type of person that needs to get pumped up before you work out. But being too jazzed causes you to lose focus. And if you are too relaxed, you may catch yourself reclining on the couch. Get pumped up but not too much. Your mind affects your workout. Use music, a HRM, TV, or whatever it takes to tie those shoes and get moving.*

SAMPLE RESISTANCE TRAINING PROGRAM (1)

THIS IS ARM DAY. LET'S DO TWO EXERCISES FOR YOUR BICEPS AND YOUR

TRICEPS. AND ONE SET OF TEN REPETITIONS FOR EACH EXERCISE.

1. Reverse curl (forearms; biceps): Grip the dumbbells at thigh level with an overhand grip, hands a little less than shoulder width apart. Bring the arms up from the waist to shoulder level until your biceps touch your forearms. Lower the weights back down to your thighs using your elbows as the fulcrum.

Tip: If it is difficult to perform with both arms, execute unilateral flexions.

2. Arm curl (biceps): Grasp the dumbbells in an underhand grip, palms up, arms close to your sides. Allow the dumbbells to rest against your thighs. Pull the dumbbells toward your chin in a semicircle until your forearms touch your biceps. Keep your wrist locked. Lower the dumbbells on the same path you lifted them. Move the bar (should be dumbbell) up and down slowly through the full range of motion.

Tip: If it is difficult to perform with both arms, execute unilateral flexions.

3. Triceps extensions (triceps): Lie on your back holding one dumbbell in your right hand. Extend the dumbbell into a vertical position and then slowly lower it back towards your left shoulder. Repeat with your left hand.

Tip: Use a weight that is easy to handle while allowing a smooth transition.

4. Triceps kickbacks (triceps): While on your hands and knees grasp a dumbbell with one hand with your elbow at a 90-degree angle. Extend your arm straight back until your elbow is locked. Hold for 1 second then return to the 90-degree angle. Repeat with your other arm.

Tip: Use a comfortable weight, and execute repetitions with slow speed, control, mindfulness, and exhalation on the concentric contraction.

Train smart-- not hard-- by reading and following these suggestions before you begin each workout:

- a. Train each muscle group two times per week.
- b. Ease into your workout. Choose a weight that you can comfortably control.
- c. Start with some easy repetitions, then gradually increase the intensity.
- d. Perform one exercise per body part.
- e. Stretch each muscle group following each set.
- f. Breathe normally during an exercise; however, if you are exerting exhale during the contraction. Inhale on your short rests between each contraction.
- g. Maintain good posture; contract your abdominals; relax your neck; keep your back naturally extended with neutral spine.
- h. Focus your concentration on a specific muscle group. Feel the weight in every repetition.
- i. The amount of weight you lift should never compromise your form. For example, to train your chest and triceps, focus on the pectoral muscles in your chest. Concentrate on pushing with the triceps muscles in the back of your arm.

SAMPLE RESISTANCE TRAINING PROGRAM (2)

SAMPLE LEG DAY WORKOUT

THIS IS LEG DAY. LET'S DO TWO EXERCISES FOR YOUR LEGS. AND ONE SET OF TEN REPETITIONS FOR EACH EXERCISE.

The Quads are the front part of the thighs, and as the name implies, consists of four muscles. The rectus femoris, the large muscle in the center of the thigh, crosses both the knee and hip. It connects from your pelvis to below the kneecap. This muscle can help you bend your hip or straighten your knee.

The vastus lateralis is your very visible outer thigh muscle. This muscle provides the "sweep" – the lower part of the "X" that creates the illusion that your legs attach directly to your waist. When you have well-defined legs, there is a perceptible separation between this muscle and the hamstrings muscle in the back of your legs.

Your vastus medialis is on the inside of your thigh. It creates that "teardrop" appearance just above the knee. Keep this muscle strong to prevent knee problems and to balance out your entire set of thigh muscles.

The vastus intermedius, underneath the rectus femoris, runs from the top of the thighbone to the knee and works to straighten the knee. Place your right hand on your right thigh. Extend your right foot out in front. You can feel the vastus intermedius and your other thigh muscles flexing.

The large muscles on the front of the thigh can be compared to the muscle on the back of the upper arm. That is, by flexing, they straighten the leg.

Different foot positioning during leg exercises target different areas of the thighs. For greater overall development of the front thigh, you want to keep the toes pointed forward and have your feet just outside your shoulders.

To firm your inner thighs point the toes out but keep the feet closer.

For outer thigh development (the sweep), keep the legs close and toes pointed straight ahead.

Heavy squats and partial range of motion leg presses develop the upper thigh, hips and butt. The lower thigh teardrop shaped muscle can be developed with a narrower stance.

The front squat shapes the upper thigh because it targets your rectus femoris that goes all the way up to your hips. When this muscle is developed, it makes your legs appear longer.

1. Half-Squats (quadriceps, glutes, hamstrings): Stand with a dumbbell in each hand, arms extended at your side. With your feet shoulder width apart slowly bend your knees until your upper thighs reach a 45-degree angle. Pause and extend up again, exhaling.

Tip: Keep your cervical spine and back extended.

2. Lunge (quadriceps, glutes, hamstrings): Stand upright with your feet shoulder width apart. Take a natural step forward. Keep your upper body vertical. Lower body straight down until your back knee comes close to the ground. Hold the tension in the front of your leg, then raise your body straight up and return to starting position.

Tip: You may do repetition unilaterally or bilaterally.

INFORMATIONAL TIP SHEETS FOR YOUR FEMALE CLIENT

Women have a different reason to train their hamstrings – cellulite. Every woman has cellulite. Cellulite is simply fat, water and toxins under the tissue beneath the skin causing that "cottage cheese" appearance.

Whether you want to build muscle, lose fat, or incinerate cellulite, your hamstrings workout is a huge part of the solution.

Legs are neglected but the hamstrings are the forlorn stepchildren. The hamstrings are a set of muscles that lie along the length of your rear thigh. They connect near the butt and the back of the knee.

Leg flexing or bending uses the hamstrings muscles. They act in the same manner as the front of your arm ergo leg-biceps.

The three muscles of your hamstrings are the biceps femoris, semitendinosus, and semimembranosus.

The bicep femoris (leg biceps) is the outer sweep of the hamstring. When you turn sideways, this is the muscle that gives your leg that full, sexy look. It has two heads, the long head crosses the knee and the hip, the short one only crosses the knee. These muscles curl the lower leg up toward your butt, and work with your butt muscles to straighten your hip.

As much as you may hate training your hamstrings, it is the most impressive part of your upper leg. Nothing looks better than seeing a firm, rounded group of hamstring muscles.

To improve the lines and symmetry in your hamstrings, train with enough weight that the tenth repetition is a challenge. Your hamstrings are mostly fast twitch muscle fibers.

If you want your hamstrings to be round and full, train them by doing leg curls. But the secret to filling out your hamstring muscle is to keep your ankles relaxed. If you flex your ankle, you use your calf muscle in your lower leg to do the work that the hamstrings are supposed to do.

Train your hamstrings at different angles and intensities to get full development. You can vary your toe position when doing exercises to target different areas of your hamstrings. When you add density to your hamstrings you create a perfect balance with your thighs.

The gluteus maximus (butt muscle) is the largest and most superficial of the three buttocks muscles that form the gluteal complex. So that's where most of your firming will take place. The glutes originates on the back of your pelvis and attaches to the rear thighbone.

While standing, place your right hand on your right bun and raise your right leg backward a couple of inches off of the floor. Feel your glutes flex? This is the muscle that gives your butt that lifted look.

The glutes are the muscles responsible for moving your leg backward and outward. They are the most powerful muscle in the body. You use your gluteals whenever you step, sit or stand.

Straightening your legs from a bent-knee position requires you to straighten your hip. This is a major function of your glutes.

Stand up from your chair and you will feel your glutes tighten. If you want to really activate your glutes, press through your heels when you stand up. You just performed the up phase of a squat called hip extension.

Unlike muscles such as the thigh, the glutes are nearly impossible to train by themselves. When you train your thighs or hamstrings, your glutes usually help.

Since butt firming and toning is a side effect of training your legs, you may not have to give them a second thought.

Even without butt-specific training, you may already have firm tight buns from everything else you do.

But if you don't have the firm butt you desire, small adjustments in your leg workouts can maximize your maximus.

You can maximize gluteal stimulation during the squat by adopting a wider stance. From a wide stance, you increase hip extension and decrease knee extension, so the emphasis shifts somewhat from your thighs to your glutes.

Outer hips

Some people gain cellulite in their lower body while others gain fat around their mid-section. You have probably heard about pear shaped and apple shaped body types, but there is more to your anatomical structure than just fat deposits.

If you have trouble with your saddlebags, flat fanny, thunder-thighs or bubble buns, change your silhouette by training your gluteal muscles layer by layer.

Although you cannot lose your saddlebags on the outer hip by working them, if you tone the muscle underneath the fat, there is an appearance of spot reduction. This is because the overlying fat is stretched over a greater surface due to your increased muscle tone. Your outer hips appear thinner, although the total amount of fat stays the same.

Place your right hand on the side of your right hip. Raise your right leg out to the right side. The muscle that you feel flexing is your hip abductor. It is part of the upper hip. This is the muscle that firms your saddlebag area. It is also called the gluteus medius.

The gluteus medius lies under the gluteus maximus and adds to the roundness of your butt. This muscle connects from the upper pelvis to the upper edge of your thighbone. The gluteus minimus is a smaller muscle that lies underneath the gluteus medius.

These muscles are easy to tone up using isolation exercises. But their most important function is to balance your movement during lunges and squats.

These balancing muscles help with other glute-toning activities that you do outside of the gym such as walking and hiking.

Inner Thighs

If you were asked to demonstrate your muscularity, you would probably flex your upper arm rather than your inner thigh.

Flabby inner thighs are common. Fat and muscle are two separate entities and there is no magic formula to change fat into muscle.

You can't change how your muscles attach, your bone structure, or other hereditary factors, but you can certainly change the overall shape and definition of your inner thighs and improve your symmetry. You can sculpt your inner thigh muscles into a work of art.

Your inner thigh muscles are found deep in the inner groin and along the inner thigh. They are noticeably larger than the hamstrings and are almost as big as the quads.

Your inner thigh muscles are easy to feel with your own hands. Place the palm of your hand on the inside of your thigh. Press your knees together and you will feel the large tendon become firm as the muscles pull taut. Trace the firm shape of the flexed muscles almost all of the way down to your knee.

The five muscles that make up the inner thighs are collectively called the hip adductors, named after the movement they perform, which is bringing the legs toward and across the midline of the body. Individually, these muscles are the adductors magnus, longus, and brevis; the gracilis; and the pectineus. The latter two are also hip flexor muscles.

All five muscles attach from the pubis bone and ischial tuberosities (sit bones) and connect to the thighbone. Two of the adductors, the pectineus and the adductor brevis, are quite short and are connected to the back of the upper thighbone.

The adductor longus and adductor magnus are longer and larger, and connect at the back of the lower thighbone. The longest adductor, the gracilis, inserts below the knee, on the inner upper shinbone.

Together, all five of these muscles pull the thighs together. Several of them also have good leverage to flex the hip, pulling the thigh and torso toward each other.

The inner thigh muscles help you to keep your balance and are used for walking, standing, or climbing.

The other actions of the inner thigh muscles are quite complicated. Depending on the position of the leg, they may also help rotate the thighbone internally or externally in the hip socket, or help straighten the hip.

These options provide you with multiple ways to train them to become firm and toned. Read chapters four through six to do just that.

SAMPLE RESISTANCE TRAINING PROGRAM (3)

Today's program: This is chest and back day. Let's do one exercise per body part. Do one set of 10 repetitions for each exercise.

Bench flies (pectorals; triceps): Lie on your back on a bench, grasp the dumbbells in an overhand grip and extend your arms from your chest-level upward. Have enough weight to provide tension so you can keep the dumbbells moving smoothly and evenly. Keep your elbows slightly bent through the full range of motion. Feel your chest and triceps working. Keep the back of your head, buttocks and lower back in contact with the bench. Arching your back takes the pressure off the chest and triceps. Tip: To take pressure off the shoulders, avoid a wide grip.

Single-handed Latissimus Dorsi work: Grab the dumbbell with one hand and start the exercise at your hip while the same knee is braced or kneeling on a bench. Extend the arm as far down as you can toward your side and feel a pulling sensation in your Latissimus Dorsi. Then lift the dumbbell to your hip as the resistance presses down. Reverse hands and make sure to move through a full range of motion.

Tip: Begin the movement from your shoulder blade instead of your arm.

SAMPLE RESISTANCE TRAINING PROGRAM (4)

Your client has one-hour to get in and out of the gym, and that includes her shower. Might as well give up, right? Wrong. She can get a full body workout in 45 minutes. That leaves 15 minutes for a quick rinse and change back to the real world. Here's how to get fit in 45 minutes three days a week. Her first trick is to change outfits at super-speed. To do this, she becomes her favorite super hero. Suggest that she wear her workout suit underneath her dress clothes. She can shed them in the blink of an eye, and she's ready to fly.

Teach her to set her alarm-watch to buzz at five-minute intervals. Her first five minutes is her warm up. She can walk in place for 5 minutes. She may prefer to walk on a treadmill that's okay (but she's still walking in place). Once her muscles are warm she can begin strength training. She should spend 5 minutes on each muscle group. She can split her muscle groups so that she trains chest, shoulders and triceps on day 1 (e.g. Mondays), legs, back and biceps on day 2 (e.g. Wednesdays), and abdominals, lower back and forearms on day 3 (e.g. Fridays). During her first two weeks, be sure that all of her repetitions are easy to accomplish. Focus on her form. Keep the weights light in the beginning to emphasize mindfulness and form over weight. Quality counts over quantity.

Day 1:

5 minutes - Chest

1 set of 10 repetitions flat bench press with dumbbells, barbells or machines.

1 set of 10 repetitions of incline bench press with dumbbells, barbells or machines.

1 set of 10 repetitions of decline bench with dumbbells, barbells or machines.

5 minutes - Shoulders

1 set of 10 repetitions of lateral raises with dumbbells, barbells or machines.

1 set of 10 repetitions of front raises with dumbbells, barbells or machines.

1 set of 10 repetitions of rear deltoid raises with dumbbells, barbells or machines.

5 minutes - Triceps

1 set of 10 repetitions of triceps kickbacks with dumbbells, barbells or machines.

1 set of 10 repetitions of close grip bench presses with dumbbells, barbells or machines.

1 set of 10 repetitions of triceps extensions with dumbbells, barbells or machines.

Day 2:

5 minutes – Legs

1 set of 10 repetitions of squats with dumbbells, barbells or machines.

1 set of 10 repetitions of leg extensions.

1 set of 10 repetitions of leg curls.

5 minutes – Back

1 set of 10 repetitions of seated rowing with dumbbells, barbells or machines.

1 set of 10 repetitions of lat pull downs.

1 set of 10 repetitions of reverse grip lat pull downs.

5 minutes – Biceps

1 set of 10 repetitions of straight bar biceps curls with dumbbells, barbells or machines.

1 set of 10 repetitions of hammer curls with dumbbells, barbells or machines.

1 set of 10 repetitions of reverse curls with dumbbells, barbells or machines.

Day 3:

5 minutes – Abdominals

1 set of 10 repetitions of crunches.

1 set of 10 repetitions of oblique twists.

1 set of 10 repetitions of reverse crunches.

5 minutes – Lower Back

1-30 second set of Superman's.

1-30 second set of Superman's (reverse arms and legs).

1-30 second set of holding a Superman with both arms and legs extended.

5 minutes – Forearms

1 set of 10 repetitions of supinated (palms up) wrist rollers.

1 set of 10 repetitions of pronated (palms down) wrist rollers.

1 set of 10 repetitions of externally rotated (palm sideways) wrist rollers.

The lactate she built up during her strength workout will be converted into glycogen to energize her 20 minutes of cardio. Allow her to choose her favorite aerobic activity. Her heart doesn't care if she stair climbs, walks, jogs, jumps rope, swims or glides. Begin with a low intensity 5 minute warm up. During the next 5 minutes, tell her to pick up the pace so that she is huffing and puffing a bit, but can still talk comfortably. Her next 5 minute segment will be her walk-stroll intervals, so for 5 seconds she walks fast, and then for 5 seconds she recovers with an easy stroll. Her last 5 minutes is her cool down. This is her stroll celebration. Let her enjoy this period and reflect on her great workout.

Five minutes remain. That's plenty of time for a full-body stretch. Of course, to

increase overall muscular flexibility, more time overall is more ideal. In the five minutes, teach her to stretch her calves, quadriceps, hamstrings, hips, gluteals, back, abdominals, chest, triceps, biceps, and neck. Have her hold each stretch for at least 15 seconds, maintaining constant breathing.

As a personal trainer, using the EXERCISE PRINCIPLES may assist you whenever you are working with clients, whether you are prescribing a single exercise or an entire program. Keeping them in mind will assist you.

PROGRAM DESIGN

1. What is the <u>PURPOSE</u> of the exercise?
2. What is the proper <u>POSITION</u> or <u>POSTURE</u> in which to perform the exercise? Is the body properly aligned and does it maximize the use of resistance (i.e. the <u>PULL</u> of gravity and/or the weights)?
3. What is the appropriate <u>PROGRESSION</u> ? How can the difficulty and intensity be increased or decreased?
4. What is the appropriate <u>POPULATION</u> and <u>PRESCRIPTION</u> ? For whom is this exercise appropriate and how can it be modified to accommodate a variety of fitness levels.

60 IS THE NEW 40

Your older adult clients are at risk for osteoporosis and bone fractures. Three high-risk areas include your client's lower spine, hips, and wrists. Years ago, if you acquired osteoporosis and were not feeling well, a physician might have prescribed rest. Now, doctors dictate exercise such as fitness training.

Do not attempt to have your older adult client follow their grandchildren jumping off monkey bars and out of swings. They may have difficulty with eccentric contractions (jumping down and landing) and forceful movements. Instead, strength training with dumbbells or weight machines is beneficial. Lifting weights strengthens bones. Muscles pull on tendons that pull bones. Proper nutrition and hormone levels mediate improvements in bone density.

As you mature, you lose Type II B Fast Twitch muscle fibers. Your muscles tend to get weaker and smaller. Strength training reduces their rate of decline. You can enhance your client's strength using a resistance program. The first phase of her improvement is due to neurological efficiency. She learns to recruit more muscle fibers. Sending signals from her brain to her muscles keeps her muscles activated.

The second phase of her development stems from strengthened connective tissue. Tendons and ligaments become more powerful, rendering strength training extremely beneficial for the older adult. One study showed that not only did lifting weights increase strength by 50 percent, but also subjects walking time improved by a significant factor. Strengthening muscles increased walking speed, regardless of aerobic condition.

Another study investigated the relationship between older adults and reaction time/movement time. Reaction time was designated by the amount of seconds it took for older adults to begin to respond to a stimulus. Movement time was the number of

seconds from the initiation of effort until completion of the action. Subjects were instructed to walk normally through a pathway. When a light randomly blinked, subjects were required to stop and turn in one direction or the other. Results demonstrated that older adults had normal reaction time. Their movement time was compromised compared to their younger counterparts, however.

Roberta Rikli, Ph.D., professor of kinesiology, reported in the March 1994 issue of Research Quarterly that strong muscles reacted quicker than flabby ones. Forty-four women hit a footpad when a signal was given. Those with the strongest leg muscles reacted the fastest. Toned muscles have more nerve fibers and blood vessels to help the impulse get from thought to action.

Resistance training improves balance. Sometimes, the heavier the weight, the better. Always begin light, however. Gradually add weight. Be sure your client can perform ten repetitions with mindful form before advancing to a heavier weight. Do not increase resistance more than five percent in a single workout. If you do not have adjustable, light, weights, have your client perform more repetitions at the previous intensity. Most gyms have 10 pound weight increments. After she can perform 18 repetitions, increase the weight ten pounds.

Ask your older adult client to extend a dumbbell to the front of her body. Muscles in her back must counterbalance. Raise a weight from your side. Muscles on your other side brace your effort. Whenever you lift free weights, muscles throughout your body must stabilize your motion.

Consider older adults unfamiliar with weight training. They grasp five-pound sets of dumbbells and lift them to waist level. Their blood pressures rise, at first. If these individuals continue to strength train, their bodies gradually adapt and grow stronger. The stronger they become, the less their blood pressure increases upon physical demand. Soon, hoisting five-pound dumbbells affects their blood pressure as if they were plucking a blade of grass.

Remember the following general **guidelines** for the older adult:

Weight training **guidelines** for the older adult:

1. The first eight weeks should employ minimum resistance to allow for connective tissue to strengthen.
2. Emphasize alignment in technique and maintain normal breathing, exhaling on the exertion, or concentric phase. Perform all exercises in a controlled manner. Never let the amount of weight dictate form.
4. Exercises should be performed in a range of motion that is pain free.
5. Perform multi-joint exercises (closed chain) as opposed to single joint exercises.
6. Strength training should be performed regularly, not hit or miss.

OLDER ADULT RESISTANCE TRAINING

Include at least one resistance exercise for all major muscle groups including quadriceps (thighs), hamstrings (back of thighs), gluteals (hips), pectorals (chest), Latissimus (back), deltoids (shoulders), trapezius and rhomboids (upper back), abdominals, and erector spinae (back). Ideally, each training session should be completed within 30 minutes. As with any age, sessions lasting longer than 60 minutes may have a detrimental effect on exercise adherence because workouts may be too complicated for clients.

The first eight weeks should employ minimum resistance to allow for connective tissue adaptation. Emphasize technique and breathing. Initial overload should be achieved by increasing the number of repetitions, and later by increasing the weight. All exercises should be performed in a controlled manner, never using a resistance that would prohibit your client from completing at least eight repetitions. Exercises should be performed in a range of motion that is pain free. Your client should perform one set of 8-12 repetitions with a specific weight that elicits a perceived exertion rating of "somewhat hard."

Strength training **tips** for the older adult:

1. When returning from a layoff, use a resistance that is less than 50 percent of the previous intensity, and gradually increase the resistance.
2. Wear proper footwear (good traction/proper cushioning).
3. Avoid all jerky, rapid twisting or turning of any body part.
4. Avoid excessive compression of the abdominal area.
5. Avoid bending all the way over at the waist; flex instead from the hip.
6. Avoid standing on one leg for longer than eight counts.
7. Do not allow your client to hyperextend the cervical vertebrae. This can cause dizziness.
8. Avoid letting your client drop her arms forcefully from a position above her head or out to the sides. After lifting the shoulders up, the return to neutral should be slow and controlled.
9. Alternate finger work with wrist work in order to prevent overstressing potentially inflamed joints.
10. Avoid forcefully rotating from side to side.
11. Keep your client's back in a neutral position; spine relaxed up against the back of a chair to allow for more freedom of movement from the hip socket.
12. Whenever your client's legs are extended to the front, be sure that she keeps her

abdominal muscles engaged and back straight with no hyperextension of the lower back.

13. If she performs push-ups, be sure she avoids flexing her elbows more than 90 degrees.

14. Do not allow her to perform wall sits if she is unsteady or has weak quadriceps.

If your client is an older adult, be aware of a few modifications in her training program. Her vision, hearing, balance, and reaction time may decrease. Her strength and endurance functional capacity may lessen, causing her to lose muscle mass and reduce her aerobic capacity. None of this means, however, that older adults should throw in the towel. In fact, the opposite is true. A recent study demonstrated that men and women in their eighties and nineties improved their strength 150 percent on a sixteen week weight training program. Many walked without their canes, and stood up from a seated position without assistance. It is well documented that elite athletes train well into their twilight years.

III. EAT TO LOSE FAT AND GAIN MUSCLE

Exercise will keep your client halfway fit. The other half is eating. Despite low-fat foods and diet programs, Americans are fatter than ever. In the 1990's we gained an average of eight pounds according to the July, 1994 edition of the Journal of the American Medical Association. In 1993 American dieters trying to get thin spent thirty-two billion dollars.

What if I said your client could go off her diet, lose her rumbling stomach, be less irritable, eat more calories, eat **six times a day**, and actually lose body fat and feel great? You'd think it was another scam-diet-claim. Six meals a day is a lifestyle change providing increased energy. If you took a month's worth of food out camping you wouldn't eat it all in the first week. Likewise, rather than consuming three large meals, spread your calories into six small meals each day. Eating six meals a day is also beneficial for lowering your Low Density Lipoprotein (LDL) cholesterol. In the European Journal of Clinical Nutrition (1994), McGrath and Gibney found that subjects who simply moved from three meals to six meals a day significantly lowered their LDL cholesterol.

After three weeks of eating six quality meals each day greasy foods and rich desserts are not "to die for." You will crave what your body needs, not what some television commercial fools you into believing. When you diet, you lose muscle, water, and fat. If you cut your calories too far without exercise, for every 10 pounds your client loses, four to six of those pounds will be muscle. Each time she goes on a deprivation diet, her body finds it easier to conserve fat. Skipping calories usually means skipping breakfast. If she misses breakfast, her body will fall into a starvation mode holding onto fat. When she finally eats, she may eat too fast or too much, increasing fat storage.

For years, bodybuilders have known the secret for losing fat without sacrificing muscle. Six small and quick meals each day replace three marathon-gorging sessions. Each meal includes a serving of protein, two servings of a carbohydrate, and adequate amounts of fat. Vary the number of calories your client eats on a daily basis so her body doesn't adapt, lowering its metabolism. Eating to energize workouts is tantamount to exercise success.

STARVE YOUR FAT

Most Americans eat red meat, chicken, turkey, pork, potatoes, salads, fruits, rice,

beans, peas, and grains. Lean folks eat the same foods; they merely prepare them differently. They choose round steak instead of hamburger, chicken and turkey breasts instead of dark meat, pork loin instead of bacon, baked potatoes, rice, and beans, instead of French fries, fried rice, and refried beans. They trim the fat and bake, broil, and grill rather than fry.

We do need dietary fat. We should consume about 25 percent of our calories from fat. The more you exert, the more food you need.

Your final step is to teach your client to respect healthy routines and end bad patterns. No more dieting. Remember the last time she dieted? She gave up all of her favorite foods. Then after a month, she was blindsided by a pizza commercial. She decided to eat just one slice of pepperoni pizza and save the leftovers. The last thing she remembered was devouring the entire pizza and thinking, "I blew it so I might as well indulge in a carton of ice cream." And she proceeded on a Blue Bell frenzy. Days later, pants were tight. She "fell off of the diet wagon," gained all her weight back, plus a few pounds. The same foods she abandoned when she started her diet were the ones that precipitated a binge. She thought it was her fault that she couldn't resist cravings. She blamed it on lack of willpower. But she didn't fail. Her diet failed her.

Beware of celebrating or drowning your sorrow in edibles. A recent study in the February issue of the American Journal of Clinical Nutrition concluded that stomachs actually stretch after a humongous meal. Dr. Allan Geliebter suggests:

packing in huge amounts of food in one sitting is the culprit. Many overweight clients skip breakfast and have a very small lunch. That's probably not enough time to shrink stomach capacity. And, by the time dinner rolls around, they're ravenously hungry and swallow huge volumes of food. Night after night following this eating routine might eventually increase stomach capacity. The now-larger stomach requires more food to feel full.

Strive to keep your client's blood sugar level stable. Tell her to feed her muscle. Starve the fat. Keep your client on a tolerable eating and exercise program all of the time rather than depriving her, and then doing a food fling. Be patient. You lose fat in ounces, not pounds. Develop healthy habits for your client, and soon she won't obsess about food.

Decide the hours during the day when your client is normally hungry. If she doesn't know what it feels like to be hungry, symptoms include feelings of listlessness and fatigue. Her blood sugar may drop. Fad diets don't work. Temporary weight loss programs provide temporary results. It's easy to follow a step-by-step plan of cabbage or grapefruit and lose weight. The weight your client loses is fat, muscle, and water, probably not in that order. When she returns to a semblance of her normal eating pattern she will gain her weight back, and more.

KNOWING WHAT TO DO AND DOING IT

Losing weight does not require willpower; what your client needs is information. Ninety five percent of those who attempt a low calorie diet gain their weight back, and more. There are no "magic" foods that automatically mean the same benefits for all people. Clients cut calories and increase their activity too much, slowing their metabolism. Their energy levels drop, and then their bodies conserve fat. Instead of fueling their muscles throughout the day, most clients "backload," meaning that they eat

late in the day. This helps to conserve fat. Excuses include no time or money. It is, in fact, less expensive to pre-prepare foods in plastic containers rather than rushing to a fast food establishment and paying several dollars for a baked potato.

MEAT

The leanest cuts of beef are sirloin tip, eye of round and round steak. Look for "select" over "choice" and "prime," which are fattier. Pork center tenderloin and Canadian bacon are the leanest pork cuts. Small chickens are leaner than larger ones, and turkey breast is leaner than chicken. The least fatty fish are cod, flounder, haddock, scrod, halibut, shrimp, mussels and lobster.

CHEESE, NUTS AND SEEDS

The lowest fat cheeses are feta, farmer's cheese, low-fat cottage cheese and a cream cheese you make with low-fat yogurt. Cream cheese is 85% fat while low-fat cottage cheese is only 12%. Nuts, seeds and peanut butter are 85% fat. Chestnuts have less fat.

WATER

Approximately seventy percent of your body is water. Water is needed to digest and absorb food, transport nutrients, build and rebuild cells, remove waste products and enhance circulation. Eight glasses of water is enough for a sedentary couch potato, but not for your client. Many people are chronically dehydrated. Your client needs about one milliliter of water per calorie expended. That means if she burns two thousand calories a day with exercise, she needs an additional two liters (two quarts or eight cups). If she drinks enough water to support her exercise, blood-sludging effects of dehydration will be transformed into super-hydrated peak performance. Her thirst mechanism may malfunction during exercise. Contrary to the opinions of health-fanatics, it is not mandatory to drink pure water all of the time. Juices are ninety-five percent water and oranges, ninety percent. Also, soups, grapes, and yogurt are mostly water. Coffee and tea are ninety-nine percent water but the caffeine produces a moderate diuretic effect.

Tell your client to work out with a bottle filled with "the fluid of your choice" says Nancy Clark, MS, RD, nutritionist at Sports Medicine, Brookline. Drink at least 16 ounces of beverage up to two hours before exercising, and then at least 4 to 8 ounces 5 to 10 minutes before workouts. When it's hot and humid, drink more. An overall general rule of thumb is to drink about one quart of water for every 1000 calories expended, suggests Nancy Clark.

Like any balanced eating program, your client's eating plan calls for consuming a variety of wholesome carbohydrates, lean protein and essential fats. There's no way around this, and no magic formula when it comes to eating. All fad diets do are create temporary weight loss and temporary results. Eating sensibly is the only way to create long-term success.

All fad diets are exactly that: fads. They deliver only short-term results. For long-term success, eat balanced meals consisting of protein, carbohydrate, and essential fat.

Following a well-balanced eating and exercise program requires knowledge and discipline, not willpower. Gain the knowledge, apply the discipline, and you won't have to starve or deprive yourself. Develop healthy habits and you won't obsess over food.

How much food your client needs to eat depends on three basic factors:

- her metabolism.
- the amount of exercise she gets.
- Whether she wants to lose, maintain, or gain weight.

In general, the harder the activity and the higher the metabolism, the more calories she'll be able to eat regardless of her specific weight goals. Since fitness high level activity burns so many calories, she won't have to starve herself to lose weight, if that's her goal.

The food that you eat is either burned up by your metabolism or activity, stored in your muscle as glycogen for energy, or stored in your fat cells as fat. Although setting a specific caloric goal depends on many factors, you can use the following guidelines as a start:

- If you want to maintain your weight, eat about 10 times your body weight in calories. As an example, if you weigh 150 lbs., you should be able to take in 1,500 calories a day.
- To gain weight, multiply your ideal body weight by 13. Be sure to add resistance training to the formula so you gain muscle, not fat.
- To lose weight, you should also eat 10 times your body weight in calories.

Never eat less than 1,000 to 1,200 calories a day. Doing so can slow your metabolism and put your body into starvation mode, which will actually make your cells want to hang onto their fat stores. This is why it's a good idea to do some mini-workouts between meals. Three minutes of body weight squats tones muscle and burns up any excess calories that would have been stored in the fat cells.

Making small changes in form can make a big difference in caloric output. Lifting your knees higher or moving your feet faster will increase calorie burn.

If your client is gaining weight and she doesn't want to, have her cut back slightly on her intake. If she is losing weight, and that's not her goal, add some calories.

As she gets fitter and adds muscle, she'll also be able to eat more, in order to maintain her muscle mass. Muscle is a significant part of metabolism, so she should do everything in your power not to lose it. If she is working out a lot, she must eat properly to keep her muscles fueled.

The bigger you are, the more calories you burn. The harder you work, the more calories you use. The more fit you are, the more calories you burn, even when you're asleep.

In recent years, carbohydrates have gotten a bad, and very undeserved rap for being the culprits behind increasing obesity levels in certain populations—Americans among them. But carbs, in and of themselves, are not the problem. They don't make you fat. Calories do.

Bottom line, if you eat more calories than you burn, you'll gain weight. So, don't skimp on the carbs. Just eat ones that are good for you. In general, they include:

- Whole fruits
- Whole vegetables

Basically, anything that's not overly processed. In fact, eating foods that are as close to their original state as possible is always better than eating food that's so far away from this state that you're not quite sure where it came from. They contain fewer calories than processed foods, and they're more nutrient dense. As an example, compare the calorie counts of the whole foods and the processed foods below:

Oatmeal, 1 cup 147 kcal. Honey Nut Clusters, 1 cup 214 kcal.

Apple, 1 medium 65 kcal. Apple juice, 1 cup 174 kcal.

Couscous, 1 cup 176 kcal. Spaghetti, 1 cup 197 kcal.

1 Banana 75 kcal. 1 Bagel, 4 ½ inches in diameter 303 kcal.

The other reason why it's a good idea to stick with unprocessed carbs as much as possible is because they're lower on the *glycemic index* than other, more highly-processed foods.

Glycemic index refers to how quickly food enters your bloodstream from your digestive system.

The higher the glycemic index, the faster food travels from your digestive system to your bloodstream. Your pancreas produces insulin to drag the sugar from your blood stream into your cells. When you eat high-glycemic index foods, it has to work harder. The result: your blood sugar drops and you're hungry again.

You can slow down the rate at which high-glycemic foods enter your bloodstream by pairing a serving of protein with a carbohydrate. The protein slows down the release of the sugar in the carbohydrate. This approach also slows down your digestion and will help you feel satisfied longer.

Carbohydrates are the quickest and most efficient fuel source for the muscles and the brain, and will provide quick energy to power your client's workout. When your client eats a meal with carbohydrates, his muscle and brain uses this energy quite readily. Fat and protein take longer to digest and also take a lot longer to break down than carbs.

If your client eats starchy carbs, she should stick with slow-release carbs such as oatmeal and whole grains. These long-chain carbs stay with your client longer and provide her with much-needed vitamins, minerals, and fiber. Plus, they're whole foods, and the fiber they contain slows digestion. It also helps delivery energy to the bloodstream at a slow, constant rate.

If your client eats sufficient nutrient dense carbs, the protein that he consumes is used to repair and tone muscles. If doesn't eat enough carbs, the protein he eats has nowhere to go except to be used for energy.

When your client doesn't eat enough carbs, his body uses the protein from muscle for energy. He feels sluggish and his workouts suffer. Under-eating carbs and over training slows the metabolism. Your energy levels drop and your body conserves fat.

But when you eat enough nutrient dense carbs, your workouts are energized and you lose fat more readily. There is an old saying that "Fat burns in a carbohydrate flame".

If you eat huge quantities of food in a single sitting, your body stores what is not needed as fat. A few hours later, you will be hungry again even though your fat stores are full.

Nutrient dense fruits and veggies give you the energy you need without adding fat to your body. Fruit comes conveniently wrapped in a protective skin so that you can eat it when you need it.

Protein

Protein is the other main component in your client's nutrition program. Be sure to include at least one serving of protein at each meal. Not only is protein the foundation for hard-earned muscle, it helps slow down carb release so your client will feel full longer.

Good protein choices include the following:

- Any red meat with the word loin or round in it (sirloin, tenderloin, eye of round, round steak). A serving is about a size of a deck of cards.
- Chicken – one small breast.
- Fish – the equivalent of about a deck of cards.
- Eggs – two whole.

- Low-fat dairy products – one cup.*

*Serving size depends on your size and your goals. If you want to gain muscle, you should eat several small meals throughout the day, and include a serving of protein at each meal. Figure about .8 grams of protein per pound of body weight.

Kidney beans, dried peas, lentils and other types of beans are also good, low-fat protein sources. They're also an excellent source of fiber, which is why you tend to feel fuller longer when you eat them.

Fats

You need fat in your fitness program to keep you fit and healthy. Drizzle a tablespoon of olive oil, flaxseed oil or canola oil into your meal plan. Eat omega three fatty fish whenever you can. Grab a handful of seeds or nuts. Peanut butter on whole wheat is also a great source of essential fat.

Essential fats are good for your joints, skin and hair. Fats also provide “satiety,” which means you feel more satisfied after a meal.

You can choose from a number of different fats to satisfy your palate. Try to avoid trans fats as much as you can. These are products with the word “hydrogenated” on the label. Trans fat has been proven to be a major culprit in causing cardiovascular disease. Trans fats add to the shelf-life of food products, but decreases your shelf-life. Trans fat is also used to change the consistency of foods. One reason margarine stays solid at room temperature is because of the addition of trans fat. Cookies, baked goods, and any other products that have been in your cupboard for a year and still appear fresh when you take off the wrapper are probably loaded with trans fat.

Instead of trans fat, choose monounsaturated or polyunsaturated fats and oils. Many of the oils mentioned earlier are perfect for cooking and dressing up your salads.

If you are choosing between an omega six and an omega three fat, look for the one that contains omega three fatty acids. You can find omega three fats in fish, flaxseed oil, and canola oil.

Omega three fatty acids are great for oiling up your joints, lubricating your skin as well as preventing cardiovascular disease.

Staying Wet

Water is a coolant that circulates through your blood to help you digest and absorb food, build and rebuild cells, transport nutrients, and remove waste products.

Drink about 64 ounces of water a day. If you have a tough workout planned, drink more than that. If it is hot and you are sweating profusely, drink even more.

Get in the habit of drinking water instead of soft drinks. A can of your favorite sweetened beverage contains about 10 teaspoons of sugar or corn syrup.

Your muscles are 70 percent water. Before you begin your workout, drink two cups of water. To stay trim and toned, drink eight ounces of water every 20 minutes throughout your workout.

At first prime the pump because you may not feel thirsty. Sip a few gulps of water every few minutes. It is very difficult to drink too much water. If you have to run to the bathroom a time or two, you will burn a few extra calories sprinting back and forth.

Most people work out and don't recognize that they are dehydrated. Drink enough water so that your urine is clear. Water speeds your metabolism and facilitates the fat burning process.

You may not enjoy the taste of water, but try it ice cold with a twist of lemon. Drink flavored water and tea until you bite the bullet and go all- natural.

If you are working out in a hot, humid environment, your thirst mechanism may malfunction during your training. Bodyweight may drop a few pounds before feeling thirsty. It's possible you may dehydrate or experience hypoglycemia during a workout.

Be sure your muscles are fully hydrated before and after each training session. Sip water before, during and after your workout, and drink before you get thirsty.

Sports Drinks

If you haven't eaten a meal before your work out, your blood sugar may drop after you throw your first few punches. To prevent hypoglycemia, sip carbohydrate juices or sports drinks between exercises. Carbohydrate sports drinks and juices are quick energy.

Look for sports drinks with between 10 and 20 grams of carbohydrates per eight ounce serving. Sometimes they are too sugary. If so dilute them with water. Make sure your drink has equal amounts of potassium and sodium (about fifty milligrams in an eight ounce serving).

A variety of sports drinks are on the market. Be sure you enjoy the taste and you will be more likely to drink it.

If you're doing heavy, intense workouts and don't include enough fruits and vegetables in your diet, your sodium levels might drop too low when you work out. This is called hyponatremia, and it's easily remedied by sipping sports drinks with 50 mg of sodium per eight ounce serving.

Putting It All Together

You may say that you do not have the time or the money to eat properly. It is less expensive to pre-prepare foods in plastic containers than it is to rush to a fast food restaurant and pay several dollars for a baked potato and chicken salad.

Rather than blindly following your food urges, spend a few minutes each evening planning the next day's meals and snacks. If you already have pre-prepared meals in your fridge, you will be less likely to swerve your vehicle into a fast food restaurant. Pre-prepare meals in advance and you actually save time. Slice up a bowl of your favorite veggies, grill some lean meat, add your favorite rice dish and you have a week's worth of food stored in the fridge ready and waiting.

Eat throughout the day to fuel your workouts. Fuel your muscles in the morning with a nutrient dense, muscle building breakfast. Try your favorite fruit with cottage cheese. Make your own egg-white omelet filled with your favorite sliced veges. Oatmeal is always the traditional best choice for breakfast because it gets you through your morning. Add any fruit to your cereal and you're ready for your day.

Between breakfast and lunch choose a snack that will stop your stomach from growling. A protein carbohydrate combination such as yogurt and a banana or turkey on whole wheat works.

If you didn't get any veggies in your breakfast or mid-morning snack, make it a point to include a veggie side dish at lunch. Choose a serving of fish, chicken, or lean red meat. And if you are planning to work out between lunch and dinner, be sure to add a starchy carbohydrate such as potato, corn, beans, peas, or rice.

About mid-afternoon, your shoulders slump and your eyes droop. Don't give in to a candy bar and soda. Choose a nutritious high energy snack such as cottage cheese and fruit, sliced veggies, or even a plastic container with the remnants of last night's broccoli chicken casserole.

Dinner time is not an all-you-can-eat until it's time for bed extravaganza. Since you have eaten wholesome meals throughout the day, your last meal should simply ice the cake so to speak.

Complete your day with a balanced meal including your favorite lean meat, as many fibrous veggies as you can stand, and a serving of a starchy carbohydrate. If you are planning to train after dinner, two serving of starchy carbs may be just what you need to top off those muscle glycogen stores.

Eat before your stomach starts growling and drink before you are thirsty. Never let yourself go more than a couple of hours without sustenance.

If you allow your body to become ravenously hungry you crave high fat and high sugar foods. Your body knows that's where the mega-calories are.

Serving It Up

On a round plate, 1/3 should be a lean protein from chicken, fish, or low-fat dairy, 1/3 a fruit or a starchy carb such as whole grains, rice, potato, beans, peas, or corn, and then eat as many fibrous vegetables from your garden as you want. Add a tablespoon of your favorite healthy essential fat on your veggies or in your salad and you're on your way to that lean boxer's body you deserve.

Healthy meals that fuel your muscle include:

- Turkey burrito with low-fat cheese, sour cream, whole-wheat tortilla, fruit.
- Chili with beans and meat, with some sort of grain, fruit, yogurt, etc.
- Stir fry chicken and veggies in canola oil with brown rice.
- Grilled lean beef fajitas with no added oil (use lemon juice) with sliced peppers, onion, and tomatoes. Corn tortillas, salsa. An order of frioles and if you're still hungry, some fruit for dessert.

Breakfast

Eating breakfast is the single most important feat you can accomplish to insure you will lose body fat. Breakfast revs your metabolism and energizes your day. If you eat a healthy breakfast, your workouts will improve and you will eat less total calories throughout the day. If you don't eat breakfast you will make up for it by eating more empty calories later.

As mentioned previously, breakfast is your first stop to energize your workout. If you want to keep your body muscle toned and strong, eat a balanced, wholesome breakfast.

After fasting all night your muscles need energy. Eating breakfast not only increases your energy for your fitness boxing workout, it also helps you make better food choices for the rest of the day.

You might not be hungry in the morning, but eat or drink anyway. Begin with a glass of juice and eventually you will wake up looking forward to a hearty, nutritious breakfast.

Don't be overzealous and attempt to cut calories and increase your training to accelerate weight loss. If you don't eat enough to support your workouts, your body uses your muscle for energy. Under eating and overtraining slows your metabolism. Your energy levels drop and your body conserves fat.

Try eating mini-meals through the day rather than a few super-sized feedings. Smaller meals keep a steady flow of energy from your bloodstream to your muscles. You will succumb to fewer peaks and valleys and feel pumped for your workouts.

If you claim that you don't have time for breakfast, eat only a salad for lunch and then don't stop eating all night, you have discovered a perfect way to gain fat. Fuel your muscles through the day instead of back loading.

Fuel the fire by eating breakfast-snack-lunch-snack-dinner. This style of eating keeps your metabolism revved all day. Plus, you're constantly feeding your muscle so you don't have to worry about them being used for energy.

Mini meals stabilize your blood sugar and diminish cravings. Feed your body properly throughout the day and your body won't go crazy eating all of the food in the house at night. You will feel better, your workouts will be more intense, and you will lose weight.

Eat and drink appropriate meals to accommodate your energy expenditure and use a variety of mid-meal snacks to fill in the gaps. At first, use trial and error to figure out how much to eat at each meal.

You need stored energy to complete your fitness boxing workout. Eat a balanced diet throughout the day to keep your body firm and tight. If you eat meals and mini meals every few hours, you won't have to worry about not having enough energy to complete your workout.

Eating Before Working Out

Your muscles love to be fed before and after workouts. Eating before your workout provides your muscles with ample energy. Eating after your workout revitalizes and refuels them.

Before your workout be sure that your muscles are loaded with energy. A complete meal a couple of hours before your workout is perfect. If it has been several hours since your last meal and you are preparing for your workout, grab a carbohydrate/protein energy bar or drink to fuel your muscles.

After your workout, grab a sports drink or glass of juice to energize worn out muscles. Your depleted muscles need energy to return to normal function.

Include a little protein into your after-workout snack. Working out tears down muscle tissue. Protein rebuilds muscle. Add a tuna on whole wheat with that glass of juice.

Eat a four to one ratio of carbohydrates to protein as soon as you can after your workout to speed nutrients to your depleted muscles. After you work out your muscles are starving for energy. The sooner you eat after you complete your workout the better chance your muscles will be replenished and refueled for your next session. Try to eat between 30

minutes and an hour after training. The longer you wait, you lose the window of opportunity to restore and rebuild your worn out muscles.

- Eating right is essential to building your client's body.
- Not eating enough can lead to over-training. If you don't eat enough to support your workouts your body will use your muscle for energy.
- Don't miss meals. Skipping a meal is as deleterious as eating a "forbidden food."
- Know the times when you get hungry and have food available. Carry wholesome snacks with you to work so that when cravings hit you will be prepared.
- Know what you are going to eat tomorrow. Pre-prepare your meals in advance so that you won't be tempted to make bad food choices.

ALCOHOL

Alcohol acts strangely in the human system. Your body will choose to oxidize alcohol instead of fat. "Alcohol spares fat," according to Swiss Calorimetry Chamber Studies. Therefore ingesting alcohol is similar to consuming quantities of dietary fat.

PALEO, ATKINS...?

Everyone is looking for a quick fix when it comes to diet. Fad-fraud programs promise rapid weight loss, but they do not work. They usually lack carbohydrates, which leads to muscle and liver glycogen depletion. Since water is stored with carbohydrates (breads, pasta, potatoes, rice, etc.), when you stop eating carbohydrates, you notice a rapid **water** weight loss. This looks and feels okay at first, but in a short time, water weight returns. The bad news is your client did not lose an ounce of fat. And when her water weight returns, her resolve diminishes.

It is not surprising your client felt a lack of vigor on her diet. She probably was irritable too. Carbohydrates are your muscle's best source of energy, similar to rocket fuel for your muscles. Low carbohydrate diets frustrate your ability to exercise because your muscle glycogen stores are drained.

These diets encourage low blood sugar (hypoglycemia) because your liver glycogen stores are spent. When fats and proteins are broken down for energy use, your client may feel sluggish. Instead of burning carbohydrates for energy, her body used fat and protein (ketosis), causing symptoms such as nausea, loss of coordination, and an inability to concentrate. In addition, taking in fewer carbohydrates usually means stocking up on fats, which increases her risk for heart disease.

Low carbohydrate diets are based on the belief that eating carbohydrates raises insulin so your body will store more fat. Selected studies suggested that when diabetics injected too much insulin, they gained fat. It is also true that high glycemic foods (foods high in simple sugar) tend to raise insulin levels. However, high glycemic foods generally have more calories.

Sample Glycemic Index

Foods

Honey	87
New potato	70
Brown rice	66
Oatmeal	49
Whole Wheat Spaghetti	42
Orange	40
Apple	39

DID YOUR CLIENT GO WRONG?

Carbohydrates don't make you fat, but total calories do. If your client eats more calories than she burns, regardless of the source of these calories (carbohydrates, proteins, or fats), she gains fat. Excesses of carbohydrates, proteins, or fats can leave your client with an unwanted spare tire. The lesson here is that carbohydrates are not the enemy. However, there are different kinds of carbohydrates called “nutrient dense” carbohydrates and “calorically dense” carbohydrates. Nutrient dense carbohydrates are fruits, vegetables, and unrefined grains. Calorically dense carbohydrates are processed, man-made products such as bagels, pasta, and boxed cereals. “Over consumption of high-calorie, highly refined and processed carbohydrates is one of the biggest dietary problems in America! Most of the carbohydrates eaten today are high in calories and low in quality. We need to get back to eating the nutrient-dense vegetables, fruits, and unprocessed grains that nature intended for us to eat,” admonishes Woodruff, author of *The Good Carb Cookbook: Secrets of Eating Low on The Glycemic Index* (Avery Publishing, 2001).

When your client followed the latest low-carbohydrate (LC) diet, since water combines with carbohydrates (breads, pasta, potatoes, rice, etc.), she stopped eating carbohydrates and noticed a rapid water-weight loss. This looked and felt okay at first, but in a short time, water-weight returned and she did not lose an ounce of fat.

