

HOUSTON TEXANS

STRENGTH & CONDITIONING PROGRAM (Players Manual)



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TABLE OF CONTENTS

Texans Football & Conditioning Calendar	2
The Fitness Profile of a Texans Football Player	3
NUTRITION	4
Supplements/Health Foods	5
Registered Dietitian	7
Protein/Vitamins	9
Water/Dehydration	11
Diets	12
Spot Reducing	14
Sample Menu's	15
CONDITIONING	18
Aerobic Exercise	19
Predict Maximum Heart Rate	20
Interval Training	21
Texans Interval Workouts	22
Specificity of Conditioning	26
Skilled Pattern Running	27
SPEED & QUICKNESS TRAINING	38
Speed Gadgets/Strength Shoe	38
Plyometrics	39
Stance	40
Start	41
Running Techniques	42
SKILL DEVELOPMENT	44
Skills/Abilities	44
Skill Transfer	44
Skill Transfer – Positive/Negative/Neutral	44
Task-to-task transfer	46
FLEXIBILITY	47
Stretching guidelines	47
MUSCULAR FITNESS	49
Program Organization	50
The Rep	50
How Much Weight	53
How Many Sets	53
Order of Exercise	55
Multi-joint Exercises	56
Isolation Exercises	57
How Much Rest Between Exercises	57
Explosive Training	58
In-Season Training	60
REST	63
Conclusion	65
Bibliography	66
Recommended References	68

TEXANS FOOTBALL & CONDITIONING CALENDAR

Coach Capers has divided our football and conditioning calendar into five periods. The date each period begins and ends may vary from season to season.

First Period:

From the end of the last game of the season to the first day of the off-season conditioning program.

This period should be used to recover mentally and physically. Schedule surgeries and vacations during this period. From the end of the season until the off-season conditioning program begins we suggest the following:

1. Do not gain any weight (Do not gain a pound).
2. If you are not lifting ... lose weight (if you are not lifting regularly your muscles will atrophy ... and your body weight should decrease accordingly).
3. Lose excess body fat.
4. Participate in recreational exercise (total inactivity not suggested).

Second Period:

The beginning of the off-season conditioning program to the April Coaching Sessions.

Organized lifting workouts and supervised running sessions begin during this period. Specific running times and days will be posted. Maximum fitness levels can be generated by summer camp if:

1. You didn't gain excess body fat during the first period.
2. You sustain disciplined work habits throughout the entire off-season (sporadic training will produce sub-maximal results).
3. You do not wait until this period to schedule surgeries.

Third Period:

The April Coaching sessions through the June Coaching sessions.

You must be in good football running shape to meet the rigors of on field coaching sessions, conditioning, and weight workouts.

Fourth Period:

The end of coaching sessions until the first day of summer camp.

Do not become inactive during this period. Schedule a vacation early to recover mentally and physically from the April and June coaching sessions and then resume your training. Report to camp in peak condition.

Fifth Period:

The first day of summer camp until the last game of the season.

Seven weeks of summer camp is followed by the regular season (17 weeks to include a bye week). Playoffs can extend the season by another five weeks. It is during this period that a player needs to be strongest and most fit. This is the most important period to emphasize strength training. Near maximum strength and fitness levels can be maintained if:

1. Players remain disciplined on and off the field.
2. Sound nutrition habits and adequate rest are crucial.
3. Players exhibit near maximum effort each weight workout.
4. Practice fast and play fast to develop fitness levels needed to play the game.

Texans Strength and Conditioning Program

The fitness formula for a well-conditioned Texans football player is a simple one. There are no shortcuts, no magic pills or potions. A long-term commitment is necessary to reach and maintain your full physical potential. Many athletes can be disciplined for a workout, a week, or a month. The commitment of a true professional is for his entire career.

Many years ago most strength programs were inherited from weight lifters, bodybuilders, and track athletes. There are some similarities between and among the needs of the power lifter, the Olympic lifter, the bodybuilder, the track athlete, and the football player. There are also some definitive differences.

A football player must invest the majority of his time studying, practicing, and playing the game of football. The amount of time and energy available to recover from lifting and running is limited. Our goal is to provide you with a program that is safe, efficient, and compatible with the physical needs of a football player.

The fitness profile of a Texans football player is made up of seven components. We must address each of these components individually.

- 1. Nutrition**
- 2. Conditioning**
- 3. Speed & Quickness Training**
- 4. Skill Development**
- 5. Flexibility**
- 6. Muscular Fitness**
- 7. Rest**

NUTRITION

Our primary concern in the area of nutrition is to enhance the quality of your life, not performance enhancement.

To reach your full potential physically you must develop a disciplined approach to eating, exercise, and getting enough rest. How disciplined are you in the area of nutrition? Ask yourself the following questions.

Do you ...

- * Eat breakfast daily and at breakfast consume approximately 25% of your daily caloric needs?
- * Eat at least three meals/day?
- * Consume a nutritious snack between meals?
- * Eat from all food groups?
- * Consume 60% of your calories from carbohydrates?
- * Restrict your intake of fat calories to 25%?
- * Read the labels?
- * Eat five servings of fruit daily?
- * Eat at least one vegetable a day?
- * Consume at least 25 grams of fiber/day?
- * Drink at least eight (8 ounce) glasses of water each day in addition to replacing water lost through sweat?
- * Avoid low calorie diets and fasting?
- * Avoid losing more than 1 lb. of fat/week?
- * When losing weight find out how much food you can eat (not how little) and continue to lose fat?
- * Avoid spot reducing/rubber sweat suits?
- * Pay attention to body composition instead of bodyweight?
- * Avoid random supplementation and testimony?
- * Rely upon a Registered Dietitian and the academic community for sound nutrition advice?
- * Laugh and walk away if something sounds too good to be true?

It's not just by chance that the average life expectancy of an NFL player is lower than the average adult. In the past many retired players paid little attention to what foods, and how much, they ate. Some abused drugs and didn't exercise enough.

Poor health, a lower quality of life, and premature death can result from long-term unsound eating habits. Your interest in sound nutrition can avoid some of those problems.

There are no magic pills or potions available that will give you more energy, make you run faster, or improve your skills. Having the discipline to eat a balanced diet of normal foods each day is the only "secret formula."

The term "balanced diet" is often misinterpreted. It is not a computer-generated menu of organically grown beans and sprouts. It is the proper amount of normal foods purchased in the grocery store.

Poor eating habits today will affect you (and your family) long after your playing days are over. Concerns for your long-term health and the health of your wife and children, should be the only motivation you need to develop a more disciplined approach to nutrition.

Scientists and the educational community have provided us with an abundance of research and facts in the area of nutrition. This information has been available for many years. Unfortunately, some athletes and coaches don't rely upon the facts.

Supplements/Health Foods

Today the health food industry is a multi-million dollar business. Why? Money, money, money. More fraud and half-truths exist in the area of nutrition than in any other segment of the fitness industry. We are a gullible public. For years we've been told to take a pill or potion for any ailment that we have. We want a quick fix.

Enthusiasts have discarded the basic food groups for amino acids, vitamins, fat burners, and energy bars. Athletes are the most gullible. Often they have little or no knowledge of what they're taking. Some will try anything if they think it might give them an edge. Unfortunately many players taking supplements are less inclined to eat a balanced diet, and often choose pills and potions instead of eating meals.

The Food and Drug Administration doesn't control food supplements. Laws don't exist to protect the consumer. There's no guarantee that what's on the label is actually in the bottle.

Dr. Bob Goldman, in his book, Death In The Locker Room, refers to a questionnaire he administered to a group of Olympic athletes. One of the questions asked was, **"Would you be willing to take a pill that would eventually kill you, if it guaranteed you would win a gold medal?"** More than fifty percent of the athletes responded, **"Yes."**

In real life we don't know if any of those Olympians would have actually sacrificed their life for a gold medal. It is an indication, however, of how strong the will of an athlete is to succeed. The vulnerability of an NFL player is easily exposed. Some are willing to try anything to make the team, play well, and extend their career.

Nancy Clark, M.S., R.D., author and eminently qualified nutrition expert states, "People who take mega-doses of vitamins and minerals should consider that the practice is similar to pumping your body full of chemicals. It may create imbalances that interfere with optimal health."

