Stretching – different types

**STATIC, BALLISTIC and DYNAMIC STRETCHING**
Flexibility, one of the health-related components of fitness, can be improved by incorporating stretching into one’s physical fitness program. Three modes of stretching used to increase flexibility include ballistic stretching, static stretching, and dynamic stretching.

**Ballistic Stretching** exercises are performed using rapid, bouncy movements which provide force to lengthen muscles. Although this particular type of stretching has been indicated to improve flexibility, it also can lead to injury due to tearing of muscle tissue. Similarly, ligaments (which connect one bone to another) can be overstretched, which can promote joint instability. Loose joints may further lead to subluxation and dislocation. Plus, when a muscle is very quickly stretched, it will often naturally tense up to avoid being over stretched. This can prevent obtaining a beneficial stretch.

**Dynamic Stretching** involves movement and motion while stretching a muscle or muscle group, without the bouncing associated with ballistic stretching. Dynamic stretching has been shown to be the most effective way to warm up prior to exercise. Because of the constant movement, blood flow increases and the core temperature of the muscle rises.

**Static Stretching** involves the slow, gradual lengthening of a muscle. Once a final position is reached, and the stretch is held for several seconds, the muscle will continue to relax allowing the individual to further the stretch. Because the stretch occurs slowly, the muscle can relax, resulting in greater length. This is the stretching technique practiced most frequently among fitness professionals, and poses very low injury risk. However, slow, static stretching is constantly done at the wrong time.

Static stretching is too often performed *before* exercising. Research shows that static stretching actually “dulls” the nervous system, shutting your muscles down – aka relaxing them. Muscle
strength and contractile speed also decrease during static stretching. The best time to static stretch is after you workout; the muscle is warm, you are finished training, and can now “shut those muscles down”. Experiment with this: warm up with movement and motion (ex light jogging followed by dynamic stretching). You will notice a remarkable difference in how warmed up you feel. So don’t ruin it by static stretching next!

Static stretching is important, but is more effective from a flexibility, safety, and efficiency standpoint if it is done after your training session. If you feel a must to static stretch before you exercise, you must first warm the muscles up, and then warm them up again after you’re finished in order to have a safe and efficient exercise session. To optimize performance and minimize injury risk, all stretching should be performed when the body’s muscles are warm.

WATER:

FLUID MAINTENANCE
Rigorous exercise over an extended period of time will undoubtedly result in thirst. The majority of people, however, do not realize the body’s thirst “response” (the feeling of being thirsty) is inadequate to prompt needed fluid replacement, especially during exercise. Furthermore, a physically active individual will lose more fluids through perspiration than a sedentary individual, making proper hydration even more important. And on top of that, if you wait until you are thirsty, you’re all ready dehydrated! A muscle loses roughly 10% strength and 8% contractile speed when dehydrated - so don’t wait until you get thirsty!

What type of fluid is “best”? Should the fluid be cold or warm? How much should be consumed? What benefits do sport beverages provide?

The type of liquid replacement as well as its temperature can affect the rate of fluid absorption into the body. The body absorbs most of its fluids from the small intestine. Therefore, the faster one can get the fluid into the intestine, the faster it may be absorbed. Cold water is one of the best fluid replacements for the average exercising person, as it not only speeds gastric (stomach) emptying into the intestine, but also aids in core temperature reduction. Contrary to what many
believe, cold water does not cause stomach cramping. The volume of water, however, can be a factor in gastric distress. Since many people find consuming large volumes of fluid at once can impair performance, smaller amounts (3-1/2 to 8 ounces) taken at frequent intervals during the workout or competition are recommended. This doesn’t mean one should only consume 8 oz of fluid during exercise, it just means sipping slowly may be more comfortable.

Sport beverages (Gatorade, PowerAde, etc) are heavily marketed to the public. They are promoted to supply electrolytes (potassium, sodium, chloride, magnesium) and calories lost through physical activity. An individual or athlete who participates in prolonged aerobic activity (over an hour in length) on a regular basis and/or who exercises in a high-temperature or high-humidity environment may need to consider electrolyte replenishment. Since many use physical activity as a means for weight management, consuming sport beverages negates caloric loss. Endurance athletes, however, may be concerned about carbohydrate replacement.

While most exercising individuals do not need sport beverages, those participating in regular, prolonged endurance exercise may need them. The presence of glucose (a simple form of carbohydrate), found in many current commercial products, can improve fluid absorption. Although such beverages may not empty from the stomach as quickly as cold water, they may be absorbed out of the intestine and into the body as rapidly as water. Beverages containing 6-8% glucose or sucrose can provide energy to working muscles, which water cannot do. Thus the use of such beverages in long distance runners, triathletes and other endurance performers, who require added energy in order to continue their prolonged activities, may be beneficial.