It is not surprising she felt a lack of energy on her LC diet. She probably was irritable too. Carbohydrates are her muscles best source of energy, similar to rocket fuel for her muscles and brain. “A diet that supplies 50 to 60% carbohydrate is a healthy amount for most people--if the carbohydrates are mostly unprocessed and have a low glycemic index (GI),” suggests Woodruff. LC diets frustrate your client’s ability to exercise because her muscle glycogen stores are drained. LC diets encourage low blood sugar (hypoglycemia) because your liver glycogen stores are spent. When fats and proteins are broken down to be used for energy, your client may feel sluggish. Instead of burning carbohydrates, her body uses fat and protein (ketosis), causing symptoms such as nausea, loss of coordination, and an inability to concentrate. In addition, taking in fewer carbohydrates usually means stocking up on fats, which increases her risk for heart disease. Ketosis can be dangerous.

LC diets are based on the belief that eating carbohydrates raises insulin so her body will store more fat. Selected studies suggested that when diabetics injected too much insulin, they gained fat. And it is true that high glycemic foods (foods high in simple sugar) tend to raise insulin levels. But it is also true that high glycemic foods generally are more dense in calories. Insulin is a good thing. Insulin carries nutrients from your blood stream into your cells. Insulin is the vehicle that provides your muscles with energy.

Grinding and mashing foods increases GI by speeding digestion and sugar utilization. GI is measured by how fast the carbohydrate consumed is converted to blood sugar. Apple juice has a higher GI than the apple from which it was squeezed because the process to break it down is less; the fiber and larger apple particles in the whole fruit take longer to be absorbed than a cup of apple juice that finds its way quickly to the bloodstream. "Low GI carbohydrates, which help minimize large fluctuations in blood sugar and insulin, can be instrumental in preventing and managing obesity, diabetes, heart disease, and many other health problems. People need to understand, though, that just because a food has a low GI does not necessarily mean it is good for you or that it can be eaten in unlimited amounts. For instance, some candy bars fall into the low GI range, but they are still high in empty calories," says Woodruff. Furthermore, the GI numbers are only valid when foods are eaten in isolation; multiple-food interactions alter the way the body reacts to food breakdown.

Problems With Low-Carb Diets (according to Sandra Woodruff, RD)

- 1 *Restricts nutrient-dense foods such as fruits, some vegetables, and whole grains.*
 - 2 *Higher intakes of fatty animal foods increase exposure to environmental contaminants that bioaccumulate up the food chain.*
- *Excess animal protein burdens the kidneys and may contribute to bone loss (ketosis).*
 - *High-meat diets excessively consume and pollute natural resources.*

CARBS & PROTEIN

Low carbohydrate diet authors suggest high protein should replace carbohydrates in your diet to lose fat. Their assumption is that carbohydrates increase insulin, which causes your body to store fat. However, insulin is a good thing. Insulin carries nutrients from your blood stream into your cells. Insulin is the vehicle that provides your muscles with energy.

Several factors determine how many calories you expend. If you are bigger, you dissipate more calories than a smaller person. The harder you work, the more calories you disperse. If it is extremely cold or hot, your body burns extra calories to maintain your normal temperature. And if you are fit, you burn more calories than a sedentary person, even in your sleep.

INTERMITTENT FASTING

Some people fast for religious reasons, others to "cleanse their bodies", and still others to lose fat. Fasting to lose fat is a fantasy. When you eat less than a few hundred calories a day, you lose water, muscle, and a little fat. This slows your metabolism and depletes your liver and muscle glycogen. Seven days of fasting can

cause you to lose a third of your muscle.

Your client would have little energy for training, and even if she did, she would be burning precious muscle tissue. In addition, fasting for more than a week can cause mineral imbalances, low blood pressure, kidney stones, impaired kidney and liver function, and anemia. What's more, when she gains her weight back, she will be fatter than ever.

Vegetarianism is becoming popular because many people believe meat is bad for your health. It can be, if you eat meat that is high in saturated fat. Turkey, chicken, egg whites, lean cuts of beef, pork, and lamb can provide your client with a significant source of lean, high quality protein. Your client needs protein daily, so suggest she includes lean protein in a carbohydrate base.

Fast food restaurants sell lean roast beef sandwiches. Beware, however, of too many hamburgers. Even if you purchase 90 percent lean ground beef from your grocery store, 50 percent of those calories are from fat. To reduce the fat, brown your ground beef, throw it in a colander and rinse it in hot water. After rinsing, place the meat back into a clean pan. Use it sparingly, maybe as a flavoring for tomato sauce and other recipes.

Meat is an excellent source of iron, zinc, and B vitamins. As a vegetarian, you can get iron, zinc, and B vitamins from plants, but they are not as readily absorbed. If your client's lack of energy stems from anemia, eating red meat a few times a week can give her a boost. The darker the meat, the more iron available.

DIABETIC DIET

If your client is a diabetic, she should never skip meals. If she misses breakfast she might incur low blood sugar. She may be irritable and her energy drops. When she finally eats, she may devour too much. She should talk to her dietician about spreading her meals into manageable feedings about every three hours. Tastes can be changed and habits altered by making low sugar choices in several small meals through the day.

Eating frequently is an effective plan for most all of your clients. A study in The New England Journal Of Medicine showed that over a three-week period a group of men ate three meals a day totaling about three thousand calories. Several weeks later they again ate three thousand calories each day, but this time they dispersed their meals into seventeen small ones. Their food was absorbed more efficiently, and the nutrients were utilized more effectively when they were grazing throughout the day. In addition, their metabolic rates increased and so did their energy levels.

Nutritionist Keith Klein advises us to make "better-bad" choices. Instead of storing ice cream in the freezer, purchase individual servings of sugar free frozen yogurt. Rather than squandering carbohydrates on a single cookie, enjoy a hefty bowl of sugar-free pudding.

Another trick is to have your diabetic client phone in a special-order to her favorite restaurant or airline reservations agent. If her blood sugar is high, she can give her injection at home and by the time she arrives her dinner will be ready. She will need to be prepared for low blood sugar if dinner is late by carrying crackers or juice to tide her over. She should ask that her foods be prepared without additional sugar. Dressings and sauces can be ordered on the side to regulate fats and carbohydrates. Her food server may more readily heed her special order if she explains that she is diabetic.

She must individualize her eating to her fitness. When she increases the

frequency, intensity, or duration of her workouts, she should add extra carbohydrates to her pre- and post-workout meals or decrease insulin with her physician's advice. She might try about fifty supplementary carbohydrates for each hour she plans to exercise. Her energy levels soar when she preserves her muscle glycogen stores through systematic snacking. If she fails to increase her carbohydrates, her blood sugar plummets and she may feel droopy. She may feel weak or uncoordinated when carbohydrate sources are low leading to possible injury. She needs fuel for repair and to provide nourishment.

Her thirst mechanism may malfunction during her training. Bodyweight may drop a few pounds before feeling thirsty. She may dehydrate or experience hypoglycemia during a workout. When she works out, her blood sugar generally decreases. To prevent this, she can sip carbohydrate juices or sports drinks between exercises. Carbohydrate sports drinks and juices are quick energy. Tell her to look for sports drinks with between ten and twenty grams of carbohydrates per eight ounce serving. Sometimes they are too sugary, so she may dilute them with water. Make sure she drinks equal amounts of potassium and sodium (about fifty milligrams in an eight ounce serving). A variety of sports drinks is on the market, so ensure she enjoys the taste and she'll drink it!

*NOTE: MANY OF THESE SUGGESTIONS PRESENTED IN THE PRECEDING SECTION FOR YOUR DIABETIC CLIENT MAY BE USED FOR YOUR CLIENTS WITH HYPOGLYCEMIA AND EVEN NORMAL BLOOD SUGAR.

EATING FOR HEALTH

Some clients have not developed coping skills to handle stress. They hide from their problems by eating. Others have not learned to view themselves in a positive way. Over eating makes them feel better. They may also view themselves as failures when they cannot succeed at weight management. They may say negative things about themselves. They should not equate eating with morality. You are not "good" or "bad" based on what you ate. Eating is a health issue, not a moral concern.

Stress is a major cause of relapse. Teach your clients to tackle their problems rather than eat. Suggest that they recognize situations over which they have no control, and learn to let them go. Over eating does not solve problems; it creates more. Many researchers believe personality traits can run in families. Placid versus active personalities show up even in infants, and weight differences vary according to activity levels. Ask your client to think back to high school. Can they find a connection between their life events and their weight? What eating programs worked and which diets didn't? Are they on any medications? Do they have any medical problems? Do they have a history of depression? Who else is at home? What kind of support system do you have? What is their work atmosphere like?

Instead of saying, "I will eat less fat," propose a more specific initiative, "I will not spread butter on my toast on Tuesdays and Thursdays." Find your clients triggers that cause her to eat inappropriately. Help her to find ways to intercede in the chain of events before a binge occurs. Food diaries are useful. They raise awareness of her eating. Her diary helps her uncover unconscious sabotage - like the bag of fat free potato chips she scarfed down during *Oprah*. Losing weight is easy, keeping it off is the hard part. Figure out situations that caused her to binge.

Less than perfect eating is not a reason for your client to give up. Just get her

back on track for her next meal. There is no such thing as a forbidden food. No one eats perfectly. Tell her to give herself a break.

Eating Tips:

- *Instead of saying, "I will eat less fat," propose a more specific initiative to your client, "I will not spread butter on my toast on Tuesdays and Thursdays."*
- *Find your clients triggers that cause her to eat inappropriately. Intercede in the chain of events before a binge occurs.*
- *Food diaries are useful. They raise awareness of your clients eating. Her diary helps her uncover unconscious sabotage - like the bag of fat free potato chips she scarfed down during the football game.*
- *Less than perfect eating is not a reason to give up. Just get her back on track for her next meal.*
- *There is no such thing as a forbidden food.*
- *No one eats perfectly. Give your client a break.*
- *Ask your client to pre-prepare her meals in advance.*
- *Become sensitive to your clients energy needs.*
- *No skipping meals.*
- *Ask your client to consume most of her calories throughout the day.*

REFUELING

Ever wonder why one workout's better than another? Your client thought she did everything right. She got enough sleep. She was psyched because ate the right foods. But did your client eat right AFTER her previous workout? Did she eat her carbohydrates and protein in a 4-1 ratio? These are important factors according to Ed Burke, director of the Exercise Science Program at the University of Colorado. Nancy Clark suggests after exercising to eat 2 calories of carbohydrate (or .5 grams) per pound of weight every 2 hours for the first eight hours after exercising. Burke suggests if you want to improve your overall performance, you must not only pay attention to what you eat but WHEN you eat. Burke recommends eating ½ gram of carbohydrate per pound of body weight within the first three hours after your workout. So if you weigh 150 pounds, plan to suck down a quick 75 grams of carbohydrate (a banana) and 19 grams of protein (two, cups of non-fat milk).

The recommended dietary allowance (RDA) for protein is .4 grams per pound of body weight. Nancy Clark recommends higher ratios for competitive athletes and adults building muscle mass, between .6 and .9 grams per pound of body weight. For example, if you should be eating 60 grams of protein a day, that's about five egg whites,

two cups of non-fat milk, a chicken breast and a tuna sandwich.

If your client eats the right foods at the right time she will be paying attention to Dr. Burkes four R's.

Replenish your muscle glycogen stores immediately after your intense workout. Slurping a sports drink or a glass of juice infuses glycogen (sugar) back into your worn-out muscles. This takes planning. By the time your client takes a shower, throws her clothes in the wash and answers the phone she missed her window of opportunity.

Rebuild muscle by including some protein with your carbohydrates. Running, jumping, weight training and swimming tear down muscle tissue. Carbohydrates and protein rebuild your clients muscle. So your client should include some yogurt, low fat cheese or a protein bar with that glass of juice.

Restore your electrolytes by guzzling a sports drink that includes sodium, potassium and magnesium. Munching on fruit or enjoying a meal works too. Maintaining proper electrolyte balance improves your clients muscle function and athletic performance.

Reduce cellular damage by ingesting a carbohydrate/protein post workout mini-meal. Foods with antioxidants prevent the formation of free radicals and minimize post-exercise muscle damage according to Burke who has written fourteen books and writes columns for *Winning Magazine*, *Mountain Biker*, *Muscular Development*, *Nutritional Science News* and *NORBA News*. Not only will your client rebuild muscle, but her immunity improves. Teach your client to eat to fuel her muscles. Not only will she feel better, she'll have more energy and her performance will skyrocket.

DIET PILLS

Sociologists have found that weight goes with the economy. When times are good, "thin is in," when there is economic depression, "plumper is better." Because our culture values leanness, there is a lot of dieting, leading to diet induced obesity.

Restricting carbohydrates can lead to muscle loss, kidney problems, and acidosis. Low carbohydrate fad diets are popular every few years, but what you end up losing is water and muscle. Redux and Phen-Fen are now off the market due to heart valve problems. Orlistat binds with about 30 percent of dietary fat and is excreted. Dexatrim (Phenylpropanolamine) decreases appetite for a week to ten days before the body adapts and it no longer has an effect. It has the potential to cause rapid heart beat and palpitations. People abused it because they assumed if a little was good, more was better. Amphetamines raise the metabolism. They were used extensively in the 1960's. Some doctors continue to prescribe them.



ERGOGENIC AIDS

An ergogenic aid is a substance that is supposed to enhance fitness performance. About 204 million dollars are spent each year by athletes trying to gain a millisecond edge over their opponents. In interviews with 290 Olympic hopefuls, athletes were asked if they would take an untested drug to gain an advantage. Ninety-five percent said they would. The follow-up question inquired whether they would take the drug even if they knew it would cause them harm in the future. Ninety percent of those athletes answered "yes."

Belief in ergogenic aids has been around since there has been competition. In ancient Greece, athletes concluded eating powdered lion's teeth increased strength. In the early 1900's athletes assumed that extra protein provided additional power. Athletes are always looking for a secret formula to boost performance. Some enjoy the placebo effect. That is, they believe a pill will help them improve, so it does. This psychological benefit is okay, unless serious money is wasted or there are unwanted side effects.

Here's a look at what else has been popular:

Creatine phosphate (CP) is considered a magic bullet in the bodybuilding/athletic world, even by today's standards. It provides a small reserve of quick energy during your workouts. The energy released from the breakdown of Adenosine Tri Phosphate ATP and CP sustain all out, short duration, exercise such as during weight training. Creatine is an amino acid. It is stored in your muscles as phosphocreatine. Horror stories of harmful side effects are unsubstantiated. Unpublished side effects, which have not been proven, include kidney failure, muscle cramps, strains, and pulls. During intense activity, phosphocreatine is broken down into creatine and phosphate. This releases energy that regenerates ADP into ATP. ATP is the energy your muscles use to lift weights, punch, or kick. About 1/2 pound of raw meat contains only a single gram of creatine. And you receive about half of your creatine from animal protein. The other half is made by your body. But when you use creatine supplementation, your body stops

manufacturing its own creatine. Research studies have shown that you can use creatine supplements to increase the storage of creatine in your muscles by about 40 percent. In addition to creatine's ability to energize your ATP to be used for your training, there is a volumizing effect to your muscles. That is, your body holds onto water and stores it in your muscles, making your muscles appear larger. It is unclear whether creatine actually stimulates protein synthesis to increase your muscle fiber size. Controversy exists whether clients should do a loading phase of 20 grams of creatine daily for a week, prior to a maintenance phase. The maintenance dose is 2 to 5 grams of creatine per day. Megadoses of creatine create expensive urine and is not linked to greater muscle gains. But there is some evidence that taking glucose along with creatine increases the amount of creatine your muscles are able to store.

Carbohydrates provide energy to your clients muscles for both short and long distance activities. Products such as Gatorlode provide 140 grams of carbohydrate and Carboplex provides 164 grams. PowerBars and TigerSport Bars contain in excess of 40 carbohydrate grams per bar. A carbohydrate consumed both before and after exercise helps your client maintain a full load of muscle glycogen to power your workouts.

Vitamins are important to fitness but the jury is out concerning the benefits of vitamin supplementation. Suggest your clients try to get most of their vitamins from fruits, vegetables, whole grain cereals, meat, and poultry.

1. Vitamin C enhances immunity and is an antioxidant (antioxidants combat free radicals that "rust" your organs).
2. Thiamin helps maintain your central nervous system.
3. Niacin aids energy production and synthesis of fat and amino acids.
4. Pyridoxine helps protein metabolism.
5. Folacin aids new cell growth and red blood cell production.
6. E is an antioxidant.

The proper combinations of **minerals** IS important to regulatory functions of the body.

1. Calcium aids in bone formation, enzyme reactions, and muscle contractions.
2. Magnesium is required for energy production, muscle relaxation, and nerve conduction.
3. Sodium is responsible for nerve impulses, muscle action, and maintaining body fluid balances.
4. Zinc helps with tissue growth, healing and immunity.
5. Selenium is an antioxidant.

High doses of vitamins and improper balance of minerals may be toxic to your client. For example, too much vitamin A can cause neurological problems, while an excess of one mineral can interfere with the function of another. Of the many known nutrients, only protein, carbohydrates, fats, vitamins A, C, thiamin, niacin, and calcium, are deemed necessary for high level functioning.

Caffeine in small dosages enhances endurance performance in elite and recreational athletes. One theory is that caffeine spares glycogen in muscle and utilizes free fatty acids for energy. In addition, caffeine increases alertness and decreases fatigue. Finally, caffeine may improve sodium, potassium, and calcium balance within the working muscles. Although caffeine has no nutritional value, and is often abused, caffeinated drinks consumed moderately pose no health threats. Moderation has been defined as 2 cups of coffee or 5 glasses of iced tea a day. Surveys show coffee drinkers smoke more often, get less exercise, and eat fattier meats. Tea drinkers seem to exercise more and eat better quality foods. Previously, it was thought that coffee increased chances for breast cancer and fibrocystic breast disease. Recent research however, suggests none of this. Problems may develop however, if you drink coffee, cokes, and tea instead of beneficial beverages such as water and non fat milk. If you are anemic, and you **must** drink coffee, ingest your coffee before your meals. Polyphenols in caffeinated beverages interfere with iron absorption. Addiction to caffeine is rampant. Stimulating your adrenals with a quick coffee fix is habit forming. You know you are hooked if you feel drowsy, fatigued, or experience headaches when you go cold turkey. Caffeine mobilizes free fatty acids from your blood stream. This spares glycogen in your muscles. This means you may be able to train a little longer and harder. Ironically if you are a frequent caffeine user, there is less fitness benefit. Therefore, if your goal is to drink caffeine to improve your fitness performance, use it strategically, not constantly. Experiment with caffeine in your training long before you use it during an event. Caffeine makes some people nervous and can cause stomach upset. Because caffeine is a diuretic, be sure to locate the nearest restroom.!

Caffeine Content

10 ounces of instant coffee	130 mg.
12 ounces of iced tea	70 mg.
12 ounces of Coke	30 mg.
12 ounces of Diet Coke	41 mg.
12 ounces of Mountain Dew	55 mg.
2 tablets of Anacin	64 mg.
2 tablets of Excedrin	130 mg.

Carnitine is alleged to metabolize fat so you lose weight. In reality, carnitine facilitates the transfer of fatty acids into the mitochondria where they are burned for fuel. There is no evidence however that carnitine decreases body fat.

Choline was purported to increase strength and decrease body fat. This product has not been shown to facilitate either of these claims.

Chromium is a trace mineral found in mushrooms, prunes, cereals, whole grain breads, and nuts. It is not readily absorbed in the body, so supplement manufacturers bound chromium with picolinate to ease absorption into the system. Chromium picolinate was introduced to the American public in the 1980's. Early research suggested one 200-microgram tablet taken daily could help you gain muscle and lose fat. Imprecise measurement techniques in those studies were discovered, and the research was deemed "faulty." When experimenters tried to replicate their results, there was no

significant gain in muscle or decrease in body fat. Furthermore, recent anecdotal reports suggest that excess chromium picolinate may cause anemia, chromosome damage, and cognitive impairment. (One 200-microgram tablet of chromium each day costs about 43 cents).

Coenzyme Q 10 has been used as a supplement for years in Japan as an aid to endurance. Studies have shown no benefit.

Ginseng is a wonder drug from Asia that is supposed to be a cure all. There has not been enough research to demonstrate any benefits however.

Lecithin is an emulsifying agent and helps in digestion and absorption of fat. The body produces ample amounts of lecithin, therefore supplementation will not decrease body fat as suggested.

Metabolic bars such as PR Bars are comprised of 40 percent carbohydrate, 30 percent protein, and 30 percent fat. They have not been shown to increase fat metabolism as suggested in the advertisements.

Protein needs range from .8 grams per kilogram of body weight to 2.0 grams of protein per kilogram of body weight. Heavy cardiovascular and strength training requires additional protein. Peter Lemon, Ph.D. recommends high-level athletes consume a gram of protein per pound of body weight. For most people, there is no need for supplementation.

Amino acids are the building blocks of protein. Bodybuilders have been popping these for years. The RDA suggests we only need .8 grams of protein per kilogram of bodyweight each day. Recent research by Lemon and Gontzen demonstrated that endurance athletes and weight trainers need between 1.2 and 1.8 grams of protein per kilogram of lean mass each day. They hypothesized that increased amino acids promoted protein synthesis and decreased muscle loss during heavy strength and endurance training. (Generic amino acids cost about \$2.00 a day.)

DHEA (Dehydroepiandrosterone) is touted as the fountain of youth. It is advertised to increase muscle, decrease body fat, and increase energy. DHEA is produced in the adrenal gland and is an androgen. It is found in yams and sold in health food stores. Only a few carefully performed studies have been performed on DHEA. Two investigations reported significant increases in androgenic steroid blood levels along with feelings of physical and psychological well being. It is still unknown whether DHEA actually increases muscle and reduces fat. Side effects include hair loss, voice deepening, and irreversible virilization in women. Without longitudinal studies it is difficult to predict long term effects. One group of researchers suggest that if DHEA truly increases circulating testosterone, then it may predispose men to prostate cancer. (DHEA costs about \$1.30 per day.)

HMB (beta hydroxy beta methylbutyrate) is a metabolite of the branched chain amino acid leucine. You can find HMB naturally occurring in breast milk, catfish, and citrus fruit. HMB is purported to decrease protein catabolism (breakdown) so you can actually increase your muscle mass. Research in animals and humans have been favorable. Studies demonstrated that human subjects taking between 1.5 to 3.0 grams of HMB daily, showed significant gains in muscle. No side effects from taking HMB have been seen, but further research is needed. (HMB costs about \$2.50 per day.)

METABOLISM

One-third of your clients are currently overweight. Just 15 years ago, only 25 percent were overweight. This is an increase of 32 percent. The average adult weighs 8 pounds more now than 10 years ago. Your client's body loses about six pounds of muscle per decade. With less muscle her body burns fewer calories. She requires less food, but if she eats the same as she did when she were younger, she will gain fat. Natural weight or "ideal" weight can be described as the weight at which your clients body comfortably stays while eating for appetite and exercising regularly. Primitive folks burned approximately 2900 calories per day hunting and gathering food. Today the average American burns only 1800 calories.

If both of your client's parents are obese, she has an eighty percent likelihood of becoming obese. If 1 of her parents is obese, there is a 40 percent probability that you she will be obese. If both of her parents are lean however, there is only a 15 percent chance that she will weigh more than 20 percent over her ideal weight. A study on identical twins indicated that genetics played a critical role in what they weighed. Identical twins separated at birth weighed nearly the same after years of living apart.

Another interesting study was done on twins by researcher Claude Bouchard. Results showed similar weight gains among sets of identical twins when they were fed 1000 extra calories daily for 120 days. A fascinating outcome was the wide variance of weight gain **between** the sets of twins. Some sets gained as little as 8 pounds with the over feeding while others ballooned up as much as 29 pounds. Clearly this demonstrated that genetics played a major role in weight gain. But this investigation also demonstrated that there are other influences that determine weight. Some people gain more and others less, with the same stimulus.

Between the ages of 30 and 70, it is estimated that your fat free mass (muscle) declines by 40 percent. This is thought to be the single most important reason why your client stores more body fat as she ages. The loss of fat free mass and resulting slow down of metabolic rate makes her susceptible to gaining fat. Each pound of lean tissue burns approximately 50 calories a day. A loss of just half a pound of muscle or 25 calories expended daily, could theoretically cause her to gain 2.6 pounds in a year. In 10 years, 26 pounds. In 20 years, 52 pounds. In 30 years, 78 pounds.

There are 3 critical times when your client gains fat cells:

1. The last trimester in the womb (cant' do anything about that).
2. The first year of life (you can help your kids with this one).
3. During puberty.

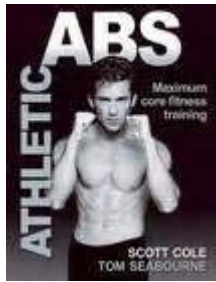
When you gain weight you increase the size of your fat cells. When you lose weight,

you decrease the size of your fat cells. Normal cell size is .5-.6 micrograms. The upper limit is 1.0 micrograms. When fat cells are full, your body can make new ones. However, when you lose weight, the fat cells do not disappear. Therefore, if your client has more fat cells than you do, she will ultimately be fatter as each of those cells will contain some fat.

Your body is not physiologically designed to lose weight or fat rapidly. One pound of fat supplies the energy to walk nearly 30 miles. Your body uses about 50 percent fat and 50 percent carbohydrate at rest. During training this will change, depending on your clients intensity. At high intensity your client uses a greater percentage of carbohydrates. At lower intensities, a higher percentage of fat is used. Alternating high and low intensity intervals is a tremendous advantage for weight loss and weight control. Your client should not be concerned with which fuel she is burning at the moment, but rather how many calories she is expending during and after her training.

To receive the greatest value from her training, your client should strive to become as fit as she can so she burns more calories from fat at rest, and utilizes more storage fat during her training. It is better that your client is disciplined about her eating than fanatical. Fueling her muscle is a major part of her fitness success. What she eats today and tomorrow will benefit her fitness the next day, and the next.

Your client can guesstimate her total carbohydrate need by her energy levels and how her weight changes over the course of a week. A suggested formula to estimate her carbohydrate intake per day is to multiply 8 by her weight in kilograms. Or, have her visit a health center to discover her resting metabolism. Your clients resting metabolic rate is how many calories her body burns at rest. She metabolizes foods differently now than when she was a teenager. And in her older adult years, her metabolism will change.



SCATTERSHOOTING DIET TIPS FOR YOUR CLIENT

**Diet sodas don't satisfy a craving and they also may stimulate your appetite. If you miss the potato chip crunch, choose cauliflower, broccoli, peppers, carrots, or celery.*

**The Thermic Effect of Food (TEF) means that when you eat, your body expends calories digesting and assimilating your food.*

**Any diet that restricts a certain food group won't work in the long term. Short term diets yield short term results.*

*

**Combine protein and carbs. Protein slow releases the carbs into your system for better utilization of nutrients.*

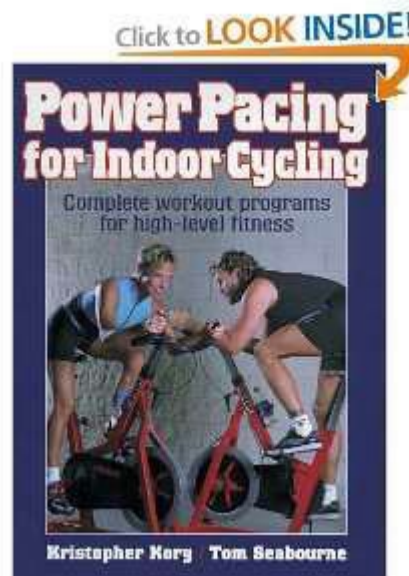
**If you don't take in enough salt and you work out for hours at a time, and you drink too much water, you may become ill with water intoxication a.k.a. hyponatremia.*

**A pocket spiral notebook will help you to determine if you are eating right or cheating too much.*

**When you move fast you burn mostly carbs. When you move slowly you burn mostly fat. Your goal is to move as fast and as long as you can to burn more total calories and lose more fat.*

**Eat slow-release carbs such as oatmeal, fruits and veggies with the skin. These long-chain carbs stay with you longer and provide you with much needed vitamins, minerals, and fiber.*

**Have soup as an appetizer. You will eat less during your meal.*



SAMPLE RECIPES AND NUTRIENT DENSITY CALCULATIONS

Breakfast

• Strawberry Waffle

Toast 1 whole-grain waffle and top with 1 tablespoon trans-fat-free margarine and 1/2 cup thawed frozen berries. Serve with a small glass (1 cup) fat-free milk. (To thaw berries, defrost in microwave to desired temperature.)

Lunch

• Beef Entrée

Microwave a beef-based frozen entrée such as Smart Ones Swedish Meatballs (look for 280-300 calories, 5-9 grams of fat). Add 1 cup French-cut green beans topped with 1 tablespoon slivered almonds.

Snack

• Soy Nuts

1/4 cup soy nuts. Serve with a small glass (1 cup) fat-free milk.

Dinner

- Ravioli and Garlic Spinach

Heat a 10-ounce box of frozen cut-leaf spinach in microwave. Squeeze out excess water. Mix spinach with 1/4 teaspoon salt, 1/2 teaspoon ground black pepper, 2 teaspoons minced garlic clove. Serve half with refrigerated low-fat ravioli, such as Contadina Light Cheese Ravioli (reserve rest of spinach for lunch Thursday). Prepare ravioli according to package directions; serve 3/4 cup cooked ravioli (reserve remaining ravioli for lunch Friday) topped with 1/3 cup spaghetti sauce. For dessert, have 1/2 sliced banana topped with 1 tablespoon warmed Hershey's syrup and 1 tablespoon slivered almonds.

Daily calories: 1,550

Fat: 60 g

Percent of daily calories from fat: 33.5%

Saturated fat: 13.7 g

Percent of daily calories from saturated fat: 7.9%

Carbohydrates: 190.3 g

Percent of daily calories from carbohydrates: 47.2%

Fiber: 30.9 g

Protein: 77.9 g

Percent of daily calories from protein: 19.3%

Cholesterol: 114.9 mg

Calcium: 1,110.5 mg

Sodium: 1,978 mg

Breakfast

- English Muffin with Ricotta Cheese Spread and Grapes

Toast 1 whole-wheat English muffin and top with 1/3 cup ricotta cheese spread . Serve with a small glass (1 cup) fat-free milk and 17 green or red grapes.

Lunch

- Veggie Burger and Spinach

Heat 1 veggie burger in microwave. Toast whole-wheat hamburger roll, top with 2 tablespoons ketchup (if desired), 3 leaves romaine lettuce, and 2 large slices tomato. Serve with remaining spinach from Wednesday's dinner and 1 cup cantaloupe cubes.

Snack

- Banana Soy Smoothie

In a blender (or with a hand blender), combine until smooth: 4 ounces low-fat firm silken tofu (such as Mori-Nu) cut into small pieces and 1 ripe banana, 1/2 teaspoon pure vanilla extract, and a small glass (1 cup) fat-free milk. Blend in 1 to 2 ice cubes.

Dinner

- Roasted Chicken with Wild Rice and Corn

Prepare 2/3 cup cooked wild rice. Serve with 3 ounces roasted chicken breast (deck-of-cards size), 1 large fresh ear of corn (or two 3-inch cobs of frozen corn heated in microwave or 1/2 cup cooked corn), and 1 cup broccoli flowerets topped with 1 teaspoon trans-fat-free margarine. Serve with 1 cup fat-free milk.

Daily calories: 1,489

Fat: 21.6 g

Percent of daily calories from fat: 12.4%

Saturated fat: 5.7 g

Percent of daily calories from saturated fat: 3.4%

Carbohydrates: 235.1 g

Percent of daily calories from carbohydrates: 59.8%

Fiber: 29.4 g

Protein: 108.5 g

Percent of daily calories from protein: 27.6%

Cholesterol: 101.4 mg

Calcium: 1,867 mg

Sodium: 2,279 mg

Breakfast

- Cereal, Walnuts, and Fruit

Pour 1/2 cup fat-free milk over low-fat whole-grain cereal (check label for 5 grams fiber per serving, e.g., 1 1/3 cups Kashi Good Friends or 1 1/2 cups Wheat Chex). Top with 2 tablespoons chopped walnuts. Serve with 1 orange and a small glass (1/2 cup) fat-free milk.

Lunch

- Ravioli and Salad

Heat 3/4 cup cooked ravioli from Wednesday and serve with 1/3 cup spaghetti sauce. Serve with 2 cups romaine lettuce and 1/2 chopped red pepper topped with 2 tablespoons fat-free ranch dressing.

Snack

- English Muffin with Creamy Ricotta Spread

Top 1/2 toasted English muffin with 1/3 cup ricotta cheese spread. Serve with 1 single-serve convenience-size container unsweetened applesauce.

Dinner

- Romaine Chicken Salad

Toss together 3 cups romaine lettuce, 1/4 cup shredded Parmesan cheese, 1 sliced red or orange pepper, 1/4 cup seasoned croutons, 3 ounces (1/2 cup) roasted chicken strips and 3 tablespoons fat-free ranch dressing. Serve with 1 1/2 cups strawberries drizzled with 1 tablespoon fat-free chocolate syrup.

Daily calories: 1,499

Fat: 35 g

Percent of daily calories from fat: 12.4%

Saturated fat: 9.7 g

Percent of daily calories from saturated fat: 5.8%

Carbohydrates: 228.2 g

Percent of daily calories from carbohydrates: 57.4%

Fiber: 40 g

Protein: 90.8 g

Percent of daily calories from protein: 22.8%

Cholesterol: 151.7 mg

Calcium: 1,350 mg

Sodium: 2,693 mg

Breakfast

- Peanut Butter and Jelly Toast

Toast 1 slice whole-grain bread, spread with 1 tablespoon peanut butter and 1 tablespoon jelly. Serve with 1 cup cantaloupe cubes and a small glass (1 cup) fat-free milk.

Lunch

- Sizzling Edamame Stir-Fry

Heat 2 teaspoons olive oil in skillet over medium heat. Add 1 sliced red or orange pepper and 1 cup frozen broccoli flowerets. Cube one 4-ounce block low-fat firm silken tofu (such as Mori-Nu) and add to skillet with 1/2 cup chickpeas and 1/2 cup frozen shelled edamame beans (sweet green soybeans). Heat through and top with 1 tablespoon light soy sauce. Serve with 17 red or green grapes.

Snack

- Pria Bar and Peanut Butter

Spread 1 tablespoon peanut butter on a Pria bar (crisp, chewy energy bar).

Dinner

- Veggie Burger with Cheese and Wild Rice

Heat 1 veggie burger in microwave until nearly cooked. Top with 1/4 cup shredded low-fat mozzarella cheese and cook for another 30-45 seconds in the microwave. Top with 2 tablespoons ketchup and Dijon mustard, if desired. Serve with 2/3 cup cooked wild rice and 1 cup French-cut green beans topped with 1 tablespoon slivered almonds. For dessert, slice a banana and dip into 4 tablespoons of sweet sour cream spread (one 8-ounce container fat-free sour cream mixed with 2 packets artificial sweetener, 1 teaspoon pure vanilla or almond extract and 1/2 teaspoon maple extract; keep in refrigerator for up to 7 days). Spear each slice with a toothpick for fun, mess-free dipping.

Daily calories: 1,553

Fat: 36.5 g

Percent of daily calories from fat: 20%

Saturated fat: 8.4 g

Percent of daily calories from saturated fat: 4.8%

Carbohydrates: 246.7 g

Percent of daily calories from carbohydrates: 60%

Fiber: 38.7 g

Protein: 81.3 g

Percent of daily calories from protein: 19.8%

Cholesterol: 14.9 mg

Calcium: 1,269.8 mg

Sodium: 2,594 mg

Breakfast

- English Muffin with Sweet Sour Cream Spread

Toast 1 whole-wheat English muffin. Top each half with 2 tablespoons sweet sour cream spread with 6 dried apricot halves and a small glass (1 cup) fat-free milk.

Lunch

- Mexican Chicken Pita

Preheat toaster oven to 300 degrees. Combine 3 ounces sliced chicken breast from the deli with 1 tablespoon light mayonnaise, 2 teaspoons Dijon mustard, and 1/2 teaspoon ground black pepper. Stuff mixture into 1 whole-wheat pita and add 5 roasted red peppers (from jar). Top with 1/3 cup salsa. Serve with 17 green or red grapes.

Snack

- Berry Smoothie

In a blender or using a hand-held blender, combine 8 ounces light yogurt (any flavor) with 1/2 cup thawed frozen berries and 1/2 teaspoon pure vanilla extract.

Dinner

- Spring Mix Salad

Toss 3 cups spring mix prewashed salad greens, 10 halved grape tomatoes, 1/2 cup chickpeas, 1/4 avocado, 1/4 cup reduced-fat shredded mozzarella cheese, 1/4 cup seasoned croutons, and 3 tablespoons fat-free ranch dressing. Serve with 1 sliced green apple spread with 1 tablespoon peanut butter.

Daily calories: 1,427

Fat: 27.9 g

Percent of daily calories from fat: 16.6%

Saturated fat: 5.4 g

Percent of daily calories from saturated fat: 3.4%

Carbohydrates: 242.2 g

Percent of daily calories from carbohydrates: 64.3%

Fiber: 37.2 g

Protein: 67.4 g

Percent of daily calories from protein: 18.1%

Cholesterol: 46.9 mg

Calcium: 969.7 mg

Sodium: 3,100 mg

Breakfast

- Cheese and Crackers with Fruit Salsa

Top 3 Wasa crispbread crackers with 1/4 cup reduced-fat shredded mozzarella cheese and put in toaster oven until cheese melts. For fruit salsa, combine 1 teaspoon olive oil and 1 1/2 tablespoons lime juice and mix with the following finely chopped ingredients: 1 fresh peach (or 1/2 cup canned in juice), 1/4 avocado and 2 tablespoons red onion. This makes two servings of fruit salsa; reserve half for Tuesday's snack. Serve with a small glass (1 cup) fat-free milk and 1 single-serving-size can mandarin oranges.

Lunch

- Burrito

Microwave according to package directions 1 Amy's Bean and Rice Burrito or Don Miguel's Lean Olé Bean and Rice or Chicken and Black Bean Burrito (check labels for

260-280 calories, 6 to 9 grams fat). Serve with 2 ribs celery dipped in 4 tablespoons sweet sour cream spread (one 8-ounce container fat-free sour cream mixed with 2 packets artificial sweetener, 1 teaspoon pure vanilla or almond extract and 1/2 teaspoon maple extract; keep in refrigerator for up to 7 days).

Snack

- Pita and Sweet Sour Cream Spread

Serve one 6 1/2-inch pita cut into triangles with 4 tablespoons sweet sour cream spread.

Dinner

Exclusive Recipe: Whole Wheat Pita Pizzas with Vegetables

Make 2 pizzas. Reserve 1 pizza to split between breakfast Tuesday and lunch Thursday.

Or, serve 2 slices Domino's large hand-tossed veggie pizza (or check nutrition information on any frozen pizza for 500 calories and 13 grams of fat or less). Serve with 17 red or green grapes.

Daily calories: 1,549

Fat: 30.7 g

Percent of daily calories from fat: 17.3%

Saturated fat: 13.3 g

Percent of daily calories from saturated fat: 7.7%

Carbohydrate: 247.8 g

Percent of daily calories from carbohydrates: 62.2%

Fiber: 17 g

Protein: 27.1%

Percent of daily calories from protein: 19.9%

Cholesterol: 34.8 mg

Calcium: 857 mg

Sodium: 2,672 mg

Breakfast

- Whole Wheat Pita Pizza with Vegetables

Serve half the pizza reserved from Monday's dinner with a small glass (1 cup) fat-free milk. Or serve 1 slice Domino's large hand-tossed veggie pizza (or check nutrition information on any frozen pizza for 250 calories and 6.5 grams of fat or less).

Lunch

- Turkey and Hummus Sandwich

Toast 1 slice whole-wheat bread and spread with 2 tablespoons hummus. Fill with 2 thin deli slices turkey, 1/2 cup baby spinach leaves, and 2 large slices tomato. Serve with 1 apple.

Snack

- Fruit Salsa and Crisp Wheat Toast

Serve 1 slice whole-wheat toast topped with rest of fruit salsa from breakfast Monday.

Serve with 1 cup fat-free milk.

Dinner

Exclusive Recipe: [New Fish 'n Chips](#)

Make half this recipe. Serve with 2 cups prewashed baby spinach salad and 1/2 sliced red pepper tossed with 2 tablespoons balsamic vinegar.

Daily calories: 1,590

Fat: 28.7 g

Percent of daily calories from fat: 15.9%

Saturated fat: 8.5 g

Percent of daily calories from saturated fat: 4.8%

Carbohydrate: 238.5 g

Percent of daily calories from carbohydrates: 58.8%

Fiber: 20.5 g

Protein: 102.4 g

Percent of daily calories from protein: 19.9%

Cholesterol: 103.8 mg

Calcium: 1,020 mg

Sodium: 3,060 mg

Breakfast

- French Toast

Dip 1 slice whole-wheat bread in 1/4 cup Eggbeaters or 2 egg whites mixed with 2 tablespoons fat-free milk, beat well. Grill in a nonstick skillet coated with nonstick spray. Top with 1/2 cup thawed frozen berries. Serve with 1 cup fat-free milk.

Lunch

- Fruit Salad with Nuts

Combine one 11-ounce can mandarin oranges (packed in water or juice) with 1/8 cup dried, sweetened cranberries, 1/3 cup chopped walnuts, and 1 tablespoon shredded coconut. Serve with 10 grape tomatoes dipped in 2 tablespoons fat-free ranch dressing.

Snack

- Carrots and Hummus

Serve 12 baby carrots with 1/4 cup hummus for dipping with 1/2 cup canned (juice or water pack) pineapple cubes. Serve with 1 cup fat-free milk.

Dinner

Exclusive Recipe: [Lighter Beef and Broccoli](#)

Serve with 2/3 cup wild rice and 1 cup cantaloupe cubes.

Daily calories: 1,517

Fat: 49.3 g

Percent of daily calories from fat: 29%

Saturated fat: 8 g

Percent of daily calories from saturated fat: 4.7%

Carbohydrate: 211.9 g

Percent of daily calories from carbohydrates: 52.7%

Fiber: 29.5 g

Protein: 77.5 g

Percent of daily calories from protein: 18.3%

Cholesterol: 7.9 mg

Calcium: 854 mg

Sodium: 1,652 mg

Breakfast

- Hot Cereal with Apricots

Prepare 2 packets regular-flavor instant oatmeal (using 2/3 cup water and 2/3 cup fat-free milk), topped with 6 dried apricot halves and 1/4 cup chopped walnuts. Serve with 1 cup fat-free milk.

Lunch

- Whole Wheat Pita Pizza with Vegetables

Serve reserved 1/2 pizza from Tuesday's breakfast with 1 cup cantaloupe cubes and 1 cup cooked broccoli flowerets, tossed with 2 teaspoons trans-fat-free margarine. Or serve 1 slice of Domino's large hand-tossed veggie pizza (or check nutrition information on any frozen pizza for 250 calories and 6.5 grams of fat or less).

Snack

- Peanut Butter Waffle

Toast 1 whole-grain waffle; top with 1 tablespoon peanut butter and 10 peanuts. Serve with 1 cup fresh strawberries.

Dinner

Exclusive Recipe: [Shrimp and Pineapple Stir-Fry](#)

Make half of recipe (2 servings instead of 4); eat one serving and reserve one serving for lunch Friday. Serve with 17 red or green grapes.

Daily calories: 1,551

Fat: 51.7 g

Percent of daily calories from fat: 28.6%

Saturated fat: 9.5 g

Percent of daily calories from saturated fat:

Carbohydrate: 206.8 g

Percent of daily calories from carbohydrates: 50.8%

Fiber: 20.7 g

Protein: 83.3 g

Percent of daily calories from protein: 20.5%

Cholesterol: 169.4 mg

Calcium: 612 mg

Sodium: 2,110 mg

Breakfast

- Scrambled Egg Sandwich

Heat a small nonstick skillet sprayed with nonstick spray over low to medium heat.

Scramble 1 egg and 2 egg whites or 1/2 cup egg substitute. Add 10 halved grape tomatoes and heat through. Top 1 slice whole-wheat toast with the egg mixture. Serve with 1 cup fat-free milk.

Lunch

- Shrimp and Pineapple Stir-Fry

Reheat serving from dinner Thursday. Serve with 1 cup cooked spinach tossed with 1 tablespoon balsamic vinegar.

Snack

- Soy Nuts and Strawberries

Serve 1/4 cup soy nuts with 1 cup fresh strawberries and a small glass (1 cup) fat-free milk.

Dinner

- Big Chef's Salad

Toss together: 2 cups baby spinach leaves, 1 cup spring mix salad greens, 1/2 red and 1/2 orange bell pepper, 1/3 cup shredded reduced-fat mozzarella cheese, 4 thin slices deli ham (sliced into strips), 3 tablespoons fat-free ranch dressing. Serve with 1 toasted whole-wheat English muffin spread with 2 teaspoons trans-fat-free margarine. Serve with 1 apple spread with 2 tablespoons peanut butter.

Daily calories: 1,468

Fat: 40.1 g

Percent of daily calories from fat: 24.5%

Saturated fat: 11 g

Percent of daily calories from saturated fat: 6.9%

Carbohydrate: 170 g

Percent of daily calories from carbohydrates: 46.1%

Fiber: 36 g

Protein: 108 g

Percent of daily calories from protein: 29.4%

Cholesterol: 414.17 mg

Calcium: 1,477.8 mg

Sodium: 3,084 mg

Breakfast

- Cereal, Walnuts, and Fruit

Pour 1/2 cup fat-free milk over low-fat whole-grain flake cereal (check label for 5 grams fiber per serving, e.g., 1 1/3 cups Kashi Good Friends or 1 1/2 cups Wheat Chex). Top with 2 tablespoons chopped walnuts or almonds. Serve with 1/2 cup mandarin oranges (packed in juice or water) and a small glass (1/2 cup) fat-free milk.

Lunch

- Veggie Burger and Spinach

Heat 1 veggie burger in the microwave. Serve on 1 whole-wheat hamburger roll, toasted, and top with 2 tablespoons ketchup (if desired), 1 tablespoon light mayonnaise, 3 leaves romaine lettuce, and 2 large slices tomato. Serve with 1 cup cooked spinach tossed with 2 teaspoons trans-fat-free margarine and 1 cup cantaloupe cubes.

Snack

- Nutri-Grain Bar, Fruit, and Nuts

1 Kellogg's Nutri-Grain Bar, 1 small orange, and 30 peanuts.

Dinner

Exclusive Recipe: Salmon Fillets with Tomato Jam

Make half of recipe (2 servings instead of 4); eat one serving and reserve one serving for lunch Sunday. Serve with 2/3 cup cooked brown rice (make 1 1/3 cups cooked brown rice; reserve half for lunch Sunday) and 17 frozen red or green grapes.

Daily calories: 1,598

Fat: 62.5 g

Percent of daily calories from fat: 32.9%

Saturated fat: 9.9 g

Percent of daily calories from saturated fat: 5.5%

Carbohydrate: 207.4 g

Percent of daily calories from carbohydrates: 48.5%

Fiber: 35.1 g

Protein: 79.9 g

Percent of daily calories from protein: 18.7%

Cholesterol: 14.8 mg

Calcium: 1,209 mg

Sodium: 2,378 mg

Breakfast

- Cinnamon and Cheese Toast

Spread 1 teaspoon trans-fat-free margarine on 1 slice whole-wheat bread, sprinkle with 1/2 teaspoon sugar and a dash of cinnamon, and top with 1/4 cup reduced-fat shredded mozzarella cheese. Toast in toaster oven until cheese is melted. Serve with 1 cup fat-free milk and 1 cup strawberries.

Lunch

- Salmon Fillets with Tomato Jam

Reheat leftovers from Saturday's dinner. Serve with 2/3 cup cooked brown rice.

Snack

- Cottage Cheese, Fruit, and Nuts

Have one 5.5-ounce Cottage Cheese Doubles brand or 1/2 cup 1% or fat-free cottage cheese with 1/2 cup canned fruit (any variety) packed in juice or water. Serve with 15 peanuts.

Dinner

- Breakfast for Dinner

Lightly beat 1/2 cup Eggbeaters with 2 tablespoons fat-free milk (or 3 egg whites with 2 tablespoons fat-free milk). Dip 2 slices whole-wheat bread in the egg mixture, then grill in a nonstick skillet coated with nonstick spray. Top with 1 cup thawed frozen berries. Serve with 1 cup fat-free milk.

Daily calories: 1,499

Fat: 62.5 g

Percent of daily calories from fat: 27.7%

Saturated fat: 10.9 g

Percent of daily calories from saturated fat: 6.1%

Carbohydrate: 207.5 g

Percent of daily calories from carbohydrates: 45.1%

Fiber: 25.4 g

Protein: 80 g

Percent of daily calories from protein: 18.7%

Cholesterol: 14.8 mg

Calcium: 1,790 mg
Sodium: 2,186 mg



IV. CARDIO TRAINING

Cardio in this millennium can be varied and quite different, perhaps more customized to your client. We claim to know more now about fat-burning potential, and most experts are recommending interval training, incorporating the knowledge that your client can burn more fat in a shorter period of time than in the traditional sustained aerobic period of yesteryear.

Aerobic capacity is your body's ability to deliver oxygen to your working muscles. As your client matures, her aerobic capacity decreases, but it doesn't have to if she continues to train. **VO2 max.** is your client's muscle's ability to efficiently use nutrients from oxygen. World class aerobic athletes are genetically gifted with a high VO2 max.

If your client trains at the upper limits of her aerobic capacity, she will perform favorably. Increase the pace of her training, but not too fast. Prevent deadening lactate from permeating her muscles. Lactate and hydrogen ions is that searing sensation as she exceeds her anaerobic threshold. She reaches her anaerobic threshold when her legs burn and she can hardly catch her breath. If she remains aerobic, but very close to her lactate/anaerobic threshold, she can run faster and longer.