Clark states, "A diet with 1500 calories a day from appropriate foods can satisfy the RDA in most categories." She adds, "Athletes who take in 2,000 to 4,000 calories daily increase their chances greatly of getting the proper nutrient amounts. They are also getting things in food, like fiber and other health protective compounds, that supplements don't provide."

Do not be duped into using any supplement or drug not prescribed by a Registered Dietitian or our Texans Medical Staff. You may unknowingly consume a product containing a substance banned by the league. The league drug policy is well documented.

The **NFL policy** on steroids and the use of supplements is clear. The policy warns players; **"You and you alone are responsible for what goes into your body."**

Supplements are not monitored or regulated by the FDA. You have no way of knowing if the product:

1. Contains the ingredients listed on the label.
2. Contains prohibited substances.
3. Can actually do what the manufacturer claims the product can do.
4. Can be harmful to your health and/or performance, or have lingering long-term effects.

The Players Union states, “If you take these products you do so **AT YOUR OWN RISK!**” The risk is a four game suspension without pay. You are ultimately responsible should you test positive for any banned substance, regardless of your intent or how it ended up in your body. Do not risk your health or good standing in the league by consuming a product not recommended by a Registered Dietitian.

Testimony

Beware of **testimony** from another athlete or an “expert.” Testimony is an *opinion* regarding the effect a product has on the individual. It is not based on facts, research, or scientific study. Research often demonstrates that the *placebo effect* is the cause of these opinions, not an actual change in the physical makeup or performance of the athlete.

The strength of the placebo effect has been demonstrated many times. In one particular study a group of people were given a *sedative* but were told it was a stimulant. When their bodily functions were measured they responded as if they had taken a *stimulant*.

Before taking a product athletes often listen to and believe the testimony of another athlete or the sales pitch of a salesperson. Regardless of how ineffective a product is, the athlete already has a preconceived opinion. If a product sounds too good to be true...it probably is.

Many of these products have come and gone. Few stay on the market for any length of time. Consumers discover that the claims made by the product are false. Research on products often exploits the erroneous claims made.

There are many products available. One of the popular high-tech supplements is MET-Rx. It is a very visible and popular product. Many prominent athletes use and endorse the product. Claims are made about its positive effect on fat loss, strength gains, recovery, and performance enhancement. Some athletes use the product and sincerely believe it has a positive impact.

How much of that impact is real, and how much is perceived (placebo)? How much of the information available regarding MET-Rx and other supplements is fact, and how much is testimony?

In the February 1995 issue of the Penn State Sports Medicine Newsletter, an article appeared entitled, “**Is It Real or Is It MET-Rx?**” The following is the first paragraph from this article: “Here’s a riddle. What comes with an owner’s manual, is expensive, and is endorsed by movie stars and famous athletes? A Mercedes Benz? A Rolls Royce? No, it’s MET-Rx, a product enjoying multi-million dollar sales whose inventor makes spectacular claims.”

Mr. William J. Evans, Ph.D., is the director of the Noll Physiological Research Center at Penn State. His comments regarding Met-Rx include the following: “I don’t see anything magic in the ingredients. The protein contained in Met-Rx is milk based, which is the highest quality you can get. But you can get the same thing in milk by itself. If an

athlete insists on using a protein supplement, we recommend non-fat powdered milk, which contains calcium and is a rich source of protein.”

The scientific community will not accept claims and testimony. Double-blind studies must be conducted to support the effectiveness of a product. Dr. Evans states, “If this product (MET-Rx) were tested in a double-blind study, I doubt if it would demonstrate any significant effect.” He adds, “...everyone wants to think that there is something there that will provide an extra nutritional boost. I can tell you that, if something were there, it would be known. We have conducted as much research as anyone on protein metabolism and we don’t have any evidence that these kinds of products provide anything unusual.”

The conclusion of the Met-Rx article states, “Until independent, objective, and meticulously controlled studies are conducted that show significant physiological changes, do not expect any more from MET-Rx than from other formulated products.”

When taken as prescribed, MET-Rx and most other supplements are not harmful. They’re also not necessary. Telling this to some athletes is like telling them there’s no Santa Claus. They’d rather believe the testimony of a buddy than research. In no other field do we ignore the facts from our scientific community like we do in the area of nutrition.

Reliable experts inform us that your time, energy, and money can be better spent on normal foods, a balanced diet, and daily discipline.

The message you should be sending to your children and other young people is eat a balanced diet. Spend your money on fruits and vegetables. Eat more carbohydrates. Drink more water. Eat less fat and sugar. Rely upon the facts from Registered Dietitians, not supposition, testimony, and half-truths.

Specialists

Supplements are not more effective than the food you eat. If they were, scientists would publish this information for all to see. Unfortunately few athletes review the scientific literature. Muscle magazines, literature handed out in the health food store, and opinions of other athletes are not reliable sources.

In the 1990’s we’ve all become experts in the area of nutrition and supplements. We visit the health food stores and buy potions like there’s no tomorrow. Yet when we’re sick we don’t randomly take medicine to cure the illness. We visit the doctor and he or she prescribes the appropriate medication.

If your vision becomes blurry you do not go to the department store and prescribe your own bifocals. You visit the optometrist and let a specialist test your eyes. You’re given a prescription to correct your vision deficiency.

Before taking any supplement you should visit a **Registered Dietitian**. In the phone book they have an **R.D.** after their name. R.D.s are members of the American Dietetic Association. Registered Dietitians are the most qualified nutrition specialists available. They have the education, expertise, and information necessary to prescribe a supplement if you need one.

Beware of some **Nutritionists**. Nutritionists are people with an interest in nutrition. In most states there aren’t any professional standards or credentials required to be a nutritionist. Nutritionists number in the thousands. Their advice might be reliable. However their advice could also be unsound.

You can eliminate the possibility of unsound nutrition information. How? Listen to the advice of a Registered Dietitian. They are certified and rely upon scientific facts.

Let an expert administer the appropriate tests to determine if you have any deficiencies before taking a supplement. Few people have deficiencies and most can be corrected with normal foods, not pills and powders.

Don't expect supplements to replace the need for a daily balanced diet. Some athletes eat poorly, drink too much, don't get enough rest, and assume taking a supplement will compensate for their poor habits.

Most athletes lead a very disciplined life. They prepare themselves physically with a demanding regimen of exercise. They practice hard and study the game. Yet when it comes to one of man's most basic instincts, eating, some lack the discipline to eat a balanced diet.

Why, because food is so readily available. Open the refrigerator, look in the cupboard, visit the grocery store, stop at McDonalds on the way home; food is accessible everywhere you look.

Keep in mind that there are worse things you can put into your body than a protein shake. There are also better things. A **new supplement** you should try if you haven't already is called **discipline**. The formula to good nutrition is an easy one. Visit the grocery store and select food from all food groups. Go home and eat those foods.

The RDAs

You don't have to visit the mall to find health food. The best health food you can buy is in your neighborhood grocery store. The prices are cheaper and the quality of the food is superior to supplements. There's nothing your body needs that can't be purchased in a grocery store.

Our government established an organization in 1943 to set nutrition standards. Its standards are called the Recommended Dietary Allowances (RDAs). The organization is called the Food and Nutrition Board (FNB) of the National Research Council, a subdivision of the National Academy of Sciences. The FNB is a panel of experts that provide the guidelines used to ensure proper nutrition. The sole responsibility of the FNB is to tell the American public what nutrients are needed to lead a healthy life. Those needs don't include supplements.

The RDA's exceed the needs of most people, including athletes. Don't worry if your daily intake fluctuates, it will balance out weekly and yearly, unless you abstain from a food group.