Fructose, another form of carbohydrate, is not absorbed as quickly as glucose, and is often associated with gastric distress. Subsequently, while beverages with carbohydrate in the form of glucose, glucose polymers and/or some sucrose are recommended as exercise fluid replacements, juices and other high-fructose beverages (like soda) are not.

Whatever form of fluid replacement you choose, remember to drink plenty of water throughout the day. Approximately 8-12 (64 to 96 oz) glasses of water is recommended.
Nutrition

THE BODY’S FUELS

There are three basic fuels, or “substrates” the body uses to produce energy. These substrates, or macronutrients, are found in varying amounts in all foods. Because an individual requires varying amounts of each substrate in the diet, monitoring what goes into the body is important.

Carbohydrates: Carbohydrates are the body’s main source of fuel, as they are easy to break down and readily available. Pretty much anything that grows from the ground is considered a carbohydrate. Sources of carbohydrates include rice, potatoes, oats, beans, corn, vegetables, fruits, breads, cereals and other grains, and pasta. Carbohydrates are broken down into different types of sugars, and then eventually converted to glucose. From here glucose is either used immediately for energy; stored in either the muscle or the liver (referred to as glycogen) for later use; or converted to body fat.

There are four (4) calories per gram of carbohydrate. Thus, if a food item has 20 grams of carbohydrate, the food contains 80 calories of carbohydrate (20 grams x 4 calories per gram).

Carbohydrates can be classified as simple and complex. This deals with the length of the carbon chain and how long it takes the body to break down the specific type of carb.

Simple carbohydrates are broken down very quickly and used for energy right away, stored as glycogen for later use, or stored as body fat. For the most part you want to limit your simple sugar intake. Simple sugars include but aren’t limited to: processed food/junk food, juice, soda, crackers, chips, white bread/bagels, fruit, milk, sports drinks, etc.

The best time to consume simple carbohydrates would be directly after an intense weight training session. This will help replenish the energy lost during the training and help shuttle the protein into the muscles (which should be consumed at the same time) quicker, to start the repairing and replenishing process.
Complex carbohydrates are broken down much slower (in most cases) and provide a greater, prolonged release of energy. Complex carbs include oats, rice, potatoes, beans, corn, whole grains, most vegetables, pasta and bread (if whole grain/whole wheat), etc.

The glycemic index is a scale that was created for diabetics to help monitor blood sugar levels. It is based on 100 being the highest number, with table sugar (sucrose) and white bread (both simple sugars) being at the very top. The higher the number, the quicker insulin is released from the pancreas to help move this blood sugar (glucose) out of the blood stream. Insulin is a double edged sword- it will take blood sugar to exhausted muscles after a grueling workout, or it will take it body fat cells for storage. This is why simple sugars after a workout can be helpful because insulin will take the glucose (broken down carbs) to the hungry muscles. Similarly, if simple sugars are eaten when the muscles don’t need quick energy, insulin will take the glucose to be stored as fat.

People freak out with foods like rice and potatoes because (although complex) they have a relatively high glycemic number. The problem with the glycemic index is this: these numbers are only true if the carbohydrate food is eaten alone. When a “good, clean” carb like potatoes are eaten with a lean protein, a fibrous carb (veggie), and a healthy fat (olive oil), the glycemic number is thrown out the window. Plus, new evidence shows that rice and potatoes have a type of starch called resistant starch that is difficult for the body to break down. So go ahead and eat these foods, just combine them with a veggie and a lean protein.

I personally classify carbohydrates into starchy carbs (rice, potatoes, corn, oats, whole grains, beans, etc) and fibrous carbs (vegetables). I try to always combine a starchy carb with a fibrous carb (in addition to a lean protein) to slow down the release of insulin. In addition to this, I limit simple sugars almost all together except for after a workout or during a cheat meal 😊

Fruit – the double edged sword: First off, fruit is healthy. It is loaded with vitamins, minerals, fiber, and other good nutrients. It is low in fat and low in calories, therefore a good choice for dessert. I think the average person who is just trying to stay healthy and fit, should consume fruit in moderation - perhaps 1-2 pieces a day (although focus more on veggies). However, the main
sugar in fruit (fructose) is not broken down very well and not easily converted to glucose. Therefore, fructose can very easily be stored as body fat. People looking to drop as much body fat as possible or someone wanting to get extremely lean (competitive bodybuilder for example), should avoid fruit all together. So determine your goals, and set your fruit intake accordingly.