Your client's aerobic capacity is not an issue if her goal is to complete a 2-hour fitness class and lose fat. More important is the percent of her VO2 max. she can maintain over a long period. This depends on her ability to tolerate lactate. A couple of days a week of quality fitness interval training workouts may be her prescription for peak fitness performance. Sometimes your client must "go anaerobic." When exercising hard she will feel lactate. This requires a physiological adjustment.

If you are just beginning, walk before you jog. Walking for thirty minutes will prepare your muscles for jogging. When you can walk continuously for thirty minutes, you are ready to jog. On your first walk-jog workout, walk for seven minutes and then jog for three. Jog at a fast walking pace. Repeat this three times for a total of thirty minutes. When you feel ready, walk for five minutes and then jog for five. In a few months you may be able to jog the entire thirty minutes.

JOGGING AND RUNNING: Jog in an upright position, stomach in, heel to toe, taking short, smooth strides. Pick up your feet, lifting your front knee and extending your back

leg. Keep your elbows bent, your forearms and chin parallel to the ground. Breathe deeply from your diaphragm. Some people measure their heart rate at intervals throughout their workout, others wear heart-rate monitors. Jogging three to five times a week at eighty percent of your maximum speed is enough to reach a high level of cardiovascular fitness. If you feel winded, slow to a walk. Don't ignore discomfort in your shins, knees, or back. Pay attention to your body.

Interval training is varying your intensity throughout your exercise session. Alternate high-intensity work bouts and low-intensity rest periods. Intervals are used to improve your performance using effort intervals followed by recovery intervals. You can make interval training specific to your sport. Or you can use intervals to improve your fitness. To begin, make intervals equal to your normal steady state program. Follow this with a rest/recovery segment performed at a lower intensity.

Research has shown that interval training improves both your aerobic and anaerobic capacity. Continuous, long, slow, distance training improves aerobic capacity only. Interval training has also been shown to burn more total fat and calories than continuous training. Intervals allow you to perform more work increasing your Excess Post Oxygen Consumption (EPOC). EPOC, the "afterburn", is the absolute number of calories you consume, long after you have completed your workout.

Intervals have the potential to train your heart muscle longer and more effectively than a single bout of continuous training. During interval training, your heart must overcome a greater resistance. This leads to improved venous return which results in greater ventricular filling and contractility. You experience a more complete emptying which increases your stroke volume and cardiac output.

Interval training also improves your muscle's ability to tolerate lactic acid. You become accustomed to short periods of training, just below your anaerobic threshold. This helps you learn to delay the onset of fatigue.

An interval training program (aerobic system) is low intensity but continues for longer than three minutes. Both the work and rest intervals occur at an intensity that is within your aerobic system. The interval period is performed at a slightly higher intensity than your steady state.

The rest period is slightly lower than your steady state. The time in each interval usually ranges anywhere from 4 to 15 minutes. Climb on your exercise bicycle. Warm up for 3 minutes. Pedal at 70 percent of your maximum for 5 minutes. Take a one-minute easy-pedaling break. Perform another 5 minute interval.

An advanced interval training program (ATP-PC) is very high intensity, and short in duration (1-15 seconds). Sprint or lift weights at 95 percent intensity for 15 seconds. Then take a 45 second break. Your recovery interval is absolute-rest to allow for replacement of ATP and creatine phosphate. Because your work/rest cycle is relatively short, you can repeat the cycle 10 - 20 times within a single workout.

Another advanced interval training program (lactic acid system) kicks in at a high intensity and short duration (45-90 seconds). The work interval is greater than your anaerobic threshold. After your warm up, run the length of a track at 65 percent of your maximum speed. Jog slowly around the curve. Your rest interval occurs in the aerobic system. Use this program if you are highly fit and athletic. Your rest interval is active recovery. This allows for removal of lactic acid.

Speedplay is a form of interval training that is based on how you feel. It is less systematized than normal intervals. You govern how hard you want to work. You control your intensity based on your tolerance. Speedplay may be more enjoyable than timed intervals. It teaches novices how to progress beyond their anaerobic threshold. They learn to subjectively rate their perceived exertion.

WORKOUT PROGRAM (1)

BEGINNING FITNESS INTERVAL TRAINING

An aerobic interval-training program is low intensity but continues for longer than three minutes. Both the work and rest intervals occur at an intensity that is within your clients aerobic system. The interval period is performed at a slightly higher intensity than her steady state. The rest period is slightly lower than her steady state. The time in each interval usually ranges anywhere from four to 15 minutes.

Speedplay is a form of interval training that is based on how your client feels. It is less systematized than normal intervals. She governs how hard she wants to work. She controls her intensity based on her tolerance. Speedplay may be more enjoyable than timed intervals. It teaches beginning clients how to progress beyond their anaerobic threshold. They learn to subjectively rate their perceived exertion.

Studies demonstrate metabolism remains elevated up to fifteen hours after an interval training session. One investigation examined a group who trained moderately four times a week burning 400 calories per session. Another group trained moderately twice a week, but on the other two days performed interval training. The intervals-only group burned 250 calories per session, but two days of moderate exercise combined with two days of intervals incinerated nine times more fat than four days of moderate exercise.

FITNESS INTERVALS – SAFETY & SPEED

The benefits of interval training include:

1. Increasing your clients VO₂ maximum. She will also be able to work out at a higher percentage of her VO₂ max. because she will increase her anaerobic threshold.
2. Your client can burn more total fat and calories in a shorter workout session thereby maximizing the use of her time.
3. Your client will be effectively stimulating both fast and slow twitch muscle fibers.
4. Your client can change her interval routine to avoid overuse injuries.
5. Intervals add variety to your client's program and therefore increase the likelihood of adherence and motivation.

Now, as your client practices these techniques, she will experience various levels of fatigue. Know that she can beat fatigue and discomfort (not joint pain, lactate and the hydrogen ion burn). Go with it. Pushing herself through discomfort will lead her to her goal. As she increases her stepping speed, she should expect an increase in discomfort. An increase in the burn is a signal she is nearing the finish line. Teach her to be objective about the burn and fatigue. Allow her to observe it; and eventually enjoy it.

Here are some cues to improve your client's focus and form

- Ask your students to stay in the present. If they miss a cue, they should note it, adjust, and then go on.
- Remind your students to associate with their workouts by cueing them to stay “smooth”, add “control”, or “power.”
- When your students are tired, remind them to be especially vigilant to minimize lapses in concentration to prevent injury.
- Use the mirror to adjust your student’s posture. Are his shoulders back? Is his spine neutral, and is his chest open during his entire activity? Here are other cues: *Are her knees tracking over her toes, not beyond? Is her head up? Is her spine extended?*

Cue your students to concentrate on their breathing. “Breathe deeply from your diaphragm. Feel your rib cage and abdomen expand with each breath. Count your presses on each inhalation and exhalation. Focus only on the relationship between your presses and your breath. . Continue to focus on the rhythm of your breath. Allow your awareness to sink into your gluteals and hips. Enjoy the power of each press and notice how your breath energizes each footfall. Bring your attention to a spot a few inches below your navel. Each press begins and ends here.

Among others, you can look forward to the following improvements in your student’s health:

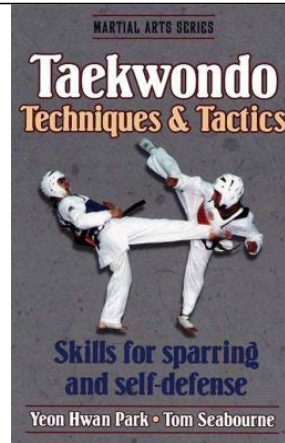
- Lower blood pressure.
- Increase in food transit time through the colon to combat some types of cancer.
- Increased bone density, thereby decreasing your chance for osteoporosis.
- An increase in good HDL cholesterol.
- More muscle helps prevent type II diabetes because additional muscle uses more oxygen, and takes up extra sugar. Lower blood sugar levels are important for the prevention of type II diabetes.

- Avoid bending all the way over at the waist.
- Avoid standing on one leg for longer than eight counts.
- Do not allow your students to hyperextend the cervical vertebrae. This can cause dizziness.
- Avoid letting your students drop their arms forcefully from a position above the head or out to the sides. After lifting the shoulders up, the return to neutral should be slow and controlled.
- Avoid forcefully twisting from side to side.

Do's and Don'ts for your client’s on the floor training:

1. Do be sure she contracts her abdominal muscles.
2. Don't let her hold her breath.
3. Don't let your client arch her back too much, keep a neutral spine.

4. Don't let her pull on her neck.
5. Do be sure she uses slow and controlled movements.
6. Don't let her swing her legs.
7. Don't continue repetitions if she loses her form.



Delayed Onset Muscle Soreness (DOMS)

Your students may experience unexplained muscle soreness from some of the more vigorous workouts. Answer this question: Why are your quadriceps sore after running down a hill? Your quadriceps decelerate the speed of your legs. When you decelerate your quadriceps, gluteals, and hamstrings must stop a powerful force (your body weight). Look at the development of an ice skater. Some of these skaters don't lift weights but their gluteal muscles are well developed from the constant eccentric contraction. This eccentric contraction of your antagonist muscles may cause delayed onset muscle soreness (DOMS). Therefore, just like always, begin slowly, and progress gradually. Give your students plenty of time to master technique. Then, the antagonist muscles will adapt to their newfound power.

Monitoring Intensity

To monitor your level of intensity or exertion throughout the class, pay close attention to subjective cues. Using the Borg Rating of Perceived Exertion (RPE) scale, you should subjectively estimate how hard you are working approximately every 10 minutes throughout the workout. On a scale of 1 to 10, with 1 being almost no effort at all, and 10 being like an all-out sprint, you'll need to decide how hard you think you are working—you are the best judge of how you feel the work effort is. You'll probably choose to work somewhere between 3 and 7, depending on your fitness level and goal. Modify your effort level to increase or decrease your intensity using the options offered during the workout.

Rating of Perceived Exertion Scale

- 0 Nothing at all
- 0.5 Very, very weak
- 1 Very weak
- 2 Weak
- 3 Moderate

- 4 Somewhat strong
- 5 Strong
- 6
- 7 Very strong
- 8
- 9
- 10 Very, very strong

INTERVAL TRAINING

Interval training involves the manipulation of your client's intensity throughout her workout, featuring alternate high-intensity work bouts and low-intensity rest periods. Intervals are used to improve your clients fitness using effort intervals followed by recovery intervals. You can make interval training specific to your client's fitness goals by practicing a specific drill, or you can use intervals to help her to lose weight and improve her overall fitness. To begin, make intervals equal to your clients normal steady state program. Follow this with a rest/recovery segment performed at a lower intensity.

Research has shown that interval training improves both your clients' aerobic and anaerobic capacity. Continuous, long, slow, fitness training improves aerobic capacity only. Interval training has also been shown to burn more total fat and calories than continuous training. Intervals allow your client to perform more work increasing her exercise post oxygen consumption (EPOC). EPOC, the "afterburn", is the absolute number of calories your client consumes, long after she has completed her workout.

Intervals have the potential to train your client's heart muscle longer and more effectively than a single bout of continuous training. During interval training, your client's heart must overcome a greater resistance. This leads to improved venous return, which results in greater ventricular filling and contractility. Your client experiences a more complete emptying, which increases her stroke volume and cardiac output.

Interval training also improves your client's ability to tolerate lactate. She becomes accustomed to short periods of activity just below her anaerobic threshold.

This helps her to delay the onset of fatigue during exercise.

If you feel you need to take a break, make it active rest – keep moving to maintain your elevated core temperature. Should you need to stop working out for any reason, gradually decrease your level of exertion to allow your body to recover and remember to stretch the muscle groups targeted in the activity.



Alignment

While the weight of the upper torso should be centered and balanced between the legs. During lunge-type movements, participants should control stride length and

maintain a slight hip hinge to facilitate balance.

The knees, ankles, and hips should flex and extend or hinge as the joints are intended to move, within a safe range of motion. Bodyweight should be stacked or centered so that the legs can control impact and reciprocate weight shifting, without compromising alignment. The arms will help to balance the body weight by naturally complementing or counterbalancing the leg movements. The head, neck, and shoulders should stay centered over the working leg(s), and the spine remains neutral throughout the workout.

- Upright posture
- Upper torso centered over hips
- Slight hip hinge during lunge-based foot patterns
- Arms complement or counterbalance
- Neutral spine maintained throughout



BEGINNING INTERVAL TRAINING

An aerobic interval-training program is low intensity but continues for longer than three minutes. Both the work and rest intervals occur at an intensity that is within your clients aerobic system. The interval period is performed at a slightly higher intensity than her steady state. The rest period is slightly lower than her steady state. The time in each interval usually ranges anywhere from four to 15 minutes.

Speedplay is a form of interval training that is based on how your client feels. It is less systematized than normal intervals. She governs how hard she wants to work. She controls her intensity based on her tolerance. Speedplay may be more enjoyable than timed intervals. It teaches beginning clients how to progress beyond their anaerobic threshold. They learn to subjectively rate their perceived exertion.

Studies demonstrate metabolism remains elevated up to fifteen hours after an interval training session. One investigation examined a group who trained moderately four times a week burning 400 calories per session. Another group trained moderately twice a week, but on the other two days performed interval training. The intervals-only

group burned 250 calories per session, but two days of moderate exercise combined with two days of intervals incinerated nine times more fat than four days of moderate exercise.

INTERVALS – SAFETY VS. SPEED

The benefits of interval training include:

1. Increasing your clients VO₂ maximum. She will also be able to work out at a higher percentage of her VO₂ max. because she will increase her anaerobic threshold.
2. Your client can burn more total fat and calories in a shorter workout session thereby maximizing the use of her time.
3. Your client will be effectively stimulating both fast and slow twitch muscle fibers.
4. Your client can change her interval routine to avoid overuse injuries.
5. Intervals add variety to your client's program and therefore increase the likelihood of adherence and motivation.



HEART RATE TRAINING

So what is this 150 beat- per-minute thing? Is there such a thing as “hot spot” training to melt fat? Can you incinerate blubber by training at your target heart rate?

Every fitness fanatic owns a heart rate monitor —to monitor performance, goals, and workouts. What should your client do to lose those ‘love handles’?

- a. Take her percent body fat?
- b. Check her training log?
- c. Dip into her supplement stash?
- d. Pay attention to her heart rate monitor?

If you answered “d” you realize that heart rate training is part of the madness, and an easy training tool to carve away fat. Sally Edwards, heart rate training guru from Sacramento, CA suggests that “a heart rate monitor is one of the most important pieces of technology to use to gain muscle and lose body fat.”

What is a heart rate monitor (HRM) anyway? A HRM consists of a transmitter strapped around your chest, and a wireless receiver that resembles a wristwatch. Just as your antique personal computer cost a fortune, early HRM's were pricey. Today your client can pick up a HRM for less than what she would pay for a night out. “One of the reasons that nearly 50% of Americans are overweight is because they aren't training in the right heart rate zones,” warns Sally Edwards, author of twelve books including, *The Heart Rate Monitor GuideBook to Heart Zone Training* (Heart Zones Publishing, 1999). “We have been taught to exercise at a fixed or target heart rate and it doesn't work for most people so they are getting less fit and more fat every year. People need to learn the

new way of training- don a heart rate monitor and train within multiple zones to get fit and lose fat”, explains Edwards. We burn fat in all the heart zones ... the burn rate is the key factor in your fitness training. “The closer to your anaerobic threshold that you can workout for the longest period of time results in the most calories burned”, adds Edwards.

“A HRM serves as a guide to make sure you train according to the demands of your workout in conjunction with your target heart rate”, explains Ed Burke, Ph.D., author of *Precision Heart Rate Training* (Human Kinetics, 1998). Besides, a HRM is more accurate than taking your pulse from the neck or wrist, he says. “If you are just beginning to train, use a HRM to be sure that you are not over training”, suggests Burke. Your HRM can keep you at 60 to 70% of your Max HR so you do not overdo. After a few months of training, your HRM may reward your client by sending her the message that her resting heart rate has dropped several beats per minute, says Burke.

Your client’s resting heart rate is measured when she first wakes in the morning before she gets out of bed. The lower the number the better, because this means that the heart is efficient. In general, the more fit your client, the stronger her heartbeat, and the less times it will beat per minute and the more blood it pumps with each beat. Common resting heart rate numbers are in the 50-60 beats per minute range, but some really fit athletes display resting heart rates in the 30's and 40's. If your client’s resting heart rate drops after a few months of exercise, she is probably getting fitter. And “the more fit you are, the more effectively you burn fat to maintain a healthy weight”, says Edwards.

Three ways to determine your client’s resting heart rate:

1. Have someone gently wake her up and then take her pulse one-hour before her normal waking hour. Count the pulse for one whole minute.
2. In the evening, suggest that your client lie down in a supine position with some calming music and just allow her body to relax without any distractions and breathe comfortably for about 20-30 minutes. Tell her to count her pulse for one whole minute.
3. Your client can wear a heart rate monitor to sleep and glance at it just as she is starting to wake.

Tell your client to record this number seven days in a row. Then she can add them together, and divide by seven. This will give your client a true average of her resting heart rate (RHR). If your client regularly records this figure and notices that her numbers are increasing by 10%, it means she is overtraining, overstressed, or her body is starting to break down and she could be starting to get ill. If you notice this happening, tell her to take the day off and pamper herself by resting, getting a massage, or just training very light and easy for a couple of days until her RHR gets back to her normal average.

On the flip side, if your client notices her RHR dropping slightly, that is one indication that her cardiovascular fitness level is improving. When this happens her heart has to beat fewer times within each minute to sustain her normal body functions.

If your client wants to use a HRM to improve her progress, her first step is to figure out her maximum heart rate (MAX HR). Your client’s Max HR is the fastest her heart can beat for one minute. **Among the most recent heart rate formulas is the following, which is a bit complicated, so grab a pad and pencil:**

Max HR = 210 minus 1/2 your age minus 5% of your body weight + 4 (males), says Edwards. Your client's genes account for about 50% of her Max HR. Smaller hearts beat faster than larger ones.

"Your Max HR is affected by altitude, drugs, and antihistamines. It cannot be increased by training and a high Max HR does not predict better performance", says Edwards. "If you go to a gym and see the Max HR charts, be cautious. They aren't very accurate. Maximum heart rate is genetically determined; it simply isn't going to decrease according to those charts. In fact if you stay fit as you get older, your Max HR may not change much at all", Edwards explains.

Ready, set beam me up Scotty and dial-in my Max HR. Use percentages of your client's Max HR to determine the intensity for her workouts. Then you can chart her individual training zone percentages and easily program them into her HRM. Your client's monitor will notify her with a beep if she is exercising above or below the pre-programmed zones. Many HRM's record heart rate at selectable intervals. Evaluate your client's exercise after each session and adjust her intensity if needed. Recording heart rate also allows you to monitor your client's fitness improvements over time.

Once you determine your client's resting heart rate and training heart rate, it will be easy to discover if she is working out too hard or too easy. After a few months of training, she will be amazed that she can probably estimate her heart rate within a couple of beats. For example, during your client's warm up, her heart rate may be around 100 beats per minute. But when she accelerates her speed, she will perceive that she is exerting more. Her training heart rate will correlate quite closely with how she feels.

OTHER FORMULAS

There are more traditional formulas for calculating the maximum heart rate, according to the ACSM. Subtracting the age from 220 is the most traditional fitness estimation.

MHR = 220 – age

Once maximum heart rate has been determined, it is necessary to establish the "training range" which is 60%--90% of the maximum heart rate. By exercising within this range, the ACSM has determined that the exercise will be safe, effective and challenging for the average adult exerciser. The traditional formula often used in fitness establishments is the (Dr.) Karvonen Formula, detailed below. It requires knowing the participant's resting heart rate. Using the resting heart rate increases the accuracy because resting heart rate is indicative of a person's fitness level.

Heart rate can be measured at a variety of sites. The carotid artery (on the neck under the jaw), and the radial artery (on the inside of the wrist) are the two most popular sites, but heart rate can also be taken at the temple or even by simply placing the hand over the heart.

To determine resting heart rate, you should take the heart rate first thing in the morning (preferable after waking up on your own, without a jolting alarm clock). Find the heart rate at either the carotid or radial site, and count for one minute. It is best to do this for at least 3 consecutive mornings and add the readings together and divide by 3. This

will be your resting heart rate (RHR).

Once MHR and RHR have been determined, the training range of 60%--90% can be calculated using the following formula:

$$\begin{aligned} 220 - \text{age} &= \text{MHR} \\ \text{MHR} - \text{RHR} &= \text{Heart Rate Reserve (HRR)} \\ (\text{HRR} \times 60\%) + \text{RHR} &= \text{Lower end of training range} \end{aligned}$$

$$\begin{aligned} 220 - \text{age} &= \text{MHR} \\ \text{MHR} - \text{RHR} &= \text{HRR} \\ (\text{HRR} \times 90\%) + \text{RHR} &= \text{Upper end of training range} \end{aligned}$$

For example, let's take Constance who is 32 years old and has a resting heart rate of 65 beats per minute and determine her training range.

$$\begin{aligned} 220 - 32 &= 188 \\ 188 - 65 &= 123 \\ (123 \times 60\%) + 65 &= 138.8 \end{aligned}$$

The low end of Constance's training range should be 139 beats per minute. If you take a 10-second heart rate check during cardiovascular conditioning, Anne's heart rate should be no lower than 23 beats. The 23 beats is determined because there are six 10-second counts in one minute (6 x 10 seconds = 60 seconds / 138 divided by 6 = 23). Instructors often prefer taking a 10-second count during class because it gives an accurate indication of intensity, but keeps participants from standing still for a long period of time if a 30-second or 1-minute count was used.

$$\begin{aligned} 220 - 32 &= 188 \\ 188 - 65 &= 123 \\ (123 \times 90\%) + 65 &= 175.7 \end{aligned}$$

The high end of Constance's training range should be 176 beats per minute which would be 29 beats for a 10-second count.

RECOVERY HEART RATE

This is the heart rate typically determined two minutes after your client's workout is finished. Determine your client's recovery heart rate (RHR) by counting her pulse for one minute. The only difference between recovery heart rate and resting heart rate is that your client's recovery measure is taken after exercise. Record this number frequently since it is another method of determining cardiovascular fitness. The quicker the number drops, the better your client's cardiovascular condition.



HR TRAINING ZONES

There are two training zones that we will be concerned with for your client: the “start up,” or “recovery” training zone, and the “improved fitness,” or “higher” caloric expenditure zone. When your client knows her training zones, she can increase or decrease her workload accordingly. For example, if your client’s recovery-training zone is 80 to 100 beats per minute, and her actual heart rate is 120, she should decrease her intensity. And if her improved fitness zone is 140 to 170 beats per minute, and her heart rate monitor shows that she is working out at 190 beats per minute, once again she should slow down.

1. The start-up, or recovery, training zone is 50-70% of MHR

Determine zone by using this formula:

$$\underline{\hspace{1cm}}(\text{MHR}) \times .50 = \underline{\hspace{1cm}} \text{Low end figure}$$
$$\underline{\hspace{1cm}}(\text{MHR}) \times .70 = \underline{\hspace{1cm}} \text{High end figure}$$

Example for a 40 year old male with a MHR of 180

$$180 \times .50 = 90$$

$$180 \times .70 = 126$$

This client’s start-up or recovery training zone is 90-126 beats per minute. She should allow her heart rate to drop to this level during the warm up, between intervals, and during the cool down. If her heart rate is higher than 126 beats per minute, she should slow down.

2. The working zone or higher caloric expenditure zone is 70-90% of MHR.

Determine zone by using this formula:

$$\underline{\hspace{1cm}}(\text{MHR}) \times .70 = \underline{\hspace{1cm}} \text{Low end figure}$$
$$\underline{\hspace{1cm}}(\text{MHR}) \times .90 = \underline{\hspace{1cm}} \text{High end figure}$$

Example for a 40 year old client with a MHR of 180

$$180 \times .70 = 126$$

$$180 \times .90 = 162$$

So, this client’s working zone or higher caloric expenditure zone is 126-162 beats per minute.

INTERVAL CIRCUIT SAMPLE WORKOUT (1)

NEWSFLASH! Bodybuilders Circuit Train with HRM's to get Shredded!

- *Do a set of 10 reps on the bench press at a weight that is 60% of your one repetition maximum (how much weight you can lift one time).*
- *Then without rest, pedal a stationary bike for a three-minute, gut-busting interval keeping your heart rate between 70% and 80% of your Max HR.*
- *Next, hit the shoulder press for another quick set of 10 reps at 60% of your one repetition maximum.*
- *Jump on your stationary steed for another pedal party keeping your heart rate between 70% and 80% of your Max HR.*
- *Continue to work each major muscle group followed by three-minutes of cardio until you are fried. Eventually you will be fit enough to train all of your body parts without your heart rate dropping below 70% of your Max HR (and without keeling over from exhaustion.)*
- *Set your HRM to signal if you drop below or rise above your target of 70% to 80% of your Max HR, explains Burke. Edwards sums up by saying, "The best way for a bodybuilder to increase fat metabolism is to increase his or her muscle to fat ratio and increase total daily caloric output".*

Fit and unfit people burn fat differently. The more fit your client is, the more efficiently her body guzzles fat. On the other hand, perhaps your client has been exercising, but not losing the weight. Maybe she has been working out too hard for too short a period. To burn more total calories, she may need to increase her exercise time at a lower intensity. "There is no such thing as a hot spot fat burning zone", says Edwards. "Rather, human physiology works on the principle of individuality - each person burns fuels unique to their physiology", she says.

If your client is just beginning to work out, and she wants to lose fat (who doesn't), she should exercise at 60-65% of her Max HR. Let her build up to an hour of continuous exercise at this level. After several months of this baseline training, kick her metabolism into overdrive and accelerate fat loss by "training in all heart rate zones on different days at various intensities to burn fat and raise metabolism", recommends Tony Vargas, Master Presenter for the Spinning™ program, and owner of Physique Plus in Orlando, FL.

SAMPLE INTERVAL TRAINING WORKOUT (2)

"Turbo Training" in the Zone

All your client needs is one of these - Bike, Stationary Bike, Stairclimber, Elliptical Machine, Treadmill, Step, Heavy Bag, Swim, Jump rope, Walking Shoes, or Jogging Shoes.

GUIDELINES

- *Warm up for five minutes before each turbo-training workout.*
- *Maintain the same workout duration throughout the entire week. Your first week is a 30-minute turbo-training program.*
- *Add two minutes each week to your daily turbo-training workout until you are training between 45-minutes and one-hour, five days a week.*

- *Cool-down and stretch for five minutes after you complete your workout.*

DAY 1: Interval Training –Thirty seconds of effort followed by 30 seconds of recovery at 80% of your client’s Max HR for her effort intervals. Allow your client’s heart rate to drop to about 120 beats per minute for her recovery intervals. Keep her moving for a total of 30 minutes of turbo-training.

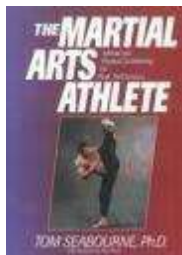
DAY 2: Recovery Workout –Pedal, walk or step at a steady state. Make sure your client’s heart rate never exceeds 70% of her Max HR but never drops below 60% of her Max HR for the entire 30-minute workout.

DAY 3: Tempo Training- Kick your client’s intensity up to between 70% and 80% of her Max HR and stay just below her anaerobic threshold. (That is, if she goes any faster she will feel the burn and begin huffing and puffing uncontrollably). Try to keep her at this intensity for 30 minutes. Slow her down if she feels uncomfortable.

DAY 4: Recovery Workout – Pedal, walk or step at a steady state. Be sure your client’s heart rate never exceeds 70% of her Max HR but never drops below 60% of her Max HR for the entire 30 minutes of turbo-training.

DAY 5: Strength Day- Increase the resistance on her ergometer or do hills to take her between 70 and 80% of her Max HR for the duration of her entire turbo-training workout.

DAY 6 & 7: Active Rest - The only reason your client’s heart rate rises above 120 beats per minute on weekends is because her spouse tells her to mow the lawn or he taps her on your shoulder in a “welcoming way” (sorry, there is no significant fat burning here.)



Your heart is self-regulating but beware of the psychological, environmental and physiological factors that can affect your client’s beats-per-minute, says Edwards who is a member of the Triathlon Hall of Fame. For example if your client is tired, on medication, under stress, at high altitude, or in high humidity, her heart rate may change. Also, blood sugar levels, different foods, lack of sleep, anxiety, fear, or anger can alter your client’s heart rate. When your client ties her training shoes, her heart rate increases. Just by anticipating a workout, your client’s heart rate can increase as much as 100%.

Again remember your client’s fitness level determines what percentage level of heart rate she will be working. The harder and longer your client can work, the more fat she obliterates. The more fit she is, the more fat she burns just sitting around. But to lose inches and keep them off, “you must start slowly and progress gradually”, says Vargas.

Heart rate determines your client’s level of intensity, which then becomes an excellent fitness guide. Your client can use her HRM regularly, and remember it is supposed to be about fun. Heart rate monitors are simply another way to add that yummy spice. So, suck up and let your client borrow your HRM for a week. If she likes the informational feedback it provides, she can buy one.

MORE ON INTERVALS

Interval training is simply the interspersing of work-efforts with recovery cycles. So,

instead of only working in a sustained duration period, the following interval exercises will eventually work both your aerobic and anaerobic systems, involving both your slow and fast twitch muscle fibers, strengthening your client's heart, and burning fat in the safest most efficient way. Start your client slowly, progressing gradually to prevent injury. If your client becomes injured she can't train, she gets irritable, and everybody suffers.

Your client's interval-training may be accomplished in a number of ways and means: on a bike, a stationary bike, a stair-climbing machine, a treadmill, or by jogging around the backyard. All your client needs is a pair of running or cross-training shoes, her exercise machine of choice (not required), her body and a timepiece with a second hand.

For the first month your goal is to gradually increase the duration of your client's effort interval (sustained activity) to develop her aerobic base.

SAMPLE INTERVAL TRAINING PROGRAM (3)

I. Warm up for five minutes with some easy pedaling, climbing or walking. Then, whenever your client feels ready, she can pick up the pace to a speed where she can carry on a conversation, but is beginning to "huff and puff". Ask her to hold this pace for a comfortable five minutes. Then she can recover with a five-minute active rest of easy pedaling, climbing or walking. Take a few moments for her to stretch, and she is done for the day. Add one-minute per week to her effort interval until she is training for 20 minutes straight.

Always pay attention to your client's form during her effort interval and recovery interval. Are her knees tracking over her toes, not beyond? Is her head up? Is her spine extended? Are her shoulders and arms functioning with resilient strength?

II. After a few weeks your client's body is getting stronger and fitter and she is ready for a new challenge. We're going to break up her program so she gets to work harder and rest harder. Here we go. Pick up her pace but let her know that this increased speed will only last for 15 seconds. Fifteen seconds at a pace where she is breathing heavily and yes, she feels the burn. This should be the first time she has experienced "the burn" on our program (exhilarating, not painful). When 15 seconds is up, tell her to slow her pace to active rest. That is the same speed she has been using to recover and cool down in her previous workouts. Tell her to maintain this recovery period for 45 seconds. When that second hand hits the "12:00 position" ask her to do another 15-second work interval with 45 seconds of recovery. Continue this cycle until she has accomplished 20 work intervals and 20 recovery intervals (or 20 minutes of training). Let her cool down with five minutes of active rest. Take a few moments to stretch and she is done for the day.

III Pyramids

After her five-minute warm-up, when that second hand hits the "12:00 position," perform her fast-paced 15-second effort interval. Allow her to recover for 15 seconds. Now cue her 30-second effort interval. Let her recover for 15 seconds. Now prompt her to do a 45-second effort interval. Then she can recover for 15 seconds. Now she attempts a full minute effort interval! Recover for 15 seconds. Now tell her to come down the pyramid with a 45-second effort interval. Recover for 15 seconds. Come down again with a

30-second effort interval. Recover for 15 seconds. Tell her to try her last interval at 15 seconds. Recover for 15 seconds. She's done! Cool down, stretch, and shower up.

IV. 30-Second Pyramids

After your client's five-minute warm-up when that second hand hits the "12:00 position" tell her to perform her fast-paced 30-second effort interval. Recover for 30 seconds. Now she should do a 60-second effort interval. Recover for 30 seconds. Now ask her for a 90-second effort interval. Recover for 30 seconds. Now tell her to attempt a full 2-minute effort interval! Recover for 30 seconds. Now she can come down the pyramid with a 90-second effort interval. Recover for 30 seconds. Come down again with a 60-second effort interval. Recover for 30 seconds. Perform her last interval at 30 seconds. Recover for 30 seconds. She is done! Cool down, stretch, and shower up.

V. Speed Bursts

If she enjoyed pyramids, do them again this week. If not try 30-second speed bursts. Speed bursts are intervals of 30 seconds effort and 30 seconds of active recovery. Depending how she feels you can adjust the effort and recovery intervals accordingly. Thirty seconds may be too long of a sustained effort. If so, she can try a 20-second effort interval and a 20-second recovery. If that is still too much, try a 15-second effort interval followed by 15 seconds of recovery.

After her five-minute warm-up, when that second hand hits the "12:00 position" ask her to perform her 30-second effort interval. Take a good 30 seconds to allow her to recover. Then hit it with 30 seconds all over again. And recover again for 30. Continue this cycle 10 times until she has trained for 30 minutes. That's enough. She is through for the day. Now cool down, relax and stretch.

VI. Speedplay

Design your own interval workouts. Go by how your client feels. If she feels like moving fast – GO! When she is ready to rest, rest... Speedplay is fun and productive. Begin with a warm-up. Then, whenever you're ready, tell her to pick up her speed. Faster! Then slow down when SHE is ready. Pick it up again when you can tell she is ready. Watch her and tell her to listen to her body. Don't push her too hard. Let her enjoy it. When 30 minutes is up, she is done. This should be so much fun that 30 minutes flies by. If not, try to watch Larry King Live, maybe Suzanne Somers and Richard Simmons will be on there arguing about protein vs. carbohydrates.



MEDICINE BALL TRAINING (see PT videos for specific exercises).

Exercise doesn't have to be tedious or intense to be effective, and working with a medicine or power ball will drive this point home real fast.

Tossing around a heavy ball—which is all that a medicine ball is—may seem more like recreation than a great workout, but don't fool yourself for a minute. It's a very effective way to build muscle strength and size or just tone muscles, if that's your goal.

Beyond this, medicine ball training is just plain fun!

Medicine or med ball training is strength training with a twist. Like other strength training approaches, it builds muscle strength and size, but instead of doing it the traditional way—by increasing reps, sets, or loads—it does it through a unique combination of speed and resistance—or, to put it more technically “by training muscles at an increased rate of speed with a given amount of resistance provided by the ball.”

Sound confusing? The good thing is, you don't really have to understand why it works. Just know that it does!

Tossing a medicine ball around works muscles at different speeds and angles. This not only gives you a great workout, it also helps increase your balance, your reaction time, and your agility, too.

Med ball training develops your ability to accelerate and decelerate your moves. Both are important in fitness.

Med ball training uses explosive strength—you'll contract your muscles forcefully and use a greater percentage of fast twitch than slow-twitch fibers—which means you'll exert maximal force in minimal time. Doing this well calls for being rested and refreshed, both physically and mentally.

Be sure you're fully recovered from any previous activity before you do medicine ball workouts. Doing so will allow you to better concentrate on your moves, which, in turn, will allow you to get more out of them.

If you've never used medicine balls before, simply start out by just playing catch, either with yourself or with a partner. Or, you can jump right into the following drills. After several months, start increasing the speed of your throws. Concentrate on simulating the act of punching as closely as you can when you throw.

If you don't have a partner, you can throw the ball against a wall, a rebounder or even a heavy bag.



STABILITY BALL TRAINING (see PT videos for specific exercises).

Using an exercise or stability ball will help you develop better balance and stability—hence the name! Its round shape provides an unstable base from which to perform various exercises. As a result, stabilizer muscles strengthen and balance improves.

The stability ball also provides you with the chance to move through your exercises with a greater than normal range of motion.

When you do crunches from the floor, you lose about a 30-degree angle that you can achieve on the stability ball. This requires you to stretch muscles before you flex them.

Stretching your muscles beyond their normal resting length on a stability ball gets more muscle fibers involved in your exercise. The more muscle fibers you use, the greater the toning effect.

Getting Your Balance

At first, brace the ball so it doesn't roll. Balancing on the ball is difficult enough instead of

having to worry about if it going to roll out from undr you. Brace the ball against the wall or have your partner hold onto it. Take some air out of the ball for increased balance. Letting air out allows the bottom of the ball to flatten against the floor so that it is easier to maintain your balance.

Begin with easy exercises until you feel stable. As you get in better shape, you will be amazed at how your stabilizer muscles improve your balance ability. Don't be tempted to stretch too far on the ball. Stretch just a little bit beyond the resting length of the muscle you are training. You should feel a light stretch.

Modify exercises to meet your needs. If an exercise is too difficult or doesn't fit your body correctly, change it. Just be sure to maintain perfect posture and body alignment.

You should feel comfortable on the ball at all times. If your exercise feels uncomfortable, change it or have a spotter help you to complete it properly. Rather than risk falling off of the ball, modify the exercises to fit your needs and your ability level.

PLYOMETRIC POWER TRAINING (see videos for plyo workouts)

Plyometrics appear to be a bunch of jumping drills. They are at that, but there is more to it. Plyometrics takes advantage of the stretch-recoil effect in your muscles. That means when you stretch your muscle beyond resting length, the stretch reflex causes a rubber band like response. This helps you move faster than your normal rate of acceleration.

Most elite power athletes do plyometrics. Imagine the physique of a sprinter or a long jumper. They have powerful, well-defined athletic looking muscles.

Regardless whether you have equipment or not, a regular dose of plyometrics will get you in great shape.

These routines will help you lose fat gain muscle and improve your work threshold and anaerobic endurance. Perform these exercises two days a week.

Plyometric drills increase your strength and power and burn a tremendous number of calories. You can even fit plyometrics into your old fuddy-duddy jogging routine.

After you jog for a five minute warm up, skip with an exaggerated knee-lift and long stride for thirty seconds. Then jog for another five minute recovery. Now sprint raising your knees high for another thirty seconds. Jog for five minutes. Perform five consecutive standing broad jumps forward and backward. Without resting, hop ten steps forward on your right leg and then ten steps forward on your left leg. And finally, jump up and down ten times as quickly as you can keeping your feet as close to the ground as possible. Jog for five minutes and take a good cool down and stretch.

Plyometric power training increases the size and activity of your fast twitch muscle fibers. Training your fast twitch fibers increases your metabolism so that you will burn extra calories even at rest.



V. PRE-HAB AND RE-HAB UNDERSTANDING YOUR CLIENT'S BACK

To examine your client's flexibility and balance, have her lie flat on a hard floor. Where does she feel the heaviest pressure against the floor? Tell your client to stand barefoot facing a mirror. How is her weight distributed? Are her feet angled? Are her hips even? Are her shoulders level and parallel with her hips? Do her toes and kneecaps face forward? Does she see the sides or back of her hands?

Bend your index finger back until it feels uncomfortable. An x-ray won't show what is causing your pain. When you return your finger back to normal, it feels fine. Similarly, some postures make your client's back "unhappy." When a random sampling of subjects were required to have their backs x-rayed, some showed abnormalities and others did not. Amazingly, some of the folks with spondylolysis and spondylolisthesis were pain free. Others, who complained of severe back pain, showed no sign of deformity.

Weak abdominals are not always to blame for low back pain. Usually tight hamstrings are the culprit. Fitness testing in the appendices may help determine the origin of your client's pain. If she scores high in the bent knee curl up test, but low on the sit and reach trunk flexion test, focus on improving your client's hamstring flexibility. Muscles can be short or overtight from disuse. (Always consult a doctor before performing any interventions with your client).

Poor fitness leads to poor posture. If your client carries most of her weight in her abdomen, her back muscles must counterbalance. The same is true concerning the relationship between your client's quadriceps and hamstrings. Your hamstrings should be at least 60 percent as strong as your quadriceps (thigh muscles). Tight hip flexors and hamstrings, combined with weak abdominals and upper back may be a prime cause for your client's suffering.

Drop this book on the floor. Bend down to pick it up. You probably twisted in

your chair and leaned over sideways from your waist. Unsupported forward flexion with a shearing diagonal force is unhealthy for the disks in your low back.

Your disks are collagen packets filled with water. You are taller in the morning because your disks are not compressed from hours of daily standing or sitting. When you wake up, sit on the potty, and proceed directly into your abdominal training, your inflated disks may protrude into your spinal nerve causing pain. Therefore, tell your clients to perform her crunches later in the day.

Does your client's back hurt when she walks? Walking loads and unloads your disks, like a massage. With most muscular problems, moving around helps to relieve pain. But more serious ailments could be aggravated while walking or moving. This may be due to a nerve impingement or herniated disk. In these cases, walking exacerbates pain because of nerve involvement. Pulsing and throbbing pain, or temperature disturbances may be a vascular issue.

Bend forward from your waist. At about 15 degrees of flexion your back muscles (erector spinae) eccentrically lengthen. When you bend to about 45 degrees your hips take over. Bend past 90 degrees and your back is supported by ligaments. Pain receptors called nociceptors are in these ligaments.

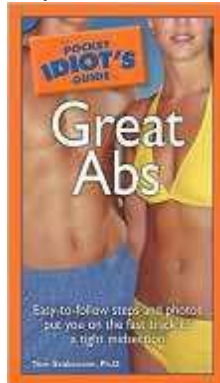
INJURY PREVENTION PROGRAM (1)

Tell your client to sit in a chair with her left leg on the floor and her right ankle crossed over her left knee in a figure 4 position. Slowly ask her to bring her chest toward her right knee. Did she feel pain? Try the other leg. Disc injuries, muscular imbalances, lack of flexibility in the gluteals and piriformis (muscle under the hip) can create sciatic nerve problems. Tell her to check with her doctor if she feels tingling or numbness radiating down her leg.

Other stretches may relieve your client's low back pain:

1. Have your client lie on her back and bring her knees to her chest in a fetal position. This stretches the erector spinae and quadratus lumborum.
2. Tell your client to lift one knee to her chest and grab it with her arms. Let her other leg remain on the floor. Switch legs and repeat. This stretches her hip flexor muscles.
3. Ask your client to lean sideways into a wall keeping her pelvis stable. She should bend sideways not forward. This may help if she has a disk that protrudes sideways.
4. While your client sits in a chair and slowly twists sideways, be sure she is maintaining a neutral spine throughout. This may relieve pressure on her disks.
5. Your client should lie on her abdominals. Ask her to raise her right arm and her left leg. Then reverse it: Her left arm and right leg will be raised. This "Superman" exercise strengthens her erector spinae in her back.
6. Tell your client to roll over onto her hands and knees. Ask her to lift her upper back and stretch resembling a "mad cat". Tell her to hold this stretch for 3 seconds.

7. Ask your client to stand with her right hand against a wall. She can grab the top of her left foot with her left hand. She should bend her left knee until she feels a stretch in her left quadriceps. Switch legs and repeat.



STRONG CORE

It is not beneficial to possess awesome abs at the expense of awesome low back pain. I have seen people do bizarre exercises in the gym in an attempt to gain awesome abs. One young man placed a twenty five-pound weight on his face while he performed sit-ups. His nose protruded through the hole in the middle of the plate so he could breathe.

If your client's lower back hurts, begin with trunk stabilization movements. Have your client lie on his back and lift her arm and opposite knee toward her chest while maintaining a neutral spine. Next perform pelvic tilts. To perform a pelvic tilt, tell her to place her palms over her abdomen and chest so that the pinky of one hand is above the thumb of the other. Those fingers do not touch each other while she is in a relaxed position. When she posteriorly tilts her pelvis, her pinky and thumb touch.

Performing hundreds of crunches a day may be harmful to your client's disks. Crunching forward forces the annulus of lower back disks into your spinal nerve causing pain. After your client finishes her abdominal workout, have her perform some hyperextensions to move lower back disk material into place.

Your abdominal wall is thinner toward your ribs near your solar plexus. That is one reason the upper part of your rectus abdominis fatigues quickly when you perform crunches. Your hip flexors do most of the work when you execute reverse crunches. It feels as if you are training your lower abdomen, but it is simply the close proximity of your hip flexors to your rectus abdominis. Consider it a case of "referred" soreness.

Test your client's balance of strength between her lower back and abdominal muscles by performing the following exercise. Have her lie on her back and keep her lower back flat while she extends her legs toward the ceiling. Ask her to slowly drop her legs while attempting to hold her lower back flat to the floor. If she can pull this off, her abdominals are strong enough to counter the pull from your hip flexors.

When your abdominals contract they produce an innertube like effect to stabilize your torso. When you contract your obliques you provide structural support to your spine as if filling an innertube. In aerobics classes, instructors directed you to "pull your belly button to your spine" to protect your lower back. Ironically it is not your abdominals that hold your belly button in, it is your diaphragm. A preferred guideline is to maintain a neutral spine when performing your abdominals. A neutral spine is a slight arch in your low back. If your client owns a large buttocks she may be incapable of holding her lower

back to the floor. If she has a heavy chest or thick legs, crunches and reverse crunches are difficult.

The location and design of your abdominal muscles affect their function. Lying on your back doing sit-ups strengthens your hip flexors and rectus abdominis (a.k.a. six pack). But sit-ups do little to equalize the strength in your obliques and back. Humans stand in an upright posture. Your abdominal muscles stabilize your movement. Stand and place your hands around your waist. Move in any direction. You do not have to move far before you feel your abdominals brace your effort.

Teach your client to practice contracting her abdominals during her normal, upright posture. Why? Because most of her daily activities are performed while standing or seated. Electromyography studies demonstrate that your obliques (side of your abdominal muscles) are active when you are standing. Improve the balance and strength in your client's trunk. Build her back and abdominal muscles from the inside out. Rather than just worrying about a "six pack," train her core for internal stability.

The safest position for your client's low back is a neutral spine. Neutral simply means a slight, natural curve in your lower back. A neutral spine places the least amount of pressure on your client's disks, ligaments, and bones. She can absorb impact better. The breadth of her lordotic curve is individual, like a fingerprint. Excessive arching and flattening of your back stresses your spinal disks. This can lead to nerve root irritation, degeneration of the vertebrae, and herniated discs. Chronic pain may be caused by gravity pulling your client out of alignment while she is sitting or standing. In minutes, gravity and a variety of other factors pull your client out of perfect alignment. It takes practice and muscular endurance to stay in neutral. Ask your client to try spending five minutes in neutral. Tell her to add two minutes a week until she can sit through her favorite sitcom in neutral.

Ask your client to practice neutral spine while sitting, standing, and exercising. While reading, she should think, "posture." Your torso is the connection between your upper and lower limbs when you perform any fitness technique. A synergy between body parts provides stability. A powerful core allows your client to train her entire physique with less likelihood of injury. Acute back injuries occur from failing to stabilize your torso when you are trying to move heavy objects.

Low back pain in your client may be caused by weakness in her abdominals or lower back muscles. It may be tightness in her hamstrings or hip flexors. Or she might have a structural problem such as scoliosis (S-curve), no curve, or bone degeneration. Screenings such as trunk flexibility tests, hamstring flexibility tests, and bent knee curl up tests can help to determine the problem. A leg length discrepancy may cause pain on one side of your back. Good posture while sitting and bad posture while standing could be an indication for leg length problems.

Form

Emphasize keeping your form perfect and maintain normal breathing. All exercises should be performed with control and in a comfortable range of motion.

Maintain perfect posture on every exercise. Keep your stomach in; relax your neck; keep your back flat (don't arch). Don't bend too far, a few inches in either direction is all you need.

Focus on a specific part of your stomach. For example, to train the side of your stomach, think about leaning forward and twisting to the side.

Relax the rest of your muscles so a higher percentage of force is exerted behind the specific muscle group you are working.

Place the palm of your hand just below your navel. Pooch your stomach out as if attempting to pose for the “before” picture on an infomercial. Then use your lower stomach muscles to slowly squeeze your lower abs toward your spine and hold for three seconds. Relax for a few seconds and try it again. Do this exercise for a few reps. Then, whenever you’re performing stomach exercises, remember to flex these muscles before and during all of your reps.

Using your lower ab muscles to pull your navel toward your spine makes all of your stomach exercises more effective. This is not the same as sucking your stomach in. It’s flexing the muscles in your lower abs and pulling them toward your backbone.

Flexing these lower stomach muscles stimulate muscles that are connected to your spine. This makes your entire stomach area more stable. More stability means that your ab muscles will produce more force and therefore tone more muscle. Flexing the lower ab muscles also keeps your back healthy.

Never let the amount of weight or repetitions dictate form. If you are training the front of your stomach, keep your neck relaxed. The rest of your muscles should not be helping with the movement. Move smoothly into each repetition with a controlled and one-hundred percent energized effort.

Use the suggested range of motion on each of your ab exercises. Ease into your workout. Start with some easy repetitions, then gradually increase the intensity. Breathe normally when you are first learning the exercise. But when the exercise becomes familiar, exhale during the exertion phase of each rep. Inhale on your short rests between each contraction.

Symmetrical development of your abs and lower back is important. An unbalanced workout program decreases the flexibility in your abs and upper thigh muscles leading to abnormal posture. Postural problems may increase the chance of injury to your under developed back.

Fortunately this program has built-in back exercises that you perform at the same time you are training your abs.

Speed

Take your time on each repetition. The slower you move, the less momentum, and the more work your ab muscles are accomplishing. You should be able to stop at any point during each rep.

Three seconds in both directions works well. During each repetition of your ab workout there are two different parts. One part is called the "positive" - the "up phase" of the repetition. The second part is the "negative" or the "down phase" of the repetition. It is important to come down slowly on the "negative" phase. Moving slowly on the negative phase will chisel those abs fast.

Slower uses more muscle fibers.

Some ab fans pay far too much attention to the quantity of crunches then to the quality of each movement. If you are too fatigued to do the negative portion of the three second rep, maintaining absolute control of the movement, then you are done with that ab exercise for the day.

Focus on the reps you do correctly instead of how many reps you should do. Your ab muscles will respond when you use good form at a controlled speed.