The Basic Six

There are six basic nutrients in the foods you eat. A balanced daily diet will provide you with more than enough of these essential nutrients. Look no further than the grocery store to find all six:

- 1. Carbohydrates**
- 2. Fats**
- 3. Proteins**
- 4. Vitamins**
- 5. Minerals**
- 6. Water**

Carbohydrates

Carbohydrates are your best source of energy. The body can break carbohydrates down into a usable source of energy rapidly. **It is the best health food you can eat.** It is the jet fuel of food. Sixty percent of your daily caloric intake should come in the form of carbohydrates. Good sources of carbohydrates include bread, grains, cereals, pastas, fruits, and vegetables. **60%** of your daily caloric intake should come in the form of **carbohydrates.**

Fats

Fat is a poor source of energy. It takes the body a long time to break it down into a usable fuel. If the body cannot break it down to a usable source of energy it stores it as fat in the body. There are two types of fat, saturated and unsaturated. Saturated fats include animal fats which is damaging when too much is consumed. Other common sources of saturated fat include butter, margarine, cream, salad dressings, cheese, shortening, whole milk, fried foods, chocolate, and many pastries. Unsaturated fats are less harmful. Examples include corn oil, olive oil and peanut oil.

The additional fat serves no value except to insulate the body and make it more buoyant. Unless you plan on swimming a long distance in cold water, there's no advantage to adding any excess fat to your body.

Only **25%** of your daily caloric intake should come in the form of **fat.**

Protein

Protein is primarily used to rebuild and repair muscle. It is broken down into amino acids for the muscles and other tissues to use. It is a poor source of energy. Most people consume far more protein than they need. Excess protein is converted to fat and stored in the body, or excreted in your waste products.

Good sources of protein include dairy products, lean meats, fish, and chicken. **Protein pills and powders (including amino acids) are a waste of money.** Amino acids became the "super potion" of the 1990's. However, the literature states that the body can obtain all essential amino acids from a balanced diet.

Additional protein supplementation is both expensive and unnecessary. Covert Bailey, a fitness expert, states, "A growing body of evidence indicates that consuming too much protein is not only foolish; it can be harmful."

The Federal Trade Commission (FTC) in Washington, D.C., published a report entitled "Protein for Athletes." In this report the FTC states that athletes don't need any more protein than the suggested RDA. People selling supplements tell athletes otherwise.

The report says, "...many protein supplement manufacturers use such misconceptions to promote their powders, tablets, or liquids to athletes -- a group that is particularly susceptible to health and body building claims. Athletes have bought the claims and the supplements. Now the FTC staff says the supplements are generally unnecessary and, in some instances, cause decreased muscle efficiency and performance."

Instead of wasting money on supplements, you should use that money to purchase lean meats, fish, and chicken. The FTC states, "Protein supplements are more costly per ounce than protein in food form." The FTC report adds, "...supplements are, in general, of a lower quality protein."

There are no secret potions. There are no magic foods. Eat a balanced diet and you'll consume more than enough protein. The March 1988 issue of The Physician and Sports Medicine magazine published an article titled, Amino Acid Supplements: Beneficial or Risky? In the article the authors state, "Athletes who consume adequate calories generally obtain sufficient protein and amino acids." They add, "Clearly, amino acid supplementation for athletes is a confusing topic--rife with anecdotal evidence. For most athletes, amino acid supplements are just expensive-and unneeded-protein supplements."

Most Americans (including athletes) consume far more protein than they need. Only **15%** of your daily caloric intake should come from protein. You don't need more protein you need more carbohydrates.

Vitamins

Vitamins are chemicals that sustain life. They serve as metabolic catalysts that regulate all chemical reactions in the body. People often take vitamins to give them more energy. **Vitamins do not provide energy.** Food provides you with energy...not vitamins.

A balanced diet will provide more than the minimum daily requirements. If you're concerned, take no more than a multiple vitamin. Mega dosing any vitamin is unnecessary and potentially harmful.

In their book, Vitamins & Health Foods: The Great American Hustle, Victor Herbert, M.D., and Stephen Barrett M.D., state, "*The RDA (Recommended Daily Allowance) for each vitamin and mineral is usually set by noting the entire range of normal human needs, selecting the number at the high end of that range, and adding a "safety factor" to allow for "reserve" body stores without risking toxicity from overdose.*" They add, "*For example, the range of normal adult need for vitamin C is 5 -10 mg per day. In setting the RDA at 60 mg, a 50 mg "safety factor" is added so that the body will store 1,500 mg of vitamin C, enough to last 5 months if you ate no vitamin C at all.*"

Few athletes in our country are deficient in any nutrient. If they are deficient a better selection of foods is the answer, not pills and powders. Dr. Fred Stare, M.D., and Virginia Aronson, R.D., are authors of the book, Dear Dr. Stare: What Should I Eat? In their book they state, "*Despite claims to the contrary by food faddists, there is no reason for anyone who eats a well-balanced diet to take vitamin supplements unless they are recommended by a competent physician for the treatment of a specific problem. Unfortunately, many people have been influenced by vitamin mythology to think otherwise.*"

Dr. Stare adds, "*Ingestion of vitamins and/or minerals in excess of the RDA will be of no benefit to ordinary individuals regardless of activity. Active men and women do not need a specially formulated vitamin and/or mineral product, or for that matter, **any kind of nutritional supplement.***"

Minerals

Dr. Charles Marshall defines minerals as inorganic compounds (usually salts and oxides). The Food and Nutrition Board considers 16 minerals essential for humans.

Minerals form structures in the body. Bones, for example, are formed with the help of calcium. Minerals also regulate body processes. For example, the iron in red blood cells transports oxygen. A balanced diet provides you with all the minerals you need.

Water

The body is predominantly composed of water. All systems in the body are dependent upon water. **Premature fatigue** during a game and poor **recovery** can be the result of not drinking enough water each day. Most athletes live in an under-hydrated state, which significantly decreases the efficiency of all systems in the body.

Dr. Pat Mann, former nutrition consultant for the Washington Capitals Hockey Team, states, "There is no fountain of youth, no magic pill or potion to enhance performance. But there is water." She adds, **"...few things cripple athletes faster than dehydration."**

You don't need to be in an exhausted state to negatively impact your performance. Dr. Mann states, "A one to two percent drop in body weight due to water loss can cause a 15% decrease in performance."

Athletes simply don't drink enough water. They contribute to the problem by consuming diuretics such as alcohol, coffee, tea, and caffeinated sodas. Athletes perspire profusely every day. You lose additional water simply by breathing. Under normal circumstances, we lose 2 to 3 liters of water a day. This water must be replaced. You should consume at least two extra quarts (eight 8 ounce glasses) of water every day above and beyond what you sweat to remain properly hydrated.

Water Tips For The Football Player.

How do you know if your water intake is adequate? A rule of thumb you can use is the color of your urine. It should be almost clear in color. If it is bright yellow you're not drinking enough water. Another rule of thumb is to replace each pound of weight lost with a pint of water. A pint of water weighs approximately one pound.

When the body gets hot it perspires in an attempt to cool the blood down. About 50% of your body heat is lost through your head. During hot weather, you should remove your helmet whenever possible (TV time-outs, measuring for a first down). Expose your skin as much as possible (pull your socks down when you're off the field, remove your pads at half-time, replace sweat drenched clothing, don't wear a bandanna).

Thirst is not a reliable indicator of proper hydration; those who work out tend to replace only about two-thirds of the water they've lost during exercise.

Players prone to cramping should use extra salt during periods of abnormal sweating. At their testing laboratory in Chicago, Gatorade researchers have discovered that we lose sodium in significantly greater amounts than other minerals. Salty snacks (pretzels) and additional table salt are recommended during periods of high heat and humidity.

You also need to drink during cold weather. Often the urge to drink when you're cold is suppressed, but proper hydration is still critical.

On an airplane you breathe recirculated air, which is drier than the air you breathe outside. This recirculated air is inhaled into your lungs and causes rapid dehydration. One liter of water is lost during every 3 1/2 hours of flying time. Dehydration during air travel is magnified if you drink coffee, tea, alcohol, or caffeinated soda. Be sure to replace this water.

A football player should drink 20 ounces of water two hours prior to kickoff, and about eight ounces every 15 minutes throughout the game.

Often at dinner parties the topic of conversation turns to fitness and supplements. You can join in and tell your friends that the **best supplement you take is water.**

Starvation Diets Don't Work...Eat Small Frequent Meals

Starvation diets or eating only one meal per day is not the solution to losing weight. This will slow your metabolism down and make it harder to lose fat. To speed up your metabolism, exercise aerobically, eat small meals, and eat frequently. Three to six small meals are preferred to one or two big meals a day. Eating frequently teaches the body that there is no need to store fat for future energy.