Carbs are not the enemy - you need them for energy. Yes, your body can use stored fat for energy when your carbs get low, but it might also break down some muscle, which you don’t want! Carbs have a protein sparing effect, allowing the protein you eat to be used for it’s main functions, rather than for energy. Plus, if your calories get too low because you dropped your carbs too much, your body will hang on to stubborn body fat in a “starvation mode”. So, when you understand the type of carb, the amount consumed, and the timing, you can manipulate them to achieve a great physique.

**Protein:** Protein is required for tissue (muscles, hair, nails, etc) rebuilding and repair, among other functions. Proteins are created from hundreds of different amino acid combinations. In other words, amino acids are the building blocks of a protein structure. When you eat a protein, your body breaks it down into usable amino acids, which are then used to make new body tissues.

There are 20 different amino acids (AA). And although all 20 are important, your body can make 12 of them. The remaining 8 must come from food. Therefore, these 8 are called the “essential amino acids”. What you need to remember is that not all protein foods are equal. Meaning, not all protein foods are “complete”. A complete protein means it has all 8 essential AA.

For the most part all animal products (fish, chicken/turkey, beef, pork, eggs, lamb, etc) are considered “complete proteins”. This is why they are so important to consume. Now, a vegetarian can still obtain all 8 essential AA by combining certain foods. For example, rice, beans, and corn; milk and cereal; or consuming a variety of nuts, seeds, legumes, and vegetables etc. - therefore eliminating the need to eat meat. However, it’s much easier to get it from quality source. A high quality protein supplement will contain all 8 AA, which could be an option for a hard-training vegetarian.
While protein is important, the body does not prefer to use this substrate as its predominant fuel source. If it must, your body can break down protein and have certain AAs be converted to glucose for energy, but for the most part you don’t want this. Also, your body will catabolism (breakdown muscle tissue) if calories get to low – starvation diets don’t work!

Excess protein not used or excreted by the body can also be converted to, and stored as fat. There are approximately four (4) calories in one gram of protein. Thus, if a food item has 10 grams of protein, the food contains 40 calories of protein (10 grams x 4 calories per gram).

**Fat:** Most Americans consume too much fat. Furthermore, researchers find that individuals from other countries where the typical diet is low in fat may eventually become “Americanized,” gradually adding fat into their diets, upon moving to and residing in the United States. Fat is found in convenience foods typically found in “fast food” restaurants, margarine/butter, oil, mayonnaise, potato chips, cheese, meats, etc. While the body does need some fat for stored energy, organ protection and other functions, a healthy diet typically consists of 20-25% of fat. There are nine (9) calories in one gram of fat. Thus, if a food item has 5 grams of fat, it contains 45 calories worth of fat (5 grams x 9 calories per gram). Although all fats have 9 calories per gram, not all fat is the same. There are “good” fats and “bad” fats.

*Saturated fats* are considered “bad” fats. Most are solid at room temperature, except for palm and kernel oils. These types of fats can lead to heart disease (clog arteries, etc), and can increase LDL’s –low density lipoproteins (basically bad cholesterol), etc. Examples include animal fat, butter, egg yolks, cheese, full-fat dairy and many condiments, most junk food etc.

*Unsaturated fats* are considered “good” fats. They can improve your immune system, lower LDLs and increase HDL’s (high density lipoprotein - aka good cholesterol). Good sources include olive oil, nuts, seeds, fish, flax oil, avocados, etc. The majority of the fat you consume in your diet should come from unsaturated sources. Although they are considered healthy fats, they can still make you fat if you consume too much.
So how should carbohydrates, fat, and protein be divided up within the diet?

There are many different macronutrient ratios that can be used for different goals. After establishing the desired amount of calories to be consumed, I personally feel the average person who tries to stay fit by exercising regularly would benefit from a ratio like this:

55% of calories from carbs; 25% from protein; 20% from fat.

Some might say you don’t need this much protein, but with all the benefits of protein, I’d rather keep it up a little higher and my fats a little lower. For example, I’ll see some recommend 60/15/25, where both carbs and fats are higher and protein comes down. It is true this might be all the sedentary person needs to function, but take a look at their body 😊

A bodybuilder at certain times of the year may consume 50/30/20, or even 35/40/25 (when dieting for a contest.)

A marathon runner might consume 60/20/20. There are basically many different ways to do this.