Cheating on your reps slows your progress and leads to possible injury, if not immediately then down the road. Don't compare how many reps you can do with someone else. Compare you to you.

Resistance

There is no better way to contour and streamline your abs than using resistance. You cannot target fat around your waist. But you can tone the muscle underneath.

To shrink a spreading waist, resistance training helps to speed your metabolism. Your muscle becomes toned and more compact than fat.

Use dumbbells, bands, or weight plates to challenge your stomach muscles. Resistance bands are great for training the sides of your stomach. Stash one in your suitcase and you have your own on-the-road ab toning device.

Your stomach muscles will tone and tighten in response to progressively increased resistance. As your stomach muscles get stronger, gradually increase the amount of weight you are using.

You may also increase reps, sets, or take less rest between sets to challenge your abs.

Three important factors in your ab workouts will dictate your progress -the intensity of the stress put on the muscle, the duration of the workout, and how many times a week you train your abs.

Don't be concerned that your abs will grow huge from resistance training. Women are especially worried that they will develop huge stomach muscles and increase their waistline.

Listen to your body. If your stomach muscles are stronger, and more toned, and you

are not gaining additional body fat, you are doing everything right.

Resistance is not necessary for most exercises. At first, your body weight is enough resistance to train your abs. Gradually add weight. Be sure you can perform ten repetitions with perfect form before advancing to a heavier weight. As your muscles adapt, and your abs get stronger, your goal will be to do ten reps with about 75% of the maximum resistance you could handle for one rep.

Your body weight is enough resistance.

When you begin to use resistance for your ab training, start with very light weight. Do not increase your resistance more than five percent in a single workout.

Do one exercise for each ab muscle group. Make sure you don't duplicate movements. For example, it makes no sense to do a set of crunches with no resistance, and then another set of crunches with resistance bands. Both of these exercises are exactly the same movement and work the same specific muscles. Instead, do a set of crunches for your overall midsection and then a side ab training exercise for the sides of your stomach.

SETS

Perform one to three sets per body part. After you have trained for a few months, your stomach muscles can handle more than one set of a particular exercise.

Work your way up to three sets of ten repetitions on every ab exercise. You know you are doing too much if you lose your form.

Losing your form means you can't finish a rep without changing your body position. If you're doing crunches and you start bouncing off of the floor, you're finished with the exercise. Whether you've done one set or four sets, once you've had a break in your form, you're done. Simply pay attention to your form rep by rep.

Perform sets consecutively or in a circuit

If one of your goals is to lose belly fat, move quickly from one ab exercise to the next. Keep charts to record how you are advancing in each of your muscle groups. Write down how many sets, reps, how much resistance you are using and how much rest you take between sets. As you increase the resistance and the number of repetitions, your muscles will respond.

When you are ready for another challenge, do an ab-training circuit. Perform one set of each exercise without rest in between exercises. This burns more calories than straight sets of crunches.

Circuit training also forces your cardiovascular system to work overtime. Without resting between sets you increase the amount of time you spend toning those abs compared with the amount of time you spend resting. This increases the metabolic demand of the workout and defines those abs.

Pulsing through your abdominal crunches is another way to add intensity. The principle behind pulsing is that instead of doing full crunches, you just stay at your mid-range and make a small movement up and down.

Pulsing preps your abs for using more resistance because it allows you to overload the part of your ab muscles that are strongest, without being limited by the part of the movement where you're weakest.

Do three sets of ten repetitions, resting one-minute between each set. Follow those with a set of ten full range of motion crunches.

Choose an abdominal exercise that you have difficulty performing a single rep. Do ten sets of one repetition, resting 30 seconds between each set.

This is a fabulous workout because you end up performing ten repetitions of an exercise you normally can only do one or two reps. This program requires you to recruit more total ab muscle fibers than usual.

Reverse your sets and reps. Take your current set and rep scheme and reverse it. Since you normally do three sets of ten reps, try crunching ten sets of three reps.

Since you're stopping at three reps instead of ten, rest ten seconds or less between sets. Reversing your sets and reps allows you to do the same number of total repetitions, but increases the average amount of force your muscles apply during the exercise.

Cut your ab workout in half. You may be overtraining your abs. By reducing the demand on them, you'll allow them to recover.

Another option is to take a week off. When you come back stronger after this ab-break, you know you were overtraining.

"Tri-sets" consist of performing three different exercises for your abs consecutively. Set one is performed followed immediately by a set of the second and third exercise with no rest in between sets. For example do a set of crunches followed by side planks on both sides. After completing this tri-set, take a minute break and do the cycle again.

A "superset" is performing two different exercises for your abs and lower back consecutively. Do a set for your back right after a set for your abs. Take no rest between exercises. For example do a set of reverse crunches followed immediately by bridging. After completing this superset, take a minute break and do the cycle again.

"Negatives" are flexing your ab muscles as they lengthen. These are performed by completing a set of an exercise and then having a training partner help you with the up-phase of your exercise. If you don't have a partner, use your arms to pull you

through the up phase. For example if you were doing crunches, you would grab your legs and pull yourself to the up position. Then perform the down-phase unassisted, slowly and with total control.

Reps

Toning your abs is not only achieved by increasing the amount of resistance you are using. Increasing the amount of repetitions you perform will make your abs toned and sleek.

If you increase the number of repetitions you can do, and maintain perfect form, you have increased your strength and most likely the muscle tone in your abs as well.

But doing hundreds of crunches in a single workout doesn't adequately challenge your muscles.

First of all, you are probably not performing perfect crunches, and secondly if you can do hundreds of crunches with perfect form, you need to add resistance.

Doing hundreds of repetitions is similar to chewing gum. You don't get a trimmed, toned jaw if you chew gum.

Do ten repetitions of each exercise

When you train your abs, you damage your muscle fibers. After your workout, your muscle fibers repair; a process that requires calories.

Added resistance to your ab training requires you to use more muscle fibers. You'll increase the number of fibers that are damaged and burn more calories after you've finished your workout.

Do less reps for strength

Increase the weight and do fewer reps (six to eight) if your goal is to gain strength in your abs. Add enough weight to challenge your abs but not enough to compromise your form.

Do more reps for endurance

Complete ten to 12 repetitions with enough resistance to fatigue your muscles if your goal is muscular endurance. Ten reps is a good compromise between absolute strength and muscular endurance.

Rest

Training your abs three days a week is plenty. Figure out which days will work best in your busy schedule. Spread your days out to get enough rest in between your workouts. Tuesday, Thursday and Saturday works great.

Rest no longer than a minute between sets

Rest no longer than a minute between sets of any exercise. If you rest too long you

may lose "the pump," and decide to call it a day.

Short frequent rest periods during a workout are important so that your abs don't burn out too early in your program.

During your rest period, blood delivers oxygen and energy to your abs and carries away waste products.

Rest longer on heavy sets and shorter on light sets.

As your conditioning improves, perform the same total number of sets and reps, but lessen your rest periods to a maximum of ten seconds. This requires your muscles to recover faster between sets and increases your results.

The harder the set, the more rest you need. One way to maximize your time is to superset abs and back exercises. For example, do a set of scissors followed immediately by a bridge.

Take at least one-day rest between workouts

Your abdominal muscles should be given 24-48 hours of rest before attacking them again. Your muscles firm up between training days. However, too much rest between workouts can hurt your progress. In as little as 72 hours, the benefits of your hard ab-work can begin to disappear.

Do's and Don'ts for your client's abdominal exercise:

1. Do be sure she contracts her abdominal muscles.
2. Don't let her hold her breath.
3. Don't let your client arch her back too much, keep a neutral spine.
4. Don't let her pull on her neck.
5. Do be sure she uses slow and controlled movements.
6. Don't let her swing her legs.
7. Don't continue repetitions if she loses her form.



MORE CORE REMINDERS FOR YOUR CLIENTS

**It doesn't take 20 minutes of exercise to begin burning fat around your waist. Break your workouts into a few minutes each scattered throughout your day.*

**Your body adapts to training so change up your workout program occasionally.*

**Sit and stand with perfect posture and your lower pooch will all but disappear.*

**To maintain your eye-catching abs, take the hip flexors out of your ab exercises.*

**The "kiai" in karate trains your TVA. So does the forceful breathing of Lamaze.*

**Subcutaneous fat is the adipose tissue between your skin and ab muscles that smooths out definition.*

**Get pumped up by listening to your favorite music. Imagine yourself lean and ripped and focusing on your ultimate goal.*

**Close your eyes and imagine your ab muscles flexing and shortening like slow-moving cables through a pulley that draws your chest and shoulders off the floor.*

**Rehearse your ab-workout in your head and it actually sends electrical signals to your ab muscles.*

**Exhale on the up phase of your ab exercise. This pulls your abs inward, making sure you use the deeper muscles of your abs. Inhaling on the up phase may cause your abdomen to pooch out causing overarching and strain to your lower back.*

**The “overload principle” states that your ab muscles will continue to respond as you progressively increase the resistance.*

**At the top of your sit up, don’t twist your elbow to your opposite knee. This creates torsion stress to your lower back, and it does nothing to tone your abs.*

**Don't interlock your fingers behind your head for ab training. You unconsciously pull on your head which decreases your ab work but increases your chance of neck strain.*

**Whether exercising, standing in line, or sitting at your computer, maintaining perfect posture is a great ab exercise.*

**Your rectus abdominis (six-pack) on the front of your stomach is a single muscle. If you train your lower abs your upper abs are working too.*

**The reason we suggest you keep your back flat to the floor and do not recommend maintaining your natural lower back curve is that you might arch your back too much and strain yourself.*

**Train your abs like any other muscle group. Give them at least a day’s rest before training them again.*

**Since you probably do not want the muscles underneath your waistline to grow larger, there is no need to over train your abs.*

**A static contraction is when you squeeze your stomach muscles by holding them flexed without moving.*

**Train your stomach muscles at different angles if you want to see great results.*

**On most stomach exercises, it is very difficult to isolate a certain muscle. All of them work together to get the job done.*

**Whiplash type injuries may occur from doing stomach exercises too fast.*

**Besides your six pack, ab muscles that are important for every move you make are the muscles on the side of your stomach (external and internal obliques), and your coughing muscle (transverse abdominis).*

**For every exercise you do for your stomach, do two for your back. Fortunately, most of the exercises in this chapter train your back as well as your stomach so that you will maintain perfect balance and symmetry.*

**If you miss a workout, no sweat. It is not one workout that matters, it is the weeks and months of training that make a difference.*

**Momentum is your worst enemy in the weight room. Move slowly to prevent injury and to be sure the correct muscles are working.*

**Crossing your anaerobic threshold or lactate threshold means that you are no longer training at a steady state. You have crossed over the line and are huffing and puffing and burning.*

**Start each movement slowly, as if you are in slow motion.*

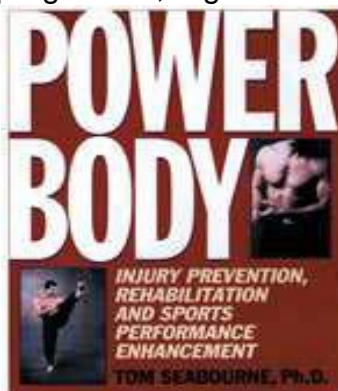
**Don't get caught up with thinking you must have a sensational workout every time you hit the pavement. Everyone has off days.*

Osteoarthritis: bone degeneration may cause nerve impingement. Have your client perform pelvic tilts from a chair or against a wall.

Rheumatoid arthritis: shows up in bone deformities in your client's legs and hips, which may affect her lower back. Do not allow her to exercise if she is in pain. Adjust her range of motion so it does not elevate pain in her deformed joint.

Fibromyalgia: feels as if she has the aches and pains of flu without the fever. It has been described as arthritis of the muscles. Good form and moderation is important in your client's abdominal program if she suffers from fibromyalgia.

Osteoporosis: modify your client's abdominal exercise to eliminate the hunching forward of her shoulders; the position she is degenerating towards. Pelvic tilts in a chair, against a wall, or on the floor, are indicated if her osteoporosis is severe. If it has not progressed, regular exercises are fine but incorporate chest stretches.



LOW BACK PAIN?

Back pain is treated differently now than 10 years ago. Grandparents hurt their backs and went to bed. Doctors prescribed bed rest and narcotic painkillers. This led to strength, endurance, and muscle loss. Recent research demonstrated that prolonged bed rest has no benefit, and actually hinders recovery. Specifically, a study showed that 186 patients given 2 days of bed rest recovered slower than a control group who were told to continue their normal day-to-day activities. Today, treatment for back pain is active

recovery. The goal is to improve function quickly, before muscles atrophy and tighten. Nonsteroidal anti-inflammatories are recommended for acute pain and inflammation. But these drugs should not be continued longer than 12 weeks because of possible harmful side effects.

The disks in your client's spine are collagen packets filled with fluid. They are fed by solute transported during her normal activities. Simply moving around pumps liquid through her disks. It keeps them hydrated. If she lies flat on her back for extended lengths of time, she jeopardizes nourishment to her disks. That is why immobility increases back pain.

A vicious cycle occurs when her back hurts. She lies in bed. Her muscles atrophy. Your client's connective tissues and muscles shorten. Her aerobic fitness deteriorates. When her aerobic level decreases her pain levels increase. A study of 1,652 firefighters in Los Angeles revealed that back injuries were 10 times higher among those who were least aerobically fit.

There are other reasons training may prevent low back pain. Exercise helps to decrease fat around your client's middle. Less fat on her tummy places less stress on her lumbar spine.

And while she is working out, she is increasing her endorphins. Endorphins are pain-relieving chemicals released in your brain when you train. These chemicals provide a "natural high" which alters her perception of pain and helps decrease anxiety and depression. Walking loads and unloads your client's disks in a gentle massage to aid healing. Slow rhythmic fitness type movements strengthen her lumbar flexors and extensors in a natural, balanced way. These exercises do not require repeated pounding or shearing forces caused by anaerobic activities such as racquetball and heavy weight lifting.

There has not been enough research to determine which types of fitness are best for preventing low back pain. One study showed that sedentary women were motivated to perform intensive, dynamic, vigorous exercises. Blue-collar males reduced pain by doing isometric exercises such as stance training for their legs and trunk.

Stretching and strengthening muscles in your client's trunk reduces the chances of having another acute attack of back pain. Your client's main goal of training is to balance the strength between her abdominal muscles and her back muscles. If her back hurts when she performs crunches or hyperextensions, she should simply perform isometrics. Isometrics allow her to contract muscles without moving them. Sit back so your low back is flat against your chair. Notice that as you flattened your back, your abdominals isometrically contracted.

Your client can do the same for her back muscles by lying prone. Tell her to raise her right arm out to the front and her left leg to the back. Ask her to switch arms and legs. Then she can raise both arms and both legs simultaneously. If these exercises are painful, limit the range of motion so she is barely moving. Just have her contract the muscles.

Crunch type exercises are contraindicated for people with bulging disks. Each time your client flexes her spine she may be pressing her disk against the spinal nerve, increasing pain. Therefore, if she is diagnosed with a disk problem, concentrate on extension movements. After several months of stretching and strengthening, there should be some remission of pain. If not, mind/body stress management techniques

may be an option. Clinical depression and high levels of anxiety may contribute to low back pain. Surgery is a last resort and is suggested only after conservative measures have been used. Statistically, only one percent of back pain cases require surgery.

Low Back Training Tips For Your Client:

1. Have your client move from one position to the next comfortably with a slight arch in her lower back. Keep your client's abdominal muscles firm and breathe from her diaphragm.
2. Be sure your client warms up before she performs any vigorous exercise.
3. Your client may feel slight discomfort as she trains. If she feels a sharp pain in her lower back, she is pushing too hard.
4. In all cases, refer your client to a physician if her pain is severe or lasts longer than a week.

YOUR CLIENT'S ELBOW

Tennis elbow can affect your client even though she is not a tennis player. This injury, termed lateral epicondylitis, is an overuse injury of the tendon that attaches the forearm's extensor muscles to the elbow at its bony outer knob, the lateral epicondyle. With repeated stress from many different activities, the tendon can suffer microtears that cause the elbow to become tender and inflamed. If your client has tennis elbow, have her avoid lifting objects with her hand in the palm down position. Also, your client might try wearing a counterforce band around her upper forearm during her training. This allows shock to be absorbed in the band rather than farther up at the epicondyle.

Anti-inflammatories are recommended, and so is ice. Some patients receive steroid injections. Tennis elbow is slow in healing, sometimes taking from 8 weeks to a year to become pain free. Tennis elbow involves damage to your forearm muscles and tendons. Your first preventive measure is to teach your client to keep her elbow "soft" at all times. That is, be sure she does not lock her elbow on any movement. With the recommendations of her doctor, she can ice her elbow for 10 to 20 minutes after each training session.

Your client should not cause pain. If any movement causes pain, she should modify it by changing the range of motion. Your client should listen to her body. Pain is your body's way of saying: "Rest me!" Rest means to use the elbow for all of your normal activities, unless there is pain.

YOUR CLIENT'S SHOULDER

Because your client's shoulder can move in seven quadrants, it has the greatest range of motion of any joint in your body. No other joint is as flexible, and unstable, as the shoulder. The shoulder (glenohumeral [GH]) joint is a shallow ball and socket variety that allows your client's arm to move freely in all directions. Your client's shoulder, therefore, depends heavily on the surrounding muscles to provide necessary stability. The shoulder joint consists of the ball of the humerus (upper arm) and the socket (glenoid) of the scapula (shoulder blade). The surrounding capsule allows a wide range of movement. The place where the humerus articulates with the glenoid is reinforced by a fibrocartilage collar, which increases the stability of the shoulder.

Four short rotator cuff muscles and their tendons surround the joint and contribute

towards its stability. The rotator cuff muscles are small, but play an important role in shoulder stabilization. These four rotator cuff muscles include your supraspinatus, infraspinatus, teres minor, and subscapularis. Together, they have an essential steadying effect on the head of the humerus. A fluid filled bursa(e) sac acts as a shock absorber for your client's shoulder joint. If it is inflamed it bulges and becomes, thick, scarred, and painful. This is how your client's body lets her know that she should discontinue the heavy weight work that created inflammation in the first place. Pain also has an inhibiting effect on muscle. Your client's rotator cuff muscles waste away (atrophy) within a short time. Other muscles take over in an attempt to alleviate the pain.

Rotator cuff problems may be attributed to the soft ligamentous structures that attach the ball to the socket. Imagine a big ball balancing on the end of a seal's nose. Compare that to the ball and socket joint of your shoulder. If the ball moves around too much in the socket, it may ride to high (subluxate).

The worst case scenario is that it comes out of the socket and dislocates. At the pre-World Taekwondo Championships in Taiwan, I witnessed a Chinese fighter throw a punch and yell a blood-curdling scream. He had dislocated his shoulder. Without missing a beat, he used his other hand to place his limp, dislocated arm into his karate uniform as a sling.

Another analogy to help you understand the importance of your rotators is to visualize a tent. Your upper arm is a tent pole, extending from the ground. Your shoulder is the place on the ground where the pole sits. Your rotator cuff muscles are the ropes that secure the tent pole. If these ropes remain strong and in place, the pole maintains its proper position, and the tent does not collapse. However if any of the ropes stretch, loosen, or snap, the remaining ropes will tug the pole out of position and the tent will fail. Your client's rotator cuff muscles hold the ball at the end of her arm in your GH socket when she cocks her arm to throw and when she follows through.

Clients train their pectoral muscles (chest) for cosmetic value, but many do not take the time to strengthen their invisible rotator cuff muscles. When she throws a ball, her shoulder joint funnels any motion from the ground and channels the force.

DEALING WITH SHOULDER ISSUES

Have your client stand with her scapula (shoulder blades) against a wall. Ask her to attempt to raise her affected arm to shoulder height, parallel to the floor. If she cannot do so without moving her scapula or trapezius (muscles on the top of her shoulder beside her neck), she may have a rotator cuff injury. There is a poor supply of blood to your client's rotator cuff. That is one reason it is slow to heal. If your client has a rotator cuff injury, your goal is to improve blood flow to that area by performing passive range of motion (ROM) exercises.

1. The first exercise your client's physical therapist may provide for your client is the pendulum swing. She simply bends over and supports herself from the waist with her uninjured arm. Gently she rotates her injured arm in a circular motion allowing momentum to create the movement.

2. The next exercise requires your client to let her fingers do the walking. She walks up and down a wall using her fingertips. Let her press her fingertips against the wall for

balance. She can walk around the wall with her fingertips. This is an exercise to strengthen her rotator muscles while maintaining stability.

3. Finally your client is ready for unweighted arm circles. Let her move her arms in a small ROM, gently strengthening her rotator muscles.

FIGURING OUT SHOULDER PAIN

Watch your client's right shoulder blade (scapula) while she performs the following movement. Ask her to bend her right arm 90 degrees at the elbow. Slowly she should try to raise it (abduction). Ask her to continue to raise her arm without moving her shoulder blade. If she can lift her arm almost parallel to her shoulder without moving her shoulder blade, her rotator cuff may not be the problem. Also, if her collar bone (clavicle) were injured she could not raise her arm, period.

This time, provide light resistance as your client lifts her arm to the front. If she must tip her shoulder blade to avoid pain, she might have an impingement. The ball of your client's upper arm (humerus) might be bumping into the top of her shoulder socket (glenoid fossa). Or, there might be impingement of her fluid filled bursa(e) sac. When the damaged bursa(e) gets caught in the arch of her shoulder joint, it hurts. Her shoulder is reminding her not to raise her arm. It bulges when it becomes unhealthy. It may become thick and scarred with continued abuse.

Stage 1 symptoms of impingement syndrome include swelling and inflammation. Your client will feel tenderness in the shoulder joint, and pain and weakness with overhead moves.

Stage 2 occurs when your client has thickening of the subacromial bursa(e) and tendonitis is apparent.

Stage 3 is evident with tears in the ligaments of the rotator cuff, tears in the biceps tendon, and changes in the bone. If you discover your client has impingement syndrome, keep all arm movements below the level of her shoulder.

Too much movement between the ball and socket of your client's shoulder may cause soft ligamentous tissue injury. This can lead to a subluxation where the ball moves around even more. A subluxation can generally heal without much intervention. A dislocation, where the ball comes completely out of the socket is serious, however.

Several ligaments provide a soft tissue barrier between your client's ball and socket. They limit motion, so when your client cocks her arm to throw a ball, her arm doesn't slide back out of her socket. These ligaments are as vital as her rotator muscles.

Your client's rotator cuff muscles hold the ball of her humerus in her shoulder socket as she extends her arm on her follow through. These muscles include her supraspinatus, infraspinatus, teres minor, and subscapularis. They should be strengthened. There are several simple exercises she can perform with light dumbbells or tubing. Devices such as the Shoulder Horn maintain her form while she completes her rotator-strengthening program. Some clients, however, don't want to train their rotators because they can't see them.

Pain has an inhibitory effect on your client's muscles. Muscles lose their connection when they are injured. Because the rotator cuff has a poor blood supply, damage to this area is slow to heal. If your client injures her rotators, they may atrophy 100 percent in a very short time because other muscles take over.

When you perform behind the neck shoulder presses, or lat pull downs, your rotator cuff muscles are in a shortened position. Shorter muscles are not as strong. They cannot stabilize the shoulder as well from this position. Do not teach your client behind-the-neck moves because the risks outweigh any benefits. Teach your client most of your resistance exercises from slightly in front of your shoulder for greater strength and stability.

Have your clients perform the following exercises to fortify their shoulder for improved sports performance:

- | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">a. External and internal rotation exercisesb. Reverse flies in external rotationc. Shoulder extension in external rotationd. Rowing, lat. pull downe. Bench press with a limited range of motionf. Lateral raises |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

HEAL YOUR CLIENT'S HEEL

Fitness fanatics suffer from it, and so might your client. Even if your client is a weekend warrior, plantar fasciitis (pronounced fa-see-ii-tis) could be her next Achilles Heel. At the onset, plantar fasciitis feels like a bruised heel. It is especially annoying when you roll out of bed from a long snooze and step onto the floor. As the day wears on, the pain lessens. But each morning you step lightly for fear of your heel touching the floor. Stepping lightly alters your gait and causes muscles in your foot to atrophy, according to Val Guzman, a sports medicine specialist in Philadelphia, Pennsylvania. And if it hurts that badly, it's time to consult your physician.

The plantar fascia is a tough fibrous ligament on the bottom of your foot. It stretches from your heel to the ball of your foot. Inflammation of the plantar fascia is as painful as it sounds. Possible causes include overpronation of the foot (the rolling inward of your foot with each step), tight calf muscles, poor ankle flexibility and weak muscles on the bottom of the foot.

To prevent plantar fasciitis, teach your client to stretch her calf muscles daily and keep the muscles in her feet strong by occasionally wearing flip-flops. This forces her toes to grip tightly on each stride. If your client is already hobbled by plantar fasciitis, your first goal is to relieve the inflammation. Treatment consists of ice, relative rest and anti-inflammatory medications. Then she can experiment with orthotics, inserts that fit into your shoe to take the pressure off of your inflamed plantar fascia, according to Topper Hagerman, a sports medicine consultant at the Howard Head Sports Medicine Clinic in Vail, CO. The orthotics are designed to limit pronation and bolster weak ankles.

Tell your client to stretch her foot several times each day. To do this, she should stand facing a wall. Place her heel four inches from the wall with her toes pointed toward the ceiling and the ball of her foot touching the wall. She leans her chest toward the wall slowly, and should notice a stretch in her calf muscle and plantar fascia. Ask her to hold her stretch for 10 seconds, and then relax. If pain persists following anti-inflammatory treatment and stretching, cortisone injections along with personalized orthotics are recommended by some sports medicine experts.

Once these treatments ease your client's pain, add some muscle to her foot. Keep her wearing flip-flops and ask her to try picking up a marble with her toes. She should grip it under her toes for a few seconds, then drop it and pick it up again. Ask her to do this for about 50 repetitions. Now pain free, she will step out of bed each day muttering thanks. But don't forget to remind her to keep up her stretching and strengthening. If not, plantar fasciitis will humble her again.

YOUR CLIENT'S OSTEOARTHRITIS

If your client has pain in her joints when she works out, have her check with her doctor to find out if she has osteoarthritis. Osteoarthritis is a progressive, irreversible degeneration of the articular surfaces of the joints. Anti-inflammatories, Glucosamine Sulfate and Chondroitin, and analgesics are treatments of choice. Your client should refrain from fitness when her joints are inflamed. She should focus on slow, range of motion and muscle strengthening. Since workouts may feel painful at first, she should try training just 15 minutes, twice a day.

Women are affected more by osteoarthritis than men. And in older adults it is even more common. If your client has problems climbing stairs and squatting, she might have osteoarthritis. Jumping, running, and other high impact activities can be painful, and may worsen your client's condition. She might feel pain on the inside, outside, or middle of her knee. It can be localized or spread out. If her knees usually hurt when she exercises, and they progressively get worse by the end of the day, she has symptoms of osteoarthritis. If your client is overweight, losing body fat can help take the load off of her joints. Her exercise should always be at an intensity below the level of pain. Be sure her exercise is regular.

Tight hamstrings increase your client's osteoarthritis pain. Therefore her doctor may send her to a physical therapist to show her exercises to increase the strength and flexibility of her hamstrings and thighs. Here is an easy-to-do hamstring stretch that your client can do anytime, anywhere:

Bend your right knee and place your hands on your right thigh for support. Extend your left leg forward with your heel on the floor and your toes pointed up. Gradually draw your hips back as you lengthen the hamstrings of your left leg. Switch legs and repeat.

To strengthen your client's quadriceps tell her to sit on the floor with her legs extended to the front and her hands behind her supporting her back. Tell her to slowly press the back of her knees toward the floor. She should hold this position for 3 seconds, and then relax. Ask her to perform 10 repetitions of this exercise.

Another quadriceps strengthening exercise is as follows:

Lie on your back with your elbows supporting your upper shoulders. Bend your right knee so that your right foot is flat on the floor. Extend your left leg to the front and lift it a foot from the floor. Hold for 10 seconds. Switch legs and repeat. Perform between 10 and 20 repetitions with each leg depending on your level of fitness.

Wall slides will further strengthen your client's quadriceps. Have your client sit against a wall with her knees bent. She should lower herself a few inches and hold that

position for 10 seconds. Then she slowly rises up to her original position. If your client has lost her meniscus or articular cartilage, it might be advisable to ask her doctor about an implant. Our present technology allows for transplantation, which helps to prevent any further negative consequences from the debilitating effects of osteoarthritis.

YOUR CLIENT'S KNEES

Randall Ideishi did not have an eight to five job like you and me. While we were sitting on our duffs, Randall was extending powerful kicks, and performing flips and jumps. Kicking to full extension, and jump kick landings caused swelling, pain, and a loss of motion in his knee. Randall Ideishi, Taekwondo master, and Olympic caliber (Ninja Turtle) superstar found out the hard way he was human. In 1989 he went under the knife to repair his anterior cruciate ligament (ACL) and medial meniscus.

All was not well however. Scar tissue developed, and Randall was in a world of hurt. The medical term was arthrofibrosis - scar tissue in the knee joint. In 1992 Randall found his way to the Steadman-Hawkins Clinic in Vail, Colorado. Dr. Steadman performed arthroscopic surgery to remove scar tissue, calcium deposit, and anything else that was not supposed to be there. After the surgery, Randall was sent to rehabilitation specialist, John Atkins, M.S., ATC. of the Topper Sports-Medicine Group in Vail. John, a Taekwondo black belt prescribed a variety of strengthening and stretching exercises for the muscles surrounding Randall's knee joint.

Atkins also prescribed a magic bullet. He suggested that Randall change the way he threw his kicks. Now if I approached Michael Jordan and told him I could improve his vertical jump, he probably would walk, or run the other way. But John had a simple and direct cure for Randall's chronic knee pain - "Do not lock out on your kicks." John's exercise prescription and sage advice worked! Randall wisely followed John's program and walked away symptomless and pain free.

Your knees are amazing joints. You stand on them all day long. But they are very much exposed. Knee joints are shallow; one bone does not fit tightly into another. Consider them similar to hinges. But when you bend your knees to ninety degrees, unlike a hinge, they can rotate too, making them even more complicated.

Your knee is your anatomical pulley between your femur (thigh bone) and tibia (shin bone) and fibula (small bone beside your tibia). Cartilage protects the ends of your bones and occupies the space between your bones. Consider cartilage as a cushion to prevent your bones from grinding. Your cartilage is filled with synovial fluid.

The end of your femur closest to your knee is enclosed by your femoral condyle. It is referred to as your articular cartilage. It protects the end of your femur. Aging can cause osteochondritis dessicans (cracks or fractures) in your articular cartilage.

You also have lateral and medial meniscus within your knee joint. These are cartilaginous material that has very little blood supply. They dry out with age and do not absorb as much fluid. Excessive rubbing of the end of the femur and tibia from full knee extension on your kicks may cause these cartilaginous fibers to wear out. Soon there is bone on bone contact. This is the origin of osteoarthritis.

Ligaments connect your bones together. Your lateral and medial collateral ligaments along with your anterior and posterior cruciate ligaments help to bring your femur in line with your tibia. Damage to your anterior cruciate ligament (ACL) may be a traumatic injury. Posterior cruciate ligament (PCL) impairment can also be severe.

Several muscles extend your knee. Your quadriceps allow you to extend your leg for a full force front kick. You can jump, and add power to your kicks using your extensors. These muscles (rectus femoris, vastus lateralis, vastus medialis, and vastus intermedius) are on the front of your thigh. The only one of these muscles that crosses your hip is your rectus femoris. Your hamstrings, in the back of your upper leg, produce knee flexion and hip extension. These muscles are generally weaker than your quadriceps. If your client's hamstrings are more than 3 times weaker than her quadriceps, then she has a muscle imbalance, which may precipitate knee problems. It is a good idea to strengthen her hamstrings (biceps femoris, semimembranosus, semitendinosus).

On the inside of your knee closest to your groin, you have muscles called adductors. These muscles (adductor magnus, longus, brevis, and gracilis) help to pull your leg toward your body. On the outside of your knee you have abductors. These muscles (tensor fascia latae, gluteus medius) pull your leg away from your body. Your adductors and abductors help to stabilize your movements when you flex and extend your knees from a standing position.

There are a variety of known and unknown causes of knee pain. Tendonitis is generally caused by overuse. Bursitis is irritation of the bursa(e) sac in your knee. Prolonged kneeling may cause it. You have several sets of muscles that surround your knees. Your thigh muscles (quadriceps) are powerful and are located above and in front of your knees. The purpose of each quadriceps muscle is to extend your knee. Your hamstrings are also very strong. They are located on the back of your upper legs. Your hamstrings flex your knees so you can pull-down for an ax kick. Knee flexion enables you return your leg as fast as you kicked. Cartilage is the cushion between your bones. You have two semi-lunar cartilage (meniscus) in each knee that act as shock absorbers. These menisci are filled with synovial fluid. There is also articular cartilaginous material that protects the ends of your femur.

Ligament damage may be minor (1st degree) on a continuum to severe (3rd degree). Twisting and getting stuck in external rotation may injure your client's ACL. Your client's PCL may be damaged when she hyperextends her knee. But when her PCL is injured, usually this is accompanied by medial collateral ligament (MCL) or ACL strain. Her MCL and lateral collateral ligaments (LCL) may be damaged by a blow to the outside or inside of her knee, or knee rotation when her foot is planted. Cartilage problems may be recognized by pain, clicking, or locking of your knee. But a loud "pop" is usually the ACL. A sudden twisting may cause Meniscal tears.

When your client extends her knee, there is a slight lateral rotation of her tibia and femur. This is termed the "home screw mechanism." Some meniscus tears cause the knee to lock up because the torn meniscus gets caught in rotation. There is a 4 to 1 ratio of women to men who injure their ACL. Possible explanations include weak hamstrings, poor conditioning, lack of pre-preparation agility drills such as plyometrics, and tracking problems in women because of their greater Q angle (wider angle from hip to knee).

Single leg, open chain exercises to strengthen the muscles surrounding your client's knees include leg extensions and leg curls. If your client feels uncomfortable performing leg extensions, omit the last 15 degrees of extension. In other words, don't lock out the knee at the top of the extension.

Double leg, closed chain exercises are closer to real world activity. These

movements include half squats and lateral shuffling. Your client can practice quarter squats, half-squats, and lateral and diagonal squats. After mastering open chain and double leg closed chain exercises, your client can try single leg closed chain activities. These include partial lunges, stationary lunges, and full lunges. If she is successful with these, she may attempt diagonal lunges, and one-leg partial squats.

When her muscles, tendons, and ligaments are strong enough, she can attempt to balance on one leg. Then she can close her eyes and continue. Find a balance board or wobble board to activate her stabilizer muscles. If your client is attempting to return to sports, try plyometrics. Plyometrics include forward, backward, lateral, hops and leaps off both feet. Soon your client may perform these same exercises with one leg. Progress to walk-jog-run-hop-jump drills. And when her knee is ready, agility drills and lateral movements such as the carioca and side shuffles are appropriate.

If your client has knee pain, she should talk to her doctor to rule out knee pathology. Chondromalacia is a progressive fissuring or softening of the patellar cartilage. Osgood-Schlatters disease is common in young teenage males where the bones grow faster than the muscles and there is irritation of the connection between the patella and the tibial tubercle. Tendinitis and bursitis are uncommon in the quadriceps, but may occur in the musculotendinous junction high on the hip of the hamstrings. The iliotibial band, which stretches from the top of your hip to your knee, may become irritated.

Patellar tendonitis may be caused by overuse. Within your knee joint is cartilage that protects the ends of the thigh bone (femur) and tibia. When you step down, you squish fluid out of cartilage. When you relax, fluid rushes back in. As you age, your cartilage does not absorb as much water. It dries out.

If the outside (lateral) portion of your client's knee was hit hard, she may have "blown out" her lateral and medial collateral ligaments, and her anterior cruciate ligament. Women sometimes have more trouble with their knees because of wide hips. The "Q" angle between their hips and knees is larger. A normal Q angle is 10 degrees. If the Q angle exceeds 10 degrees the knee cap (patella) becomes unstable. That is probably why you rarely see women with wide hips running marathons in the Olympics. Intense mileage for such events has selectively eliminated them from competition. If your doctor performs surgery on your client, she may find herself in a cast or splint. Soon after her operation, she will be required to practice quad-setting, which is simply contracting her quadriceps for several seconds. This is an isometric contraction used to prevent atrophy of the muscles surrounding her knees. In addition, your client should increase the range of motion (ROM) of her knees with stretching. She should stretch all of the muscles in her legs from the ground up. Stationary cycling can help maintain her cardiovascular endurance while she increases the circulation in her legs.

After your client's knees are rehabilitated, prepare her to begin a lifetime of strengthening and stretching exercises. Teach her to perform single leg open kinetic chain movements. Open chain activities allow her to isolate specific muscle groups without having to balance or stabilize them. Your client may perform leg extensions for her quadriceps with a limited ROM (terminal knee extensions) depending on her doctor's prescription. Then she can work the muscles on the inside of her thighs (adductors), and the muscles on the outside of your thighs (abductors) using a seated ad-abductor machine. Finally, your client can do leg curls for her hamstrings.

When her legs become stronger, begin double-leg closed kinetic chain exercises.

These simulate movements in the real world. Wall sits, lunges, diagonal lunges, ½ squats, and around the clock can get her started. After her balance improves, challenge her neuromuscular system. The simple act of walking may be demanding. Between steps there is a momentary loss of balance. When walking becomes effortless, she can try standing on one leg, like a stork or a flamingo. After she has mastered this stork pose, tell her to close her eyes and keep her balance on one leg for 30 seconds. Soon she may begin jogging, running, hopping, and jumping. When all of this is easy, she can experiment with agility drills.

YOUR CLIENT'S ANKLES

Ankle sprains are a recurring injury for some of your clients. No acute injuries are more common. An ankle sprain is generally a stretch or tear to a ligament. It may be a mild tear – grade 1, moderate tear – grade 2, or severe tear – grade 3. Each sprain is a tear; it just varies in its degree of severity. Most sprains involve an injury to the ligaments on the outside of your client's ankle when your foot turns over. This is called an inversion sprain.

Sometimes your client feels a “pop” where her ligaments are actually tearing. When her ligaments tear they bleed. This immediate bleeding increases inflammation beginning the extensive swelling that occurs. If your client injures her ankle her doctor will ask the following questions:

- Did your ankle invert?
- What part of your ankle hurts?
- Was the pain so severe that your ligaments tore or you incurred a fracture?
- Could you stand up on it after the injury?
- Have you hurt this same ankle in the past?

R-I-C-E is the remedy fitness personal trainers can suggest for most fitness-related issues. “R is for “Rest.” Rest your ankle until you can walk without a limp. “I” is for “Ice.” Ice relieves pain and reduces swelling. Some of the chemical icings are too cold and can actually blister the skin. Pull a bag of frozen peas out of your freezer and ice your client's ankle for 20 minutes every 2 hours. Vegetable bags conform to the natural curve of your ankle. When your peas thaw out, grab a bag of corn. “C” is for “Compression.” Compression, or a specially designed pressure wrap helps to decrease the swelling. Be sure your client loosens an elastic wrap before bedtime. Physical therapists use a special machine called JOBST that sequentially squeezes the fluid from your client's foot and ankle. “E” is for “Elevation.” Holding your leg above your heart also reduces swelling. And at night, your client should rest her ankle on a couple of pillows to keep her ankle above chest level.

Swelling is the body's way of cleaning up. The fluid is channeled through the lymphatic system. As the swelling subsides, your client may notice a bruise. This is blood that is close to the skin. Sometimes, the degree of bruising is an indication of how badly the ligaments were torn.

The doctor's job is to determine what he must do to insure that the torn ligaments will repair themselves. He hopes that the ligaments overlap, and can be held in a neutral position until they heal. This sometimes requires a cast. Anti-inflammatory medication may help. Be sure your client takes anti-inflammatories with food. And some doctors recommend bracing until her ligaments heal.

A slow-healing sprain may not be a sprain at all. Often a slight fracture can cause less swelling than a sprain. An x-ray may help determine if your client indeed has a fracture. When your client returns to fitness, practice balancing drills before you jump into plyometrics. Unused muscle and ligaments atrophied during her time away from fitness.

Regaining your client's proprioception is your first priority to prevent another ankle injury. Proprioception is your client's ability to balance herself. Simple exercises help your client's muscles and ligaments to stimulate nerve endings that were dormant during her recuperation. For example, she can stand on one foot while she performs her quadriceps stretch. Switch legs and repeat. Tell her to repeat these exercises again with her eyes closed.

Ankle problems do not necessarily require your client to curtail her fitness. Each case depends on the severity of the specific injury. She can return to her fitness if she has a pain free normal range of motion. And be sure she can walk, jog, shuffle, and hop before she considers hardcore fitness training.

STRESS FRACTURES

If your client has pain in her lower leg, her training should be moderate and always at an intensity below the level of her symptoms. It is a must that she visits her doctor to find out exactly what the ailment is. She might have a stress fracture, compartment syndrome, tibial stress syndrome, or a sprain or strain. In any case the treatment depends on the diagnosis.

If the pain in the front of the bone on your lower leg (tibia) was sudden, she might have a fracture, bruise, tear, abrasion, or laceration. A gradual onset of pain however, may simply be overuse. A sharp, focused, site of pain on the bone of your client's lower leg might indicate a stress fracture. Pain along the entire shin might be medial tibial stress syndrome a.k.a. "shin splints." If your client's leg is pain free at rest, but hurts when she exercises, or walks up and down stairs, she might have a stress fracture. Find a tuning fork and try this test. Pass a vibrating tuning fork along your tibia. If you feel a sharp pain, that indicates the possibility of a stress fracture at that site (ouch!). If your client's lower leg is painful at night however, even when she is resting, she should talk to her doctor immediately because these may be symptoms of a tumor.

Repeatedly overloading your tibia -sometimes by changing shoes - or increasing your intensity causes stress fractures. Take a look at your client's shoes. If they are more than 6 months old, and she trains daily, they may have lost some resiliency. Limiting impact is your first step to curing your client's stress fracture. Replace high impact plyometrics with cycling and swimming. If her injury is severe, a splint may be required. After your client's inflammation subsides, and her doctor gives her the okay, try this exercise to strengthen the muscles on the front of her shins (tibialis anterior): Ask her to walk on her heels with her toes up in the air for a minute. Add 1 minute a week until she can walk comfortably on her heels for 3 minutes.

Another strengthening exercise is to sit on the end of a leg curl machine. Place the top of your client's toes underneath the curling pad. Without moving her upper legs, she should raise her toes toward your knees (dorsiflexion). She should do 20 repetitions with a very light weight three to four days a week. Be sure she stretches both her calves and tibialis anterior after she completes these strengthening exercises.

Besides strengthening and stretching her lower leg muscles, research has demonstrated that females with menstrual irregularities, lower bone density, or less lean mass in the lower leg, are predisposed to incurring stress fractures. If there is non-union of your client's tibial bone at the fracture site, and this is demonstrated by a black line on her x-ray, a doctor should treat this fracture aggressively. Usually a cast or immobilization is required. Sometimes a rod is inserted which would allow her to return to fitness in 6-8 weeks.

BLOOD PRESSURE

As you get older there is not as much oxygen rich blood to deliver nutrients to your working muscles. Aging causes blood vessels to become more rigid, restricting their ability to accept blood from the heart, resulting in high blood pressure. Eating correctly, stress management, and exercise are the best conservative treatments for high blood pressure (BP). An exercising client's blood vessels swell to twice the diameter of those of a sedentary person. Therefore, pressure is reduced, blood flow is increased, preventing a heart attack or reducing its severity.

Be sure your client warms up and cools down for at least 10 minutes. Monitor your client's BP during his training. And keep his activity level low to moderate. Have your client perform light repetitions on resistance equipment. Avoid having your client push against an immovable object (isometrics) where she holds her breath (Valsalva Maneuver). If she takes blood pressure medication (anti hypertensives) such as ACE inhibitors, beta blockers, calcium channel blockers, or diuretics her heart rate will be altered. Do not rely on the heart rate formulas presented in this book if your client is taking these medicines.

Your heart and blood circulation is a closed system. Liken it to a balloon half filled with water. If you add water or squeeze the balloon the pressure rises. The greater the pressure, the increased risk factors for coronary artery disease (CAD). About 30 percent of your clients will have high blood pressure. And of those, 70 percent are classified as mild to moderately hypertensive. High blood pressure exerts its impact in three primary organs: the heart (CHD), the brain (stroke) and the kidneys (renal failure). Regular training lowers blood pressure. Several hours after a bout of exercise, blood pressure continues to lessen. Losing body fat may be a possible explanation for the profound effect exercise has on decreasing blood pressure. This reduction may be the result of decreased fluid volume and or a decline in sympathetic nerve activity.

Visceral fat in the abdomen is associated with metabolic disturbances that increase your client's risk of coronary heart disease (CHD). These disturbances include insulin resistance, glucose intolerance, hypertriglyceridemia, and reduced high density lipoprotein (HDL) cholesterol. Your client may lose weight faster from her waist but carrying excess weight in this area can be dangerous.

When you are nervous, the fight or flight response activates your sympathetic nervous system to prompt beta receptors to pull free fatty acids from your abdominal fat stores to be used for energy. Unfortunately, if your client is predisposed to high cholesterol, a fatty buildup in your client's arteries may occur, increasing your chances for a blockage.

Dean Ornish, M.D., assistant clinical professor of medicine at the University of California, San Francisco, presented data demonstrating that a low-fat diet, stress

management, and exercise form a non-surgical approach to combating heart disease, high blood pressure, and diabetes. According to Ornish, it's easier to get a person to eat low-fat, exercise, and do stress management than to diet and exercise sporadically. His results showed that people, who submerged themselves into an eating, exercise, and stress management program realized significant short term results, motivating them to continue for the long haul. Ornish's program includes less than 10 percent fat in the diet (no saturated fat, so no animal products).

DIABETES

If your client has diabetes, be sure she monitors her blood sugar frequently, eats properly, and continues her training. Participating in a regular fitness program may enable your doctor to reduce her medication. Be consistent in the frequency, intensity, and duration in the administration of her workouts to help stabilize her blood sugar.

If she is insulin dependent, and she is preparing for a cycling class, tell her not to inject insulin into the working muscles of her leg. Be sure her blood sugar is above 60 before she begins exercise. Admonish her to carry carbohydrate snacks during her activity. And monitor her feet for sores, abrasions, or blisters so you can provide immediate care.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

If your client has chronic obstructive pulmonary disease (COPD) such as asthma, bronchitis, or emphysema certain precautions are necessary in order to continue training safely.

Be sure your client maintains control of her breathing. Tell her to relax, take deep breaths from her diaphragm. She should workout below the level of her symptoms. Vigorous activity may increase her breathing demand. She should keep her inhaler available at all times.

She should extend the time of her warm up and **gradually** increase her intensity. Accelerate the intensity of her workout no more than 5 percent during a single session. She should drink water to avert dehydration. And avoid cold, pollution, and high pollen.

YOUR CLIENT: INJURY AND REHAB

Your clients may be relaxed, confident, and focused. That is, until they are injured. Imagine that your livelihood depended on your fitness, or health. In the heat of sprinting, you hear a loud pop and are crippled with pain. Lactate is one thing, but the debilitating pain that sidelines your client is physically and mentally crushing. An injury can be disheartening. Physical pain is only part of it. Impairments can decrease confidence and increase fear. Your client may wonder if she will ever be the same. The pain may be so severe that she does not think she can handle another day.

At the onset of an acute injury, many clients are basket cases. "Why me" they say. Their injury dictates their level of thinking. They ride an emotional roller coaster, at first feeling sorry for themselves, and sometimes leading to a mild or serious form of clinical depression. Fortunately, support from family, friends, and coaches may get them through the crisis phase. Once reality has set in, clients must deal with the problems at hand and begin planning. However, your clients are looking for specific answers. "How bad am I injured?" "How long will my injury last?" "Can I return to my fitness next week or

next year?" "What are my options?" "Can I use rehab to get me through?" "Or is there a need for emergency surgery?" These questions usually revolve around the nature of the injury and the diagnosis involved. The medical clinic the client select must understand their situation and know how to react to different personalities and realities. The medical team needs to bring understanding and meaning to the physical, mental, emotional and spiritual aspect of healing.

After clients see their physicians, regardless if it is non-operative or there will be surgical intervention, they will generally see a rehabilitation specialist. It is here that clinicians teach clients to use their tenacious, win at all cost spirit, to speed their recovery. Just as a shaman understands his patients belief system before prescribing a cure, rehab specialists probe their athlete's mind/spirit, not just their injuries. The rehab clinicians help client's set short and long term recovery goals. Their mission is to turn their patients "will to win" into a "will to recover."

The "rehabilitation of the mind" is one of the key factors in recovery. Clients can sense this one-on-one approach. Furthermore, because of the varying personalities encountered, this approach is task specific. Clients are sent with a checklist of activities that the physician has requested. The injury will dictate the activity list, but it can be as simple as range of motion exercises, or it may require a clinician sitting down with each patient and describing a more extensive program. If there are certain modalities the physician requests, patients will begin this program immediately along with any range of motion.

Some clients become over-zealous, however. They think that if a few repetitions are good, a lot are better. Overtraining during recovery leads to meltdown. That's why there is constant communication between patients and their rehab specialists. Long after patients are released the dialogue continues. One of the best customer services a rehabilitation clinic can establish is telephone contact with their patients.

Recovery is not just physical. Recuperation is emotional. Look on the bright side to being sidelined. You probably needed the rest. Maybe overtraining caused your injury in the first place. Take a break. Enjoy your time off. See yourself from the inside out. In the heat of battle, day after day, year after year it is difficult to be objective. Use your down time to assess your strengths and liabilities. Time off provides you the opportunity to balance your priorities. It is easy to get caught up. Let your convalescence heal your outer and inner self.