Losing more than two pounds of fat per week for most people is impossible. What about those ten pounds you lost on a hot day during practice? On the scale you were ten pounds lighter. However little, if any, of that loss was from fat. Where did the ten pounds come from? It came from your *muscles*.

Your muscles are primarily composed of water. When you sweat you lose water. As soon as you consume any fluid it returns to the muscle. There is only a trace of water in fat. Fat is a gooey, oily substance.

Wearing a rubber suit and sitting in a sauna causes you to sweat, not lose fat. The water lost comes from muscles -- not fat. It is a temporary loss and will eventually be replaced when you hydrate.

A scale will only tell you how much weight you lost. It will not tell you how much of that weight loss was fat, muscle, or water. More important than your body weight is your percent body fat. What percentage of your body weight is fat?

The only reliable method to measure body fat is to cut you open and scoop out the fat and weigh it. Several less radical methods can be used to measure body fat, but most aren't very reliable. Instead of cutting you open we suggest you strip naked and look in the mirror. If you see any excess fatty deposits you should lose weight (fat).

What difference does it make if your body fat is 14% or 15%? The key is how you lose the weight (fat). Proper eating habits and regular exercise is the prescription.

Diets Don't Work.

If any one diet worked there wouldn't be any fat people. Instead of dieting try monitoring your eating and exercise habits for the rest of your life.

Observe the definitions given for the word diet: *limiting intake of food, fast, abstinence from food, starvation*. Each of these terms is a temporary condition. Losing weight is difficult. It's easier to maintain a certain body weight. The message? Don't gain any excess weight.

Diets don't work. Most people regain the weight lost within six months. Losing fat requires patience. You cannot rush the process. Do not lose more than two pounds per week. A smaller person will find it difficult to lose one pound of fat per week.

You can go on a starvation diet and lose five pounds in a week. You may have lost a pound or two of fat, but the additional weight loss is muscle and water. Remember a muscle is 72% water. If you don't take in enough calories your body will use some fat and then begin using protein (muscle) for energy. Eventually you'll gain this weight back and then some.

Starvation diets slow the metabolism down. This will make it easier to gain more weight when you stop dieting.

How Many Calories In One Pound Of Fat?

There are 3500 calories in a pound of fat. In order to lose one pound of fat in a week you must eat less and/or burn more calories (exercise aerobically). Let's assume you

want to lose one pound of fat per week without exercising (bad decision). You must eliminate 3500 calories from your weekly intake to do this.

This caloric restriction must be spread out over seven days. Divide 3500 calories (one pound of fat) by seven days to determine how many fewer calories per day you must consume to lose one pound of fat that week.

$$\frac{3500 \text{ calories}}{7 \text{ days}} = 500 \text{ calories (take in 500 fewer calories per day)}$$

The answer? Take in 500 fewer calories per day than you need to maintain your body weight, and you'll lose one pound by the end of the week (500 calories x 7 days = 3500 calories = 1 pound of fat).

How Many Calories Per Day?

There is a formula you can use to help give you a guideline regarding how many calories you need to begin losing weight.

Multiply your body weight times 15 calories. Then subtract 500 calories. This will give you the approximate number of calories you must consume each day that week to lose one pound of fat.

Let's assume you weigh 250 pounds. Observe how you would utilize the above formula to calculate how many calories you must consume daily to lose one pound of fat in seven days.

$$\begin{array}{r} 250 \text{ pounds} \\ \times 15 \text{ calories (standard used when losing weight)} \\ \hline 3750 \text{ calories (number needed to maintain 250 lbs.)} \\ - 500 \text{ calories (deduction per day for 7 days = 1 lb. of fat)} \\ \hline 3250 = \text{number of calories to be consumed daily for one week} \end{array}$$

To lose one pound of fat in a seven-day period you can only consume 3250 calories a day. At the end of the seven-day period a one-pound loss will be observed. To lose an additional pound the next week, and each succeeding week, you must recalculate the formula based upon your new body weight (249 pounds x 15 calories = 3735 - 500 calories = 3235 calories /day for the next seven day period).

Burning calories Via Exercise.

Do not lose more than a pound of fat per week through calorie reduction. Any additional fat loss should come from caloric expenditure (increased activity). To lose two pounds of fat per week (via calorie reduction) you must reduce your caloric intake by 1000 calories a day.

A 1000-calorie decrease from your normal daily intake may not provide you with an adequate amount of energy each day. Do not reduce your daily caloric intake by more than 500 calories. Any additional weight loss should come from exercise. Most diets fail without some form of aerobic exercise to compliment the caloric reduction.

Spot Reducing

Spot reducing is impossible. You can't lose fat from one part of the body. Excess fat in one area of the body is an indicator of additional fat displaced throughout the entire body that may not be as visible. Fat loss must come from the entire body, not just from the area of excess.

Specific exercise for one part of the body will not eliminate fat from that area. Sit-ups will not “burn away” the excess fat from your abdominal region. If you want to “burn away” the fat you’d be better served to set your belly on fire.

Sit-ups will firm and tone the abdominal muscles but will not eliminate excess fat in the midsection. You can eliminate the fat over time with a balanced diet and aerobic exercise.

Many studies have been done to support the inability to spot reduce. Tennis players are an excellent example. They over use one side of the body while serving, hitting the ball, and gripping the racquet. Yet when tested, the amount of body fat is identical on both sides of the body. The muscles on the dominant side are more developed but the amount of fat on both sides of the body remains the same.

Perform exercises to strengthen the abdominal muscles. Don’t expect these exercises to rid the body of any excess fat.

Read The Label!

Players ask, “What foods should I eat? Give me a diet!” When a daily menu is provided few players are willing to eat the exact foods, in the amounts listed, and take the time to prepare the food in the manner suggested. The answer is to learn to eat the foods you would normally eat, in the appropriate amounts, and make minor modifications to ensure good quality and a balanced diet.

You must become more aware of the caloric value of the foods you eat. You can do this by purchasing a **calorie counter** at the grocery store. A calorie counter is a small booklet that lists hundreds of foods, and the number of calories from fat, carbohydrates, and protein found within those foods.

Most food packaging provides nutritional information on the label. This label lists how many calories are in a serving, as well as the grams of fat, carbohydrates, and protein. You can easily determine how many calories in that serving come from fat, carbohydrate, and protein once you know how many calories is in each.

The caloric value of each is listed below:

1 gram of fat (f)	=	9 calories
1 gram of carbohydrate (c)	=	4 calories
1 gram of protein (p)	=	4 calories

With the above information you can calculate the caloric content of any food. For example, a small bag of peanuts contains 191 calories per serving. The label doesn’t indicate how much of that serving comes from fat, but it does give the number of grams of fat, carbohydrates, and protein. Below is an example of a label found on most products.

Small bag of peanuts	=	191 calories
Fat	=	15 grams
Carbohydrates	=	9 grams
Protein	=	5 grams

With this information you can calculate how many calories come from fat, carbohydrates, and protein. Remember that 1 gram of fat = 9 calories, 1 gram of carbohydrate = 4 calories, and 1 gram of protein = 4 calories.

Small bag of peanuts = 191 calories			
Fat	= 15 grams	x 9 calories	= 135 calories
Carbohydrates	= 9 grams	x 4 calories	= 36 calories
Protein	= 5 grams	x 4 calories	= <u>20 calories</u>
			191 calories

From the information above you can see that peanuts are very high in fat. Almost 66% of the calories in peanuts come from fat. The ideal food should contain only 25% fat and 60% carbohydrate. Peanuts are not a very good source of energy.

Does this mean you shouldn't eat peanuts, or any food high in fat? The answer is no! You can eat any food you want if you balance the percentage of calories you consume by the end of the day, the week, and the year. If you eat a meal high in fat, you should decrease your fat intake the rest of the day.

Remember, the ideal ratio of calories is 60% carbohydrate, 25% fat, and 15% protein. When you shop for food check the labels. Look for food that is low in fat and high in carbohydrate. Bring your calculator and figure out how many calories come from fat, if it isn't provided on the label.