Example: A person who consumes 2000 calories a day, using the 55/25/20 ratios, would look roughly like this:

<table>
<thead>
<tr>
<th>Macronutrients</th>
<th>Ratios</th>
<th>Grams of food</th>
<th>Total calories from each</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>55%</td>
<td>275 grams</td>
<td>1100 (4 calories per gram - 4 x 275)</td>
</tr>
<tr>
<td>Protein</td>
<td>25%</td>
<td>125 grams</td>
<td>500 (4 calories per gram - 4 x 125)</td>
</tr>
<tr>
<td>Fat</td>
<td>20%</td>
<td>44 grams</td>
<td>396 (9 calories per gram - 9 x 44)</td>
</tr>
</tbody>
</table>

By adding the calories together in the far right column, you would consume roughly 2000 calories a day using this macronutrient break down.
**Higher intensity training principles** – example: supersets, drop sets, compound sets, etc. These are just a few, as there are many other principles as well.

**Supersets:**

**Definition:** Working opposing muscle groups in a back-to-back fashion, taking as little rest as possible between sets.

**Example:** Completing an exercise for your biceps and then immediately doing an exercise for your triceps. Chest and back, or quads and hamstrings are other examples. The benefit here is supersets are good if you’re short on time, increases blood flow, and while one muscle is being trained, the other is resting and being somewhat stretched.

Note - The individual can either go back and forth with little to no rest, or complete one “round”, rest, and then repeat. Combining opposite muscle groups is considered a true superset, but one could technically superset anything (ex chest and calves), as long as it doesn’t violate an “exercise order rule” – For example: supersetting a bicep curl and a lat pull down is not effective, because the biceps will limit the back exercise (lat pull down).

**Compound Sets:**

**Definition:** Alternating two different exercises for the same muscle group, resting between sets as little as possible.

**Example:** A set of db shoulder presses, followed by a set of db lateral raises. Another example would be hack squats followed by leg extensions. This achieves greater muscle stimulation and creates a bigger muscle “pump”. The “pump” refers to the accumulation of blood in the muscles, which makes them temporarily larger and tight feeling. This blood flow is beneficial because it brings nutrients, oxygen, and hormones to the working muscles which in turn can help them grow.
**Tri-sets:**

**Definition:** Doing three exercises in a row for the same muscle group (in most cases) with as little rest as possible between sets.

**Example:** A lat pull down, db bent over raise, and a cable pull over – all for your back. Similar benefits to a compound set – but greater intensity. Should only be used from time to time.

**Drop sets:**

**Definition:** Taking a set to positive failure (failing to complete another rep with good form), and then immediately decreasing the weight and doing another set without stopping to rest.

**Example:** You get 8 reps on the bench press, decrease the weight by about 30%, and go for another 6-8 reps without stopping. If you can easily do another 8-10 reps, you “dropped” to low.

**Different Training Splits**

Use these for help in designing your own program. These are just a few, as there are many other options as well. With the examples below, other body parts like traps, forearms, and abs can fall on certain days that work well for you. For example – traps (trapezius) fit well on back or shoulder; and forearms go well on back day, or arm day. Week days not listed are considered “off/rest days”

**Examples:**

**3 Day Routines:**
Monday/Wednesday/Friday – full body
Monday/Wednesday/Friday – upper/lower/upper – and the next week it switches to:
lower/upper/lower
Monday: Chest/Back; Wednesday: Legs; Friday: Shoulders and arms
4 Day routines:
Monday: Upper body
Tuesday: Lower body
Thursday: Upper body
Friday: Lower body

Monday: Legs
Tuesday: Shoulders & Triceps
Thursday: Back & Biceps
Saturday: Chest & Calves

Monday: Chest & Biceps
Tuesday: Legs
Thursday: Back & Calves
Friday: Shoulders & Triceps

Monday: Chest & Back
Wednesday: Quads* & Calves
Thursday: Shoulders & Triceps
Saturday: Hamstrings & Biceps

* The Quads cannot be fully isolated from the hamstrings in most leg exercises. So instead, think “quad-dominant”, and do your hamstring specific (RDL’s and leg curls) on a different day (Saturday in this example)

5 Day routines:
Monday: Back
Tuesday: Chest
Thursday: Legs
Friday: Shoulders & Calves
Saturday: Bicep & Triceps
Monday: Quads & Calves  
Tuesday: Chest & Biceps  
Thursday: Back & Triceps  
Friday: Hamstrings & Calves  
Saturday: Shoulders  

These are only suggestions. Most of the 4 day routines (and all of the 5) are not intended for beginners. They require more experience - meaning your body has learned and adapted to this kind of volume (lots of sets and reps per body part), and you are eating right and getting enough sleep.

Also, in many cases, even with very experienced (drug-free) trainees, 5 days a week usually doesn’t provide enough recovery – because an experienced individual should be able to push themselves enough, that the extra recovery on a 4 day routine is better.