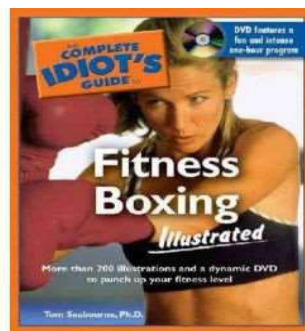
If a client injures her right knee, 25% of the body has some down or mild activity time. The other 75% can be working towards improvement. Rehab specialists usually suggest workouts for maintenance with the left leg since initially the left will take the brunt of an acute and sometimes chronic injury. In fact, if there are certain flaws or weaknesses to be worked on; rehab specialists prescribe it during their rehabilitation program. Clients should return stronger than prior to the injury. This concerted effort and focus on rehabilitation really allows her extreme concentration, not only physically, but also mentally. In fact rehab specialists council clients to utilize time away from their art to develop outer and inner strength. Rather than brooding, clients use techniques such as mental imagery to speed their healing.

"Close your eyes and relax. Imagine yourself performing your sport. See it, feel it, experience it. You are strong, fast, and agile. Better than you have ever been before. Now

take a few moments to use that same energy to focus on your rehab. See your range of motion improving. Feel your muscles growing stronger. Experience healing."

Rest is recovery. Under resting is overtraining. Take an inventory of your client's body. What needs work? Increase her upper body strength if her legs require rehabilitation. Weight lifters muscles are torn down in the gym. Their muscles grow with rest. Your client may surprise herself and return to training with a better attitude. It is like starting over. Everything is fresh and new.

When your client is finally ready to return to training, be sure she receives medical clearance. There should be no doubt about her wellness. Do not risk a relapse. She should sleep well, eat correctly, and train moderately. She should be comfortable about her workouts.



VI. POWER

Teach your client to master her body by continually strengthening it. Show her how to stabilize her spine, shoulder girdle and pelvic area so all of her muscles can handle more weight and grow larger. Increasing core strength makes her stronger and more efficient because her body is working in total synchronization. This way, there is a balance to her system so that no single muscle group becomes overloaded. When we talk about strengthening her core through these drills, you might not believe yet or understand how her arms and legs can actually grow in size, but they will. Her strong torso balances her middle with her upper and lower limbs (also known as: arms and legs), allowing better training. This section focuses on **plyometrics** and *calisthenics* training.

Remember that power begins from your core. Punches, kicks, hits, or tosses are powered from your midsection. Plyometrics train your abs by providing a stretch, recoil, and then explosive movement through a full range of motion. For instance, in a jump, you feel the preparation, the extension, the landing, and the potential explosive recoil from the bent knee landing. Plyometric drills may be performed with medicine balls, stability balls, and therabands, as well as solo with your own body and good old-fashioned gravity.

Plyometric training is an excellent method for improving your client's core strength and power. You can also use plyometrics to train her at a larger percentage of your aerobic capacity. Want to morph your client's workouts? If power is paramount for her sport, then plyometrics can help. Whether she is throwing, kicking or hitting, the object is to generate the greatest amount of force in the shortest period of time. Plyometrics can add distance to her throw and power to her punch. Plyometrics trains her nervous system

and metabolic pathways to increase her explosiveness on the court or field. It gives her the extra push she needs to go higher and faster.

If you teach your client plyometrics to gain arm power, she will increase her upper body strength and speed. Athletes tend to neglect their upper body power, so this is a remedy. She will gain strength in her shoulders, triceps, chest and back, which eventually translates into increased power. The more power she has, the faster and more forceful she will be in her sport.

Plyometrics requires you to accelerate through a complete range of motion and then relax into a full stretch. The quick stretch applied to the muscle during push-off is thought to increase your muscle contraction thereby enhancing your power, says Donald Chu, Ph.D. and director of the physical therapist assistant program at Ohlone College in Newark, CA.



SAMPLE SPORTS PERFORMANCE WORKOUT (1)

Before your client begins plyometrics, have her warm up for five minutes and then stretch. Ask her to begin with five repetitions. She can add one repetition each week until she can perform 20 repetitions consecutively. Allow her to spend a couple of seconds resting between repetitions and at least 30 seconds resting between sets, but she should perform her repetitions consecutively. After a month of plyometrics, she should spend less time resting between sets and increase to two sets of each exercise.

Plyometric Exercises:

1. She can use a medicine ball to practice chest passing with you. Tell her to keep her knees bent, elbows soft and the ball moving without rest between throws.
2. Clap push-ups: She should press up into a push-up position and clap her hands before her hands return to the floor.
3. Double-clap push-ups: Clap twice. She presses up into a push-up position and claps her hands twice before her hands return to the floor.
4. Lateral push-ups: She presses up into a push-up and slides both hands six inches to her left before returning her hands to the floor. On her next push-up she slides her hands back to the right.
5. Wall-ups: She performs a handstand using a wall for balance. She places her hands a little less than shoulder-width apart. She bends her elbows slightly and explodes back up into a handstand.

After she is finished with her upper body plyometrics program, she should cool down and stretch. She should expect some muscular soreness for the next couple of days. She should probably not do plyometrics more than twice a week because of the stresses and recovery periods involved. If she is sore from a previous workout, allow her to wait an extra day before her next set of plyometrics.

SAMPLE SPORTS PERFORMANCE WORKOUT (2)

Who said your client needs weights to improve her sport. Her body weight is enough resistance to put her over the top. Add a few jumping drills, and she's ready for pre-season. Topper Hagerman, John Atkins and I have put together a month long, 3 times a week (Monday, Wednesday, Friday) workout with one set of most every exercise to get your client fighting ready.



EXPLOSIVE MOVES

Squat Thrust: Stand with your feet shoulder-width apart. In one fluid motion, while keeping your feet flat on the ground, squat until your thighs are parallel to the ground (no farther) and place your palms flat on the floor alongside your feet. Keeping your weight planted over your arms, kick your feet straight back so that you end up in a straight-armed push-up position. Do one push-up, hop back into the starting squat, and stand.

Week 1: 20 reps

Week 2: 30 reps

Week 3: 40 reps

Week 4: 60 reps

Stair Sprint: If your training area has enough room, sprint 15 to 20 yards to the base of a flight of stairs, then sprint up them. Take the stairs two or three at a time, raising your knees high. Try not to hunch your torso forward, and stop if you experience any lower-back pain.

Week 1: 2 sprints

Week 2: 4 sprints

Week 3: 4 sprints

Week 4: 6 sprints

Lunge Jump: With your head up and back in its natural alignment, step forward with your left leg, lowering your body until your front knee is bent 90 degrees and your right knee almost touches the floor. From this starting position, jump up a few inches and switch feet in the air, landing in the starting position with your right foot forward.

Week 1: 10 reps

Week 2: 15 reps

Week 3: 15 reps

Week 4: 20 reps

Knee Up: Drive your right knee into the air toward your chest while simultaneously jumping up with your left leg. Bring your left knee up toward your chest while straightening your right knee to land. Switch legs and repeat.

Week 1: 6 reps

Week 2: 10 reps

Week 3: 16 reps

Week 4: 30 reps

UPPER BODY MOVEMENTS

Push-Up: Use the standard, back-straight military push-up form, but change grip position on each set. Start with a grip that is wider than your shoulders, and then move to a shoulder's width grip and, finally, a "diamond" grip with your hands together and your thumbs and index fingers forming the diamond.

Week 1: 20-15-10 reps

Week 2: 30-25-20 reps

Week 3: 40-35-30 reps

Week 4: 50-45-35 reps

Note: Women usually perform push-ups from their knees.

Plyometric Push-Up: Follow the same form for a medium-grip push-up, but explode off the ground an inch or so at the end of each rep. Land softly, lower your chest to the ground slowly, then push yourself off the floor again. "This will build explosiveness, but if you push yourself too hard, too soon, you'll face plant. Watch out.

Week 1: 6 reps

Week 2: 8 reps

Week 3: 10 reps

Week 4: 15 reps

Note: Women perform plyometric push-ups from their knees.



Chair Dip: Place your hands on two chairs or a bench so that they are slightly behind your torso. Your feet should rest on the floor or a bench two or three feet away. Your torso should be bent about 90 degrees at the waist. Lower your upper body as far as is comfortable, then push back up to the starting position.

Week 1: 30 reps

Week 2: 40 reps

Week 3: 50 reps

Week 4: 50 reps

Pull-Up: Grab the bar with your hands shoulder's width apart and slowly raise yourself as high as you can. Stop at the bottom of each repetition, but don't lock your arms. Keep your abdominals contracted, and your torso still at all times. Don't kip, and don't use momentum. (If you can easily do more than 12 pull-ups in a row, widen your grip and/or add resistance by wearing a weight belt or holding a dumbbell between your feet.)

Week 1: max. with perfect form.

Week 2: max with perfect form.

Week 3: max with perfect form.

Week 4: max with perfect form.

LOWER BODY MOVEMENTS

One-Legged Squats: Stand six to 12 inches in front of a chair. Bend the knee of the non-working leg; support it on the chair. Squat deeply with the working leg, bending its knee about 80 degrees. Rise up until the knee is bent slightly (20 degrees); do not lock your knee. Each rep should take several seconds—the idea is to move slowly through a full range of motion.

Week 1: 25 reps/leg

Week 2: 30 reps/leg

Week 3: 35 reps/leg

Week 4: 40 reps/leg

Plie Squat: Stand with your feet slightly farther than shoulder's width apart; point the toes of both feet off to the sides at about a 45-degree angle. Bend your knees until your core is

directly over your heels. Then rise up on the balls of your feet, raising your heels; hold for an instant, then lower them slowly to the floor.

Week 1: 25

Week 2: 30

Week 3: 35

Week 4: 40

Lunge lifts: Start in a standard lunge position, then lift your back leg off the ground a few inches by contracting your glutes. Balance for a second, lower and repeat. Switch legs.

Week 1: 10/leg

Week 2: 20/leg

Week 3: 25/leg

Week 4: 30/leg

ABDOMINAL MOVEMENTS

Butterfly crunches: Lie on your back with your hands behind your head, and then press the soles of your feet together a few inches in front of your groin. Wait a few seconds for your inner-thigh muscles to relax, and then curl your torso a few inches toward your knees while keeping your lower back flat on the floor. Hold the contraction for a beat, and then lower your shoulders. This exercise focuses the contraction on your abs, not your hip muscles.

Week 1: 3 sets, 15 reps

Week 2: 3 sets, 25 reps

Week 3: 3 sets, 40 reps

Week 4: 3 sets, 50 reps

Twist Crunch: Lie on your back with your hands behind your head and your knees bent perpendicular to the floor. Crunch your torso forward while aiming your right elbow at your left knee; simultaneously extend your right leg in front of you. Slowly lower yourself back to the ground while returning your right leg to the starting position. Repeat on the opposite side, crunching your left elbow toward your right knee while extending your left leg. This will make your hip flexors *ache*—but for athletes, that's not a bad thing.

Week 1: 3 sets, 15

Week 2: 3 sets, 20

Week 3: 3 sets, 25

Week 4: 3 sets, 30

Superman: Lie on your abdominals with your arms straight out in front of you. Lift your arms and legs a few inches off the ground simultaneously until you feel your back muscles fully contract. Hold the tension for a few seconds, then slowly lower your legs and arms.

Week 1: 10 reps

Week 2: 10 reps

Week 3: 12 reps

Week 4: 15 reps

COOL-DOWN (examples of a variety of cool-down exercises are shown in the PT videos).

A proper cool down is used to gradually return your heart rate and blood pressure to normal after exercise. The rhythmic contractions of the large muscles help return blood to the heart (large amounts of blood pumped to extremities during exercise). Also, a proper cool-down minimizes muscle soreness. Muscular soreness results from cellular micro trauma, caused by either, torn or damaged tissue, or by metabolic accumulation.

A cool-down is especially important after high intensity interval training (HIIT). HIIT results in lactic acid build up in the bloodstream and muscles and a cool-down helps remove these products.

After the cool down, it's time to stretch. Static stretching should be held for 15-30 seconds per stretch and should progress from your neck downwards. Neck, shoulders, upper back, chest, triceps, biceps, forearms, abdominals, lower back, sides, hips/glutes, groin, quadriceps, hamstrings, calves, and feet.

The dynamic stretches presented on the videos should be performed with as many sets as it takes to reach maximum range of motion in any given direction. Generally three sets are plenty.

Dynamic stretching is a great way to lengthen muscles. First stretch the muscle until you feel tension. Then flex that same muscle for three seconds. After you flex your muscle, that allows it to relax so when you stretch it again, it will stretch even further.

Dynamic stretches should be performed with as many sets as it takes to reach maximum range of motion in any given direction. Dynamic stretching is then used to reach the maximum range of movement. Dynamic stretches involve controlled movements, such as walking lunges, trunk rotations and arm swings.

These could include: Neck turns (up and down, left and right), arm twirls (forwards and backwards, as well as inwards and outwards), trunk twists (left and right), waist bends (in all directions), leg swings (forward, backward and across body) and ankle bounces.



VII. FLEXIBLE MOVES

Let's try an experiment. You be the subject. Lie on your back. Keep both knees just slightly bent and raise your right leg up toward the ceiling until you feel a stretch in your hamstring. Hold that stretch and take note of the angle of your leg in reference to your body.

Now stand. Raise your right leg up again. How far did you lift it before your leg stopped going up? What angle was your leg at your peak stretch? Why couldn't you raise your leg to the same degree as when you were lying on the floor?

Try another experiment. Lie on your back and raise your leg as you did before. This time, grab your ankle and slowly add a few inches to your previous stretch until you feel slight discomfort in your hamstrings. Release your grip and attempt to hold your leg in your newfound extended stretch. If your leg did what mine did when I performed this experiment, it bounced back down about 30 degrees.

Our goal is to eliminate that 30-degree drop. Obviously, our hamstrings were flexible enough to extend that extra 30 degrees in the first place, but we needed help to pull our leg into position. Why couldn't we continue to hold our leg in the extended stretch when we released our grip?

The answer to this question is, and you may or may not believe it when you look into a mirror, but we are just not strong enough. The reason your leg dropped 30 degrees was a lack of muscle strength and stability. The antagonist muscles to your hamstrings are your quadriceps and hip flexors. These muscles must be extremely strong to hold your hamstrings in a lengthened stretch.

Please follow the steps below to take your client's flexibility to the next level. These are advanced stretching drills and should be accomplished only after several months of **static stretching**. **Static stretching** involves no visible movement, in which muscles

actually lengthen. Your workout room should be quiet and calm. The temperature should be warm, no less than 80 degrees Fahrenheit.

Take your time through all of the procedures; do not rush these exercises. Make this stretching sequence predictable so that your client knows what to do next and her mind can focus on her stretch. Tell her to be mindful of her muscles throughout each and every exercise to achieve her best stretch. Teach her to breathe calmly at the edge of tension as she executes each stretch. Realize that your client's stretch will improve and that this is the perfect stretch for you her today.

SAMPLE FLEXIBILITY WORKOUT (1)

Combining PNF and active isolated (AI) stretching, is a magnificent way to improve your client's flexibility and performance. To perform these exercises, you will first teach your client to contract her agonist (the muscle she is trying to stretch, strengthen, or limber) for three seconds. She will then relax, stretching that same muscle for three seconds. Next, your client will contract her antagonist (the opposite muscle) for three seconds. Relax, stretching the agonist muscle again for three seconds. Then relax. Although it sounds complicated, remember you are only dealing with two muscle groups at a time, and stretching only one (the agonist) in each set below. Using biceps and triceps as an example, you can break it down into:

1. Contract agonist (biceps)
2. Stretch agonist (biceps)
3. Contract antagonist (triceps)
4. Stretch agonist (biceps)

READ THESE STRETCHES TO YOUR CLIENT. BE SURE SHE FOLLOWS ALL OF YOUR DIRECTIONS:

Biceps Femoris: "Stand and bend slightly at your waist. Place your hands on your left thigh while you extend your right knee. Drop your hips back and lean your chest toward your right knee until you feel a light stretch in your hamstrings. Contract your hamstrings for three seconds by pressing your right heel into the floor. Relax and stretch a little bit further by drawing your hips back. Contract your thigh muscles (quadriceps) for three seconds. Relax and stretch your hamstrings a little bit further. Hold for three seconds. Switch legs and repeat."

Hip Flexors: "Take a step forward as if you are about to perform a lunge. Hold that position as you tilt your pelvis forward (anteriorly) so you feel a stretch in your hip flexor (iliopsoas). Contract your hip flexor for three seconds. Relax and stretch your hip flexor. Contract your gluteal muscles by pressing your heel into the floor for three seconds. Relax and stretch your hip flexor a bit further. Stop when you feel tension. Hold for three seconds. Switch legs and repeat."

Gastrocnemius: "To stretch your gastrocnemius (calf) assume your lunge position. Keep your back heel on the floor as you lean into your lunge with your back leg almost completely straight. You will feel the stretch in the back of your lower leg. Contract your calf muscle for three seconds by pressing the ball of your foot into the floor. Relax and stretch your calf muscles a bit further. Contract your shin muscles (tibialis anterior) by lifting your toes toward the ceiling. Hold for three seconds. Relax and stretch your calf muscles a bit further. Stop when you feel tension. Hold for three seconds. Switch legs and repeat."

Soleus: "To stretch the muscle underneath your calf (soleus) assume your lunge position. This time, instead of holding your back leg straight, bend it until you feel a stretch in your lower leg. Stop when you feel tension. Now contract your soleus by keeping your knee bent and pressing the ball of your foot into the floor for three seconds. Relax and stretch your soleus a bit further. Contract your shin muscles (tibialis anterior) by lifting your toes toward the ceiling. Hold for three seconds. Relax and stretch your soleus until you feel tension. Hold for three seconds. Switch legs and repeat."

Quadriceps: "Hold onto a chair for balance with your left hand and bend your right knee so that you almost kick yourself in the butt. Grab the top of your right foot with your right hand. Gently pull your heel toward your gluteals with your right hand. Stop when you feel tension. Contract your quadriceps muscle for three seconds. Relax. Stretch your quads a little further. Contract your hamstrings for three seconds. Relax and stretch you quads until you feel tension. Hold for three seconds. Switch legs and repeat."

Abductors: "Stand sideways next to your chair. Place your left hand on the chair. Slowly lean your left hip toward the chair until you feel tension in your left hip (abductors). Contract your abductors for three seconds. Relax and stretch your abductors. Contract your adductors for three seconds. Relax. Stretch your abductors by leaning a little closer to the chair. Hold for three seconds. This is a stretch for your abductors and iliotibial band. Switch sides and repeat."

Pectorals: "Kneel in front of a chair. Extend your arms and place your hands on the seat with your elbow slightly bent. Slowly drop your chest toward the floor until you feel a stretch in your chest (pectoral muscle). Contract your pectoral muscle for three seconds. Relax and stretch your pectoral again. Contract your rhomboids by retracting your shoulder blades for three seconds. Relax and stretch your pectoral a bit further. Stop when you feel tension. Hold for three seconds. Switch sides and repeat."

Triceps: "Stand and reach up toward the ceiling with both arms. Place your left hand on your right elbow pulling your right hand down your back. Stop when you feel tension. Contract the muscles in the back of your right arm (triceps) for three seconds. Relax and stretch a bit further. Contract your right biceps for three seconds. Relax and stretch your right triceps a bit further. Hold for three seconds. Switch sides and repeat."

Deltoids: "Stand and grab your right elbow with your left hand and pull it across your body. Stop when you feel tension in your shoulder (lateral deltoid). Contract that muscle for three seconds. Relax and stretch a bit further. Contract your pectoral for three seconds. Relax and stretch your right lateral deltoid one more time. Hold for three seconds. Switch sides and repeat."

Neck: "Stand comfortably and bring your chin toward your chest. Contract the muscles in the back of your neck. Relax and stretch a bit further. Then contract the muscles in the front of your neck. Relax and stretch a bit further. Then bring your right ear toward your right shoulder. Contract the muscles in the right side of your neck. Relax them and stretch

a bit further. Contract the muscles in the left side of your neck. Relax and stretch toward your right side. Then bring your left ear toward your left shoulder. Contract the muscles in the left side of your neck. Relax them and stretch a bit further. Contract the muscles in the right side of your neck. Relax and stretch toward your left side.”

Full Body: “Lie on your back and stretch out as tall as you can. Reach as high over your head as you can and extend your heels as far as you can in the other direction. Contract all of the muscles in the front of your body. Relax and reach higher. Contract all of the muscles in the back of your body. Relax and reach higher. Hold for three seconds. Relax.”

Quadratus Lumborum: “Lie on your back and place your arms around your knees. Bring both knees toward your chest to stretch your lower back. Contract your hip flexors and quadriceps and bring your knees closer to your chest. Relax and hold the stretch. Now contract your hamstrings and gluteals against your arms for three seconds. Relax and try to bring your knees even closer to your chest. Hold for three seconds. Relax.”

Gluteals: “Lie on your back. Extend your left leg and keep your foot flat on the floor. Point your right foot high toward the ceiling so your legs form a 90-degree angle. Slowly lower your right foot to the left so that you feel a stretch in your right hip. As your leg drops, gradually bend your right knee until it forms a 90-degree angle. Stop when you feel tension. Contract your right hip for three seconds. Relax and stretch a little bit further. Contract your right inner thigh (adductor) for three seconds. Relax and elongate the stretch one more time. Hold for three seconds. Switch sides and repeat.”

Hamstring: “Sit in a straddle position on the floor. Contract your right hamstring muscle. Hold the contraction for three seconds. Relax. Now exhale and bring your chest toward your right knee. Stop when you feel tension. Now contract your right quadriceps for three seconds. Relax and again bring your chest closer to your right knee. Hold for three seconds. Switch sides and repeat.”

Another Gastrocnemius stretch: “Sit on the floor. Place your right leg in front of you and hold it straight. Bend your left knee so that your foot supports you on the floor. Reach toward the toes of your right foot with your right hand. If you can reach your toes, pull them back. Contract your calf muscle by pressing your toes against your fingers. Hold for three seconds. Relax. Exhale and stretch your calf muscles. Now contract your tibialis anterior by lifting your toes up toward your knee for three seconds. Relax and stretch your calf muscle a little bit further. Stop when you feel tension. Hold for three seconds. Switch sides and repeat.”

Obliques: “Sit on the floor. Bring your inside foot across your knee and turn your upper body in the same direction. Feel the in your torso (obliques). Contract those oblique muscles and hold for three second. Relax and stretch a little bit further. Now contract your oblique muscles on the opposite side of your body for three seconds. Relax and stretch. Stop when you feel tension. Hold for three seconds. Switch sides and repeat.”

Adductors: “Sit on the floor with the soles of your feet together. Pull your feet as close to

you as possible. Contract your inner thigh muscles (adductors) for three seconds. Relax. Exhale and stretch your adductors further. Now contract your gluteals for three seconds. Relax and see if you can bring your knees closer to the peanut. Stop when you feel tension. Hold for three seconds. Relax.”

Another Pectorals stretch: “Stand with your feet shoulder width apart. Extend your arms out to the side with your palms facing the ceiling. Slowly bring your arms back. Contract the muscles in your chest. Hold the contraction for three seconds. Relax. Exhale and stretch your pectorals a bit further by continuing to draw your arms backwards. Now contract the muscles between your shoulder blades (rhomboids) for three seconds. Relax and see if you can take your arms back a bit further. Stop when you feel tension. Hold for three seconds. Relax.”

Abdominals: “Lie down on your abdominals. Place your forearms underneath your chest with your palms on the floor. Press down with your hands until your elbows support you. Notice a stretch in your abdominal muscles. Contract your abdominals for three seconds. Exhale and stretch your abdominals a bit further by extending your elbows. Now contract your back muscles (erector spinae) and hold for three seconds. Relax. See if you can stretch a bit higher into spinal extension. Stop when you feel tension. Hold for three seconds. Relax.”

Erector Spinae: “Go to the floor on your hands and knees. Round your back and stretch your upper and lower back muscles (erector spinae). Contract these muscles for three seconds. Exhale and stretch into a “cat-stretch” position. Now contract your abdominal muscles for three seconds. Relax and see if you can deepen your cat stretch pose. Stop when you feel tension. Hold for three seconds. Relax.”

Piriformis: “Lie on your back. Place your left foot on the floor with your knee bent. Place your right ankle across your left knee in a “figure 4” position. Allow your right foot to pull your left knee to the right until you feel tension. Contract those muscles (glutes, piriformis, and obliques). Hold the contraction for three seconds. Relax. Exhale and stretch a bit further. Now contract in a counter-force measure as if you were performing an isometric tension exercise for three seconds as your ankle pulls against your knee. Relax and see if you can stretch a bit further. Stop when you feel tension. Hold for three seconds. Switch sides and repeat.”

APPENDIX A: AUTHOR BIO



Tom Seabourne, Ph.D. exercise science, Penn State Univ. Scholarship Athlete, University of North Texas Alumni of the year, Texas Professor of the Year- all colleges and universities (2015), American Council on Exercise fitness educator of the year (2005) finalist, Selected to Taekwondo Hall of Fame, (2013), GUINNESS WORLD RECORD HOLDER (2009), National/international multi-sport athlete. Commencement Keynote Speaker NTCC (2015).

*Television & Videos: QVC Fitness Expert (National), Co-host of the #1 rated Fitness Infomercial (National) 6SecondAbs, Fox & Friends (National), Positively Texas-Dallas, Fox Morning Show-Dallas, Good Morning Texas-Dallas (twice), Sally Jessy Raphael (National) , ESPN's Full Contact Karate (National), Spenco 500 ESPN (National), Race Across America Discover Channel (National), Texas Country Reporter-Texas, Pride of East Texas, Stay Fit-ABC affiliate East Texas (10 times), Inside Fitness-CBS National (twice). PowerBlock video, Best Abs on Earth video, A Guide To Inner Strength video, Introduction to Cardiokickboxing video. Upper Body Strength, Lower Body Strength, Core Stability Videos with Sara's City Workouts. Appeared on National Reality Show as "Extreme Million-Mile Cyclist" (2011).

*Certified Strength and Conditioning Specialist, Certified through the American Council on Exercise (ACE) continuing education provider, American College of Sports Medicine (ACSM), United States Professional Tennis Association (USPTA), Chairman of the United States Taekwondo Union (USTU) safety committee 2006. Fitness Consultant to USA-Taekwondo 2007.

*Presenter for: ECA, Sara's City Workout, IDEA Personal Training Summit, IHRSA, CAN-FIT-PRO, AFPA, DCAC, AAAI, NEFC, Club Industry, and IDEA WORLD.

*Tom has authored over 200 articles in refereed journals and magazines including: Journal of Sports Psychology, Journal of Motor Behavior, Bicycling, Men's Fitness, Maxim, Physician & Sports Medicine, Diabetes Self-Management, Fitness Magazine, Self, Men's Health, Muscle & Fitness.

*Tom has authored 16 published books: Self Defense- A Body Mind Approach, 1986, Prospect Press, A Guide To Inner Strength, 1993, Hunter Textbooks, Cross-Training, 1996, Eddie Bowers, Taekwondo-Techniques & Tactics, 1997 Human Kinetics, The Martial Arts Athlete, 1998, YMAA. Power Pacing for Indoor Cycling, 1999 Human Kinetics, Power Body-Injury Prevention, Rehabilitation, and Sports Performance Enhancement, 1999, YMAA. Complete Cardiokickboxing-A Safe and Effective Approach to High Performance Living, 1999 YMAA, Mind/Body Fitness 2000, YMAA. Athletic Abs, 2002, Human Kinetics. Power Training, 2002 Keiser. Basic Training for Cycling Homestudy Course 2003 Desert Southwest. SCW Personal Training Homestudy Course 2003 Mania Events. The Pocket Idiot's Guide to Great Abs, 2005, Alpha Books
The Pocket Idiot's Guide to a Great Upper Body, 2005, Alpha Books
The Pocket Idiot's Guide to Great Buns and Thighs, 2005, Alpha Books
The Complete Idiot's Guide to Fitness Boxing Illustrated, 2006, Penguin.
The Complete Idiot's Guide to Quick Total Body Workouts, 2012, Penguin

*Taekwondo: Two-time All-American, Two-time member of the United States Taekwondo Team Pan American Champion (twice), North American Champion (twice), ESPN Professional Karate Association full-contact karate winner, Runner up in the World Taekwondo Championships (Stuttgart, Germany).

*Cycling: ·Winner: RAAM Open West. ·Top ten in the 1990 Race Across America (RAAM).
·Oklahoma State IronButt 24-hour cycling record: 458 miles. ·Holder of two Texas state cycling records. ·Holder of Arkansas and Louisiana state cycling records. ·National 12-hour record holder: 229 miles. ·24-hour Texas State Cycling Champ. Top 20 in the 2007 RAAM – 1,740 miles, 7 days. Guinness World Indoor Cycling Record in 2009 – 185 hours.

*Tom has been featured in Sports Illustrated magazine 3 times. Ultimately as the Sports Illustrated Athlete of the Month. Men's Fitness magazine –Sportsman of the Month. Men's Exercise magazine – Mr. Fitness. And most recently "Learn to Endure" in Muscle & Body Magazine's April, 2015 issue. Tom also appeared in Encyclopedia Britannica as AAU National Heavyweight Taekwondo Champion.

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<http://www.health.com/health/gallery/0,,20678467,00.html>

APPENDIX C

ASSESSMENTS: STRENGTHS AND WEAKNESSES

The purpose of fitness testing for your client is to determine strengths and weaknesses in her program. Heart rate measures help to determine her recovery rate. It's nice to know her body fat so she can adjust her eating to her fitness programming. Muscular strength and endurance can be assessed with the crunch, bench press, and push up tests. Your client can improve her muscular endurance by practicing the test itself.

Heart Rate Evaluation: The purpose is to measure frequency of your heart's contractions. It is measured in beats per minute (BPM).

Measure your client's heart rate by placing your fingertips on a pulse site such as her carotid artery or inside your wrist. If you have a stethoscope, position the bell on the third intercostal space to the left of your sternum. Heart rate watches and monitors consist of a chest strap containing electrodes that register your client's heartbeat. These devices cost between \$150.00 and \$300.00.

Heart rates range from 40 to 100 BPM. The average for men is 70 BPM. Women average 75 BPM. Elite athletes generally have lower resting heart rates, but not always.

Resting heart rate is most accurately measured before rising from your bed in the morning. During the day, have your client seated 15 minutes prior to taking her count.

Your client's pulse should be taken for 60 seconds. Or, take it for 30 seconds and double the number. Exercise heart rate should be taken for 6 seconds so your client may return to her workout. Multiply her total by 10. The product is your exercise BPM.

Body Composition Evaluation: The purpose for measuring your client's body composition is to determine her percent body fat in comparison to her total body weight. Excess body fat is a secondary risk factor for coronary artery disease (CAD).

Hydrostatic weighing is considered the "gold standard" for measuring body fat. Your client's body density is calculated from the relationship between her normal body weight and her underwater weight. Fat weighs less than water.

Bioelectrical impedance measures your client's body fat by passing an electric current from her finger to her toe. The conductivity of an electrical impulse is faster through lean tissue than through fat. She should be well hydrated, not have exercised within 6 hours, and consumed no alcohol 24 hours before the test, for an accurate reading.

Skinfold measurements are based on the presumption that 50 percent of your total body fat is just below your skin. The trainer pinches 3 sites on your body. For men these include your chest, abdomen and thigh. The average percent body fat for men is 12 to 18 percent. For women the sites are your triceps, suprailiac, and thigh. Women average between 18 and 25 percent body fat.

Waist to Hip Ratio Evaluation: The more weight you carry in your belly, the higher your risk for CAD. Use a tape measure to assess your client's waist and hips in

inches. Divide her waist by her hip measurement.

If his waist is 36 inches and his hips are 42 inches ($36/42 = .85$), this signifies a moderate/high risk for CAD. High CAD risk for men is greater than 1.0. For women, high risk is greater than .85.

Push-up Test: The purpose of the push up test is to measure muscular endurance. Have your client perform as many push-ups as possible. Do not allow her to rest in either the up or down position. Men assume the standard push up position with their knees straight. Hands are shoulder width apart. Chests come 3 inches from the floor with each repetition. Women rest their knees on the floor. An excellent score for men is over 50 push-ups. For women, 30 is an excellent score.

Bench Press Test: This is another muscular endurance test. The weight is set at 80 pounds. Your client lies with her back on a flat bench. A metronome is set at 60 BPM. Spotters are present for safety. Repetitions are counted when her elbows are fully extended (not locked), and the bar comes down to her chest. The test is concluded when she cannot maintain form, or loses the beat of the metronome. An excellent score for men is 37 repetitions. For women the test is identical except the weight is set at 35 pounds. An excellent score for women is 35 repetitions.

Canadian Crunch Test: The purpose of this test is to measure muscular endurance of your client's abdominal area. Have her lie on your back with her arms extended to her sides. Place a strip of tape on the floor at the end of her fingertips. Place another piece of tape 3 inches away from the first strip. To perform a proper crunch, your client should curl her rib cage toward her pelvis. Her fingers move from one strip of tape to the next. She should perform as many crunches as possible to a 40 BPM metronome. The test is completed when she cannot execute another crunch. An excellent score for men is 60. Women receive an outstanding score after performing 50 repetitions.

Trunk Flexion Test: The purpose of the trunk flexion test is to measure flexibility of your client's lower back and hamstrings. She should remove her shoes and sit with her knees straight and her feet 12 inches apart. Place a yardstick between her legs with the 15 inch mark even with her feet. The 0 inch mark should be closer to her knees. Place one of her hands on top of the other. The tips of her fingers are aligned. Ask her to exhale and slowly lean forward by dropping her head toward her arms. Her fingers slide over the yardstick. Take the best of three measurements. An excellent score for men is greater than 20 inches. A superior grade for women is more than 24 inches.

Hip Flexion Test: The purpose of the hip flexion test is to determine if your client's hip flexors are too tight. Have your client lie on her back. She should maintain a flat lower back while grabbing behind her left knee. She should pull her left knee to her chest. Normal flexibility is indicated when her right leg remains flat on the floor. Her hip flexors are considered tight if she attempts to lift her left knee toward her chest, and her right leg leaves the floor. Repeat with her other leg.

APPENDIX D

Q&A

What is the best exercise to get a six pack?

You probably already have a "six-pack" but you just can't see it. That layer of fat between your skin and your muscle (subcutaneous fat) is just too doggoned thick. To lose those pretty little love handles, combine a full body weight-training program with aerobics. Most importantly, don't forget to fuel your workouts and starve your fat cells with a good eating plan. Train each of your muscle groups twice a week, do aerobics five times a week for between 30 and 40 minutes, and eat five small meals a day combining a balance of nutrient dense foods.

What is the best exercise to lose fat?

Although the best exercise is "the one that you enjoy," a combination of weight training and aerobics is your answer. Weight training speeds your metabolism so that you burn more fat while you're watching cartoons. For each additional pound of muscle you gain, you burn about 40 extra calories a day just sitting there. And if you couple that with a little cardio, your fat burning skyrockets.

What do you recommend, free weights or machines?

All bets are off on this one. Free weights is your answer. Free weights build those tiny, little stabilizer muscles that help keep your balance. Lifting free weights is also more real world - like grabbing a six-pack out of the trunk or washing your cat. And besides that, if your elbow or shoulder doesn't feel right, you can always move dumbbells around the injury so it doesn't hurt.

Which is better, water or sports drinks?

Have you ever noticed that when you drink plain water on your run or ride that you have to take more bathroom breaks than if you sip a sports drink? I have! "Sodium and carbohydrates can increase fluid absorption because sodium is readily absorbed in the small intestines; thus these drinks are more likely to enter the system than water alone, which would end up in the bladder", says Ken Sparks and Dave Kuehls on page 104 of their book, *The Runners Book of Training Secrets*. In addition, research by a variety of sports drink companies suggest that the carbohydrates in their products serve as an energy source during long runs and can help prevent blood sugar levels from dropping.

Should I buy a heart rate monitor?

A heart rate monitor is an efficient way to keep tabs on your training to be sure that you are not overextending yourself, according to Sally Edwards author of *The Heart Rate Monitor Guidebook* (1999), who resides in Sacramento, CA. Some runners and cyclists set their monitors to sound a warning signal if their heart rate wanders above the target level, which would indicate that they are burning precious glycogen reserves too early. A heart rate monitor also enables you to monitor your weekly progress to ensure you are not overtraining.

How do I get to the next level in my running and cycling?

If you are preparing to move to the next level in your running or cycling, do it gradually and change only one variable at a time; otherwise you are setting yourself up for injury, says Val Guzman D.C. sports medicine specialist in Philadelphia, PA. Increase the frequency of your runs or rides, your mileage, or your speed. But never try to make all of these changes at once, says Guzman. This progressive overload theory keeps you running or pedaling the fine line between enhanced performance and overtraining.

I slosh when I run. Should I not drink before I run?

If your sports drink is too tasty, it might slosh around too long in your tummy. Sports drinks that contain less than seven percent carbohydrate are absorbed faster than those with more sugar warns Susan Allen, R.D., on staff at American WholeHealth in Chicago, IL. Quicker gastric emptying means less sloshing, she says. Calculate the percent of carbohydrate in your favorite sports drink by dividing the grams of carbohydrate per serving by the serving size in milliliters, and then multiply that number by 100. If you discover your sports drink has more than seven percent carbohydrate - happy sloshing; or mix it ½ and ½ with water.

I run on an out and back course and it's boring. Any suggestions?

Think it's boring to train on an out-and-back course? Out-and-back is a great training tool to maximize your speed, recommends Mitch Bogdanfy, Ironman triathlete and exercise physiologist. Ride or run back faster than you went out. A quicker return trip helps you to develop a "negative split mindset", says Bogdanfy. This teaches you to pedal or stride the second half of your race slightly faster than the first half. It is a great way to mentally and physically prepare for the last few miles of your event, suggests Bogdanfy.

My knees are beginning to bother me in my outdoor triathlon training. Any tips?

Here are five ways to protect your knees according to John Atkins, ATC and sports medicine rehabilitation specialist in Vail, CO.

- * Wear shoes that fit **your** feet (If you are a pronator or supinator orthotics can help).
- * Don't increase your weekly running or cycling mileage by more than five percent.
- * Run on smooth trails or grass instead of concrete.
- * Avoid cycling in gears so big that you cannot pedal faster than 60 revolutions per minute.
- * Train your quadriceps and hamstrings with weights twice a week to bolster your knees.

What are micro, meso and macro cycles?

These are fancy words for weekly, monthly and yearly training regimens. And all of these training protocols combined are called periodization. Periodization is the secret to increased racing speed and maintaining your conditioning year-around, maintains Joe Signorile, Ph.D., exercise scientist at the University of Miami in Florida. Train differently before and after your race. Similarly, for different periods during the year, consciously train harder or easier to get fitter or recover more completely, suggests Dr. Signorile. Become scientific about your training and watch your performance skyrocket, says Signorile.

I want to race faster, any mental tips?

Imagine sprinting a 5K or pedaling a 10-mile time trial. Just you, the road, and a stop watch. To set a personal record associate with your body, suggests Robert Weinberg, Ph.D. sports psychologist at the University of Miami in Oxford, Ohio. Association means that you tune into your sensations. You are not obsessed about caloric expenditure or worried about your grocery list. Focus on your breathing and your form. Process signals from all parts of your body so you can alter your stride length or pedal stroke according to the terrain, says Weinberg.

To be a good road racer is genetics really important?

To win a cycling or running road-race you do not have to be born to the right parents. That is, you do not have to own predominantly fast twitch muscle fibers according to Douglas Brooks, MS in exercise physiology and author, lecturer, and video personality. Fast-twitch fibers fire with power and quickness, but also exhaust their supply of fuel very quickly. Slow-twitch muscles contract slower, but they are able to maintain that contraction longer. Running and cycling road races typically require surges of hard sprints alternating with steady-state recovery. The winners aren't necessarily the fastest runners or cyclists, they are the ones who can recover from the sprints most efficiently.

What is the pain on the outside of my leg while I'm running?

Your iliotibial band (ITB) extends from your hip, past the side of your knee and attaches to the outside of your tibia (shinbone.) ITB syndrome or inflammation of this tendinous sheath can cause pain and sometimes swelling says Topper Hagerman, Ph.D. rehabilitation specialist at the Howard Head Sportsmedicine Clinic in Vail, CO. Be sure your shoes are in perfect condition. And be careful of running on the side of the road where it banks. "Too many days running in a row, or running too long may also cause ITB syndrome", says Hagerman.

Is it a good idea to do aerobics and cut down on eating at the same time to lose weight?

A fascinating study reported in the March, 2000 issue of *Medicine and Science in Sports & Exercise* demonstrated that if you are an ardent runner you must eat to lose fat. Georgia State University researchers analyzed world-class female runners' energy expenditure hour-by-hour during a typical training day. Runners who did not eat enough to fuel their workouts had lower metabolic rates and more body fat. Those who ate enough to cover the cost of their caloric expenditure had less body fat. The lesson here is that your body responds to food deprivation by storing fat. So keep running and keep eating!

I get butterflies before my races. Can that hurt my running?

Don't let pre-race butterflies snowball. Even the best and most experienced cyclists and runners experience the jitters according to David Yukelson, sports psychologist at the Pennsylvania State University in State College, PA. Consider your pre-race pump an anticipated and necessary part of your best performance. Rather than trying to cover up your anxiety, acknowledge it. Then channel this tension into a laser-like focus by remembering that you are ready to race. Warm up, take a deep breath, "see" yourself in the zone, and go.

I constantly sprain my ankles. Are there any exercises I can do?

Are you prone to ankle sprains? Strengthen your peroneal muscles (the muscles on the outside of your lower legs) and you're on your way to a healthier running career according to Carol Frey, assistant clinical professor at the University of California in Los Angeles. Improve your balance too. Stand on one leg for one minute. Not too hard? Try balancing on one foot with your eyes closed. Switch legs and repeat. If you are prone to ankle sprains, wear an ankle brace only when you run on uneven ground so that your ankle functions normally without the brace says Dr. Frey.

Will weight training hurt my cycling and running performance?

Weight training is a powerful addition to your cycling and running program according to Allen Jackson, assistant professor of kinesiology at the University of North Texas in Denton. Pump iron during your pre and post season to add power to your stride or stroke. Perform a maintenance program during the season but never as a substitute for running or cycling. Although the benefits of weight training for distance runners and cyclists are minimal, hoisting weights does strengthen your muscles and tendons around your joints and could help in preventing injuries says Dr. Jackson author of *Physical Activity for Health and Fitness* (Human Kinetics, 1999).

Will taking a day off here and there hurt my workouts?

If your local weather forecast is "The Perfect Storm", or you feel nauseous on time-trial day, take a day off, lessen your intensity or shorten your workout. It is not one workout that matters, it is the weeks and months of training that make a difference according to Larry North, owner of Larry North's Total Fitness in Dallas, Texas. And do not become compulsive about making up missed workouts or hitting your scheduled mileage. Easy days and recovery workouts are as important to your running/cycling success as your high intensity training, says North.

What is a side-sticker and how do I prevent it?

The origin of the intolerable pain of a side stitch continues to bewilder the medical community. The latest theory is that a side stitch may be caused by stretched ligaments near your diaphragm says Paul Meriwether, M.D. who owns a family practice in Mt. Pleasant, Texas. If this is true, it would make sense not to eat or drink just before you stride out your door so that you do not add weight to your stomach. If you experience a side stitch, lean forward while contracting your abdominal muscles and apply pressure into the painful area. Exhale through pursed lips (as if you were whistling) while contracting your diaphragm to push out the air, suggests Meriwether

What is a good mindset for long distance racing?

When things get tough in training or a race, break your effort down into manageable segments suggests Adam Bean, editor of *Runners World* magazine. During the Race Across America (RAAM) everything hurt – my hands, feet, butt; any body part that made contact with the bike. I chose a point in the distance and said to myself, "I'm going to cycle hard until I reach that spot." Then I picked another point and cycled hard to that one.

Sometimes it required pedaling vigorously through an entire state. I made better time this way, and it was a lot more fun then trying to swallow the entire country in a single bite.

APPENDIX E

GLOSSARY

Abdominal Fat- Nobody wants it, and men prefer to store their fat here. Stress releases epinephrine, which reacts with hormone sensitive lipase, to help you lose fat around your waist. Some women comment: "Too bad that doesn't work for fat around your hips."

Abdominals- Everybody wants to see his or her abdominals. They are flat, bandlike, muscles on the front of your trunk. They connect your pelvis to your rib cage. They consist of your rectus abdominis, external and internal obliques, and your transverse abdominis.

Abduction – Think of someone stealing an arm or a leg. Moving one of your limbs away from the midline of your body. This means extending an arm or leg out to your side.

Abductors- Also referred to as outer thigh muscles. These muscles include your tensor fascia latae and gluteus medius.

Abs –Also referred to as abdominal muscles. A slang term.

Absolute Strength – Your best effort. The amount of weight you can lift one time. Absolute strength is developed through heavy weight training, typically involving above the 80-85% of your maximum effort. Powerlifters compete in an absolute strength event.

Absolute work - The amount of calories used in performing a task. The harder it is, the more calories burned, the more absolute work.

Acclimatization –Your body's ability to become accustomed to a change in temperature or altitude. A couple of weeks are usually recommended to do this. And if you're trying to maintain your sports performance, you must train in this new temperature or altitude, not just sit around. If you train in the heat, you get better at conserving sodium (salt). Your sweat is more dilute. You preserve sodium. If you lose too much sodium it is more difficult for you to remain hydrated.

Accommodating Resistance – Thought to be the last fitness device you would ever need, but never lived up to its billing. A weight-training machine that controls your speed and resistance so that you are exerting maximally throughout the full range of motion of your exercise.

Accommodation- This is what you lose when you get older. Your eye's ability to change the shape of its lens. This allows you to focus on objects that are far away or close.

Acetylcholine- This is what you need if you're up for the last seat on a standby flight to Japan. A neurotransmitter that slows your heart rate. It is controlled by your parasympathetic nervous system.

Acid-Base Balance –You DON'T want to feel the burn of acidosis. Your acid-base balance refers to the condition in which the pH of your blood is kept at a constant level of 7.35 to 7.45. Your breathing, buffers, and work done by your kidneys help you to remain in balance.

Actin – No we're not talking about "actin" school. Actin is one of the fibrous protein components of your muscle tissue that combines with myosin in a cross-bridge to contract your muscle.

Active Isolated (AI) Stretching- This is a fancy name for a new form of stretching. A type of stretching where you contract your antagonist muscle for 2 seconds prior to stretching your agonist for 2 seconds. You can do as many as 10 repetitions of each stretch. The purpose of AI stretching is to inhibit the stretch reflex.

Active Recovery- If you really want to hurt, run a sprint and then sit instead of performing an active recovery. Toxins accumulate in your muscles after exercise. These waste products are drastically

reduced if you perform some type of activity after your workout. Walking, pedaling, or light jogging for 10-15 minutes will greatly improve the breakdown of metabolites to reduce unwanted stiffness and soreness.

Acute – A cute guy just walked by. This refers to something that is sudden, short-term, sharp, or severe. The opposite of acute is chronic.

Acute Urinary Retention- You don't want this, especially if you are female. An enlarged prostate causes an inability to squeeze urine past it. Usually a catheter is required to transfer urine from the bladder to the urethra.

Adaptation – Also referred to as improve. The adjustment of your body or mind to achieve a greater degree of fitness. Adaptation is usually accompanied by training.

Adduction – Think of “adding” together. Movement of one of your limbs toward the midline of your body.

Adductors- Also referred to as inner thigh muscles. These muscles include your adductor magnus, adductor longus, adductor brevis, and gracilis.

Adenosine diphosphate (ADP) – Energy waiting to happen. A chemical compound that is transformed into ATP by adding a phosphate group.

Adenosine triphosphate (ATP) – When your ATP is gone, you are no longer with us. An organic molecule which is a storage form of energy in your cells. It is the final phase in the transfer of food energy to work performed by your muscle. ATP must be present in your muscle cells for a contraction to occur.

Adherence – Also referred to as sticking to your program. Most people quit exercising within the first three months of beginning an exercise program.

Adhesion – Think of a band aid. An adhesion is a fibrous tissue holding parts of your muscles or other tissues together that have been damaged through trauma.

Adipose tissue –Also referred to as fat tissue. This is a yellowish substance within your fat cells. Years ago it was valuable during times of starvation. In over fed America, adipose tissue around your waist and hips is a curse.

Aerobic – Also referred to as using oxygen.

Aerobic activities – The scientific study of these made Dr. Kenneth Cooper a millionaire. Activities such as walking, running, jogging, cycling or swimming that use large muscle groups at moderate intensities to allow your body to use oxygen to supply energy and to maintain a steady state of exercise for more than a few minutes.

Aerobic endurance – Don't quit; the ability to continue aerobic activity for a period of time.

Aerobic Exercise- Same as aerobic activities, I'm getting paid by the hour to write these. Aerobic means "with oxygen." Move your large muscle groups in a rhythmic fashion and you are doing aerobics. Walking, jogging, stair climbing, swimming, and jumping rope are examples.

Aerobic power – If you can outrun a cheetah, you have excellent aerobic power; the ability of your body to maximize the use of oxygen by its tissues.

Aerophagia- Also referred to as swallowing too much air.

After-Cataract- The good news is that the doctor removed your cataract. The bad news is that there is a blank spot that develops in your lens capsule.

Age-related Macular Degeneration- You're going to get old someday. And the part of your retina that is responsible for sharp, in-focus vision is called your macula. As you get older, your macula deteriorates.

Agonist – This is not about agony unless you hate weight training. Your agonist is a muscle which directly engages in an action around a joint. The antagonist provides the opposite action.

Alcohol- Can you drink just one a day? If so, this is associated with a lower risk for heart disease in some individuals. One drink per day was found to increase the level of high-density lipoprotein (HDL) cholesterol, a.k.a. "good cholesterol," in your blood. The higher your HDL levels, the lower your risk for heart disease.

Aldosterone- Want to raise your blood pressure? Your adrenal gland secretes this hormone. It is responsible for signaling your kidneys to conserve sodium and water. This raises your plasma volume. It raises your blood pressure too.

Alimentary Canal- Also referred to as gastrointestinal (GI) tract.