Fast Foods

Fast food restaurants are a popular part of American cuisine. The goal of most fast food chains is to satisfy the palate. Many of the foods are fried. If you stop at McDonalds on the way home and order a Filet-O-Fish Sandwich for your dining pleasure you might assume that fish is low in fat and a wise choice.

Fish is low in fat and a wise choice if prepared properly. Unfortunately the Filet-O-Fish Sandwich is cooked in grease. It contains 26 grams of fat. That's 234 calories (26 x 9) from fat. More than 50% of the calories in a McDonalds Filet-O-Fish come from fat.

There is nothing wrong with eating a Filet-O-Fish sandwich. With the rest of your meal try and balance your fat intake to a total of 25%. If you can't do it that meal try to balance your fat intake by the end of the day. If you eat out frequently you must be more selective in the foods you eat and how the food is prepared.

Below are sample menu's to demonstrate the amount of food needed to compose a 2500, 3500, and 4500, calorie menu.

2500 CALORIES

<u>Breakfast</u>	<u>Serving</u>	<u>/Cal.</u>
raisin bran cereal	2 cups	315
2% milk	4 oz.	60
orange juice	8 oz.	112
<u>Lunch</u>		
turkey sand. on wheat	2	588
pretzels thin twist	8	185
diet cola	12 oz.	0
<u>Dinner</u>		
baked chick. breast no skin	2	282
baked potato w/butter	2	500
tossed garden salad	1	35
lite Italian dressing	3 tsb.	15

2500 CALORIES

<u>Breakfast</u>	<u>Serving</u>	<u>/Cal.</u>
waffles w/but.& syrup	2	237
2% milk	4 oz.	60
banana	1	104
<u>Lunch</u>		
tuna sand. on wheat	1	365
vegetable beef soup	2 cups	160
orange	1	71
<u>Dinner</u>		
spaghetti w/meat sauce	1 cup	334
tossed garden salad	1 cup	35
lite Italian dressing	3 tsb.	15
Italian bread	3 slices	255

iced tea/sweetened	12 oz.	132
<u>Snacks</u>		
apple	1	80
graham crackers	2	112
popcorn air pop w/butter	1 cup	86
TOTAL		2,502 calories

3,500 CALORIES

<u>Breakfast</u>		
French toast w/but./syrup	2 pieces	319
orange juice	16 oz.	224
banana	1	104
<u>Lunch</u>		
turkey sand. on wheat	2	588
tossed garden salad	1	35
seedless grapes	1 cup	113
fruit punch drink	12 oz.	177

Dinner

baked white fish w/lemon	12 oz.	308
baked potato w/butter	2	500
long grain white rice	1 cup	267
green string beans	1 cup	60
2% milk	8 oz.	120

Snacks

corn flakes	1 cup	120
2% milk	4 oz.	60
fresh fruit salad	1 cup	131
chocolate pudding	1 cup	320
TOTAL		3,512 calories

4,500 CALORIES

<u>Breakfast</u>		
frosted flakes	2 cups	298
2% milk	8 oz.	120
orange juice	16 oz.	224
banana	1	104
<u>Lunch</u>		
roast beef sand. w/gravy	1	421
baked beans	1 cup	236
thin twist pretzels	15	344
apple	2	160
Gatorade sports drink	24 oz.	180

Dinner

spaghetti w/meat sauce	2 cups	668
tossed garden salad	1	108

Gatorade sports drink	24 oz.	180
<u>Snacks</u>		
fresh fruit salad	1 cup	131
baked potato w/butter	1	250
peanut butter & jelly sand.	1	321
TOTAL		2,518 calories

3,500 CALORIES

<u>Breakfast</u>		
scrambled eggs	2	222
wheat toast w/jelly	2	201
apple juice	16 oz.	208
<u>Lunch</u>		
cheese pizza	4 slices	704
lite Italian dressing	3 tbsp.	15
regular cola	12 oz.	100

Dinner

baked chick. breast/	2	282
mashed pot. w/gravy	1 cup	217
corn/whole kernel	1 cup	302
whole wheat roll	2	191
lemonade	12 oz.	163

Snacks

Gatorade sports drink	24 oz.	180
apple	2	160
graham crackers	4	224
P& Jelly sand.	1	321
TOTAL		3,525 calories

4,500 CALORIES

<u>Breakfast</u>		
pancakes w/but. & syrup	4	520
poached eggs	2	164
English muffin w/jelly	1	187
orange	1	71
<u>Lunch</u>		
tuna sandwich on wheat	2	730
chili	1 cup	170
Ritz crackers	15	270
fresh fruit salad	1 cup	131
iced tea/sweetened	16 oz.	176

Dinner

meat loaf	1/2 lb.	435
potatoes w/gravy	1 cup	217

whole wheat roll	4	381	mixed veg. w/butter	1 cup	164
iced tea/sweetened	16 oz.	176	2% milk	8 oz.	120
<u>Snacks</u>			<u>Snacks</u>		
seedless grapes	2 cups	226	pnut butter & jelly sand.	1	321
chunky chicken soup	1.5 cups	267	banana	2	208
raisin bagel w/pnut butter	1	292	animal crackers	20	160
fresh fruit salad	2 cups	262	grape juice	12 oz.	255
TOTAL		4,502 calories			4,509 calories

KEY POINTS TO REMEMBER

1. **More fraud exists in the area of nutrition than in any other segment of the fitness industry.**
2. **In most cases athletes are not reliable sources for nutrition information.**
3. **Testimony is an opinion not based upon facts or scientific research.**
3. **Supplements are not more effective than the food you buy at the grocery store.**
4. **Carbohydrates are the best source of energy.**
5. **Only 25% of your daily calories should come from fat.**
6. **Vitamins do not provide energy.**
7. **A 1% - 2% drop in body weight due to water loss can cause a 15% decrease performance.**
8. **There are 3500 calories in one pound of fat.**
9. **A sauna and a rubber sweat suit cause you to sweat and lose water, not fat.**
10. **Spot reducing is impossible.**
11. **There are nine calories in one gram of fat and only four calories in one gram of carbohydrate.**
12. **The body can eat most foods in moderation...BALANCE is the key.**

CONDITIONING

Conditioning is the second of seven components making up your fitness profile. The energy used to play the game of football is provided by two predominant energy systems. They are the **aerobic** system and the **anaerobic** system. The term aerobic means with oxygen and the term anaerobic means without oxygen.

The aerobic system draws its energy from oxygen in the air you breathe. Aerobic exercise improves the ability of the cardio respiratory system to transport oxygen (fuel) to the working muscles.

The anaerobic system draws its energy from **ATP** (adenosine triphosphate) and glycogen. Both are stored within the muscles. The body uses the food you eat and converts it to ATP and glycogen. Your car engine uses gasoline. Your muscles use ATP and glycogen.

The amount of ATP and glycogen your muscles can store is limited. Interval training, strength training, and proper diet, improves the muscle's ability to store more ATP and glycogen. It also improves the efficiency of the anaerobic system to replenish these energy stores.

The actual act of lifting a weight (I bench pressed 300 pounds) is meaningless to a football player. The process of depleting ATP and glycogen from the muscles during the lifting process is the goal of a football player. This will allow the muscles to store more energy for a practical application (playing the game for four quarters).

Gearing the strength program for heavy one max reps may be best suited for a competitive lifter. However, this training protocol isn't designed to best prepare the energy systems used to play the game of football.

The aerobic system is called the **O₂ System**. The anaerobic system has two separate energy systems. They are called the **ATP-PC System** and the **LA (lactic acid) System**.

The **ATP-PC** and the **LA** system have a limited supply of energy. For example, try sprinting up a 400-yard steep incline as fast as you can. You will fatigue rapidly and won't make it very far. After running a short distance your legs will buckle, and you'll be gasping for air.

You've just exhausted most of the ATP and glycogen available. Rest and your body immediately begins to replenish ATP and glycogen. Wait long enough and you can perform the same activity again.

A properly organized interval running program will increase your muscles' ability to store more energy. Interval training will also improve the muscles' ability to recover more quickly.

On a different day instead of sprinting up the hill as fast as you can, jog slowly all the way to the top. You can make it to the top because the exercise intensity is lower and the majority of the fuel is coming from the aerobic energy system (oxygen). Your ability to utilize oxygen can be increased with aerobic training.