Allergies- Would you rather your stuffy nose be from a cold or an allergy? Allergies occur when your immune system reacts to pollen, mold, or dust. Your body perceives these irritants as if they were alien invaders. Your symptoms include- watery nasal discharge; sneezing; coughing; itchy eyes, nose, and throat; nasal congestion; and dark circles under your eyes.

Alpha State- If you're daydreaming instead of reading this sentence your brain is producing alpha waves. Alpha brain waves are characterized by relaxed-concentration.

Alternative Approaches- More and more folks are trading their M.D.'s in for alternative medicine specialists. Dr. Dean Ornish has shown that patients may reverse their heart disease with a combination of a low-fat diet, meditation, and exercise. Norman Cousins healed his ankylosing spondylitis (a form of arthritis of the spine) by watching funny movies and high doses of vitamin C. Many patients have cured their digestive disturbances by avoiding certain foods.

Altitude Training- Who are you supposed to believe? The latest research suggests it is better to live at thirty five hundred meters and train at fifteen hundred meters, then equivalent sea level training or equivalent altitude training. This flies in the face of previous research that suggested it was better to train at a higher altitude than the subsequent competition.

Amino acids – Also referred to as the building blocks of protein. They all contain nitrogen, oxygen, carbon and hydrogen. Amino acids are either essential or nonessential. . There are 24 amino acids, which form countless number of different proteins. You need not spend your hard earned money purchasing amino acid supplements. Instead eat lean proteins such as egg whites, chicken breast, turkey breast, fish, non-fat dairy, and game meats. Eight essential amino acids must be provided from your food. Non-essential amino acids are made within your body.

Amygdala- Also referred to as the part of your brain that is involved with emotion and memory.

Amylase- Carbohydrates are good! Amylase is an enzyme that is secreted by your pancreas. It helps you digest carbohydrates.

Anabolic – Also referred to as growth producing. Many times this simply refers to putting together complex substances from simpler ones such as the building of body proteins from amino acids. The opposite of catabolic.

Anaerobic exercise –Also referred to as without oxygen. Usually short term, high intensity exercise. The fuel for these quick workouts are ATP, CP, and glycogen. Weight lifting and sprinting are two examples of anaerobic exercise. Weight training, sprinting, basketball, racketball, and tennis are anaerobic.

Anaerobic threshold – Also referred to as lactate threshold. You know you have hit your anaerobic threshold when your muscles burn and you start breathing heavily during exercise. This is the point where the increasing energy demands of your exercise cannot be met by the use of oxygen, and an oxygen debt becomes evident.

Androgens- Also referred to as male steroid hormones. They are produced in your adrenal glands and ovaries in women. These are the types of steroids that help you to build muscle.

Anemia- Also referred to as iron poor blood. Your body uses iron to make red blood cells. If your iron levels drop, then your body loses its ability to manufacture red blood cells. The fewer red blood cells you have, the less hemoglobin. As your hemoglobin drops, the ability of your blood to carry oxygen decreases and you have less energy. Symptoms of anemia include fatigue, shortness of breath, dizziness, light-headedness, fainting, and decreased resistance to colds and other infections.

Aneurysm- Also referred to as a large bubble or pocket in your blood vessel. It is a weak spot in your vessel wall. If an aneurysm ruptures, it is life threatening.

Angina- Also referred to as chest pain. It occurs when your heart does not get enough blood and oxygen from your coronary arteries. Your pain may be referred to your chest, jaw, arm, or a variety of other places. The pain can be sharp, dull, or a pressing sensation. Angina may last minutes or weeks.

Ankle Strengthening- Free exercise: Place your foot on the floor against the leg of a chair. Push your foot against the chair sideways; both to the inside and outside to strengthen the muscles that turn your ankle in and out. Keep your heel planted. Move the front of your foot out sideways and back. When your ankle is strong enough, use a towel for resistance.

Ankylosing Spondylitis- Also referred to as inflammation of your spinal tissue. It is so painful it may lead to stiffness. This may cause you to change your posture and change the way your facets of your spine sit atop one another.

Annulus Fibrosus- Also referred to as the protective, layered, outer portion of each of your spinal disks.

Antagonist – Your spouse. No really it's a muscle that provides an opposing action to the action of another muscle (the agonist) around a joint. The opposite of the muscle group you are referring to. For example the antagonist to the biceps is your triceps.

Anthropometry – Also referred to as the science dealing with the measurement (size, weight, proportions) of the human body.

Antioxidants – Also referred to as against oxidation. Certain nutrients, substances and vitamins and minerals that protect against free-radicals. Free radicals are unstable molecular fragments that are generated by strenuous exercise. Free radical scavengers (antioxidants) include vitamins A, C, E, selenium, and zinc. Antioxidants are suggested to inhibit oxygen-based free radicals from attaching to and destroying your healthy organs and tissues.

Antitussive- Also referred to as a cough suppressant.

Aorta- Also referred to as the main artery that carries blood away from your heart.

Aphasia- Hopefully this won't happen to you...or me. Difficulty speaking or understanding language. It usually occurs after a stroke. Aphasia affects the left hemisphere of the brain, where language is processed.

Apolipoproteins- Not used in conversational language. These are the proteins that combine with cholesterol and triglycerides. The combination is called lipoproteins.

Appendicitis- Also referred to as an acute inflammation of your appendix. Your appendix is a thin, tube-shaped structure that protrudes from the first section of your large intestine. Your appendix can become inflamed because of an anatomical obstruction, or a blockage of hardened feces. This inflammation can rapidly develop into an infection.

Aquatics – Also referred to as exercise or sports activities in or on the water.

Aqueous Humor- Not funny. The fluid within your eye that nourishes and fills the front and back chambers.

Aromatherapy- Does smelling a rose bouquet make you feel better. Aromatherapy is an alternative therapy that is purported to enhance your well being through scent. The program includes wrapping your body in warm sheets saturated with scented oils. Then you are covered with a thermal blanket, as if you were in a cocoon. The manufacturers of these products claim benefits such as reduced swelling, pain reduction, and inhibited bacteria growth.

Arousal- Also referred to as activation level.

Arrhythmia – Also referred to as an abnormal heart rhythm. This is usually caused by a problem with your heart's electrical system.

Arteriosclerosis- Also referred to as hardening of the arteries. It refers to the fact that your arteries may become hard and brittle through the deposition of calcium on artery walls.

Artery – Also referred to as vessel which carries blood away from the heart to the tissues of the body.

Arthritis –Also referred to as painful inflammation of the joints. It can lead to stiffness and limitations of motion. Rheumatoid arthritis is an autoimmune disease whereas osteoarthritis usually involves wearing away of articular cartilage causing bone to rub on bone.

Articular Processes- You can't see these, unless you look into two mirrors. These are 2 bony processes that are on the back part of each vertebra. They form your facet joints.

Association- Also referred to as focusing on the activity you are performing.

Asthma and Exercise- Exercise can induce asthma. At least that's students tell their coach when they don't dress-out for P.E. class. Carry your inhaler at all times during exercise. Keep your asthma under control so it doesn't interfere with your activity. If your doctor prescribed inhaled corticosteroids, use them according to your doctor's recommendations. Control your allergies. Visit your doctor regularly and follow his or her instructions about monitoring your condition. Be sure to report any concerns immediately.

Asthma- To wheeze or not to wheeze. The wheeze of asthma is caused by contraction of the muscular walls of the small breathing tubes in your lungs. The narrowed air tube creates a turbulent air flow. This causes the wheezing or whistling when you breathe. Because the tubes into the lung are narrowed, less air can get in and this decreases the oxygen supply to your body. The pathological muscular contraction of your breathing tubes can be stimulated by a wide range of substances such as inhaled dust or pollen, and various foods.

Astigmatism- Also referred to as an irregular curvature of your cornea. This causes distorted vision.

Atherosclerosis- Also referred to as plaque and cholesterol build up along your artery walls. This causes a dangerous narrowing of your blood vessels.

Atherothrombotic Stroke- Kind of like a dam in your brain. This is a kind of stroke that happens after a large artery to your brain has already been narrowed by Atherosclerosis. It becomes completely blocked by the formation of a clot.

Athletic Shoes- Also referred to as tennys. To find out if you need new shoes, place them on a table. Check for excessive wear. The back of your shoes should not slant inward. Shoes slanting inward may indicate overpronation, a condition in which your feet flatten and your ankles roll in. Worn spots on your shoes can also provide evidence of bone imbalances.

Atkins Diet- Run from this! A high protein, low carbohydrate, high fat diet that has not been shown to be beneficial to long-term weight loss.

Atrial Fibrillation- Also referred to as irregular heart beat. A heart rhythm problem where your atria quivers ineffectually. This allows blood to sit idly, and nonproductively, in your left atrium.

Atrium- Also referred to as the upper chambers of your heart.

Atrophy – Not a trophy, atrophy is a wasting away of muscles, tissues, or organs as a result of disease or disuse. The opposite of atrophy is hypertrophy.

Audience Arousal- Not what you think. When someone is watching you perform a task, it increases your activation.

Autonomic Nervous System (ANS)- Sorry you have little control over these. This is the part of your nervous system that controls involuntary, automatic, process. Examples include your heart beat and breathing.

Axon- Also referred to as a part of the neuron that transmits a signal to a cell.

Ballistic Movement –Also referred to as bouncing. A bouncing type of movement that may have detrimental effects on joint stability, tendons, and muscles. Elite athletes use ballistic stretching and strengthening exercises to prepare for their performance.

Barbell – If you're a body builder, you know what this is. A bar that is used to hoist for exercise. It consists of a bar, and metal disc adjustable weights at each end.

Basal Metabolic Rate (BMR)- Also referred to as amount of calories your body burns at rest. Your BMR includes 60 percent of your caloric burn from your functioning organs. Twenty five percent from your muscles. Ten percent from your bones. And 5 percent from fat. BMR is usually expressed in calories per hour per square meter of body surface.

Benign Prostatic Hyperplasia (BPH)- Also referred to as an enlarged prostate that is not cancerous. It may interfere with urination.

Biceps brachii – Also referred to as beach muscle. This is a prominent muscle on the front of your upper arm.

Biceps- Also referred to as the muscles on the front of your upper arm. They include your biceps brachii, brachialis, and brachioradialis.

Bilateral Transfer- Train one leg if the other is hurt. Bilateral transfer is a theory stating that if you work a muscle group on one side of your body, it will enhance the muscle fibers on the other side of your body. For example, if you trained your right biceps muscle, your left biceps muscle would hypertrophy.

Bile- Also referred to as a fluid that is secreted by your liver. Bile helps break down fats in your small intestine.

Biofeedback – Your heart rate monitor is a biofeedback device. A process which allows you to see, hear or feel indicators of your bodily functions. This may allow you to exert some control over these variables.

Biofeedback is often used to teach people how to relax.

Biological Value – This is a measure that helps you to determine the potency of the protein bar or meal replacement you just purchased. It is purported to measure the amounts of the essential or indispensable amino acids required for protein synthesis.

Biomechanics – Also referred to as the study of the mechanics of your movement. Studies investigate torque, drag, and posture, in an attempt to enhance athletic performance.

Bladder Infection- Also referred to as cystitis. An inflammation of the wall and lining in your bladder. It may be caused by a bacterial infection or a mechanical abrasion from microcrystals of calcium phosphate in your urine. Symptoms of cystitis include frequent urination, dysuria (cloudy or bloody urine), with pain and tenderness in your lower abdomen. Your urine may be cloudy because it contains pus or blood and it may also have an unpleasant smell.

Blisters- Also referred to as a fluid filled pocket caused by friction on your skin. To prevent blisters, minimize friction. For the feet, this begins with your shoes. Shoes should fit comfortably the day that you buy them. There should be about a thumb's width between your longest toe and the end of your shoe. Narrow shoes cause blisters on your great toe and baby toe. A shallow toe box can cause blisters on the tops of your toes. Loose shoes can form blisters on the tips of your toes.

Blood – Why are you reading this? You know what blood is! Blood is the fluid which circulates through your heart, arteries, veins and capillaries. It is composed of red blood cells, white blood cells and blood platelets, and a watery fluid called plasma. It derives its reddish color from the iron within the hemoglobin. Blood provides oxygen and nutrients to your tissues that have no access to air or food. Your blood also transports waste from your tissues to the excretory organs. Blood helps to cool you down or warm you up by moving away or toward your internal organs. Blood also transports antibodies to battle stations to fight off infection.

Blood Glucose – Very important if you are hypoglycemic, diabetic, or just cranky. As you may have guessed, blood glucose or blood sugar refers to the amount glucose or sugar in your blood. Your blood sugar normally ranges from 60 to 100 milligrams per 100 milliliter of blood. It generally rises after a meal to as much as 150 milligrams per 100 milliliter of blood. Individuals who have diabetes may find their blood sugar rises triple the norm.

Blood pressure – Also referred to as the pressure exerted by your blood on the walls of your arteries.

BMI- “Body Mass Index” tables I consider to be pretty much of a joke. Although you may have 3 percent body fat, your BMI may be 30 suggesting you are obese. The average body mass index score is 25. BMI stands for your weight in kilograms divided by your height in meters squared.

Body composition – Also referred to as the proportions of fat, muscle, and bone making up your body.

Body Fat -- The lower your percentage of body fat, the more muscular you appear. The percentage of fat in the body versus lean body mass.

Body Fat Percentage- Percent body fat is the ratio of fat to the rest of you (i.e. muscle, bone, etc.). Men can reach as low as 3 percent fat. Women 12 percent. These are extremes. A reasonable goal for men to strive for might be 10 to 15 percent fat. Women 15 to 20 percent.

Body Fat Storage- Most of us have too much of this. Women have more subcutaneous body fat than men. But as both men and women age, body fat storage is more internal.

Bodybuilding – Although you are not a huge hulk, you can be a body builder. The application of weight training and nutrition to enhance musculature and physical appearance.

BodyPump- Another way to make exercise fun and bearable. The BodyPump class is designed to work your entire body using barbells with adjustable weights. The instructor cranks up the music, and leads you through a warm-up. Then a series of specifically choreographed moves, including squats, presses, lifts and curls are performed. You use light to moderate weights with high repetitions. The bar is three pounds with the option of adding additional weight.

Bolus- Yuck! A softened mass of chewed food. It ends up traveling down your esophagus into your stomach.

Bonk – Also referred to as hitting the wall. A slang term used in endurance event where you run out of glycogen in your muscles and you cannot take another step or pedal stroke. You don't want this! Your muscles and liver are depleted of glycogen. Now it's up to your fat stores to supply you with energy. Using your fat stores for energy production is an extraordinarily inefficient process where you feel lethargic and ill.

Boxaerobics- Billy Blanks maybe thinks he invented this. An aerobic-anaerobic exercise program using punches, footwork, and blocks performed to the beat of lively music.

Bradycardia – Also referred to as slow heart beat. A well-conditioned heart will often deliver a low pulse rate.

Bradykinesia- “Brady” means slow. And “kinese” means movement. Slow movement.

Brain Stem- Don't bump your brain stem. This is the part of your brain that controls your breathing, heart rate, and other vital functions.

Breathing During Exercise- Don't forget to breathe. You could virtually hold your breath while lifting weights, sprinting to your mailbox, or serving a tennis ball. But don't try it. Exhale with exertion and you will perform better, without blowing a gasket.

Broca's Area- My wife's Broca's area must be huge. This part of your brain is located in your frontal left hemispheric lobe. It is responsible for your speech.

Bronchitis- Bronchitis is the technical term for inflamed airways. Bronchitis can last from a few days to a few weeks. It normally occurs after a cold or flu. When bronchitis lasts for more than a few weeks, or strikes at least once a year, it is considered chronic. Bronchitis is rampant among smokers and people with lung disease.

Buffed – Also referred to as increased muscle size and definition.

Bulimia – Bulimia is an unhealthful intake of large amounts of food, often is often followed by the use of self-induced vomiting.

Bulking up -- Gaining muscle, and unfortunately gaining fat too!

Burn Fat- You burn fat all day long. And all night too. But to burn fat most efficiently, a comfortable but challenging pace is your best steady-state speed to burn fat. It is not necessary to be in an "aerobic training zone" to burn fat. You burn fat all of the time. Even in your sleep. The more fit you are, the more aerobic enzymes you have, and the more fat you burn.

Bursa – Also referred to as a cushioned, liquid filled sac. It lessens friction between muscles, between tendons and bone, or between bone and skin.

Bursitis – “Itis” means inflammation. So bursitis is inflammation of a bursa. Untreated bursitis can sometimes lead to calcification. A bursa is a pocket of connective tissue that sits next to a joint. It is lined by a smooth inner surface to help your muscles and tendons glide over nearby bones. Bursitis is

inflammation of your bursa. It becomes painful, tender, and stiff. In some cases there is swelling and redness. Bursitis involving the shoulder, elbow, hip, and knee are the most common.

Butt Kicks- Can you kick your butt? A form drill in which you try to hit your butt with your heels as you jog.

Cadence- Also referred to as revolutions per minute when pedaling a bicycle.

Caffeine- Where would you be without your coffee or tea? We know that caffeine helps you to mobilize free fatty acids for your endurance events. And recent research also demonstrates that caffeine improves motor unit recruitment in trained weight lifters to increase the amount of weight they can hoist. Caffeine is found in coffee, tea, cola and chocolate. Although caffeine seems harmless, it can be highly addictive. More than a few cups of caffeine-containing beverages per day can cause fertility problems, ulcers, raise blood pressure, cause tachyarrhythmia (an abnormally increased heart rhythm), increased cholesterol, and trigger panic attacks.

Calcium channel blocker- Also referred to as drugs that dilate your coronary arteries. They are used for reducing blood pressure in hypertensive patients.

Calisthenics –Also referred to as exercising without equipment. Usually the purpose is to increase strength, flexibility, and muscular endurance.

Caloric Expenditure- Also referred to as burning calories. You can increase your total caloric expenditure by lifting weights, doing aerobics, eating small, frequent meals, and increasing your total activity throughout the day.

Calorie– Calories are the enemy but they shouldn't be. All of your bodily functions require calories. Scientifically speaking, a calorie is amount of energy required to raise the temperature of 1 gram of water 1 degree Centigrade.

Calorie cost – Also referred to as the number of Calories burned to produce the energy for your workout.

Cancer- Maybe there'll be a cure someday. An abnormal growth or tumor in which cells multiply uncontrollably. Cancer can invade and spread to other parts of the body.

Capillary –Kind of like a mixing tube. Tiny blood vessels that take blood flow from your arteries, mixes nutrients between your blood and tissues, and returns blood back to your heart through your veins.

Carb Loading- Also referred to as a pizza party. Previously, athletes stopped eating carbohydrates 5 days before their event. They became grouchy and cantankerous. Then, in order to load their muscle glycogen stores, they ate all of the breads and pastas in sight. Recent studies suggest the carbohydrate depletion stage is unnecessary. Instead, athletes should taper their training and increase their carbohydrates as their event approaches. This loads glycogen stores without creating needless irritability.

Carbohydrate–Carbohydrates are not the enemy as some of the latest diet gurus have you believe. A carbohydrate contains carbon, hydrogen, and oxygen. It is an efficient source of energy for your cells. It yields 4.1 Calories per gram. Some of the latest fad diets claim that carbohydrates make you fat. Carbohydrates include God-given potatoes, rice, beans, peas, corn, fruits, and grains. Processed carbohydrates are more calorically dense. These include pasta, bagels, and cereals. Carbohydrates supply your muscles with energy to complete your workout.

Cardiac muscle –The “other” muscle besides smooth muscle and striated muscle.

Cardiac output – Cardiac means heart and output means the amount of work your heart is doing. So cardiac output is the volume of blood that is pumped by your heart in liters/minute. If you multiply your heart rate times your stroke volume you will get your cardiac output.

Cardio vs. Strength Training- Which Should You Do First? – At least you're doing both; who cares which one goes first. But if you do care, do your strength training first. This way, you can re-cycle that lactate from your weight-work to be used for energy during your cardio workout.

Cardio-Kickboxing- Also referred to as taekwondo without the copyright. An aerobic-anaerobic exercise program using punches, kicks, strikes, and blocks. Music is your motivation and an instructor teaches you your martial arts techniques practiced to the beat of music.

Cardiovascular – Also referred to as your heart and blood vessels.

Cardiovascular endurance – Also referred to as aerobic power. How efficient your body is in getting oxygenated and nutrient-rich blood to your working muscles, and "used" blood back to your heart. It is based on the efficiency of the "loop" where the blood goes from the heart to the lungs, gets rid of water and carbon dioxide, picks up oxygen, and returns to the heart for delivery to your muscles.

Carotid Arteries- Also referred to as blood vessels located on either sides of your neck. They supply blood to your brain.

Carpal Bones- Also referred to as bones in your wrist.

Cartilage Replacement- Healthy cartilage is taken from your knee. But don't despair. It's sent to Massachusetts where the cells are grown in a test tube. A month later, millions of cells are returned and injected back into your knee. 200 operations have been performed so far. The success rate has been 90%.

Catabolism – Also referred to as breaking down. The breaking down aspect of your muscle because of overtraining or the breakdown of carbohydrates into glycogen to be used for energy. Catabolism is the opposite of anabolism.

Cataract- Also referred to as a clouding of the lens of your eye.

Catheter- Also referred to as a hollow, flexible tube that is used to add or remove fluid from your body.

Celiac Disease- Causes frequent, unplanned trips to the restroom. Malabsorption of nutrients because of a sensitivity to gluten. Gluten is a protein found in wheat, rye, and barley. Symptoms include diarrhea, weight loss, and malnutrition.

Cellulite -- A made-up name for lumpy fat deposits. It is no different than regular fat. It gets its name because "cellulite" billows against irregular bands of connective tissue that makes it appear different.

Century-Also referred to as a hundred mile bicycle ride.

Cerebellum- Also referred to as the part of your brain that coordinates your movements.

Cerebral Cortex- Also referred to as the part of your brain that is involved in thought, language, and memory.

Cerebrovascular Accident (CVA)- Also referred to as stroke.

Chiropractor- A chiropractor that claims to be able to cure the common cold is a quack. A good chiropractor treats disease by manipulation of the spine and other body structures.

Cholesterol – Not as bad as you thought. This fatlike substance is suspected as a culprit in the narrowing of your arteries. It is manufactured by your body and is consumed when you eat animal fat. A blood level of cholesterol between 180 and 230 milligrams per 100 milliliters is usually considered normal. Higher levels are thought to increase your risk of artery blockage. But recent research suggests that the ratio of

HDL (good cholesterol) to LDL (bad cholesterol) is what really matters. If your HDL is high, better than a 4-1 ratio, you're doing fine.

Chronic –Also referred to as continuing (e.g. pain, sleeplessness...)

Chylomicron- Also referred to as an extremely-low-density lipoprotein. It transports triglycerides from your intestine to the fat cells in your body.

Chyme – That yucky part fluid, part solid mass of semi-digested food that is emptied from your stomach into duodenum.

Circuit training – A great way to kill two birds with one stone. A series of exercises, performed consecutively, with little rest between sets. Circuit training increase strength and can also make a contribution to your cardiovascular endurance. But if you want to maximize your strength AND cardiovascular system, train with weights one day and do your cardio on alternate days. Circuit training is a way to get 2 workouts for the price of 1. If you do not have time for both aerobics and weight training, combine them with circuit training. Move from one exercise machine to the next, performing ten repetitions on each. Do not rest between exercises. The good news is, you will be huffing and puffing and your muscles will be pumped, all within the same workout. The bad news is, it would be more beneficial to separate your aerobics and strength training workouts to receive maximum benefit from both.

Cold Therapy- The sooner you deal with swelling after an injury the better. Apply a cold compress directly to the injury immediately. Cold shrinks blood vessels, which reduces bleeding. This helps to prevent swelling. Cold also relieves pain and keeps your muscles from going into spasm.

Collagen – Also referred to as protein laden, tough connective tissue. Consider it the framework of your body. It holds your muscles and tendons in place and connects tendons to bone.

Collateral circulation – Also referred to as your back up for circulation. This is the web like series of blood vessels that surround your main circulatory arteries and veins. Sometimes these “extra” vessels actually substitute for your main blood transport system.

Colon- Also referred to as your large intestine. It extends from your ileum to your rectum. It is divided into your ascending, transverse, descending, and sigmoid colon.

Complete protein – Better for you than an incomplete protein. These are the proteins you eat that contain all of the essential amino acids in sufficient quantity and in the right ratio to maintain a positive nitrogen balance. Eggs are the most complete protein. As much as 96 percent of the protein in eggs will be used as protein. Whereas only about 60-70 percent of the protein in milk, meat or fish is assimilated by your body and used as protein.

Complex carbohydrates – Also referred to as polysaccharides. Complex carbohydrates are plant foods consisting of 3 or more simple sugars bound together. Oatmeal and grains are examples. These are considered “slow release” carbohydrates because there is a slow and even flow of energy from the digestive system to the bloodstream unlike the monosaccharides such as table sugar found in soft drinks. These are what you are supposed to eat as more than 50 percent of your diet. Complex carbohydrates are molecules composed of at least two simple carbohydrate molecules.

Compliance –Also referred to as adherence. Staying with an exercise program.

Compound Set- Also referred to as performing 2 or more exercises for the same muscle group.

Compression Fracture- Also referred to as when one of your bones collapses. It happens most often in your vertebra.

Computerized tomography (CT)- Kind of like x-ray glasses. Doctors use this tool to visualize what's

going on in your body. X-rays are taken from many different angles. These pictures are fed into a computer to generate cross-sectional images of your body.

Concentration – Not meditation. When you drink a fluid replacement product sometimes it may be too concentrated to allow for rapid absorption into your system. Therefore, concentration refers to the amount of a substance in a defined volume of liquid.

Concentric contraction – Also referred to as when your muscle shortens as it contracts. It is considered the “lifting up” phase.

Concussion- Receiving a blow to your head once in a contest is enough. The "second impact syndrome" happens when there are two consecutive impacts to your head without time for the first concussion to heal. The second impact can cause a coma or fatal brain swelling although the two individual hits seemed to be mild.

Conditioning – Also referred to as improving your fitness through physical training.

Cones- Also referred to as the cells in your retina. They are sensitive to color and light. Cones are most active during daylight. They provide you with sharp vision.

Conjunctiva- Also referred to as your mucous membrane that lines your eyelid.

Connective tissue –Also referred to as tendons, ligaments, joint capsules and fascia. There are fibrous tissue that binds and supports the structures of your body.

Constant Resistance – A good try but no cigar. The early Nautilus machines purported that their exercises allowed for constant resistance through a full range of motion.

Contraction – You can have a contraction whether you're male or female. The shortening of your muscle caused by cross-bridging and coming together of your actin and myosin filaments.

Contraindication – Also referred to as an exercise or move that is not considered safe or advisable.

Controllability- Also referred to as your ability to control the mental picture you have created in an attempt to improve your performance.

Cool down – Also referred to as the gradual reduction in the intensity of your exercise. The purpose of your cool down is to prevent soreness, and to allow your heart rate, hormones, blood pressure and all of your physiological processes to return to your pre-exercise condition. Your cool down also helps you to avoid blood pooling in your legs and may reduce muscular soreness.

Cornea- Also referred to as a curved, transparent tissue that is in the front part of your eye.

Coronary Arteries- Also referred to as the arteries that supply your heart with blood.

Coronary Artery Disease (CAD)- Also referred to as atherosclerosis of your coronary arteries. CAD is a narrowing or blockage of the arteries that supply blood to your heart muscle. Risk factors for CAD include cigarette smoking, elevated blood cholesterol, high blood pressure, and physical inactivity. Low levels of high-density lipoprotein cholesterol a.k.a. the "good cholesterol" also increases your risk.

Corpus Callosum- Also referred to as the large bundle of nerve fibers linking your left and right cerebral hemispheres in your brain.

Cramp – You've probably had one of these when you're trying to fall asleep. All of a sudden, without warning, your calf muscle knots up into a painful spasm. This is a cramp. Sometimes it's your body's way of preventing you from participating in an activity that your muscles aren't ready for. Other times it's a

signal that you have an electrolyte imbalance.

Creatine Monohydrate – Unbelievably, creatine monohydrate is the only muscle-building supplement in the last ten years that has been shown to improve muscle size, training intensity, and recovery. Creatine monohydrate, taken orally, passes through the gut wall into your bloodstream and enters your muscle cells where it's converted into creatine phosphate and transformed into ATP to increase your energy.

Creatine Phosphate (CP) – Also referred to as another form of creatine, the magic muscle builder. An organic compound found in your muscle fibers that break down to produce ATP to energize your workout and your life.

Creatine- A white powder that is very expensive. It is also the only supplement discovered in the last few years that has been shown to increase strength and size for bodybuilding athletes.

Cross bridges – Don't burn your cross-bridges. They are your actin filaments and myosin molecules that "grab" each other and create a cross-bridge to pull together or contract your muscle fibers.

Cross-sectional study – Also referred to as a study done at a single point in time. The opposite of a cross-sectional study would be a longitudinal study.

Cross-Training- This has nothing to do with cross-dressing. In cross-training, two or more types of exercise are performed in a single workout, or used alternately in successive workouts. A distance cyclist may run twice a week, perform daily stretching, and lift weights occasionally.

Crunches – An over-rated abdominal exercise. **YOU WON'T LOSE FAT DOING CRUNCHES** because there is no such thing as spot reducing. A tilt, curl, untilt, uncurl flexion and extension of your spine from a supine (on your back) position. This abdominal exercise isolates your abdominals and prevents your hip flexors (iliopsoas) from contracting.

Crunches vs. Walking- You cannot spot reduce fat from your abdominals. To remove body fat burn calories. The abdominal muscle group is relatively small, and the number of calories expended during crunches is minimal. Twenty minutes of walking will expend more calories than a couple of hundred crunches.

Cryotherapy- Also referred to as using cold or freezing temperatures to treat disease.

Crystalline Lens- Also referred to as the transparent body directly behind your iris. It focuses light onto your retina.

Cuticles- These are not cute icicles. Cuticles serve as barriers to protect your fingernails from infection. Many people trim their cuticle away from the curve of their nail. Be careful. This practice can lead to bleeding and swelling.

Cutting up –Also referred to as getting defined. Muscular definition is promoted by reducing fat between your skin and your muscle.

Dandruff- Check out your shoulders. You either have it or you don't. Dandruff is sometimes associated with oily hair. A cause may be a yeast infection of your scalp. Hormonal and seasonal changes can also make dandruff worse. And sometimes dandruff may be the result of a dry scalp.

Deadlift—This lift is as difficult as it sounds. A one-repetition maximum powerlifting move where the barbell is lifted from the floor and the lifter stands erect holding the weight comfortably in his hands.

Definition In your Muscle- Definition is not about high repetition low weight workouts. Most people think the way to lose the fat between your skin and muscle is to lift light weights and perform lots of repetitions. But muscular definition is a function of your eating, aerobics, and full body resistance training program.

You may do 100's of repetitions of crunches, but if a layer of fat surrounds your abdominals (abs), you will never see your "six pack."

Degenerative spondylolisthesis- If you live long enough, you'll probably get this. This is where your facet joints gradually erode from wear and tear.

Dehydration – Also referred to as excessive body water loss. Prevent dehydration by taking in water and electrolytes. Be sure you are getting enough potassium which is inside your muscle fibers, and calcium which, is outside.

Deltoids- Also referred to as shoulder. These muscles include your anterior deltoid, medial deltoid, and posterior deltoid. These are large triangular shaped muscles of your shoulders which raise your arms up and away from your body (abduction.)

Dermabrasion- I'm going to run right out today to get a tattoo so I can get a dermabrasion tomorrow. Using sandpaper or wire brushes to surgically remove skin blemishes or tattoos.

Dermatitis- Also referred to as a superficial inflammation of your skin. Contact dermatitis may be relieved by discontinuing use of industrial solvents, dyes, nickel, and other metals, and leather tanning chemicals.

Determining Percent Body Fat- For humor, just look into a mirror or jump up and down and see what jiggles. To be serious, under water weighing, electrical impedance, and calipers are three of the most reliable methods used to determine percent body fat.

Detraining – Use it or lose it. Losing the benefits of your training by not exercising.

Diabetes Mellitus- Also referred to as Type II Diabetes. This is considered adult onset. It is a disorder in which your blood glucose levels are elevated. The reason your blood sugar is high, is that insulin has a hard time dragging the sugar from your blood into your cells. It is usually non-insulin dependent.

Diaphragm- Also referred to as the flat layer of muscle that separates your chest from your abdomen. Your diaphragm helps you to breath. Breathing from your diaphragm helps you to relax.

Diastole -Also referred to as the relaxation phase of your heart during your blood pressure reading. Consider diastole the rest period between contractions of your heart. It is the bottom number of your blood pressure ratio (e.g. 120/80).

Diet – Your diet is whatever YOU eat. It may or may not be a good one.

Digestive Tract- This is all of the organs that your food sees when it travels from your mouth to your anus.

Digital Rectal Examination (DRE)- This is the dreaded gloved finger into the rectum test. Your doctor is checking out the size and texture of your prostate to decide if there are abnormalities.

Dihydrotestosterone (DHT)- Also referred to as a biologically active form of testosterone. The bad news is that it stimulates prostate growth.

Discectomy- Also referred to as the surgical removal of all or part of one of your intervertebral disks.

Diskitis- "Itis" means inflammation, so disk-itis refers to inflammation of your intervertebral disk.

Dissociation- Also referred to as daydreaming. Keeping your mind on something else, rather than thinking about the activity you are doing.

Diverticula- This is not dinner conversation unless you are an older adult. These are finger-shaped pouches in your colon that sometimes develop as you age.

Dopamine- Also referred to as a neurotransmitter that helps you to move comfortably and smoothly.

Double split training – A bodybuilders dream. Working out twice a day so you can workout harder but more intensely.

Draft- Also referred to as sucking a wheel. If you are pedaling behind another cyclist, he/she breaks the wind for you allowing you to do about 30% less work.

Dry Hydrotherapy Flotation- Also referred to as a great massage. Dry Hydrotherapy flotation delivers power jets of heat to you while you are lying on a mattress. The water jets are designed to apply pressure to trigger points on muscles on your back, supposedly reducing pain, stimulating your nervous system, and reducing muscle spasms.

Dumbbell – Not your spouse. Hand weights generally used by professional bodybuilders as their preferred resistance device.

Duodenitis- Also referred to as inflammation of your duodenum.

Duodenum- This is where it all begins. The first section of your small intestine. It goes from your stomach to your jejunum.

Duration – Also referred to as the length of time you spend exercising.

Dynamic Stretching- Helps you kick as high as Chuck Norris. Dynamic stretching uses your own muscle power to stretch your limbs through a range of motion.

Dyskinesia- Also referred to as a malady that refers to excessive and uncontrollable movements.

Dyspepsia- Also referred to as indigestion. It is characterized by upper abdominal pain following meals. Dyspepsia may be accompanied by bloating, nausea, vomiting, a sense of fullness, and general discomfort.

Dysphagia- Also referred to as having difficulty swallowing.

Dyspnea – Also referred to as huffing and puffing. A measure of exertion accompanied by labored breathing.

Eat After Exercise- Want to feel better after your workout? The carbohydrate window of opportunity is a 15-minute period after a workout when your muscles are most receptive to take in recovery nutrients. Simple carbohydrates will do. Exercise provides a greater volume of blood to your muscles. Your blood carries carbohydrates that were absorbed from the stomach. This causes maximum nutrient reabsorption into your muscles providing a more rapid recovery from exercise.

Eccentric action – This is the part that hurts. A muscle that is lengthening as it's contracting. This is sometimes termed the "negative" phase. This eccentric action has been shown to cause more muscle soreness than the concentric contraction.

Echocardiography- A cool device doctors use to see your heart pumping on a video screen. Doctors use echocardiography to provide them with a visualization of the heart. It uses ultrasound.

Ectomorph- What most women wish they were. There are three distinct body types, and a variety of in-betweens. Ectomorphs are thin and small boned. They have a hard time putting on weight. Kate Moss is an example of an ectomorph.

Ejection fraction – Kind of like when you step on a water balloon. The amount of blood inside your heart's

left ventricle that is pushed into your body after your heart contracts. Your workouts can increase your ejection fraction.

Electrocardiogram (ECG)- When you watch them do an ECG on you, you pray for wavy lines instead of a flat line. These are those wavy lines you see on the E.R. crash cart. ECG's record electrical activity within your heart. A paper trail identifying the electrical activity of your heart muscle. Electrical activity is detected by electrodes on your body surface and recorded by an ECG.

Electrolytes –Also referred to as minerals including sodium, potassium, chloride, calcium and magnesium. These provide conductivity for fluid that passes through your cellular membranes.

Electromyography (EMG)- Also referred to as measuring the electrical activity in your muscles.

Elliptical Machines- One of the hottest items in gyms until the next equipment fad is born. You burn one and one half more calories moving backwards on an elliptical machine than forwards because you must use your stabilizer muscles in a different motor unit pattern.

Embolism- Also referred to as a blood clot, or clump of material called an embolus blocks arterial blood flow and causes an embolism.

Encephalitis- Also referred to as inflammation of your brain.

Endocrine -- Also referred to as a secretion that flows directly into your bloodstream.

Endocrine glands –Also referred to as your thyroid, pancreas, parathyroid, pituitary, adrenal, testes, and ovaries. These organs secrete hormones into your blood or lymph systems to regulate or influence chemical changes in your body.

Endomorph- What every man and women doesn't want to be. Endomorphs are big-boned, pear-shaped, and always seem to be on a diet. Roseanne Barr is an endomorph. Most of us are on a continuum between body types. There are ecto-mesomorphs, ecto-endomorphs, and meso-endomorphs.

Endorphins- Also referred to as the "runners high". Endorphins are a natural morphine-like substances produced in your body in response to pain, exercise, or the pain of exercise.

Endoscopy- You gotta try this. A doctor inserts a flexible tube down your throat to see your upper gastrointestinal tract.

Endurance – Also referred to as stick-to-it-tive-ness. The ability to continue a workout or movement over a period of time.

Energy – You always want more energy. Your ability to do work.

Energy Bars- Too bad they're not free. Energy bars are tasty and convenient. But four researchers recently found that a bagel gives the same exercise performance benefits as an energy bar.

Enteric Nervous System (ENS)- Also referred to as a complex network of nerves in your stomach wall that communicates with your brain.

Enzymes – Not some magic bullet supplement. Enzymes act as catalysts to induce chemical changes in other substances without being changed themselves. Enzymes act only on specific substances called substrates. They are present in your digestive fluids and in many of your tissues.

Epidemiological studies – A fancy word for studies that determine the relationships between what causes the frequency and distribution of disease.

Epinephrine- Also referred to as adrenalin. A chemical that can act as a neurotransmitter or a hormone. It constricts your blood vessels and increases your heart rate.

Epiphyseal plates – It's a myth that weight training causes premature closure of epiphyseal plates. Your epiphyseal plates are sites at the ends of your bones separated from the main part of the bone by cartilage.

Epiphyses – Also referred to as the ends of your long bones. These areas are wider than the shaft of the bone.

Epithelium- Also referred to as the outer layer of cells that line your stomach or skin.

Erector spinae- Also referred to as a long muscle group that extends down your back. These muscles attach from your pelvis, to the bony processes of your vertebrae, and to your rib cage, and upper parts of your spine: iliocostalis, spinalis, longissimus.

Ergometer – Also referred to as a device that consistently and reliably measures the amount of work you're doing. Stationary bikes were the first devices equipped with ergometers, but now, a wide variety of training machines have that capacity.

Esophagitis- Also referred to as inflammation of your esophagus.

Esophagus- Also referred to as gullet. It is a tubular passageway from your pharynx to your stomach.

Essential amino acids –Also referred to as the amino acids that your body cannot make for itself. They are-

Estrogen- Also referred to as a female sex hormone. But men have it too, at very low levels.

Estrogen-replacement therapy (ERT)- As some women age, they decide to replace their declining hormones using ERT. They take estrogen to help prevent osteoporosis.

Exercise – Also referred to as physical exertion.

Exercise prescription – Also referred to as a recommendation for frequency, intensity, and duration of exercise to meet your need or goal.

Exercise stress test- Not a walk in the park. A test used to determine your heart's response to exercise. It is usually administered in a hospital setting. While you are walking on a treadmill, an electrocardiogram (a bunch of wavy lines) measures how your heart handles the stress of exercise. Borg scales, charts which describe a range of intensity from resting to maximal energy outputs, are used as a visual aid to exercisers in keeping their efforts in the effective training zone.

Exercise- What you should do a little of every day. Regular vigorous exercise increases your need for calories and nutrients. Exercise improves your elimination and metabolism, which means you need to eat regularly. Physical exercise is also a stressor that may increase free-radical formation.

Exertional headaches – What your wife says to you before an anticipated workout. Headache pain caused by exercise.

Exhaustion – We've all been there. Your muscles simply cannot continue to contract efficiently. Even though your muscle glycogen stores are adequate, your muscles are simply not prepared for the arduous demands of your activity

Expiration – Also referred to as to breathe out -exhale.

Extension – Also referred to as moving two ends of your bones away from your joint. For example your

triceps extends your elbow.

Extensor – Also referred to as a muscle that extends a joint. For example your triceps extend your elbow.

Extensor, Flexor Muscles- Also referred to as forearm muscles.

External Obliques- Your external obliques are your visible (if there is not a layer of fat covering them) "hands in your front pocket muscles." These muscles help you pull and twist, or reach across your body as you lean forward.

Faceplant- Also referred to as crash, biff, endo.

Facet Joints- Don't hurt these. These are the tops and bottoms of your vertebra joints. The facets are located on the back side of each vertebra. They connect to the one above it, and the one below it.

Faint –Also referred to as syncope.

Fartlek-Also referred to as speed play. A type of interval training where you can move fast or slow depending on how you feel.

Fascia – Also referred to as connective tissue that surrounds your muscles and various organs of your body.

Fast Twitch Muscle- Also referred to as Type II muscle fibers are white and powerful. They contract more quickly and forcefully than slow twitch, Type I, red fibers.

Fast Twitch/Slow Twitch Fibers- What matters most is the load, not the speed of movement. Try this- Lift up a 200-pound weight. You wouldn't be able to lift it very fast (unless you are Hulk Hogan), but you would still be using fast twitch muscle fibers.

Fast-twitch fibers –Also referred to as white, glycolytic fibers that contract quickly and are valuable for high intensity, short duration exercise.

Fat – You know what fat is. A yellowish tissue made up of glycerol and various fatty acids which stores energy and provides. Contrary to popular opinion, we need to eat fat to survive. But this doesn't mean you should try to get a lot of fat in your diet. Most of us eat more than we need. The medical term for fat is triglycerides which contain 9.1 calories per gram.

Fat Cells- You developed your fat cells during the 3rd trimester in your mother's womb (so blame it on your mom), your first year of life (that's her fault again), and during puberty. It is also theorized you can add fat cells during pregnancy, and during explosive weight gain in adulthood.

Fat Loss- You cannot "lose" fat cells, unless you undergo liposuction. But you may decrease the fat within each cell.

Fat-free weight – Also referred to as lean body mass.

Fatigue –You've been there. But extreme fatigue is referred to as the slang term "bonk" discussed above. Fatigue is the point where your body's glucose stores are depleted and your energy must come from fat metabolism.

Fat-Soluble Vitamins – Also referred to as vitamins A, D, E, and K.

Fatty acids- Also referred to as the primary building blocks of fats (lipids).

Feed Zone- Not your dinner time. A place on a running or bike racecourse where you are handed food and drink.

Field- Also referred to as a group of runners or cyclists in a race.

Female Athletic Triad- Difficult to diagnose. Female athletic triad is a newly recognized link between eating disorders, amenorrhea (lack of menstruation), and osteoporosis. The combination of disordered eating and amenorrhea cause weakness in bones leading to osteoporosis.

Festinating gait- You may have noticed your grandfather shuffling with small steps while hunched forward. It is as though he was chasing his center of gravity.

Fiber Type- Your parents are responsible for your fiber type. You will never be as fast as Donovan Bailey if you were not blessed with a preponderance of white, fast twitch fibers.

Fiber- Also referred to as roughage. Fiber is found in plant foods as an indigestible form of carbohydrate. Fiber provides plants with their “upright” structure. Soluble fibers dissolve in water. Insoluble fibers do not. Most plants contain both types.

Fibrous Plaque- You don't want this either. An advanced form of atherosclerotic plaque. It forms in response to an injury on the inside lining of your blood vessel.

Finasteride- Male pattern baldness? Try finasteride. It was first designed as a drug to treat benign prostate hyperplasia (BPH).

Fine Motor Task-Also referred to as a small muscle movement such as putting in golf.

Fitness – Also referred to as your ability to move effectively and efficiently depending on your lifestyle.

Flexibility –Also referred to as your range of motion around a joint.

Flexion-Also referred to as moving two ends of your bones closer to each other. An example would be creating elbow flexion by bending your arm at your elbow.

Flip Turn- I was never good at this. An efficient way to turn when you reach the wall in a swimming race involving a summersault in the water.

Floater- You may have seen these flit across the horizon. They are clusters of protein or cells that drift through the vitreous humor in your eye and appear as black specks across your visual field. If you see these regularly, call your ophthalmologist. Seeing floaters may be an early warning sign of retinal problems.

Flow- Where you want to be. A mindful experience where there is no ego, competition, anxiety, or boredom. An alpha state that allows you to perform your activity on automatic.

Fluid deficit – Also referred to as dehydration. This usually happens to you after you exercise. It is the difference between your body's ideal water content and real water content.

Fluoride- Helps to build strong bones and teeth. It may be found in your tap water. Fluoride is a compound that can increase bone density, and is a possible treatment for osteoporosis.

Foot Pain- When your feet hurt, everything hurts. When you walk, you are slamming about one-time your body weight on each foot fall. In running, it's two-and-a-half to three times your body weight pounding through your feet, knees and back. Ignoring pain can lead to irreversible damage to your back, feet, or knees.

Free Fragment- A free fragment is not something you want, even if it is free. A free fragment is a displaced portion of your intervertebral disk. It detaches from the central portion of the disk.

Free Radicals- Antioxidants combat free radicals. But you knew that. Free radicals are molecules in your body that have two electrons in their outer shell. A molecule with one electron in its outer shell is called a free radical. It is searching for a free electron. While it is trying to bind with another electron to complete itself, it can damage your organs and tissue. Free radicals occur when oxygen in the bloodstream combines with polluted air, cigarette smoke, food additives, and re-heated cooking oil. Free radical production and damage is increased by exercise - especially running and other aerobics because there is more oxygen in your bloodstream.

Free Weights- These weights are not free of charge. Free weights allow you to follow the natural line of pull of your muscles. Free weights also require you to use stabilizer muscles to balance the weight. Free weights also let you pre-stretch your muscles to their optimum 1.2 times their resting length just before you make your lift. These are some of the reasons that professional bodybuilders seem to prefer free weights over machines.

Frequency- Also referred to as how many times a week you work out.

Frontal Lobe- Remember all those movies that threatened a “frontal lobotomy?” Actually, your frontal lobe is one of four major subdivisions of the two hemispheres of your brain. It is important for helping you control your movement.

Fructose- Some folks think because fructose is fat free it is calorie free. It is not. Fructose is a simple sugar found in corn syrup, honey and many fruits.

Fungus Infections- Easy to find on the floor of your friendly, neighborhood locker room. Fungal infections of the skin are common in all age groups. They are caused by microscopic fungal organisms which normally live on your skin surface without causing symptoms. However when conditions are ripe - moisture, warmth, irritation, or minor skin injury, they start to grow more rapidly. Endocrine disorders and immune system diseases are also responsible for fungal infections in some individuals.

Gall Bladder Disease- Gall bladder disease is characterized by severe pain that becomes localized in the upper right quadrant of your abdomen, radiating to your right lower scapula (shoulder blade). Nausea and vomiting are common. Diet is important, as any fats consumed will precipitate the pain.

Gastritis- Also referred to as inflammation of the stomach.

Gastrocnemius- Also referred to as calf muscle. The long, sleek muscle on your lower leg.

Gastroesophageal Reflux Disease (GERD)- Also referred to as heartburn, GERD is a condition in which food and acid flow back into your esophagus from your stomach. The acid may damage your esophagus.

Gastrointestinal (GI) Tract- Also referred to as digestive tract.

Glaucoma- Your grandmother had this. A disease of the eye. It is characterized by increased intraocular pressure.

Glomeruli- Say glomeruli fast. These are the tiny structures within your kidneys that filter waste products from your blood.

Gluconeogenesis – Eat your carbohydrates! When you don't eat enough carbohydrates your body must take energy from your muscle and fat stores to survive. The energy is converted from protein or fat to carbohydrate to energize your muscles. Although this is inefficient, it is a survival mechanism. So the old cliché, “fat burns in a carbohydrate flame” is a truism.

Glucose- Also referred to as sugar. Your body's main source of energy. Glucose comes mainly from the digestion of carbohydrates. Glucose is a single sugar molecule (monosaccharide).

Glucose Intolerance- Also referred to as having trouble getting sugar from your bloodstream into your cells.

Gluteal Muscles- Also referred to as butt. This is the largest muscle group in your body.

Gluteals --Also referred to as gluteus maximus, medius and minimus or buttocks. These are your hip extensors.

Glutes- Also referred to as gluteus maximus or butt muscle.

Glycemic index – Way too much fuss over. The different speed with which carbohydrates are processed into glucose by your body. Complex carbohydrates are broken down slower while simple, refined sugars are absorbed quickly.

Glycerol – Also referred to as an extremely sweet syrupy, clear substance that helps your body retain water.

Glycogen - Also referred to as sugar in your muscle. Your muscles preferred energy source. A storage form of carbohydrate in your liver and muscle. Don't run out of this or you'll feel lethargic and "bonk". Glycogen is converted to glucose to be used by your muscles for energy.

Glycogen Window-Not a real window. If you want to replenish your glycogen stores after your workout, it is best to consume a 4-1 ratio of carbohydrates to protein as soon after the workout as possible. This time period is termed your glycogen window of opportunity.