Below is a chart that illustrates approximately how long each system can provide this specific energy at high levels of intensity.

<u>System</u>	<u>Energy Available</u>	<u>Distance</u>
ATP-PC	0 to 10 seconds	0 - 100 yards
LA	11 to 60 seconds	100 - 400 yards
O₂ (aerobic)	12 minutes to unlimited	1 1/2 miles to ?

A specific running (exercise) regimen utilizing appropriate exercise time, intensity, and rest intervals is required to effectively develop each of these systems. Too often athletes pay little attention to appropriate exercise intensity and rest intervals. Specific guidelines have been established to ensure maximum benefits from your aerobic and anaerobic workouts.

Our Texans conditioning program is organized to develop the appropriate energy systems used to play the game. Our emphasis early in the off-season is the aerobic system. We make the transition to the anaerobic system in March. The energy used to play the game of football comes primarily from the ATP-PC system and the LA system. For this reason our running intervals never exceed 60 seconds, and continue to decrease in length as the off-season progresses.

There are literally hundreds of running programs that will adequately prepare you for the season. We have modified our program through the years to best meet your needs.

AEROBIC EXERCISE

The *aerobic system* is developed most effectively when the following criteria are met:

1. The activity is **continuous** and **rhythmical** in nature (running, jogging, rowing, life stepping, bicycling).
2. The activity involves **larger** muscle groups.
3. The activity is sustained for a minimum duration of **12** minutes.
4. The activity is performed at a level of **intensity** between **70% & 85%** of your maximum heart rate.

Heart rate is the key to aerobic training regardless of the activity you select. It can be running outside or on a treadmill, riding a bike, life stepping, rowing, or an aerobics class. If your heart rate is too low, little or no aerobic benefits will be obtained. If it's too high a different energy system is used.

Heart rate is determined by the intensity and pace of exercise, whether you are running, life stepping or biking.

To derive benefits aerobically, you must elevate your heart rate between **70% and 85%** of its capacity. We call this your "*aerobic training zone*." To maximize your aerobic workouts you must know the range of your aerobic training zone.

You will need the following information to calculate it:

- * **Age**
- * **Maximum heart rate or predicted maximum heart rate**
- * **70% of your maximum heart rate**
- * **85% of your maximum heart rate**

How to Predict Your Maximum Heart Rate

Your maximum heart rate (MHR) is the highest number of times your heart can beat per minute under the most stressful conditions. The only safe and accurate method to determine your maximum heart rate (MHR) is to take a graded stress test in a hospital or clinical setting.

Instead of a graded stress test you can use one of several formulas to predict your maximum heart rate (PMHR). There are several formulas you can use to predict how fast your heart is capable of beating.

Formula # 1: 220 – age (Dr. William Haskell & Dr. Samuel Fox 1970)

Example: 220

-25 = age

195 = Predicted maximum times heart will beat/minute.

X .85 = level of exercise intensity = 85%
166 = number of beats per minute to maintain 85% of PMHR

220

-25 = age

195

X.70 = level of exercise intensity = 70%

136 = number of beats per minute to maintain 70% of PMHR

From the above formula we have calculated the aerobic training zone for a 25- year old Texan football player. While exercising aerobically his heart rate should be kept between a low of 136 beats per minute and no higher than 166 beats per minute. Better aerobic results will be obtained by keeping the heart rate closer to 166 beats per minute.

Formula # 2: 208 - .7 times age (Dr. Douglas Seals 2001)

Example: Age = 25

25 = age

X .7

17.5

208

-17.5 = .7 x age

190.5 = Predicted maximum heart rate

X .85 = 85% of PMHR

162 = # of beats/minute to maintain 85% of maximum heart rate

Formula #3: Talk test.

Example: Can you carry on a conversation while you walk/jog/run?

- Walk = 1 mph to 5 mph (5 mph = 12 minute/mile pace).
- Jog = 5 mph to 7.5 mph (7.5 mph = 8 minute mile pace).
- Run = 7.5 mph to 10 mph (10 mph = 6 minute mile pace).
- Sprint = 10 mph and above

INTERVAL TRAINING

The anaerobic system is most effectively developed when the following criteria are met:

1. The **duration** of exercise is from **1 - 60** seconds
2. The **rest** between each interval is **adequate** to allow the heart rate to drop and replenish the supply of ATP and glycogen
 - A. When using time to recover: use **2 1/2 to 4 times the running time** to rest between intervals
 - B. When using recovery heart rate you must allow enough time for the heart rate to drop before running the next interval:
 - a. age: **20 - 29** yrs. old = **150** heartbeats
 - b. age: **30 - 39** yrs. old = **140** heartbeats
3. The exercise performed is **intense** enough to elevate the heart rate to **90% - 100%** of your maximum

Interval work is the most effective exercise to develop the anaerobic system. The exercise prescription for an interval workout must include the following:

- ***Time to complete interval.**
- ***Rest between intervals.**
- ***Number of reps performed.**

Monitor the above information every time you run. If you don't you may not improve from your last workout.

For example, while running 200's on the treadmill, you will run for 30 seconds. We use 2 1/2 times the running time to recover during this workout. Therefore you'll rest for one minute and fifteen seconds (2 1/2 x 30 seconds = 1 minute and 15 seconds) and then begin your next interval.

During each workout we time every interval as well as the recovery time between reps. The distance you cover is not the key to developing the proper energy system. It's the intensity of exercise and the amount of time to complete the exercise that is the key.

We've inherited many running programs from track coaches. Many of these programs were designed for athletes running a specific distance. Many had similar body types. Your needs as a football player are to condition the specific energy systems used to play football. Time and intensity of exercise is the key, not the distance you run.

For example, today's workout is to run six 440's (440 yards). Our 180-pound wide receiver runs his first 440 in 60 seconds and his last 440 in 72 seconds. Our 320-pound lineman runs his first 440 in 1 minute 40 seconds, and his last 440 in 2 minutes 45 seconds.

The distance run by both players is the same. Yet the amount of energy, and the source of energy used by the two are different. To most effectively develop the same energy systems, both players should exercise for the same period of time. The intensity level should also be similar. If 60 seconds is the appropriate time you've selected, both players should run for 60 seconds. The lineman will cover less distance, but the same energy systems will be developed.

For any distance greater than 110 yards we use time and intensity (not the distance run) as a guideline to develop the appropriate energy system.

Warming up before running.

Appropriate warm-up activities are always performed before beginning more intense interval work. We utilize a series of hurdle exercises to actively stretch and warm up. These are great exercises to warm up the hamstrings and the muscles surrounding the hips. We elevate the height of the hurdles each week during the off-season.

We move from the hurdles to a series of movements on the quick foot ladder. We use the ladder to make the transition to quicker moving activities (we do not use the ladder to improve foot speed). These activities help prepare the muscles for our interval run of the day.

Each workout listed below is designed to develop the ATP-PC system and the LA system.

The following are the standard Texans interval routines we use and a brief description of each:

400's

This workout can be performed running outside, on a treadmill, or on a stationary bike. The description below provides the guidelines we use to run 400's on our treadmills.

Treadmill Workout

Equipment used: Woodway treadmills

Exercise time: 60 seconds

Rest interval: 2 minutes 30 seconds

Speed: determined by your fitness level

Number of reps: 6

Volume of work: 1764 yards at 10 mph, 2640 yards at 15 mph

Your current fitness level will determine the treadmill speed. **For safety**, the fastest speed we recommend is 15 mph. At this point we begin increasing the elevation (2% grade) instead of the speed. Run for 60 seconds and dismount the treadmill. The rest interval is 2 minutes 30 seconds. We use 2 1/2 times the running time for recovery. Be prepared to get back on the treadmill at the end of the rest interval. Continue this process until you have finished six reps. Cool down at 3 mph for three minutes.

When you can complete all six at the same speed, increase the speed of the treadmill by 1/2 mph the next time you run 400's. This workout will take approximately 17 minutes to complete.

200's

This workout can be performed running outside, running on a treadmill, or riding a stationary bike. Below is a description of how we run 200's on our treadmills.