Glycolysis – Glyco means sugar and lysis means split. Splitting a molecule of glucose forms either pyruvic acid or lactate and produces ATP molecules during high intensity short duration anaerobic metabolism.

Golf- Injury Prevention and Health- Lift your clubs out of your car with your legs not your back. Arrive at the course 10 minutes early and do some stretching exercises for your back, shoulders, and legs. Walk the course instead of riding. Begin your practice sessions with a nine iron and work your way to a five iron. On cool days, wear layers of clothes. If you feel pain during your swing, stop immediately. Check with a golf pro and physical therapist for strengthening and stretching exercises to improve the mechanics of your swing.

Golf-Strength Training- A few old-fogy golfers believe the myth that muscle-strengthening exercises such as weight training can hurt their golf game. Golf is a sport. And sportsmen train with weights. Check out pro golfers. They understand that a stronger and more flexible body will help keep their fitness levels up and their scores down.

Golgi Tendon Organ- If you can over ride your golgi tendon organ, you can lift a car. When you stretch a muscle, you can activate your golgi tendon organ. Your golgi tendon organ relaxes the muscle so that it will not become injured. For example if you are trying to lift a weight off of the floor and it is too heavy for your muscles to support, your golgi tendon organ will cause your muscles to relax and you will drop the weight.

Gout- A painful arthritic feeling that you don't want. An attack of acute gouty arthritis is caused by the formation of needlelike, crystals of uric acid. Uric acid is a metabolite of your urine. When extreme, large deposits of uric acid surrounds joints, gout occurs acutely as intermittent attacks of joint pain. There is swelling, redness and warmth. In some individuals, it is a progressive, crippling, chronic disease that also damages the kidneys.

Graded exercise test (GXT) – Write your will first. A treadmill, or stationary cycling test that measures heart rate, ECG, blood pressure and respiration. Workload is gradually enhanced by increasing the grade, resistance or speed. When oxygen consumption does not increase, this indicates that the subject has

reached his/her maximum oxygen uptake. Medical supervision is required for this test.

Grains- Also referred to as the seeds or fruits of cereal grasses. The unprocessed kernels are several layers surrounding a core. An outer, inedible layer called the hull, protects the entire seed. A layer of bran, made up of indigestible fiber and containing iron, thiamin, niacin, riboflavin, and some protein is inside the hull. The germ is surrounded by the endosperm, a layer of starch inside a protein matrix. In the core is the germ, which contains unsaturated fat, protein, iron, niacin, thiamin, and riboflavin.

Gross Motor Task- Also referred to as a large muscle movement such as pushing a refrigerator.

Gullet- Also referred to as esophagus.

Half-Bench Squats- If you use a bench to rest for half squats, don't. Your stabilizer muscles in your spine relax forcing you to lose stability.

Hammer- To ride or run as hard as you can.

Hamstring- These are the large muscles in the back of your upper leg. They got their name because pigs (hams) would be hung by the back of their legs.

HDL Cholesterol- The good cholesterol. There are two types of cholesterol, actually three. High density lipoproteins (HDL) - the good cholesterol, Low Density Lipoproteins (LDL) - the bad cholesterol, and Very Low Density Lipoproteins (VLDL) - also bad guys.

Heart Failure- Say bye-bye. This is where your heart loses its ability to efficiently pump blood throughout body.

Heart rate reserve – Also referred to as the difference between your resting heart rate and your maximal heart rate.

Heart Rate Training- Also referred to as monitoring your heart rate while you perform anaerobic and aerobic training to reach certain heart rate levels.

Heart Rate- Also referred to as the number of times your heart beats during each minute.

Heartburn- Digestive juices usually follow gravity; they go down, not up. But if digestive juices go up, there is a problem. It's called heartburn. Your throat feels on fire and there may be pressure under your ribs. It's not very pleasant, but it is common.

Heart-rate Monitor- The latest techno-fad. An electronic device that utilizes a chest strap and a watch-like monitor that records your heart rate.

Heat cramps – Sweating is good, but not too much. Heat cramps are caused by profuse sweating usually following heavy exercise. Your legs, arms, and abdominal muscles are most affected.

Heat stroke – Slow down! Heat stroke is a life threatening illness when your body's temperature-regulating mechanisms fail. Your body temperature may rise to over 104 degrees F, and your skin appears red, dry, and warm to the touch.

Heat syncope – Also referred to as fainting from intolerable heat.

Helicobacter Pylori (H. Pylori)- You thought ulcers were caused by stress. H. Pylori is a spiral bacterium found at the surface of the stomach epithelium has recently been shown to be a major cause of gastritis and peptic ulcer disease.

Hematuria- Also referred to as blood in your urine that may be associated with a wide range of conditions.

The bleeding will occur at a site of physical trauma, such as a stone cutting the tissue or bleeding from an infection. Your urine becomes red or brown in color. If the amount of blood is small it might not be noticed, but it can be detected by a number of simple tests.

Hemorrhagic Stroke- Also referred to as a stroke that occurs when a blood vessel ruptures. This cuts off the supply of oxygen and nutrition to parts of your brain. High blood pressure is the main cause of such strokes.

Hemorrhoids- Preparation H anyone? Hemorrhoids are cushions of tissue that line your lower rectum. They serve to produce complete closure of your anal canal. Symptoms of hemorrhoids are bleeding, protrusion and pain.

Heparin- Also referred to as an anticoagulant drug that inhibits blood from clotting. It interferes with coagulation factors. Heparin is usually administered in the hospital either by an injection or an intravenous line.

Herniated disk- Very painful. A herniated disk is a displacement of some portion of one of your spinal disks out of its normal location.

Hiatal Hernia- Also referred to as when part of your stomach protrudes into your chest through an opening in your diaphragm.

High Knees- Also referred to as a running drill to teach you to raise your knees waist high or higher.

High-Density-Lipoprotein (HDL)- Also referred to as good cholesterol. HDL is a lipoprotein that protects the arteries by transporting cholesterol from body cells to the liver for elimination.

Hippocampus- Also referred to as a part of your brain's limbic system that is involved in learning, memory, and emotion.

Histamine- Also referred to as a chemical present in specific cells throughout your body. It is a mediator of allergic reactions.

Hitting the wall – Also referred to as “bonk” where your liver and muscle glycogen have been depleted. Consuming carbohydrates can prevent hitting the wall, but don't wait too long or it will be too late and when it's too late, you'll be sorry.

Halter Monitor- Also referred to as a portable device that you wear continuously to measure electrical activity of your heart.

Home Workout Machines- A machine can be well-made but still feel funny. Try the machine in the store. How does your lower back, joints, and muscles feel? Your seat should be comfortable during long exercise sessions. Bars or pull-handles should be padded and feel okay even after several minutes. How hard are the control knobs to adjust? Is the machine too noisy for your home?

Homeostasis – Also referred to as the tendency of your body to maintain balance.

Hormone therapy- Under a doctors supervision please. Using drugs to keep male hormones such as testosterone from stimulating the growth of prostate cancer cells.

Hormone-Replacement Therapy (HRT)- A hot topic. No pun intended. HRT augments a woman's depleted hormones after she reaches menopause. HRT is a combination of estrogen and progesterone. The purpose of HRT is to reduce osteoporosis risk.

Hormones- Also referred to as chemicals released from glands into your bloodstream. They affect organs or tissues elsewhere in your body.

Horsepower – Also referred to as a work rate measure equal to 746 watts, or about 550 foot-pounds per second.

Humerus- Also referred to as your upper arm bone.

Hydrogen Breath Test- Also referred to as a diagnostic test for carbohydrate malabsorption. The test measures the amount of hydrogen in your exhaled breath.

Hydrogenation- Not good for you. Check the ingredients on the wrapper of your candy bar for the word “hydrogenated.” Hydrogenation means the addition of hydrogen to a substance. It makes unsaturated oils and soft fats hard.

Hyperglycemia – Also referred to as abnormally high blood sugar, generally referred to as diabetes. Values are generally greater than 140 milliliters per deciliter.

Hyperlipidemia- Also referred to as a measure of high levels of blood fats (lipids).

Hyperplasia – This happens in animals! A theory that suggests muscle fibers actually split to form more fibers to increase muscle strength.

Hypertension- Also referred to as high blood pressure. High blood pressure is a major risk factor for stroke. Hypertension causes excess stress on the walls of your blood vessels and damages their delicate inner lining.

Hyperthermia – Also referred to as high body temperature.

Hyperthyroidism- Not a great way to lose weight. Overactivity of your thyroid gland is called hyperthyroidism.

Hypertrophy -- Usually referring to an increase in muscle. An increase in size of a body part or organ, water, fat, satellite cells, etc. in response to highly specific forms of stress.

Hypervitaminosis – Also referred to as a vitamin toxicity caused by an excess of fat-soluble vitamin consumption.

Hypoglycemia – Also referred to as low blood sugar.

Hypothermia – Also referred to as low body temperature.

Hypothyroidism- When you gain weight, you immediately think you have a hypothyroid. Hypothyroidism is an under activity of your thyroid. It results in too little production of thyroid hormone. Although hypothyroidism may be caused by a variety of diseases that affect the hypothalamus and pituitary gland, this condition is usually due to disorders of the thyroid gland itself.

Hypoxia – Also referred to as insufficient oxygen flow to your tissues.

Ice-Heat Therapy-You can't go wrong with ice. Ice is your first line of defense against injury. Heat is the second component. Heat will soften your tightened muscle and cause blood to flush the area. This enhances oxygen and nutrient delivery to your deprived and tightened muscle.

Idiopathic- Think of the word “idiot” on this one. Doctors often say it is idiopathic which means without a known cause.

Ileum- Probably insignificant to you unless it hurts. This is the section of your small intestine between your jejunum and the beginning of your large intestine.

Iliac crest – Wider in some people than others. The upper, wide portion of your hip bone.

Iliopsoas muscles- Also referred to as hip flexor. These two muscles are located on each side of your lumbar vertebrae and are attached to them. They are on the inside of your pelvis and are connected to your thigh bones. They help you to lift your knee.

IM- Also referred to as individual medley. Four strokes done in a swimming race which include the butterfly, backstroke, breaststroke, and freestyle in that order.

Interval Training- A great workout. A workout program separated into periods of high intensity activity followed by low intensity active recovery drills.

Ironman- Maybe NEXT year. A grueling triathlon consisting of a 2.4-mile swim, 112-mile bike and 26.2-mile run.

Imagery- Also referred to as formal daydreaming. A psychological strategy designed to help you improve your physical performance.

Inertia – Never lose your inertia. The tendency of an object to remain in motion.

Infarction- Say no to this one. The death of cells due to lack of blood. Infarction is usually preceded by lack of oxygen (ischemia).

Inflammation- This is the “it is” we refer to. Inflammation is a process that occurs in response to a range of traumas from sunburn and wounds, to infection and auto-immune conditions. Whatever the cause, the process leads to warmth, redness, swelling, and pain.

Inflammatory Bowel Disease- Sounds distressing. Ulcerative colitis and Crohn's disease are forms of inflammatory bowel disease. They bring along inflammation and sores in the large intestine. Symptoms include diarrhea, bloody stools, cramps and abdominal pain.

Insertion – Also referred to as the attachment of your muscle to the bone furthest from your core.

Insomnia- Also referred to as sleeplessness that may be caused by a variety of triggers. The key to successful treatment of insomnia is to find the cause and deal with it. Whether the cause is emotional, physical, or environmental (a snoring spouse), seek out the cause of your insomnia to uncover the cure.

Instructor Motivation- “Give me 10!” A group exercise leader can increase your motivation to burn an additional 2 calories per minute.

Insulin- Also referred to as a hormone produced by your pancreas. Insulin helps blood glucose (sugar) get into your cells.

Insulin-Dependent Diabetes- Also referred to as Type I or Juvenile onset diabetes. It usually appears before age 35. People with diabetes need insulin injections because their bodies have stopped producing it.

Intensity – Also referred to as your rate of performing work or how hard you work out.

Internal Obliques- Also referred to as part of your abdominals. Your internal obliques are beneath your external obliques. They form the shape of a rooftop. Your right internal oblique turns you to the right. And your left internal oblique turns you to the left.

Intervals – Intervals burn fat. Some people believe to burn fat you should exercise at a slow, steady intensity. Don't believe them. Interval training, which is a combination of increased intensity exercise alternating with periods of recovery, allows you to work harder, burn more total calories, and more fat.

And since most sport are start-stop, interval training is perfect for performance enhancement.

Intervertebral disk- Also referred to as the shock absorbers of your spine. They are small, energy-absorbing, sponge-like cushions located between the vertebrae of your spine.

Iris- Your pretty eye color. Your iris shows whether you have brown, green, or blue eyes. It is the colored ring in front of your lens that controls the size of the pupil and how much light enters gets in.

Irritable Bowel Syndrome- Make way for the restroom. There are a variety symptoms that can occur in this condition. They may include abdominal distress, erratic frequency of bowel movements, bloating, flatulence, and variability in stool consistency.

Ischemia – Also referred to as inadequate blood flow to a part of your body usually caused by a constriction of your blood vessels.

Isokinetic contraction – Also referred to as a muscle contraction against a resistance that moves at a constant speed.

Isokinetic exercise – You can't fool this machine. These are exercise machines that utilize the principle of "the harder you push, the greater the resistance. Keiser and Cybex are examples of isokinetic machines.

Isokinetic- Not quite perfect but close. A cybex type of weight machine that uses a constant resistance as it takes your muscle through a full range of motion. These machines may be used for training, rehabilitation, and testing.

Isometric Contraction – Also referred to as static contraction. A muscle that contracts without movement.

Isometric- Also referred to as pushing against an immovable object. Your muscles contract but there is no movement.

Isotonic Contraction – Also referred to as dynamic contraction. The resistance remains the same but the tension varies with the difference in joint angle.

Isotonic- Also referred to as free weight training. Hoisting weights where the resistance remains the same, but gravity makes the exercises easier or more difficult through different ranges of motion. It is measured in Calories (kcal) per minute. Weight training (not talking between sets) burns about 8 calories per minute. Group indoor cycling burns about 11 calories per minute.

Jejunum- Also referred to as the section of your small intestine between your duodenum and ileum.

Jerk – An Olympic lift where you drive the weight from your shoulders overhead into a locked position.

Joints – Also referred to as where two of your bones are jointed together.

Kickboard-Fun for the kids. A Styrofoam type of hand held float board used in the water to practice your kick stroke for swimming.

Kid's Weight Training- Hallelujah, weight training doesn't hurt kids. Running and jumping has the same effect on bones as weight training and neither seem to cause premature closure of epiphyseal bone plates.

Kilogram (kg) -- Also referred to as 4623 pounds; 1,000 grams (g).

Kinesiology – Also referred to as the study of human movement.

Kyphosis- The hunchback look. This is commonly called dowager's hump and refers to an abnormal front-to-back curvature of your mid-to-upper spine. It can be the result of compression fractures of your vertebrae.

Lachrymal Gland- Don't cry but this is the gland that produces tears. It is located in the upper, outer section of your eye's orbit.

Lactase- Also referred to as an enzyme in your intestine that breaks down lactose.

Lactate Threshold-Also referred to as anaerobic threshold or OBLA (onset of blood lactate). This is where lactate cannot be eliminated as fast as it is being produced causing hydrogen ions to cause your muscles to burn while you are huffing and puffing.

Leg Turnover- To run faster, increase your leg turnover. How fast your feet pick up and set down while you are running.

Marathon-Also referred to as a 26.2-mile race.

Lactate –Not the bad guy. Lactate is one of the by-products of your muscle metabolism. It is that burning sensation you feel when you exercise hard. If you get too much lactate in your muscles, your muscles decide to slow down, and eventually quit working. That is why during interval training it is a good idea to perform an active recovery so that all of that lactate is converted into glycogen to prepare you for your next bout of exercise.

Lactose Intolerance- You don't want to know the symptoms. The inability of your body to absorb lactose. Drinking milk products causes gastrointestinal distress.

Lactose- Also referred to as a sugar found in milk and dairy products.

Lamina- Also referred to as one of the two thin, plate like parts of each of your vertebra. They join in the midline and form the base of the spinous process of that vertebra.

Laminectomy- There goes your lamina. An operation in which all of, or a portion of one or both laminae is removed. The purpose of a laminectomy is to gain access to the spinal canal, or to decompress the spinal cord and nerve roots.

Lats – Also referred to as Latissimus Dorsi. A prime mover in your back.

Latissimus Dorsi- Also referred to as lat. The long, wide muscle of your back. When it is developed, it takes the shape of wings.

LDL- Low-Density Lipoprotein. Also referred to as bad cholesterol. A type of cholesterol that is implicated in the development of atherosclerotic plaques.

Lean body weight – Hopefully you have a lot of this. The weight of your body without the fat.

Left Ventricular Hypertrophy- Also referred to as a thickening of the wall of the left ventricle of your heart. Heavy weight training has been implicated in producing left ventricular hypertrophy.

Ligament – Also referred to as a fibrous tissue that connects bone to bone.

Limbic System- I'm so excited I forgot how to move. The part of your brain that contains your amygdala, hippocampus, and the basal ganglia. It affects emotion, memory, and certain aspects of movement.

Lipase- Also referred to as an enzyme that is secreted by your pancreas that helps digest fats.

Lipids- Also referred to as Fats, oils, and waxes. They serve as building blocks for cells or as energy sources for the body.

Lipoprotein analysis- Also referred to as HDL/LDL ratio. When you get your cholesterol tested, always ask for a lipoprotein analysis. This laboratory test determines the relative levels of HDL and LDL in your blood.

Lipoproteins- Kind of like a sandwich with protein covered fat particles. They enable cholesterol and triglycerides to move easily through your blood.

Liposuction- Slurp. Liposuction is the surgical removal of fat cells and their contents. It is not a pretty procedure. Try an eating and exercise program first. After all else fails, and you cannot lose your saddlebags, and you have lost fat everywhere else, and you are obsessed about pinching more than an inch, you may be a candidate for liposuction. If you undergo liposuction to remove fat from your hips, but you continue to eat with reckless abandon, your fat stores will balloon somewhere else.

Liver- Not very tasty, but it is your body's largest internal organ. It secretes bile and is part of many metabolic functions.

Lordosis – Also referred to as sway back. Abnormal curve in your lumbar spine.

Low Back Pain- From being around your spouse too much. Females have a slightly greater incidence of low back pain than men because their pelvis' tilt forward causing a more pronounced lordotic curve. Exercise helps to prevent low back pain by promoting calcium formation and increasing bone nutrition.

Low Carbohydrate Diets- They don't work. Carbohydrate-bashing diets claim that carbs are bad because they increase blood sugar and cause insulin to be released. Supposedly this is a bad thing. Proponents of these diets say insulin causes high-carbohydrate foods to be stored as fat rather than used for energy. This is just not true!

Lower abs – Also referred to as abdominal muscles below your belly button.

Lumbar – Also referred to as lower back.

Lumbar spine- Also referred to as lower back. This is the five lower vertebrae of your spine.

Lung Problems-Training- Breathe, push, push, push...For maximum benefits, walk or pedal at a rate that raises your heart rate to 60% to 80% of its maximum, for 30 minutes, 3 days a week. It may take days, weeks, or months to reach that goal, or you may never get there at all. But that doesn't matter. Your goal is to improve your ability to exercise. Any improvement is great. Lung patients may make tremendous gains. In 6 weeks, you might see a 70% to 80% improvement over your initial workouts.

Lunges- Fencers can do 1-legged lunges all day long. Lunges are great for training your glutes and thighs.

Lupus- Not a good thing. Systemic Lupus Erythematosus (S.L.E.) is a multi-symptom, multi-organ connective tissue disease that primarily affects women of child-bearing age. SLE tends to run in families. While no specific cause has been identified, there are thought to be many different triggers.

Lymph Nodes- Also referred to as glands that are part of your immune system. They help your body fight off disease.

Lymphoma- Also referred to as a malignant tumor of the lymph tissue.

Magnetic resonance imaging (MRI)- Kind of like a fancy x-ray. Doctors use this computerized imaging strategy to see different tissues in your body in a variety of planes. Radio waves generated in a strong

magnetic field are used to provide information about the hydrogen atoms in different tissues within your body

Malignant- A scary word. This refers to a tissue that is cancerous. It usually means the cancerous tumor will spread.

Massage- I bet you could use one of these right now. Muscles typically tighten after exercise. The speed of recovery is directly related to the amount of blood that can enter the muscle to provide the necessary food and oxygen. Deep massage immediately after exercise encourages blood to enter a more relaxed muscle. Get a massage 15 minutes after exercising, and several times during the rest of the day. Each session only needs to be 45-60 seconds.

Masters-Also referred to as older adult division of a competitive event.

Maximal oxygen consumption (VO₂max) – This is one very important measure of whether you have the potential to become an elite endurance athlete. A high VO₂max means that your body processes and uses oxygen very efficiently. The maximum amount of oxygen that you can take in and that your muscles can use in 1 minute is the formula for discovering your VO₂max. But oxygen must be supplied to your working muscle, so depending how much you weigh, and depending how much muscle you have, your VO₂max will vary. That is why you will see VO₂max expressed as milliliters of oxygen per kilogram of bodyweight per minute. It reflects the upper limit of your aerobic metabolism and is limited by the amount of oxygen that can be delivered to your working muscle cells. VO₂max is formulated as a product of your maximal cardiac output and maximal arterial-venous oxygen difference at the capillary-cell interface.

Maximum heart rate (MHR) – How high can you get your heart rate? Your maximum heart rate is the maximum attainable heart rate that you can achieve while exercising. If you run, pedal, or walk as fast as you can up a long hill and you're huffing and puffing and think you're going to die, look at your heart rate monitor and you will probably see your maximum heart rate on the screen. Your MHR decreases as you age and can be estimated using the formula- $MHR = 220 - \text{your age in years}$. This formula is not accurate if you are over 40 years old, however.

Meninges- Also referred to as the outer covering or membrane that protect your brain and spinal cord.

Mesomorph- What everybody wishes they were. Mesomorphs have little problem gaining muscle. They have small waists and look like they workout all the time, even if they do not. Herschel Walker is a mesomorph.

Metastasis- Another word you don't want to hear. When cancer spreads from one organ to another part of the body, the cancer has metastasized.

Migraines- No pain is gain in this case. Migraine is a particular type of headache. A migraine may be induced by a variety of stimuli such as foods, noise, and stress. These headaches are usually accompanied by severe, incapacitating, pain, nausea, vomiting, and visual patterns or flashes in front of your eyes.

Military press – Also referred to as overhead press. Pressing a barbell from your upper chest up into an extended arm position.

Mind/Body Recovery- "I think I can, I think I can..." Successful rehabilitation begins with learning about your injury. Know the extent of your injury, what your recovery time will be, and what you must do to recover. A recent cool study showed that just by thinking about doing a biceps curl, you actually produce muscular activity in your biceps.

Minerals – When your Mom told you to eat vegetables to get your daily supply of minerals she was right. Minerals are inorganic elements that are essential components of all of your cells. Some athletes think they need doses of minerals to enhance their physical training. But studies show that, except for iron (particularly among female athletes), the mineral needs of highly trained athletes are similar to those of the general

population. Furthermore, physical training does not inordinately deplete minerals.

Mitochondria – Also referred to as the powerhouse of your cell. Mitochondria are involved in protein metabolism and lipid utilization. If you are an endurance athlete, you have lots of mitochondria. Sometimes referred to as the powerhouse of the cell, this is where glucose, fat, or protein is oxidized to release energy for your activity.

Monounsaturated fats (MUFAs)- Also referred to as the “good” fats. Fatty acids, abundant in olive, peanut, sesame, and canola oils, in which one pair of hydrogen atoms in each molecule has been replaced by a double bond.

Motility- Older adults talk about this a lot. This refers to the speed and capability of your digestive tract to propel its contents through your system.

Motor unit – Also referred to as a motor neuron and all of the muscle fibers it innervates. In your calf muscle, one neuron can activate as many as 1,000 fibers. But in your eye, where fine motor movement is required, one nerve cell may control only 3 fibers.

Movement Time- How fast are you? From the moment you begin your movement, until you complete it.

Mucosa- Also referred to as the inner lining of your stomach.

Muscle – Everyone wants more muscle. Tissue consisting of actin and myosin filaments organized into fibers or bands. They contract to perform movement.

Muscle Cramp- It usually happens to your calf muscle at night. A muscle cramp is when your muscle contracts and shortens causing a sudden, severe pain. Muscle cramps are mostly caused by overexertion and dehydration. When you dehydrated, there is an electrolyte imbalance, and your muscles to cramp up. Electrolytes are minerals such as sodium, magnesium, calcium and potassium. An imbalance occurs when we have too much or too little of one or more electrolytes in our system. The main electrolytes affecting muscle cramping are potassium, sodium and calcium.

Muscle fiber – Also referred to as muscle cell.

Muscle fiber arrangement – Has nothing to do with a flower arrangement. Long fibers are best for speed and large range of motion movements. Short fibers are designed for strength with less movement capacity.

Muscle group -- Also referred to as specific muscle fibers that work together at the same joint to produce a particular movement.

Muscle Metabolism- Increase your muscle – increase your metabolism. You should eat enough calories to maintain your BMR. If not, your metabolism will slow, and you will store fat more efficiently.

Muscle pull (strain) – Also referred to as a tear or damage to muscle usually caused by excessive stretch.

Muscle spasm – You’ve probably had this happen to you at the worst possible moment. When your covers put pressure on the top of your foot, your calf muscle suddenly and involuntarily contracts. Do your best to immediately stretch your calf in the opposite direction.

Muscle spindle – Kind of like a guard for your muscles. This is a part of your muscle that senses stretch. When you stretch too fast or too hard, your muscle spindle tries to protect you by contracting the muscle fiber therefore disallowing your stretch to continue.

Muscle tone – Everybody wants to “tone” their muscles. The amount of resting tension in your muscle. This allows your muscle to feel hard, and ready to work.

Muscle/Fat- Muscle does not turn into fat. Muscle and fat are two separate entities. If you lose muscle your metabolism slows. If you eat more calories than you burn, you gain fat.

Muscle- Muscle is precious. Seventy five percent of your muscle is water, 20 percent is protein, and 5 percent minerals. You have more than 400 voluntary muscles in your body. Muscle makes up about half of your body weight. The more muscle you have the more calories your body burns. Muscle is metabolically active.

Muscle-Bound- The colloquialism "muscle bound" is a lack of flexibility due to tremendous amounts of muscle. I have yet to meet anyone with so much muscle that it "bound" him up. I have met folks who do not exercise, and have a restricted range of motion, however. If your reason for not lifting weights is you are afraid to become muscle-bound, find another excuse.

Musculotendinous – Also referred to as muscle and tendon.

Myelography- Doctors use this diagnostic technique to x-ray your spine. The doctor injects a contrast medium into the space within the sheath that surrounds your spinal cord. Your radiologist looks for herniated disks, tumors, and fractures.

Myofascial Release- This hurts as much as it helps. Myofascial release is using pressure from your arms and fingers to lengthen muscle and connective tissue. It is used in combination with physical therapy methods to relieve pain and stiffness.

Myofibril – Also referred to as the functional units within your muscle fibers. The more you have, and the larger they are, the stronger you are.

Myofilaments – Also referred to as the part of your muscle fiber that actually shortens when it contracts. It is composed of actin and myosin filaments.

Myoneural Junction – Also referred to as the connection of a neuron to a muscle fiber.

Myopia- Also referred to as nearsightedness. The light focuses before it gets to your retina.

Myosin – Myosin must connect with an actin filament to make a momentous connection. This is a thick contractile filament which cross bridges with the thin actin filaments to produce a muscular contraction.

Myositis Also referred to as inflammation of your muscle.

Nautilus – Not just a submarine. Variable resistance-type exercise machines that claim to provide constant resistance through a full range of motion. Arthur Jones developed Nautilus equipment in the 1970's. Jones coined the term "Nautilus" because the cams used in his machines resembled sea shells

Negative reps – Also referred to as eccentric contraction. This is the "letting down" phase of the contraction which causes a lengthening of your muscle tissue.

Nerve paralysis-Pain is good, it's a signal. There are three major types of nerve destruction that cause paralysis. Children may be born with an incomplete nervous system, such as spina bifida. An accident may occur that destroys part of the nervous system. Or a disease may destroy nervous tissue.

Neurologist- Also referred to as a doctor trained to treat disorders of your brain and nervous system.

Neuron- Also referred to as a nerve cell.

Neurotransmitter – Also referred to as a chemical that transverses the gap between nerve cells. In doing so, this transmits an electrical impulse.

Neutropenia- Also referred to as a low count of white blood cells.

Nickel Allergies-Body piercing is probably responsible for the steep rise in allergies to nickel across the country, which is why oftentimes nose rings and earrings cause discomfort.

Non-Insulin-Dependent Diabetes- Also referred to as adult onset diabetes. Often called Type II, it occurs mainly

Norepinephrine- Gets you revved. This neurotransmitter constricts your blood vessels. It is released by your sympathetic nervous system.

Nucleus pulposus- Leave these alone. This is the gel-like center of each of your intervertebral disks.

Nutriceutical -- Also referred to as a combination of the terms "nutritional" and "pharmaceutical." These are engineered foods that are advertised to provide you with micronutrients.

Nutrition – Also referred to as using nutrients to create an eating program.

Obese – Not what you aspire to. More than 25% above your ideal body weight.

Obliques – Everybody wants these. These muscles are located on the sides of your abdominal area. They rotate and flex your trunk. Your external obliques are superficial to your internal obliques and they are seen as the "hands in your front pocket" muscles. Your internal obliques are below your external obliques and they peak in the shape of a rooftop.

Obstructive Sleep Apnea (OSA)- Your spouse may tell you that you stop breathing during sleep. OSA is characterized by heavy snoring and interrupted breathing during sleep. Many times people with OSA are

Occipital Lobe- To see or not to see. This is one of the four major subdivisions of the two hemisphere of your brain. It is important for in visual perception.

Olecranon process- Also referred to as elbow.

Olympic lifts – There are only two of these. Weightlifting movements used in the Olympics termed the snatch and the clean and jerk.

One repetition maximum, 1 RM – Also referred to as the maximum amount of weight that you can lift one time.

Ophthalmologist- Also referred to as a doctor who is a specialist in eye disease.

Optimum Level Of Arousal- Not what you think. Not too bored or too anxious. At a perfect energy level for the activity you are performing.

Orbit- It's not about the moon. The bony socket that surround your eyeball.

Organic matrix- Also referred to as the protein structure found in bone tissue.

Origin – Also referred to as the attachment of your muscle to a bone. It is connected at a point closest to your core.

Orthotics- Also referred to as shoe inserts which should help balance the biomechanics of your feet.

Osgood-Schlatters Disease (OSD)- A pain in the knee, especially if you're a teenager. It is an inflammation where the tendon from the kneecap attaches to the shinbone. Teens are particularly

susceptible to these stresses because the bones are growing rapidly. Any activity can cause OSD, but it's common in jumping and cutting, like basketball, volleyball, soccer, figure skating, and gymnastics.

Ossification – Also referred to as the formation of bone.

Osteoarthritis – Not caused by working out. This is where the protective cartilage between your bones wears out. This results in stiffness and pain, especially after exercise.

Osteoblast- Also referred to as a bone-producing cell.

Osteoclast- Also referred to as a bone-destroying cell.

Osteomyelitis- Also referred to as a bone infection. Caused by fungi or bacteria.

Osteoporosis- Take your calcium and get your exercise. Osteoporosis is a thinning of your bones as you age. Your bones become more porous. Exercise is part of the treatment. As regular workouts build muscle, they also maintain and may even increase bone density. Older adults can strengthen their muscles and bones and improve their balance, thereby reducing their risk of falls and resulting fractures. For women, exercise works in combination with estrogen or other medications that increase bone density and strength. Exercise, medication, and proper diet fights osteoporosis more effectively together than any one treatment. Bone loading exercises prevent osteoporosis. These include resistance exercises such as squats and lunges to prevent the most common types of bone thinning problems in the spine, hips, and upper leg. It is never too soon to begin exercising to prevent osteoporosis. Remind your children that calcium formation is greatest between the ages of 9 and 20. Basketball and volleyball players scored the highest in bone density.

Over Distance- Also referred to as training further or longer than the distance of the event you are preparing for.

Overload – Not your brain overload. Subjecting a part of your body to loads greater than it is accustomed to. This will improve your performance because your body will adapt to this increased intensity or duration.

Overload principle – E.G. Milo lifted a calf everyday until it became a cow. And legend has it that he could LIFT THE COW.

Overtraining – Don't forget to rest. The same motivation that you have to train hard and perform well can get you into trouble. Causes diminishing returns in your exercise as you're not allowing enough recovery between training sessions. Runners are notorious for overtraining. Day after day of pounding can adversely affect your joints, ligaments, and tendons. Overtraining can also lead to a debilitating and often long term fatigue that can severely limit your performance and fitness. One way to combat overtraining is to cross-train. Cross-training is simply varying your activities to include a combination of aerobic and anaerobic activities.

Overuse- Learn to relax. Caused by overtraining where you are actually damaging muscles, tissues, or bone.

Overuse Syndrome –You didn't relax so now you pay the price. Developing an injury from overtraining.

Oxygen consumption (VO₂) – Also referred to as oxygen uptake VO₂ is simply the total amount of oxygen consumed by your cells over a given period of time (usually 1 minute) to meet your energy needs.

Oxygen debt – Also referred to as huffing and puffing after exercise. This is where the oxygen that you are consuming during exercise recovery is greater than the amount that you would normally take in at rest. If you can't breathe in enough oxygen during heavy exertion to metabolize and remove the lactate and other metabolic products that accumulate in your muscles, you are in oxygen debt. You will be huffing and puffing to try and keep pace.

Oxygen Uptake – I'll huff and I'll puff...The amount of oxygen your cells are using during exercise. A metabolic cart can determine the amount of oxygen you inhale versus the amount you exhale.

Pace line – Also referred to as wheel suckers. Several runners, snowboarders, or cyclists drafting (following closely) one another in a line to minimize energy needs and improve the performance of the group.

Pancreas-If it doesn't work right you develop diabetes. A gland located behind your stomach It secretes digestive enzymes, notably insulin.

Pancreatitis-Also referred to as inflammation of your pancreas.

Parasympathetic Nervous System- Also referred to as PNS. One of the two branches of your autonomic nervous system. It helps to regulate digestion, circulation, voiding, and other bodily functions.

Parathyroid Hormone- Bet you didn't know what this was. A hormone, made by four tiny pieces of tissue near your thyroid. It prevents your level of blood calcium from going to low.

Parietal Lobe- I can't feel anything or talk. One of the four major subdivision of the two hemispheres of your brain. It is important in sensory processes and language.

Passive Stretching- Also referred to as using a partner to take one of your limbs through a range of motion.

Patella- Also referred to as kneecap.

Peak heart rate – Also referred to as your highest heart rate value during exercise.

Pecs – Also referred to as pectoral or chest muscles.

Pectorals- Also referred to as chest. These muscles include your pectoralis major and pectoralis minor.

Pepsin- Also referred to as several enzymes secreted by your stomach. Their job is to break down protein.

Perceived exertion- Also referred to as a measure of your training intensity depending on how you feel. The scale is on a continuum from very, very light (6) to very, very hard (20) in Dr. Borg's original scale, or from very, very light (1) to very, very hard (10), the revised scale..

Percutaneous diskectomy- Yikes, you try it first. A doctor removes part of your intervertebral disk. A narrow probe is inserted through the skin and muscle of your back.

Periodization-A fancy word for well-thought out exercise program. A training program segmented into weeks (micro-cycle), months (meso-cycle), and years (macro-cycle). Each training cycle helps you to set short term goals which will ultimately help you reach your long term goals.

Peripheral Vision- Also referred to as side vision. This is what you can see outside of your direct line of vision.

Peristalsis- Appetizing. Muscles in your intestine move in a wave-like fashion to propel food along your digestive tract.

Peritonitis- This can be deadly. Inflammation of the membrane lining your abdominal cavity.

Physiatrist- Not a psychiatrist. A medical doctor who is trained as a rehabilitation specialist.

Physiology – Also referred to as the study of your body's function.

Phytochemicals- We knew that all the time. Substances in fruits and vegetables that recently have been shown to fight cardiovascular disease and cancer.

Pilates (puh-la-tease) not pronounced like “pirates;” it is named after Joseph Pilates who developed it in Germany and New York in the 1920s. It was a favorite exercise for dancers who wanted to strengthen their muscles and soothe their aches and strains. Now it's the rage among those burned out on regular weight training. Proponents of Pilates suggest that it lengthens and strengthens muscle, while improving balance and posture.

Placebo effect- Also referred to as sugar pill. Your condition improved. But whatever helped you wasn't in the pill you were taking. From chromium picolinate to shark cartilage, people think more of supplements than they are worth. Folks swear to me the benefits of colloidal minerals and magnets. Benjamin Franklin painted blocks of wood black. People thought they were magnets. They slept with these blocks of wood because they believed magnets cured arthritis. Miraculously, they were healed. The blocks of wood worked!

Placebo- If you believe something will help your performance, it probably will. This is termed the placebo effect. The placebo is generally an inactive compound.

Plaque- Also referred to as a fatty buildup of cholesterol, calcium, and other substances inside your blood vessels.

Platelets- Also referred to as tiny, colorless disks in your blood that help your clotting mechanism.

Plyometric –Also referred to as bounding drills. A stretch prior to a jump that preloads your muscle using the stretch reflex to create a myotatic response to recruit more muscle fibers for increased power in your jump.

PNF stretch – Also referred to as proprioceptive neuromuscular facilitation.

Polypro-Also referred to as polypropylene. A moisture wicking material worn next to your skin. It pulls moisture away from your body.

Polyunsaturated fats (PUFAs)- Also referred to as the good fats. These are fatty acids found in soybean, corn, cottonseed, safflower, and sunflower oils. Two or more pairs of hydrogen atoms in each molecule have been replaced by double bonds.

Post-workout fatigue- Everybody feels this. A typical response to several hours of vigorous exercise. This is an indication that you are pushing your training limits.

Power – Every athlete wants more power. And power is how fast you get your work done. It may also be expressed as speed multiplied times force. So if you can get stronger and quicker you will be more powerful.

Power training – Arhgg! Low repetition, high intensity weight training where you lift heavy weight and take lots of rest between sets.

Powerlifts – How powerful are you? Three lifts which include the squat, bench press and deadlift. The combination of these lifts is designed to measure total body strength.

PR- Also referred to as Personal Record. The best time you ever recorded for a specific race or distance.

Road Rash-Abrasions from falling off of your bicycle.

Preload – Get ready to explode. Providing a stretch of about 1.2 times resting length just prior to lifting to maximize muscle fiber recruitment and absolute limit strength.

Presbyopia- Also referred to as farsightedness. This is the natural loss of your eye's ability to focus on close objects. It becomes prevalent in people over 40 year old. But it can be corrected with reading glasses.

Prime mover – Also referred to as the primary muscle group responsible for the movement around a joint.

Process- Also referred to as the bony projections that emanate from each of your vertebra.

Pronation Also referred to as face down, palm down.

Prone- Also referred to as lying on your tummy.

Propecia - Recently some "genius" discovered that finasteride grows hair. It's new, expensive name is propecia.

Proprioceptive neuromuscular facilitation (PNF) stretch – This one really works. A stretching technique designed to contract a muscle just prior to stretching it. The golgi tendon organ senses the contraction and automatically relaxes that muscle so you may move further into your stretch.

Proprioceptive Training- Also referred to as balance training.

Proprioceptor – Also referred to as muscle spindles and Golgi tendon organs. Sense organs found in your muscles, tendons, joints and skin which help you to remain balanced within your environment.

Prostate- Pull down your shorts and cough. A walnut-shaped gland positioned at the base of the male bladder.

Prostatitis- Also referred to as an infection of the Prostate Gland. Symptoms include an aching pain in the area of the prostate. Pressure to the prostate gland is painful enough so that sitting may hurt. Other symptoms include trouble urinating, dribbling, and urinating often at night. Acute cases may be accompanied by fever.

Protein – Your muscle is mostly water, not protein. But besides water, protein is the prime constituent of your muscles and tissues. Protein consumption is necessary for rebuilding muscle tissue. Protein is the building block of your cells and tissues made up of amino acids. Also, after you've burned up all of your carbohydrates and fats, protein is your next available energy source. Protein contains 4.1 calories per gram of weight. Protein also repairs muscle damage that occurs during training. Protein also helps to make red blood cells, produce hormones, boost your immune system, and help keep hair, fingernails, and skin healthy.

Protein efficiency ratio (PER) – On a scale of one to ten.... Rating protein by measuring the amount of essential amino acids in it.

Pseudoephedrine- Also referred to as a decongestant drug.

Psoriasis- Remember the commercial –eczema, seborrhea, and ...Psoriasis is a potentially disfiguring skin disease. It generally affects adolescents. It involves the sebaceous glands in the skin which secrete lubrication for hair follicles and the surrounding skin. These are located in greatest concentrations on the face, back, shoulders, and chest.

Pulmonary – Also referred to as lung function.

Pulmonary (ventilatory) capacity –Also referred to as the efficiency of gas exchange within your lungs.

Pumped – Also referred to as that full feeling in your muscles during and just after your weight workout.

Pumping iron – Also referred to as lifting weights.

Pursed Lipped Breathing- Martial artists do this and so do pregnant females. Used to slow your exhalation by forming your lips as if you were whistling.

Pyramid Training – A tough workout. Beginning at a light weight and gradually increasing the amount of weight lifted set by set. Then when you reach your peak, coming back down the pyramid lifting lighter and lighter weight.

Quadratus Lumborum- Also referred to as lower back muscles, responsible for lateral flexion of the hip, attaching to pelvis and lower ribs.

Quadriceps- Also referred to as thigh muscles. A group of four muscles- Rectus femoris, vastus lateralis, vastus medialis, and vastus intermedius.

Quads – Also referred to as quadriceps.

R.I.C.E.- Your first line of defense against injury. The "RICE" method helps you control pain and swelling. RICE lessens the side effects of an injury. RICE means rest, ice, compression, and elevation. Severe or persistent pain and continued swelling means it's time to seek medical attention.

Radial pulse – Also referred to as your pulse taken at your wrist.

Rating of perceived exertion – How do you feel on a scale of 1-10 (6-20)? A means to quantify the subjective feeling of the intensity of an exercise.

RDA - Also referred to as Recommended Daily Dietary Allowance. Estimates of nutritional needs.

Reaction time- Are you fast like Bruce Lee? From the moment you think about starting your movement, until your muscles take action.

Reciprocal Inhibition- An effective way to stretch. When you contract a muscle group, the opposite muscle group (antagonist) automatically relaxes.

Reciprocal Innervation – This helps with your coordination. When you contract a muscle group (e.g. your biceps) your triceps automatically relax so that your biceps can move smoothly.

Recruitment – Getting all of your muscle fibers to work together to make the lift. Activating your motor units and muscle fibers. The heavier the object, the more muscle fiber recruitment to make the lift.

Rectum- Did you really not know this? This is the final segment of your gastrointestinal tract. It is located between your sigmoid colon and anus.

Rectus Abdominis- Also referred to as your six pack. Your abdominals consist of several muscle groups. Your rectus abdominis is a long strap-like muscle extending from your lower-middle ribcage to your pubis. It lifts you into a sitting position each morning. It is your "six pack."

Recuperation – Also referred to as recovery. Big muscles take longer to recover than smaller ones. Fast twitch muscles take longer to recover than slow twitch muscle fibers. Men recover faster than women. You recover faster from slow than from fast movements. You recover faster from low intensity training than from high intensity training. Regular exercise can help control high blood pressure. A few sessions of moderate physical activity each week can reduce blood pressure significantly, and at the same time, lower your risk of stroke and heart attack. If your blood pressure is just mildly elevated, exercise, along with a

healthy diet, and stress management, may be enough to bring it down. If you require medication, exercise will probably make it more effective, and possibly allow you to lower the dosages with your doctors recommendation.

Relaxed Concentration- Ohhmm. An alpha brain wave pattern where your mind and body are relaxed, but you are exquisitely focused on your task at hand.

Remodeling- You're a new man. Your body's way of systematically removing old bone tissue and replacing it with new. This preserves the strength of your skeleton.

Renal -- Also referred to as kidney.

Repetition -- Also referred to as one move of a weight or exercise.

Resistance -- Also referred to as the amount of weight you are lifting.

Rest interval -- Phew, time to rest. Recovery between sets of an exercise which allows you to lift more during the subsequent set.

Rest-Pause- Not a relaxation technique. A weight-training tool to increase muscle fiber recruitment. Pausing at the bottom of each repetition of your set for just an instant to recruit more muscle fibers.

Retina- You already know this one. The innermost layer of your eye. It converts light energy to electrical energy. It sends visual images to your brain through the connecting optic nerve.

Retinal Detachment- Also referred to as a condition in which the retina separates from the choroid. Often seen in boxers.

Rheumatologist- Also referred to as a doctor trained to diagnose and treat joints and other parts of the musculoskeletal system.

Rhomboids- Also referred to as the muscles between your shoulder blades. These muscles help you to keep your shoulders back.

Ripped -- Also referred to as definition. Visible muscularity with a minimum of subcutaneous body fat.

Roadie- Also referred to as a cyclist who enjoys riding the roads rather than the trails.

Roids -- Also referred to as anabolic steroids.

Rolfing- This stuff hurts. The massage technique called rolfing was designed to fight the effects of gravity. Some folks with back and neck problems say it releases their tension and relieves their pain.

Rollers-Don't try this without training wheels. A training device for cyclists allowing them to pedal and work on their balance at the same time.

Rotator cuff -- Not always the cause of shoulder injury. A band of 4 muscles that holds your humerus (arm bone) in your shoulder socket. These muscles are your supraspinatus, infraspinatus, teres minor, and subscapularis. Their function is to internally rotate (backhand in tennis) and externally rotate (throwing motion) your arm. Your rotator cuff is an important stabilizer of your shoulder during any throwing motion.

Rowing Machines- Nothing is more boring. Novice rowers glide on the forward, eccentric, movement so that there is too much rest to provide an excellent training effect.

Rubella- Also referred to as German measles.

SAG- It's humiliating to be picked up by a sag wagon. A support vehicle that follows riders or runners during a race to provide rest or food if necessary.

Salivary Gland- Remember Pavlov's dogs? Fatty acids, abundant in red meat, lard, butter, hard cheeses, and some vegetable oils (palm, coconut, and cocoa butter) and partially hydrogenated oils. Each molecule carries the maximum amount of hydrogen atoms.

Scapulae- Also referred to as shoulder blades.

Sciatica- A pain in the buttocks. Pain along the course of your sciatic nerve. This can be from your buttock, down the back and side of your leg, and into your foot and toes. It is often because of a herniated disk.

Sclera- Don't shoot until you see the sclera. A tough, protective coating of collagen and elastic tissue. This is the whites of your eyes.

Scoliosis- Also referred to as an abnormal lateral "S" curvature of the spine.

Second wind – Not just psychological. You know when you're huffing and puffing while your jogging and all of a sudden your breath rate normalizes and your stride is easy instead of labored. Well this is referred to in slang terminology as your second wind. It can happen during any type of endurance exercise. It usually happens after your warm up and is thought to be caused by a shift from carbohydrate to fat metabolism at the cellular level.

Sedentary – Also referred to as couch potato..

Set – Also referred to as a group of repetitions done consecutively.

Shin splints – Also referred to as pain in the front of your shin (tibia) caused by a stress fracture, compartment syndrome, or inflammation of muscle fascia surrounding bone.

Shingles- Very painful. Shingles, or herpes zoster, is a viral infection of sensory nerve cells caused by the same virus that causes chicken pox. The virus remains dormant after you have been exposed to chicken pox. The disease occurs most often in people over 50 years old. Shingles is characterized by pain along an affected nerve and its branches. There is an eruption of blisters over skin areas supplied by the nerve. A few days before the attack, you will feel intense pain in the affected area. Then painful and itchy blisters develop, normally lasting a week or two. These blisters eventually form crusty scabs and fall off.

Short Leg Syndrome- Get out your tape measure. Do you have any symptoms that are exaggerated by running, such as low back pain, hip, knee, ankle or foot pain? Do you repeatedly pull the same muscles even though you have given them sufficient time to heal? Do you get shin splints and sciatica (inflammation of the sciatic nerve that produces pain in the buttocks and down the back of the leg)? If so, these may be symptoms of having one leg significantly shorter than the other.

Skeletal muscle – What would you do without em? Muscle that attaches to your bone to cause movement.

Slow-twitch fibers –I was cursed with all slow twitch fibers. Muscle fibers that contract slowly for endurance type exercises. They are oxidative, red, and not very strong or powerful but they can contract for long periods.

Small Intestine- Not as small as you think. A section of your digestive system that includes your duodenum, jejunum, and ileum. It helps absorb nutrients for your body.

Smooth muscle – Yogi's can control these muscles. Involuntary muscle found within the walls of almost every organ of your body.

Snatch – Don't try this at home. Olympic lift where weight is lifted from floor to over your head in a single move.

Soleus- Also referred to as the muscle underneath your calf muscle. It adds volume to your lower leg. It is made up of predominantly slow twitch muscle fibers.

Soy- Keep up with the research on soy; it changes daily. Reduced risks of some diseases have been shown in populations that consume soy. Japanese and Chinese people have lower rates of heart disease and breast/prostate cancer than Americans. Soy may be a part of the explanation. Soy might also be of benefit to menopausal women.

Spasm –Ouch, ouch...Involuntary contraction of your muscle or in a sudden, violent manner.

Specificity – If you train your arms it won't help your legs. Your body adapts to whatever exercise demand you place upon it.

Speedwork- Ready to rumble? Try speedwork. A series of short, fast intervals designed to improve speed.

Spinning-Also referred to as pedaling fast and smooth. Also Johnny G's group indoor cycling program.

Sphygmomanometer- Also referred to as a device used to measure blood pressure.

Spinal fusion- Also referred to as joining two or more vertebrae with a bone graft. This operation is performed in order to eliminate motion and relieve pain.