Treadmill workout

Equipment used: Woodway treadmill

Exercise time: 30 seconds

Rest interval: 1 minute 15 seconds

Speed: determined by your fitness level

Grade: determined by your fitness level

Number of reps: 10

Volume of work: 1500 yards. (at 10 mph) to 2000 yards (at 15 mph)

Your current fitness level will determine the treadmill speed. Run for 30 seconds and dismount the treadmill. The rest interval is 1 minute and 15 seconds. We use 2 1/2 times the running time for recovery. Be prepared to get back on the treadmill and begin running at the end of the rest interval. Continue this process until you have finished 10 reps. Cool down at 3 mph for three minutes.

When you can complete ten reps at the same speed, increase the speed of the treadmill by 1/2 mph the next time you run 200's. **For safety**, the fastest speed we recommend is 15 mph. At that point we begin increasing the elevation instead of the speed. This workout will take approximately 17 minutes to complete.

Below is a description of how we perform **200's** on a **stationary bike**.

Stationary bike workout

Equipment used: Life Fitness Stationary Bike

Exercise time: 30 seconds

Rest interval: 1 minute and 15 seconds

Work level: Level 12 (use lower level if you're unable to complete 10 reps)

RPM's: 130 - 140

Number of reps: 10

Begin pedaling slowly and touch **START**. Next touch **MANUAL**, followed by touching **LEVEL**. Enter **LEVEL 12** and immediately begin pedaling rapidly until your RPM's reach at least 130. Continue pedaling for 30 seconds keeping your RPM's between 130 and 140. Stop pedaling and rest for 1 minute and 15 seconds. Continue this sequence until you have finished ten reps. Cool down for three minutes. This workout will take approximately 17 minutes to complete.

Hills on the Mills

Equipment used: Woodway Treadmills

Exercise time: 15 seconds

Speed: fast sprint

Grade: 25%

Rest interval: 1 minute 30 seconds

Number of reps: 10

Elevate the treadmill to 25% grade and remove the magnet from control panel. This will allow the running deck to rotate freely. Mount the treadmill with your legs straddling the running deck. Step on the deck and beginning sprinting while holding on to the front handrail. Sprint for 15 seconds and dismount. Rest for 1 minute - 30 seconds and continue this procedure until you have completed ten reps. Cool down.

If you do not have a Woodway treadmill, elevate your treadmill to 25% grade and adjust the speed to a level that allows you to safely sprint for 15 seconds. When you can complete ten reps using the above protocol, increase the speed by 1/2 mph the next time you run Hills on the Mills.

110's

Equipment used: football field

Exercise time: OL, DL = 19-18 sec., TE, LB, QB, RB = 17-16 sec., WR, DB = 15-14 sec.

Rest interval: 45 seconds

Number of reps: OL, DL = 8-10 reps, all others 10-12 reps

Volume of work: 1110 yards - 1350 yards

During this workout you will run one set of 110-yard sprints. From a stance, sprint 110 yards. After crossing the finish line coast ten yards and turn around. The rest interval begins as soon as you cross the finish line. Rest 45 seconds and again sprint 110

yards. After crossing the finish line coast ten yards and turn around. Continue this procedure until you have completed ten 110-yard sprints.

Conditioning 40's

Equipment used: football field

Exercise time: OL, DL = 6.1-6.0 sec., TE, LB, QB, RB = 5.5-5.4 sec., DB, WR = 4.9-5.0 sec.

Rest Interval: 35 sec.

Number of reps: 14

Volume of work: 560 yards

During this workout you will run one set of 40-yard sprints. From a stance sprint 40 yards, then coast 40-yards and turn around. The rest interval begins as soon as you cross the finish line. At the end of the rest interval again sprint 40 yards, and then coast 40 yards. Continue this procedure until you have completed 14 x 40-yard sprints.

2 Sets of 40's

Equipment used: football field

Exercise time: OL, DL = 6.1 sec., LB, TE, QB, RB = 5.5, WR, DB = 5.0 sec.

Rest interval between reps: 30 sec. (April/May), 25 sec. (June/July)

Rest interval between sets: 5 minutes

Number of reps: 10 (April/May), 12 reps (June/July)

Volume of work: 800 yards

During this workout you will run two sets of 40-yard sprints. From a stance, sprint 40 yards, then coast 20 yards and turn around. The rest interval begins as soon as you cross the finish line. At the end of the rest interval again sprint 40 yards, and then coast 20 yards. Continue this procedure until you have completed 12 40-yard sprints. Rest 5 minutes and repeat the above protocol.

2 Sets of 20's

Equipment used: football field

Exercise time: OL, DL = 2.95 secs., TE, LB, QB, RB = 2.85 sec., WR, DB = 2.7 sec.

Rest interval between reps: 20 seconds (April/May), 15 seconds (June/July)

Rest interval between sets: 5 minutes

Number of reps: 16

Volume of work: 640 yards

During this workout you will run two sets of 20-yard sprints. From a stance sprint 20 yards, then coast ten yards and turn around. The rest interval begins as soon as you cross the finish line. At the end of the rest interval, again sprint 20 yards, and then coast ten yards. Continue this procedure until you have completed 16 x 20-yard sprints. Rest 5 minutes and repeat the above protocol.

UPBACKS

Equipment used: football field, gymnasium

Exercise time: OL, DL = 17-18 sec., TE, LB, QB, TE = 15-16 sec., WR, DB = 13-14 sec.

Rest interval between reps: 45 seconds

Number of reps: 12

Volume of work: 720 yards

During this workout you will perform three different movements. They include running forward and backpedaling, carioca, and the lateral shuffle.

REP # 1

From a standing position, **sprint forward** five yards, touch the line and **backpedal** 5 yards. Immediately sprint forward ten yards, touch the line and backpedal ten yards. To finish rep number one, again sprint forward 15 yards, touch the line and backpedal 15 yards. You've just completed 60 yards of running forward and backward. Rest 45 seconds and begin rep number two.

REP # 2

Use the same protocol outlined above while performing the **carioca**. Rest 45 seconds and begin rep number three.

REP # 3

Use the same protocol outlined above while performing the **lateral shuffle**.

Repeat reps 1, 2, and 3 (4 times), until a total of 12 reps have been performed.

30-YARD SHORT SHUTTLE

Equipment Used: 20 yard running area

Exercise time: max effort

Rest interval between reps: 25-20 seconds

Rest interval between sets: 5 minutes

Number of reps: 2 sets of ten reps

Volume of work: 600 yards

During this workout you will run 2 sets of 30-yard shuttles. From the 5-yard line, sprint 5 yards to the 10-yard line and touch the line with your foot. Immediately change direction and sprint 10 yards back to the goal line. Change direction and sprint 15 yards through the 15-yard line, completing the 30-yard shuttle. Perform 10 reps and rest 5 minutes and repeat ten more reps.

THE LADDER

Equipment Used: football field

Rest interval: 60 seconds after the first rep, decrease 5 seconds from the rest

interval after each rep (55, 50, 45, etc.)
Volume of work: 1100 yards

During this workout, sprint from one goal line to the other and return (200 yards). Rest 60 seconds and sprint from the goal line to the far 10-yard line (90 yards) and return (total of 180 yards). Rest 55 seconds and sprint to the far 20-yard line (80 yards) and return (total of 160 yards). Rest 50 seconds and sprint to the far 30-yard line (70 yards) and return (total of 140 yards).

Continue this same protocol to the 40 yard line, the 50 yard line, the near 40, 30, 20, and finish the Ladder by sprinting from the goal line to the 10 yard line (10 yards), touch the line with your foot and return by sprinting through the goal line (total of 20 yards).

Specificity of Conditioning

Specificity of conditioning is a term we use to describe the specific adaptations that take place physically from an exercise or activity. This process affects all systems in the body. Riding a stationary bike develops a degree of aerobic and muscular fitness that is specific to riding a stationary bike. There will be some aerobic and muscular benefits that carry over from riding the bike to other activities.

However, the specific adaptations that come from running can only be developed by the actual act of running.

Conditioning is very specific. The demands of the muscular system while running a series of sprints straight ahead is different than while running a pass route in full pads. The same is true for the specific demands of each position.