Spinal stenosis- Also referred to as a reduction in the size of your spinal canal. This may result in compression of your spinal cord or nerve roots.

Spinous process- Also referred to as the lever-like, backward projections from each of your vertebra. Muscles and ligaments attach to these.

Spondylolisthesis- Also referred to as a displacement of one of your vertebra in relation to a vertebra

Spot reducing –There is no such thing as spot reduction. You lose fat systemically based on your genetics.

Sprain -- Also referred to as stretching or tearing of your ligaments.

Squats – Don't try to climb a flight of stairs the day after squats. One of the three powerlifting lifts using your quadriceps, gluteals, and hamstrings as the prime movers.

Stabilizer – Getting a lot of press lately. A muscle that helps you to balance yourself while doing a particular movement or exercise.

Starting A Program- Your body burns more calories sprinting than walking for the same time period. But begin easy. When you become more fit you can workout harder.

Static contraction – Also referred to as a muscle contraction without movement.

Static Stretching- Also referred to as holding your stretch at a point of tension.

Steady state – This is that wonderful feeling you experience after your warm up where you feel as if you could run, cycle, or walk forever. Your heart rate and breathing level off.

Stepper Machines- They really can make your butt bigger. The speed that you step does not affect your

caloric burn because the slower you go, the deeper you step.

Stomach- Bet you didn't know that when you eat more it gets bigger. The hollow, saclike organ of your digestive system. It lies between your esophagus and duodenum. Your stomach stores and grinds food. It secretes acid and digestive juices that break down proteins, and pushes chyme into the small intestine.

Strain – Also referred to as stretching or tearing of a musculotendinous unit. It could be mild (grade 1), moderate (grade 2), or severe (grade 3).

Strength training – Also referred to as using resistance exercises to build muscle.

Stress fracture –Also referred to as a crack or complete break in a bone due to non-violent, repetitive stress.

Stress test – Also referred to as graded exercise test.

Stress- Not always a bad thing. Stress is the response of your body to any demand. Just staying alive creates demands on your body, so you are always under stress. Even while you sleep, your body continues to function. Stress cannot be avoided nor should it be. Stress is linked to problems like high blood pressure and heart disease. It also exacerbates headaches, backaches, and digestive troubles. Stress can make your body aches more painful, your queasy stomach more upset, or worsen any of your symptoms, no matter what the original cause.

Stretch reflex – Like a rubber band effect. When your muscle spindles sense a stretch, they cause a reflexive contraction of that muscle so that the stretch won't cause damage. When you stretch a muscle too hard or too fast, it will contract to protect itself.

Stretching – Feels so good after. Lengthening a muscle to its maximum to increase flexibility of that musculotendinous unit. A combination of massage and stretching is the perfect medicine for tightened muscles after a workout. Use massage to relax your muscles. Now your muscle is prepared for recovery stretching. This keeps your muscles from tightening and shortens recovery time.

Stroke Volume- Also referred to as the volume of blood pushed out of your left ventricle with each beat

Stroke- Not talking about golf or tennis. A stroke is caused by a disturbance of the blood supply to your brain. The blood vessels that normally supply blood to your brain can become blocked. This results in not enough blood getting to your brain. A stroke may be caused by raised blood pressure, hardening of the arteries, or a severe head injury. The functional impairment that occurs with a stroke depends on the area of the brain that is damaged.

Substrate Cycling- I eat like this all of the time. Athletes adjust their voluminous training to their eating so that they can eat voraciously to make up for caloric loss, and workout again and eat, and workout.....

Superset – Won't make you into a superman. Alternating between two exercises of opposing muscle groups (e.g. biceps-triceps) until your sets are completed.

Super-Slow Training- Also won't make you a superman. Performing a set of exercises where each repetition may last from 4 - 10 seconds. The goal is to recruit more muscle fibers.

Supination – Also referred to as face up or palm up.

Supine- Also referred to as lying on your back.

Supplements- Food first, then supplements. If you are going to use supplements, they should be used in addition to an eating and exercise program, not in replacement of. As long as supplement companies claims their products are foods, their advertising is virtually unregulated. Be careful.

Sympathetic Nervous System (SNS)- Want to get pumped? One of two divisions of your autonomic nervous system. Your SNS prepares your body for action. Your blood pressure, heart and breathing rate increase to prepare for an emergency.

Synapse- Kind of like a path. A tiny space between an axon terminal that fires off a chemical signal and the neuron that receives it.

Syncope – Also referred to as fainting because of lack of blood to your brain.

Systolic blood pressure- When you get your blood pressure taken, this is the number on top. It signifies the pressure in your arteries when your heart contracts.

Tachycardia – Also referred to as rapid heart rate. Greater than 100 beats per minute.

Taper down - Also referred to as cool down.

Target heart rate (THR) – Generally 60 to 90 percent of your maximum heart rate reserve. This is where you can enjoy your steady state training for cardiovascular benefit.

Tarsal Bones- Also referred to as bones in your ankle.

Tempo- Go, go, go, go...Running or riding at a hard steady pace just below anaerobic threshold. Riding at a hard, steady pace.

Toast- Also referred to as wasted – utter fatigue.

Temporal Lobe- This is one of the four major subdivisions of the two hemispheres of your brain. Your temporal lobe is responsible for hearing, long-term memory, and behavior.

Tendinitis- If you don't have it, you may acquire it. Tendons are strong, fibrous tissues that connect muscle to bone. When your tendon swells and becomes sore we call it tendonitis. There are several causes of tendonitis. One of the biggest is overuse of your muscles. Not stretching properly is another cause of tendonitis. Flexibility is important in preventing tendonitis. Working out too hard can cause fibers in your tendon to tear. And wearing the wrong type shoes can stretch your Achilles tendon, leading to Achilles tendonitis.

Tendon – Also referred to as a fibrous tissue that connects your muscles to your bones.

Ten10k- Also referred to as 10 kilometers or 6.2 miles.

Tennis Elbow- Also referred to as epicondylitis. An inflammation of a tendon on the outside or inside of your elbow.

Testosterone- Also referred to as a male hormone. It stimulates bone and muscle growth and sexual development.

Thermogenesis- An overrated way to lose weight. Thermogenesis means increased fat loss by raising the body's core temperature. Or increased calorie burn as a result of a faster metabolism. Unfortunately, there are not a plethora of products on the market that can cause these changes to occur. More specifically, when this term is applied to B vitamins and popular herb products, it is probably a scam.

Thrombus- Also referred to as a blood clot. It forms inside a blood vessel.

Throwing- It is not a women's fault that she throws like a girl. An awkward looking overhand throw is not gender specific. It is all about training and experience. If you don't believe me, try throwing with your

non-dominant arm.

Tibialis Anterior- Also referred to as the muscle on the front of your shin.

Torque – Also referred to as the twisting effect of a force.

Trace element – Also referred to as any mineral that is present in your body in tiny amounts.

Training – Also referred to as stressing your body causes you to increase your ability to do a task.

Training effect – You have got to work to get results. When you overload your body, your body adapts by getting stronger.

Training Motivation- Get a healthy perspective. Make friends with your body. It deserves your kindness. Then, make better choices. Walk away from sedentary life. Include more physical activity and healthier foods into your day. Soon you'll feel better both mentally and physically.

Training zone – Also referred to as target heart rate.

Trans fatty acid- Don't eat this on purpose. Usually found in margarine, this is a fatty acid that has been hydrogenated.

Transcutaneous electrical nerve stimulation (TENS)- Also referred to as a counter irritant. Chiropractors use this modality to decrease pain in their patients. It provides a low-voltage electrical current

Transition- No rest for the weary. The interval in a triathlon between swimming and riding, and between riding and running.

Tri-geek- Someone who has an obsession with triathlon equipment or training techniques. Someone obsessed with triathlon, especially with equipment or training methods.

Ultra- Also referred to as long distance running or cycling.

Transverse Abdominis- If you need to up-chuck, you need your transverse abdominis. Your transverse abdominis is beneath your obliques. It allows you to compress forcefully when you cough, sneeze, vomit, or use the restroom.

Trapezius- Gorilla muscles. These are the muscles on your upper shoulder beside your neck.

Traps – Also referred to as trapezius muscles. These are the large muscles of your upper back near your neck that lifts your shoulder up towards your ears.

Triceps brachii – Also referred to as horse-shoe muscles. These are the muscles in the back of your arms that extend your elbows.

Triceps- Same as above. These are the muscles in the back of your upper arm.

Trigger point- No pain, no ____. A painful area to the touch, that when palpated, elicits pain elsewhere in your body. Locate a tender, nodular area within one of your muscles. This is called your trigger point. Gently massage it. Your goal is to restore normal, rich blood and oxygen flow to all parts your muscle. Trigger points strangulate areas of muscles, cutting off the normal nutrition and lifeline, compromising your muscles' function.

triglyceride – Also referred to as fat. Triglycerides contain 9.3 Calories per gram. It is made from three fatty-acid molecules and one glycerol molecule.

Trypsin- Also referred to as an enzyme that is secreted by the pancreas. It helps you to digest proteins.

Ulcer- Don't read this if your nauseous. An ulcer is an area of raw tissue, similar to the tissue found under the scab of a healing cut. Ulcers can occur in the stomach, or in the part of the intestine that drains food from the stomach.

Ulcerative Colitis- Also referred to as a form of inflammatory bowel disease. The inner layer of your colon wall is damaged. Symptoms include abdominal pain, diarrhea, fever, weight loss, and blood in the stool.

Ultrasound For Healing- Exercise makes your bones stronger, and so does ultrasound. Ultrasound puts a soundwave into your bone, which creates a pressure against the bone. This causes the same stress and strengthening that exercise does.

Ultrasound- Kind of like an x-ray. An imaging technique used by doctors to view blood vessels and measure how fast blood is flowing. It uses high-frequency sound waves.

Unsaturated fats- The good fats. Fatty acids in which some of the hydrogen atoms in each molecule have been replaced by double bonds (see polyunsaturated fats and monounsaturated fats).

Upper abs – Also referred to as your abdominal muscles that are located above your belly button.

Upper/Lower Body Exercises- Do this if you want to get tired quicker. If you work your upper and lower body together as in a cross-country ski machine, your sympathetic nervous system kicks in, increasing your perceived exertion, making the exercise feel more difficult even though you may be burning the same amount of calories as doing a simple lower body cycling exercise.

Urea – Also referred to as the final product of your protein metabolism.

Urethra- Also referred to as a tube that transports urine from your bladder out through the penis.

Varicose Veins- Also referred to as spider veins. Varicose veins affect more women than men, and the problem increases with age. A valve incompetency causes a reversal of blood flow. This dilates your veins and causes loss of tissue tone. There is a loss of elasticity in the walls of the affected veins and their valves. Because of their inefficiency, blood may stagnate in the vein. The veins become swollen and twisted. This may lead to fatigue and aching in the affected area.

Vascularity – Also referred to as a high level of definition seen by an increase in visible veins.

Vasoconstriction – Also referred to as narrowing of your blood vessels to decrease blood flow to a body part.

Vasodilation – Also referred to as enlarging of your blood vessels to increase blood flow to a body part.

Vein- Also referred to as the vessels that carries blood back to your heart.

Ventilation – Also referred to as breathing – inhalation, exhalation.

Vital capacity – Also referred to as the amount of air that you can exhale as measured by a spirometer.

Vitamins- They don't increase energy. Vitamins assist chemical reactions in your body. There are 13 known vitamins- Four are fat-soluble-- A, D, E, and K-- which your body is able to store in amounts large enough to last for months. There are nine water-soluble vitamins-- C (ascorbic acid), and the B-complex vitamins--B1 (thiamin), B2 (riboflavin), B6 (pyridoxine), B12, niacin, folic acid, biotin, and pantothenic acid. Your body needs replenishment of these vitamins regularly.

Vividness- Also referred to as the clarity of your mental picture during your imagery training.

Warm-up – Don't forget your warm-up. A gradual increase in the intensity of exercise to allow physiological processes to prepare for greater energy outputs and avoid injury. A thorough warm up increases your body temperature and elasticity and contractility of your muscles. Warm up before training. Stretch afterwards. A warm up gives your joints a 5-10% increase in synovial fluid. Stretch after your workout when your muscles are thoroughly heated up.

Watt – Can you pump up enough power to light a bulb? Watt is a measure of power.

Weight training – Don't wait, weight train today. Using resistance in a progressive overload to gradually increase the strength of your muscles.

Wellness – Also referred to as your physical, mental, spiritual, social, and emotional well-being. What your body's doing such as blood pressure, skin temperature, or heart.

White Blood Cell – Attacker cells. White blood cells emanate from your bone marrow to produce antibodies to attack foreign invaders. They are an integral part of your immune system.

White-Coat Hypertension- Doctors may scare you more than you think. If you go to the doctor and your blood pressure is high, but when you take it at home it is normal, you might have white-coat hypertension.

Whooping Cough- Nothing is more irritating than your spouse with whooping cough. Bordetella pertussis, is the bacteria that causes whooping cough. It is transmitted from an infected person who coughed or sneezed in your direction. Pertussis invades your respiratory mucosa causing increased secretion of mucus. At first it is a thin layer. Later it becomes viscous, and is not easily moved. Whooping cough lasts about 6 weeks.

Wind Trainer-Better than not riding at all. An indoor training device for cyclists. Their bikes are mounted onto a stand that holds the rear wheel. When pedaled the rear wheel turns a fan that creates resistance and allows the rider to experience an indoor cycling workout.

Work – Also referred to as force multiplied times distance. A measure of the amount of force you exert over a particular distance. If you move 50 kg over a vertical distance of 3 meters that equals 150kg-meters (kgm) of work. Working too hard over a long period of time can cause overtraining. Overtraining hurts your performance and can cause sickness or injury. If you overtrain, you are out of balance. If your training program exceeds your rest time, you may be pushing your limits.

Workout – Also referred to as an exercise session that includes a warm up and cool down.

Workrate – Also referred to as power, or the amount of work done per unit time.

Yeast Infections- Blame your spouse. Most women get yeast infections at some time in their lives. A variety of microscopic organisms normally reside in the vagina. These include a yeast-like fungus Candida albicans. But taking antibiotics can kill off certain flora and leave Candida to go on a rampage. This leads to Candida vaginitis, or a yeast infection.

APPENDIX F LEGAL ISSUES

Legal Issues for Personal Trainers

EMPLOYEE/INDEPENDENT CONTRACTOR

To determine if someone is considered an employer, an employee or an independent contractor, the courts look at the theory of "*respondeat superior*." This theory analyzes whether an employee's activities are directly monitored or supervised by his or her employer (i.e. when an employee "responds" to his or her "superior"). The activities reviewed include who actually collects money from the clients, how taxes are paid, whether the personal trainer is on a regular schedule, who solicits the clients, and how the employer controls the work performed by the employee/independent contractor (i.e. does the employer "train" the employee?). Basically, the courts look at how much control an employer has over the employee/independent contractor. In most cases personal trainers are seen to be independent contractors.

EMPLOYEE

If a club collects all membership dues and training fees, takes taxes out of the personal trainer's paychecks, and has specified the personal trainer as an added-insured on the club's insurance policy most likely the club is the employer and the personal trainer is the employee. Additional element of employment may also appear. If the club has the personal trainer train clients at specific and regular times, and the club manager regularly trains the staff and directly controls the methods, style, duration, and scheduling for the personal training sessions, the personal trainer is identified as an employee. In the above situation, the club or fitness center (the employer) is liable for injuries surrounding the personal trainer's (the employee's) activities during his or her job-related activities. This means that the employer would be responsible for paying all legal fees and damage awards should an injured client sue the club and/or the personal trainer and win. If the club carries insurance, the club's insurance company may have to pay the legal fees and the damage awards, depending upon the extent of the coverage. Therefore, the club (the employer) must carry insurance on this employee, and submit all appropriate taxes to the government.

TAXES

An employer is responsible for taking taxes out of an employee's paycheck and submitting the funds to the government. Should the club fail to do this and the personal trainer fails to declare income earned when paying taxes, the government may sue the club for the undeclared funds and appropriate penalties. Thus, the club could be held liable for the government fines, back taxes, and back workers' compensation fees.

INDEPENDENT CONTRACTOR

A fitness professional who is an independent contractor is responsible for carrying his or her own insurance, all liability surrounding their job performance, and for declaring his or her income and paying taxes to the government. The legal status of an independent contractor is much trickier than the employee status. An employee's activities are directly monitored or supervised by his or her employer. While an employee "responds" to his or her "superior", an independent contractor acts independently of his or her employer. The independent contractor need not respond to his or her superior (the employer) for job direction.

EXAMPLE OF INDEPENDENT CONTRACTOR

In most cases, a personal trainer is an independent contractor not an employee. Since clubs sometimes understand little or nothing about personal training, clubs typically stay away from directly supervising their personal training staff. Further, personal trainers direct their own schedules and make their own appointments at their convenience. Clubs usually do not make appointments for personal trainers; personal trainers do this themselves. Clubs prefer not to pay taxes for and not to pay insurance for their personal trainers. This lowers the clubs overhead.

Personal trainers are usually paid a direct percentage of the fees charged. For example: If the client is charged \$50 for the training session, the instructor will get 60%, and the club will get 40% of this fee. Using this percentage breakdown, the personal trainer makes \$30 and the club makes \$20. The personal trainer most likely will receive a check at the end of two weeks that includes the full \$30. No taxes are taken out. In this scenario, the personal trainer must make sure to declare their income from the sessions in his or her taxes. If they are tax audited for any reason and have not declared this income, they could be liable for penalties starting at \$3,000.

EXAMPLE OF AN EMPLOYEE

A personal trainer may be an employee if the club schedules all of their appointments. The schedule may require a trainer to work from 8:00am – 12:00pm Monday, 1:00pm – 8:00pm Tuesday, etc. The key to this scheduling requirement is that the personal trainer has SET hours. The club then makes the appointments for the trainer. The club collects all the moneys. The club sets the prices for the personal training appointments. The club sets parameters (in writing) for training techniques. The club trains the personal trainers, writes all the documents for the personal trainers, collects all the personal data from the clients, collects all paperwork from the clients – waivers, informed consent forms, health history forms, doctor releases, etc. Basically, the personal trainer is working as an agent of the club, and performs all actions as this agent. The personal training techniques of the trainer are the club's chosen techniques, and not selected by the trainer. A personal trainer who is an employee can not vary from the prescribed doctrine set by the club.

Sometimes clubs hire full-time staff that personally train. These personal trainers are full-time employees. This means that the personal trainer is paid by a set salary that does NOT vary with the number of clients seen by the trainer. In this scenario, the club must take taxes out, pay insurance for and fully train the personal trainers that they retain.

LEGAL RELATIONSHIPS

If, as a fitness professional, you are at all unsure of your legal relationship with your employer, it is recommended that you clarify it for insurance and tax purposes. Often, employers have their instructors sign independent contractor/employee relationship contracts to outline their legal statuses. These contracts are simple and lay out the relationships so that no misunderstandings occur. Assuming that both parties understand the ramifications of these contracts, the courts will honor these arrangements.

STANDARD OF CARE: REASONABLE & PRUDENT

To determine if a personal trainer is liable for an injury experienced by a client, the courts ask: "What would a reasonable and prudent personal trainer do in a similar situation?" Basically, determining if a personal trainer is liable means determining if a personal trainer is negligent. Four elements must all be present before an injured student (a plaintiff) can recover from a personal trainer (a defendant). The four elements of negligence are:

- 1) Duty
- 2) Failure to perform that duty
- 3) Proximate cause
- 4) Damage

PROFESSIONAL LIABILITY / DUTY

Professional liability of a personal trainer is the "duty" that the courts place upon a personal trainer. This duty is "to respond as a reasonable and prudent personal trainer in a similar situation." The first element of this duty is that the trainer must act "reasonably and prudently." Personal trainers must maintain an industry-wide standard of what is "reasonable and prudent." More and more fitness professionals are seeking certification and are maintaining their education. So, it is important, if not imperative, that personal trainers be certified to personally train, and re-certify when necessary.

CPR / REASONABLE & PRUDENT

Fitness professionals in Illinois (for example) are required by statute to maintain their CPR certification. There is a push for the legislature to statutorily require fitness professionals to be certified to train. While this is not a state requirement as of yet, it is a recommendation that personal trainers and club owners must not take lightly. All "reasonable and prudent" instructors are now certified.

SIMILAR SITUATION

The second element of this "duty" requires that the personal trainer act "reasonably and prudently" in a "similar situation." For example, someone may have been injured eight years ago because the trainer had a client who had bad knees and did not have supportive footwear. In this situation, the instructor may not be held liable. The reason would be that eight years ago there were no supportive fitness-specific shoes. There was no prevalent research surrounding exercise surfaces and impact in jogging, and no product readily available to support against this impact shock. A "reasonable and prudent" personal trainer eight years ago would not know to recommend (or even to require) exercise shoes. Today, of course, we know that exercising with a supportive exercise shoe is advisable for all clients, especially those individuals with bad knees and/or bad backs. Additionally, the risks of slip and fall incidents in some areas demand such supportive and non-skid shoes. However, the courts look at what was "reasonable and prudent" in a "similar situation" eight years ago when the injury occurred.

TIME FRAME FOR SIMILAR SITUATIONS

The example of a student suing an instructor or club for an injury that occurred eight years prior is unlikely to occur. All states have "statutes of limitations." These

statutes require that an injured party sue within a certain time frame. For example, Illinois civil procedure rules require that a person must sue within a two-year time period for certain types of personal injuries. This means that if a student is injured and decides to sue three years after the injury, the courts prohibit him or her from doing so. The main reason for this limitation is that, most likely after several years, the people who would be testifying in the suit may forget some of the incidents surrounding the litigation. The injured party, the witnesses, the instructor, and even the attending physician's memory become faulty after time. Further, the courts are so glutted with litigation that if people could sue after indefinite time periods our legal system would grind to a halt from overuse.

FAILURE TO PERFORM THAT DUTY

The second element of negligence would be the failure to respond as a reasonable and prudent personal trainer in a similar situation. To prove that a trainer failed in some way to respond reasonably, the court would look towards industry-wide standards. They would seek expert testimony regarding the safety standards that are set by the industry. In the case of a personal trainer, the "industry" refers to the American College of Sports Medicine, the American Council on Exercise, the Aerobics and Fitness Association of America and any other organization that certifies or trains personal trainers. The courts would analyze what the certifications train, what fitness manuals recommend and what workshops out on the market prescribe. Industry standards must be met. This means that instructors must remain abreast of new research, new training techniques, and updated standards. It is one's legal responsibility to act as "reasonable and prudent exercise professionals in a similar situation."

PROXIMATE CAUSE

The third element of negligence is proximate cause. This requires that the injury actually be *caused* by the personal trainer's actions. This means that the instructor can either "do" something to encourage an injury or "fail to do" something to encourage an injury. If the instructor has the client perform an exercise that is bad for the knees and fails to adequately spot the client, the trainer could be found liable. For example, an instructor would be liable if the instructor actually "did" something to cause the injury by using an old exercise that was unsafe and "failed to do" something by not spotting the exercise correctly.

PREEXISTING INJURY

If a client has a preexisting injury and the exercise that the instructor leads simply triggers this injury, the courts may still find the instructor liable for this injury. The courts are very lenient with the requirement of proximate cause. It is recommended that all instructors, clubs, or studios ask their clients to complete health history forms (see Health History Form section). If, during a health history form questionnaire, a student fails to indicate a preexisting injury and the court discovers this preexisting injury, the court will most likely not hold the instructor liable. This is because the instructor requested the information from the student and the student failed to inform, or hid the injury, from his or her instructor. Therefore, it would appear that the instructor did not proximately cause the injury as he or she was not made aware of any susceptibility towards injury on behalf of the student.

PERSONAL INJURY / DAMAGE

Right about now in this chapter, most personal trainers are ready to quit. Please remember that you cannot be sued if there is no actual injury (damage)! Yes, a sprained ankle is an injury, but where is the true damage? There probably are no doctor bills because the student treated the injury herself or himself with R.I.C.E. (rest, ice, compression, and elevation). The client did not have to miss work, find a baby sitter for his or her children, nor go to a psychiatrist to recover from the emotional damage of the sprain. There were no out-of-pocket expenses spent on the sprained ankle. To support a lawsuit, a court must find that there were actual damages arising out of the injury.

DAMAGE AMOUNTS

Damages are calculated by adding up the expenses relating to the injury: doctor bills, loss of income, baby sitters, etc. In California, if a student is injured as the result of a personal trainer's touch (for example, the trainer pushed the client to enhance a stretch and the student tore a muscle as a result) the court can award treble (three times the amount of) damages. This means that because the personal trainer physically handled (or mishandled) a client, the client will recover for three times the amount of actual damages that he or she incurred.

TOUCHING STUDENTS CONTROVERSY

Therefore, personal trainers should not touch their students. Instead, invade the space of your clientele by piercing that invisible bubble that Californians call "my space." Additionally, an aquatic trainer may wish to teach by pure demonstration. First, show the exercise and how it should appear. Then, copy your client, demonstrating the client's poor technique. Finally, visibly correct the client's poor technique with proper technique. If a personal trainer does wish to touch a student, the trainer must *always* ask the client "can I touch you?" This question must be asked *every* time the trainer wants to touch a client.

GENERAL LIABILITY & ADAPTATIONS

If a trainer sees a client performing an unsafe exercise or doing something unsafe (like running on the edge of a pool) and fails to stop the client from performing an unsafe exercise or activity, the personal trainer could be found liable. The personal trainer must act as a "reasonable and prudent exercise professional in a similar situation." The trainer can also be found to be liable if unsafe or unhealthy situations exist in the facility. The personal trainer is liable for using only good quality equipment that is adequately maintained. It is important to have documented scheduled equipment checks.

POSTING RULES & REGULATIONS

It is important to document that certain behavior is not permissible under the club's published rules and regulations (i.e. members must adhere to instructor's requirements during fitness classes). Members should be required to read these regulations, which should be subject to periodic renewal and change, and members should be subject to losing their membership privileges if they violate the rules and regulations. But remember, threatening a client with a revocation of membership privileges does not only

sacrifice the club's immediate income, but it may open up the club to further loss of income due to the bad press surrounding the disgruntled member.

ACCIDENT REPORTS

All clubs should create their own accident report form. These types of forms are excellent to use to jog the memories of witnesses and instructors if a lawsuit does arise surrounding a specific accident. These forms should contain spaces for the names, addresses, and telephone numbers for the injured party(s), the personal trainer(s), the witness(s), and the club supervisor(s) on duty. Dates, times and locations should all be reported. Comments surrounding the incident, answering who, what, where, when, and how the accident occurred, should be thoroughly and completely documented. (See ACCIDENT REPORT attachment.)

SAFETY STANDARDS

Often times a personal trainer is put in the difficult situation of getting a client to stop performing an unsafe activity. The instructor must take his/her position as a fitness professional seriously and understand that he/she is liable if that student is stubborn and does not listen to the trainer. If the client persists in not listening, the personal trainer may even wish to call or get one of the managers on duty at the club to come and take charge of the situation.

The trainer should quickly explain to the manager that this client will not comply with safety standards in (and around) the trainer's session. Then the trainer will have complied with the duty to act as a "reasonable and prudent exercise professional." If there is no manager on duty and/or the trainer does not wish to interrupt the session, or get someone else involved, the trainer may ask the client to sign an incident report directly after class. This report should state 1) that the trainer informed the client of the dangers of the activity, 2) that the client assumes the risk of the injuries that can result from this type of activity, and 3) that the client will not sue the personal trainer or club as a result of such possible injuries. This serves two purposes. It assures the club, studio, and/or personal trainer that they will not be held liable should the student sue for a resultant injury, and also informs the student that you are serious about safety in your sessions. While this approach seems quite severe, please remember that lawsuits are equally severe. Further, the personal trainer need not be demanding, condescending, or intimidating when requesting that the form be signed. A calm and considerate clarification explaining that for legal and insurance reasons it is required that this type of form be filled out, usually appeases the client's feelings of insult or aggression. The trainer should be as polite and accommodating as possible, even explaining that the club's lawyers and insurance carriers require this form. By placing the blame, or requirement, on someone other than the trainer, the client is usually much more willing to comply. The trainer should use the above language and fill out this form by using a club or studio incident report form.

POSTING RULES & REGULATIONS

An easy but expensive way to deal with this type of situation is to document that certain behavior is not permissible under the club's published rules and regulations (i.e. members must adhere to trainer's requirements during sessions). Members and clients should be required to read these regulations, which should be subject to periodic renewal

and change, and members should be subject to losing their membership privileges if they violate the rules and regulations. But remember, threatening a client with a revocation of membership privileges does not only sacrifice the club's immediate income, but it may open up the club to further loss of income due to the bad press surrounding the disgruntled member.

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HEALTH HISTORY FORMS

Health history forms are now the norm in the fitness industry. These forms are quite valuable because they can actually reduce the number of injuries that may occur. When a club and a trainer are made aware of a preexisting condition that makes a student subject to injury, the club or the trainer can make allowances for the client and better accommodate individual needs. Fewer injuries will hopefully result. However, health history forms are a double-edged sword because the more that you know, the more that you are liable for. This means that if the trainer or the club is made aware of the possibility of injury due to a pre-existing condition, the club and/or the trainer is voluntarily assuming the responsibility to specifically prevent against this tendency to injure. Therefore, it is imperative that clubs, and specifically trainers, utilize the information that they gather in the health history forms.

USE ALL DATA

Actively using all of the data collected in these forms is virtually impossible. The personal trainer cannot be expected to know each and every fact about each and every client that comes into the club. Therefore, it is important that clubs cover themselves against this Pandora's box of liability.

WRITING A HEALTH HISTORY FORM

First, the club should only ask questions in the health history form that the person conducting the initial interview would know how to work with. Do not inquire about medical prescriptions, unless the person conducting the interview has been specifically trained in this area. Secondly, the club should limit the usage of the information collected from the health history form to the initial interviewer. This is important because club managers, individual personal trainers, and substitute personal trainers cannot possibly read and remember every individual member's (or client's) health history information. To limit the usage of the information collected in the health history form, insert a clause at the

conclusion of the health history form that reads: "I attest that the above information is true and correct to the best of my knowledge. I further affirm that the information collected on the health history form will ONLY be used for the purpose of this initial interview and general fitness programming recommendations. The club, its staff, instructors, substitute instructors, personal trainers and substitute trainers, and affiliates will NOT be responsible for knowing or using any of the information collected on this health history form." Then ask the client to sign and date this paragraph. Below this signature and date, include the sentence: "I attest that I have read and understood the information collected in this health history form and the above paragraph limiting the usage of this form and know it to be true and correct." Then include another place for the client to sign and date the bottom of this attestation clause. This last clause assures the court that the client has in fact read and understood what he or she has signed. If anything, this clause encourages the client to actually read and ask questions if she/he does not understand everything. While such a clause has never been tested in court, this may be a viable way to limit the health history questionnaire usage to the interviewer and limit the liability of the club.

WAIVERS OF LIABILITY

In May of 1987, the Illinois Supreme Court decided on a very important case for the fitness industry. This case, Larsen v. Vic Tanny International, confirmed that an individual:

- 1) who knew of the dangers which may cause an injury in a health club
- 2) who realized the possibility of injury
- 3) who entered into a contract not to sue a health club voluntarily

can waive the right to sue a health club if they become injured. Simply, this means that if you require your clients to sign a waiver of liability (specifically, an informed consent form) prior to beginning an exercise program with you, and they injure themselves in your program, they may not be able to sue you.

LARSEN V. VIC TANNY INTERNATIONAL

Several positive effects could have come from this: more clubs would become aware of the fact that they can protect themselves from suits via a correctly worded informed consent form, the cost of insurance would plummet, and droves of attorneys would contact their health club clients and redraft their old waivers of liability. Unfortunately, this hasn't happened. Unfortunately, people continue to believe the UNTRUE following statements: "Waivers of liability are not worth the paper that they are written on." While in the past this blanket statement was true, it is not true anymore!

WAIVER OF LIABILITY VS. INFORMED CONSENT FORM

A waiver of liability is an agreement between the club and the client that, if the club permits the client to exercise in its facility, the client agrees not to sue the club should the client become injured. An informed consent form documents that the client has been fully informed of the risks and possible discomforts that involve a physical fitness program, the client assumes the risk of injury in contract form, and the client cannot sue the club should he or she become injured. The difference between a waiver of liability and an informed consent form is that, in an informed consent form, the client has been

informed of the possible injuries that could occur prior to contractually waiving the right to sue. Currently, there is a trend in the law to uphold waivers of liability if they comply with certain standards. The most important of these standards is that the client/member must have "assumed the risk" that the injury may occur to him or her.

ASSUMPTION OF THE RISK

The client must have entered into the contract "voluntarily." This means that they signed the contract without being forced into it. In some states, the client must also have been informed of the possible injuries or discomforts they may incur such as "muscle tears or strains, broken bones, heart attacks, etc." Courts reason that if a client "voluntarily assumes the risk" of an injury, the club should not be held liable. This means that, if a contract specifically describes the injuries that may occur and the client signs the contract, the courts will uphold the contract and not hold the club liable if such a designated or sufficiently alike injury occurs.

RANGE OF ACTIVITIES

In other states, where such a waiver specifically sets forth in clear language the range of activities to which it applies, the court will enforce the contract. Newmann v. Gloria Marshall Figure Salon, Illinois Appellate Court, Second District, 149 Ill. App.3d 824,500 N.E.2d 1011. The key words in this phrase are "range of activities." In these states, a contract need not specifically declare particular injuries such as heart attacks, muscle tears or strains that a client/member can incur. The court may still uphold the contract even if the waiver merely mentions an activity in which the client was injured. No longer does the seller/club need to articulate specifically the injury sustained. The only restriction on this rule is that the client/member must have been able to reasonably contemplate that he or she assumed the risk of injury resulting from the specific activity.

COURTS

The term "the court" commonly refers to what the highest court has ruled on a particular issue. The most powerful court in the United States is the United States Supreme Court. Next in line are the State Supreme Courts and then the various District Courts. There are several other type of courts, but we will not address their relationships at this time.

TRENDS IN THE LAW

Unless the United States Supreme Court has heard and decided a case dealing with a particular issue, the individual State Supreme Courts decide the issue for themselves. If neither the United States Supreme Court nor the State Supreme Courts have decided a particular issue, the District Courts decide the issue. In the case of informed consent forms, the United States Supreme Court has not addressed the issue as it pertains to health clubs. This leaves the State Supreme Courts and often the District Courts to look to other state and district courts for guidance. Most often, the courts follow the decisions of out-of-state courts. This interstitial complementary decision making is how trends in the law develop.

ELEMENTS OF AN ASSUMPTION OF THE RISK CLAUSE

Accordingly, the courts, when viewing issues dealing with waivers of liability in

health clubs, have looked from state to state to assist their decision-making. Thus, when drafting a waiver of liability that incorporates an assumption of the risk clause, one must utilize the recommendations made by other courts. Several of these recommendations include:

a. Inform the buyer/member of the exercise program thoroughly and impartially, including all the various activities ("range of activities") in which the participant may engage and the particular injuries that may occur.

b. Inform the buyer/member (either verbally or in the contract itself) that he or she is free at any time to withdraw consent and discontinue participation without prejudice. Should the buyer/member solicit questions regarding the exercise program, one should give unbiased answers to these inquiries. (This assures that the buyer/member was truly "informed" about the program and "voluntarily assumed the risk" of participation.)

c. Include a statement to the effect that the participant acknowledges that he or she is in "good physical condition."

d. Include a statement that inhibits the buyer/member's "heirs and assigns" from suing your facility.

e. Make sure that the buyer/member fully comprehends what he or she is signing. Make sure that the contract is easily readable to someone of moderate intelligence; do not use confusing legalese. Offer guidance to anyone who appears puzzled. Make sure that the buyer/member speaks English and understands what he or she is reading ("informed").

f. Have the buyer/member initial or circle something halfway through the waiver to document the fact that the contract was actually read ("informed").

g. At the conclusion of the contract, place an attestation clause. An attestation clause is a phrase such as . . . "I attest that I have read and fully understand the above waiver." This is a psychological ploy to encourage the buyer/member to actually read the contract and also proves to the court the seller/club's intent for the buyer/member to do so.

h. Make sure that the waiver is on a separate piece of paper from the printed brochure, enrollment receipt, or membership contract. This ensures that the contract was independently entered into and was not a membership requirement.

COLLECT WAIVERS

Even if your attorney discovers that waivers of liabilities are not upheld in your state, it is still recommended that you redraft your waiver to comply with these recommendations. You never know when the law may change. Should your attorney discover that waivers of liability/informed consent forms are upheld in your state, you will have the opportunity to negotiate with your insurance carrier to reduce your rates. The trend in the law is clear; it's up to us to use it!

LEGAL MUSIC SOURCES

While using music to exercise is not a requirement, it sometimes helps the time go faster and the exercises seem easier. The definition of the 1976 Copyright law states

that "the copyright owner has the right to charge a fee for the use of his or her music in public performance." Public performance is defined as "a place open to the public or as any place where a substantial number of persons outside a normal circle of family and its social acquaintances is gathered." Health clubs, studios, and even public beaches, where fitness classes, and/or personal training sessions are offered, fall into these categories. Licensing fees must be paid to each of the two major performing rights organizations: ASCAP and BMI. When you buy a legally produced music tape from one of the many companies listed below, your ASCAP and BMI rights are not covered. You are still required to pay ASCAP and BMI for the right to play the music in your facility. While you should contact ASCAP and BMI as soon as you are playing music in a public place, currently there are no late penalties or retroactive fees charged when the company contacts you. Do not ignore ASCAP or BMI contacts; pay your fees according to their charts quickly and quietly.

LEGAL MUSIC COMPANIES

Duplicating legal music tapes and selling them is illegal. Power Productions has had a bootlegger of their tapes fined and sent to jail. This is a real issue and should not be ignored. The legal music services in alphabetical order are:

Dynamix (800) 843-6499

Ken Alan Associates (310) 659-2503

Musicflex, Inc. (718) 738-MUFX

Muscle Mixes Music Productions (800) 52-MIXES

Power Productions (800) 777-BEAT

Pro-Motion Music (800) 380-4776

Sara's City Workout (800) 545-CITY

AIDS & EXERCISE

It is a very difficult situation, legally, dealing with members who have AIDS. There is absolutely no documented case which finds that AIDS can be transmitted due to health club activities. AIDS is viewed as a "disability" by courts in most jurisdictions. Therefore, health clubs should treat members who have AIDS as they would treat any other client who has a disability, and this is called "even-handedly."

DISABILITY POLICY

A club should establish a disability policy and enforce that policy. This means that if you would require any other member who has a communicable disease to supply a note from a physician stating that it is acceptable for the disabled person to exercise, it would be perfectly legal to require a member who has AIDS to supply similar physician approval. Further, if a health club has a rule that members with open sores may not exercise in the facility, the health club must enforce this policy. This means that the club should enforce this policy even when a member has a scratch, as well as when a member has an open sore due to AIDS.

REVOCAION OF MEMBERSHIPS/ COMMUNICABLE DISEASES

Many problems are currently arising due to clubs revoking membership privileges simply because a member was diagnosed with AIDS. Singling out a member because he or she has AIDS might be found discriminatory. If the club documents a rule that members who contract communicable diseases may temporarily lose their membership until remission or cure of that disease, and the rule is used for all applicable situations (not only those living with AIDS, the courts may find that enforcement of this rule is acceptable. The even-handed enforcement of this rule is what the courts examine. This means that the memberships of other clients have similarly been revoked because of similar communicable disease contraction.

STANDARDIZED POLICIES

Therefore, clubs should set up standard policies regarding communicable diseases. These policies should be posted in rules and regulations for the facility. In the membership contracts that clients sign (or in the informed consent forms that members sign), the members should be notified that they are responsible for adhering to all rules and regulations regarding membership privileges. A sample rule and regulation of this type may read:

Membership privileges may be temporarily or permanently revoked should a client contract a communicable disease, whether it is curable or not, whether the source of communicability be known or unknown."

Another policy may read:

"All membership privileges may be temporarily or permanently revoked if a member has an open sore."

AMERICANS WITH DISABILITIES ACT

According to the Americans with Disabilities Act, club owners must reasonably accommodate those with disabilities unless they can establish "undue hardship" on the operation of their business. This relates to club owners who cannot accommodate members with disabilities such as AIDS. If club owners demonstrate that they are financially crippled as a result of accommodating a member with AIDS, the courts may find that under the American with Disabilities Act, the club has demonstrated an "undue hardship." For example, if a substantial number of members are leaving and potential clients are not joining because of an existing member who has AIDS, who has open sores, and regularly uses the whirlpool and pool, the courts may find the financial strain an "undue hardship." However, this is a difficult test to pass. The courts may also examine the fact that other financial opportunities may open to a facility that accommodates members with AIDS or HIV-positive individuals. This is a very complicated issue with heavy constitutional overtones that must be dealt with in a delicate manner.

COMPENSATION

When trying to determine what a personal trainer should charge one should look at the existing market, the competition, and the trainer's professional value. Compensation is best based upon what the existing market can bear, what the competition is charging, what the client wants, and what the personal trainer has to offer (by way of expertise,

experience, and education.).

MARKET

Look at what the market can bear, and the income level of the area in which they are going to train. Determine if the community has disposable income to spend on personal trainers, and what their particular market would (and/or does) pay for their services.

COMPETITION

The personal trainer should look at what the competition is charging. Of course when looking at one's competition, it is important to analyze whether or not the services are comparable. If your competition has more experience, a personal trainer may wish to charge 15% to 20% less than their competition. For example, if personal trainers in your area typically charge \$35 per hour, one may wish to begin training at \$29 per hour. List this as your price for the next six months.

PROFESSIONAL VALUE

To determine one's professional value as a personal trainer, the trainer must look at their 1) experience in the industry, 2) how many, how valuable and how applicable the certifications are that they hold, 3) their formal educational level, and 4) their reputation and visibility to the public.

REPUTATION, CERTIFICATIONS & VISABILITY

If one has a tremendous reputation as a superior aquatics group exerciser, and is also certified in personal training, the personal trainer most likely could charge top dollar. Their value within the community's industry is high. If the same trainer holds several highly recognized certifications that directly relate to the programs that they are going to offer this may further increase their value. Even if this same aquatics personal trainer does not hold any formal fitness degree, and instead holds an undergraduate degree in political science, their services would still be seen as valuable. Additionally, if this same trainer has no visibility on a national level (i.e. they have never written for *Shape* Magazine or appeared on "Oprah"), their community value would still be significant.

CHARGING / BILLING

In larger cities personal trainers charge anywhere from \$35 to \$100 per hour. The usual range is from \$25 to \$75 per hour. In smaller towns the pricing is lower, from \$15 to \$50 per hour. And remember, personal trainers are charging for their time. If one has to travel to someone's home, the price of the session should reflect this travel time. Usually this would increase a \$35 session to \$45. This \$10 increase in price is usually well worth it to the client. One must pay for convenience.

PERSONAL TRAINING PACKAGES

If selling multiple sessions, discounts are often a valuable means to encourage advance purchases. By offering packages, clients often commit to personal training sessions and are happy to make savings and long-term commitments. A Personal Training Package may look like this:

SESSIONPRICE	VALUE	SAVINGS	PAYMENT POLICY
1 session	\$50		Payment due at session
5 sessions	\$225	(\$45 each)	Advance payment required
10 sessions	\$400	(\$40 each)	Advance payment required
20 sessions	\$700	(\$35 each)	50% down payment required & 50% final payment due at 9 th session

Another possible Personal Training Package may look like this:

SESSIONPRICE	VALUE	SAVINGS	PAYMENT POLICY
1 session	\$35		Payment due at session
5 sessions	\$165	(\$33 each)	Advance payment required
10 sessions	\$300	(\$30 each)	Advance payment required
20 sessions	\$600	(\$26 each)	50% down payment required & 50% final payment due at 9 th session

When developing a personal training price sheet it is important to layout what the value is of each session, and what the saving is. Also, make sure payment is required at each session, and advance payment is required for multiple sessions. Your business, is just that, “a business.” Treat it as a professional would, and your clients will treat you as a professional.

SCHEDULING

When scheduling clients it is best to carefully plan a week in advance. Remember to account for travel time between clients. Leave at least 15 minutes to one half hour between each client. Leave yourself enough time to transition, without leaving the clients feeling short-changed. Remember which clients require additional “talk” time, and which clients tend to run a little late. Plan!

REFUEL AND RECHARGE

Don’t forget to allow yourself time to eat and recharge. Personal training is very demanding and personal time to refuel and re-energize will ensure that the clients receive a valuable training session. If a trainer is tired or stressed, it will be difficult to focus on the client. Try to plan your schedule and include adequate time for yourself, and adequate time for your own workouts. Remember, you are an advertisement for your own business, take your appearance seriously.

OVEREXTENDING

Do not over extend yourself. Do not plan too many sessions in one day or too many commitments in one week. Everyone will suffer. The quality of your sessions may diminish and the quality of your life will decrease. Additionally, should one have to turn a client down because your schedule is full, this only serves to increase your value as a trainer in the eyes of a client.

CANCELLATIONS

A firm cancellation policy must be established and maintained. This cancellation policy must be provided to the client in writing. It is also advisable to remind the client of this policy repeatedly. Well-respected personal trainers often leave this policy on their answering machines. Please remember that when canceling a session, we require 24

hour notification, or a full session fee will be charged. Thank you for your business, and please wait for the tone.”)

This cancellation fee can either be the whole value of an individual session or any portion thereof. This cancellation fee can be waived in cases of illness or emergency. For example, if a trainer charges \$40 per hour and a client cancels the morning of the session, a \$20 (or 50%) cancellation fee can be charged.

If the client decides to waive a cancellation fee, please anticipate that the client will be more likely to cancel again, and expect the same lenient treatment. Also, a trainer never knows when their clients may talk to each other. Keep your policies standard, and try to make as few exceptions as possible.

REFUND POLICIES

The best refund policy, is “NO” refund policy. If a client were to sign up for multiple sessions, and get injured, it is best to extend the length of time on the personal training package that the client purchased rather than refunding money.

CONCLUSION

The law is somewhat intimidating. However, if you plan and react properly, you can save yourself from expensive legal fees and lawsuits. Require doctor’s notes of approval from each and every client before permitting him or her to enter your program. Additionally, they should sign waivers/informed consent forms annually. You as the trainer must save these informed consent forms. Collect health history forms on a regular basis, and utilize the information that you collect. While legal forms are somewhat burdensome, they can save your clients from tragedies and protect your business from financial ruin.

APPENDIX G
SAMPLE CONSENT FORM

"I, (print name) _____, have enrolled in a program of strenuous physical activity including, but not limited to, a variety of group exercise classes, weight training, stationary bicycling, and various aerobic conditioning machinery offered by NTCC. I hereby affirm that I am in good physical condition and do not suffer from any disability which would prevent or limit my participation in this exercise program. In consideration of my participation in NTCC Workout, exercise program, I, (please initial) _____, for myself, my heirs and assigns, hereby release NTCC (its employees and owners), from any claims, demands, and causes of action, now or in the future, arising from my participation in the exercise program. I fully understand that I may injure myself as a result of my participation in the FIT CENTER at NTCC. exercise programs including, but not limited to miscarriage, heart attack, muscle strains, pulls, or tears, broken bones, shin splints, heat prostration, knee-lower back/foot injuries and any other illness, soreness, or injury however caused occurring during or after my participation in the exercise program.

Signature

Date

I hereby affirm that I am exercising with my physician's approval regarding this program and have read and fully understand the above agreement.

Signature

Date

APPENDIX H HEALTH HISTORY FORM

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
HOME PHONE (_____) _____ WORK PHONE (_____) _____
DATE OF BIRTH ____/____/____ AGE ____ SEX: M / F
(circle one)

In case of emergency, contact:

NAME _____
HOME PHONE (_____) _____ WORK PHONE (_____) _____
NAME _____
HOME PHONE (_____) _____ WORK PHONE (_____) _____
Physician's Name _____
Physician's Phone Number (_____) _____

Do you have now, or have you had within the past year:

- | | <u>Yes</u> | <u>No</u> |
|---------------------------------------------|------------|-----------|
| 1. Difficulty with physical exercise? | ---- | |
| If yes, explain | | |
| <hr/> | | |
| 2. Advice from a physician not to exercise? | ---- | |
| If yes, explain | | |
| <hr/> | | |
| 3. A history of heart problems? | ---- | |
| If yes, explain | | |
| <hr/> | | |
| 4. High blood pressure? | ---- | |
| If yes, explain | | |
| <hr/> | | |
| 5. High blood cholesterol? | ---- | |

If yes, explain

6. Knee problems? ----

If yes, explain

7. Back problems? ----

If yes, explain

8. Shoulder problems? ----

If yes, explain

9. A history of miscarriage? ----

If yes, explain

I attest that the above information is true and correct to the best of my knowledge. I further affirm that the information collected on the health history form will ONLY be used for the purpose of this initial interview and general fitness programming recommendations. The club, its staff, personal trainers, and affiliates will NOT be responsible for knowing or using any of the information collected on this health history form.

Signature

Date

I attest that I have read and understand the above.

Signature

Date

APPENDIX I

Leadership and Professionalism

When you choose to become a personal trainer, it is important that you understand the variety of roles that you will be taking on. Your clients will expect more from you than simply to lead them in exercise. They will expect you to be their motivator, educator, confidant and many other things. The following suggestions will help you to become a true fitness *professional!*

1. Be professional. This means being prompt and prepared for your classes and dressing neatly and appropriately. Some health clubs even have dress codes for their instructors.
2. Adhere to industry standards and always teach exercises that are safe and effective for your class participants.
3. Know your scope of practice. Refer clients to more qualified fitness, medical or health professionals when appropriate.
4. Respect your clients and class participants and maintain the confidentiality of any information that they share with you.
5. Maintain your certification and your CPR training. Stay up-to-date on current research and techniques in the fitness field. Participate regularly in continuing education workshops.
6. Comply with business practices and copyright laws as outlined in the Appendices. Insure that you carry adequate insurance coverage.