The running you do in the off-season is designed to get you in good enough shape to go to summer camp. **The only way to develop the exact level of conditioning needed to play the game of football is actually play the game of football.**

At camp you will practice and play the game of football. These are new demands on each of the specific conditioning systems used to play the game. The demands in pads while practicing are different than those used to run during the off-season. During your first practice you'll take your groin and hamstring muscles through a new range of motion. This will cause new muscle soreness regardless of how much running and stretching you've done in the off-season. After a few days the body will begin to adapt to the new activities and ranges of motion you take your muscles through under practice conditions.

At the end of the first week you will scrimmage another team. Things will happen faster on the field and a new level of intensity will be reached. You will fatigue more quickly than you did during practice. Your energy systems will be forced to adapt to the new demands.

A higher intensity level will be experienced during the first preseason game and again during the first regular season game. Most players feel by the third regular season game that each system in the body has adapted (excluding severe weather).

You can't match the specific demands of a 14-play drive during a game until you actually do it. Your neck muscles will only adapt to carrying the weight of your helmet by actually practicing in your helmet. You can't recreate a specific demand on the muscular system until you actually engage in that specific activity.

Skilled patterned running is the next best activity. It is an “*attempt*” to duplicate some of the position specific patterns (not the exact skills) you perform on the field. Skilled pattern running facilitates the transition from running in a straight line (while conditioning) to performing the physical demands of your position.

You will spend a significant amount of time in summer camp and during the season practicing the game of football. Sooner or later you will adapt. Skilled pattern running is a conditioning option. The time to perform skill pattern running is approximately a week before mini-camp, summer camp, or returning from an injury. Unless it is performed all out in pads there will be another adjustment once you put the pads on and compete against another player.

Summer camp is long enough to establish all of the specific skill patterns you use at your position. However if you're interested in running skilled patterns at any time use the guidelines outlined below. It can be a welcomed diversion from the more traditional straight-line conditioning utilized in most running programs.

Skilled Pattern Running

Equipment Used: football field

Exercise time: time used to complete one pattern

Rest interval: time used to jog back to the starting position

Number of reps: 10

Rest between sets: 3 – 5 minutes

One of the most effective means of preparing the neuromuscular system for summer camp is to perform **skilled pattern running**. Two significant benefits can be obtained from this. First, you begin to familiarize the neuromuscular system with the position specific drills you will use when you report to camp. Second, it can be used as a conditioning tool for the heart and lungs, as well as your muscular system. Begin skilled pattern running approximately one week before reporting to summer camp.

We've organized a series of position specific skill patterns into a series of **ten** different routes. From a designated **starting point** perform the first skill pattern **all out** and slowly **jog** back to the starting point. Immediately perform the second skill pattern and again jog back to the starting point. Continue this process until **each** of the ten skill patterns has been executed.

This completes the **first set** of your skilled pattern running. Perform **three to five** sets of ten different skill patterns. The **rest interval** between each set will be dependent upon your fitness level. A minimum of 3 minutes to a maximum of 5 minutes recovery time should be allowed between sets. **Perform each pattern all out** and pay attention to detail regarding any specific techniques emphasized by your position coach.

You can run the patterns with a partner. Run the ten patterns and have your partner announce each pattern to you as you jog back to the starting point. When all ten patterns are completed, rotate positions. You rest when your partner runs his skill patterns.

Another method is to have several players run the skill patterns in succession. The first player runs a skill pattern. While he jogs back to the starting position a second, third, and fourth player can immediately run the pattern in succession.

A **skilled pattern tree** and brief description of each pattern is provided for your use.

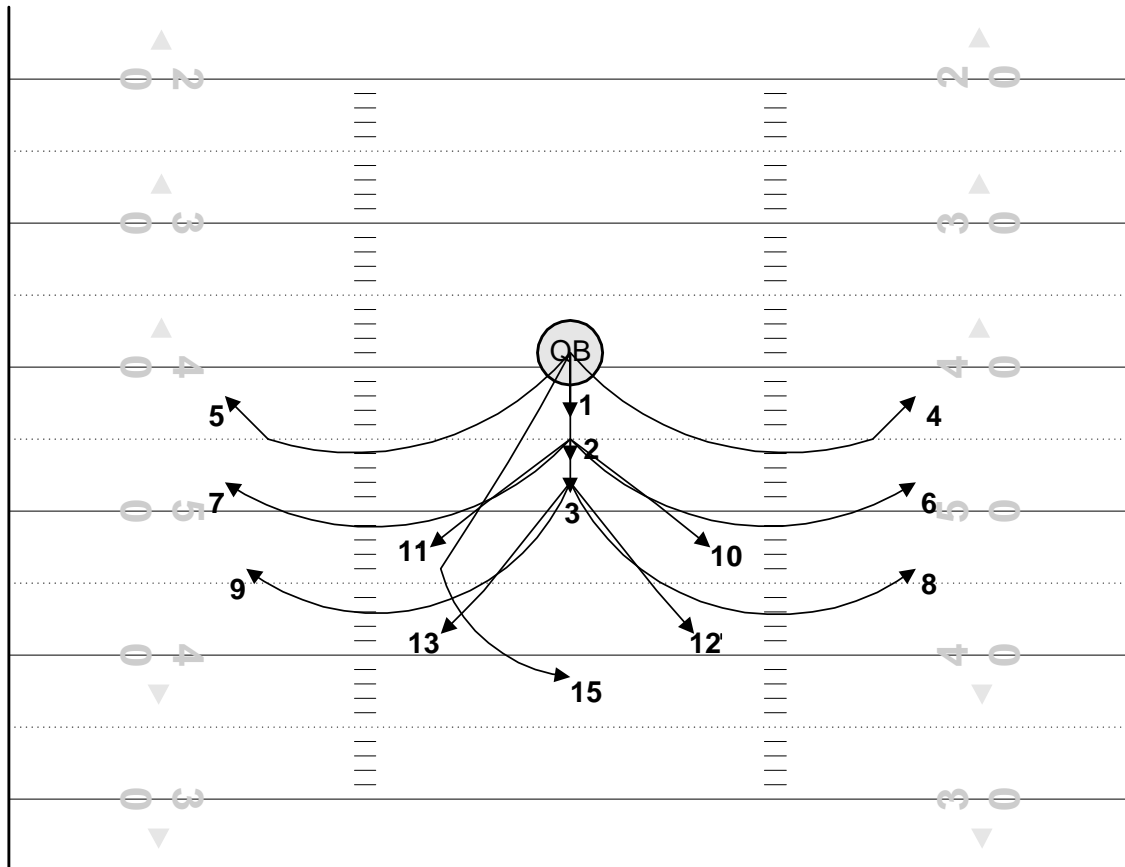
QUARTERBACK SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. 3 step plant	1 big - 2 little (approx. 4 yards), set and sprint back to start
2. 5 step plant	3 big - 2 little (approx. 5-6 yards) set and sprint back to start
3. 7 step plant	3 big - 4 little (approx. 8.5 yards) set and sprint back to start
4. sprint right	angle to ten yards deep
5. sprint left	angle to ten yards deep
6. 5 step escape right	3 big - 2 little (approximately 5-6 yards) escape right
7. 5 step escape left	3 big - 2 little (approximately 5-6 yards) escape left
8. 7 step escape right	3 big - 4 little (approximately 8.5 yards) escape right
9. 7 step escape left	3 big - 4 little (approximately 8.5 yards) escape left
10. 5 step hitch/shuffle right	3 big - 2 little (approximately 5-6 yards) with hitch/shuffle rt.
11. 5 step hitch/shuffle left	3 big - 2 little (approximately 5-6 yards) with hitch/shuffle lft.
12. 7 step hitch/shuffle right	3 big - 4 little (approximately 8.5 yards) with hitch/shuffle rt.
13. 7 step hitch/shuffle left	3 big - 4 little (approximately 8.5 yards) with hitch/shuffle lft.
14. naked boot right	start left, peel and go right
15. naked boot left	start right, peel and go left
16. 40 Yd. sprint	from start sprint 40 yards.

Skill Set #1: 1,4,5,3,12,13,14,15,2,16

Skill Set #2: 6,7,8,9,3,10,11,2,14,16

Skill Set #3: 3,12,13,5,8,9,2,15,6,16



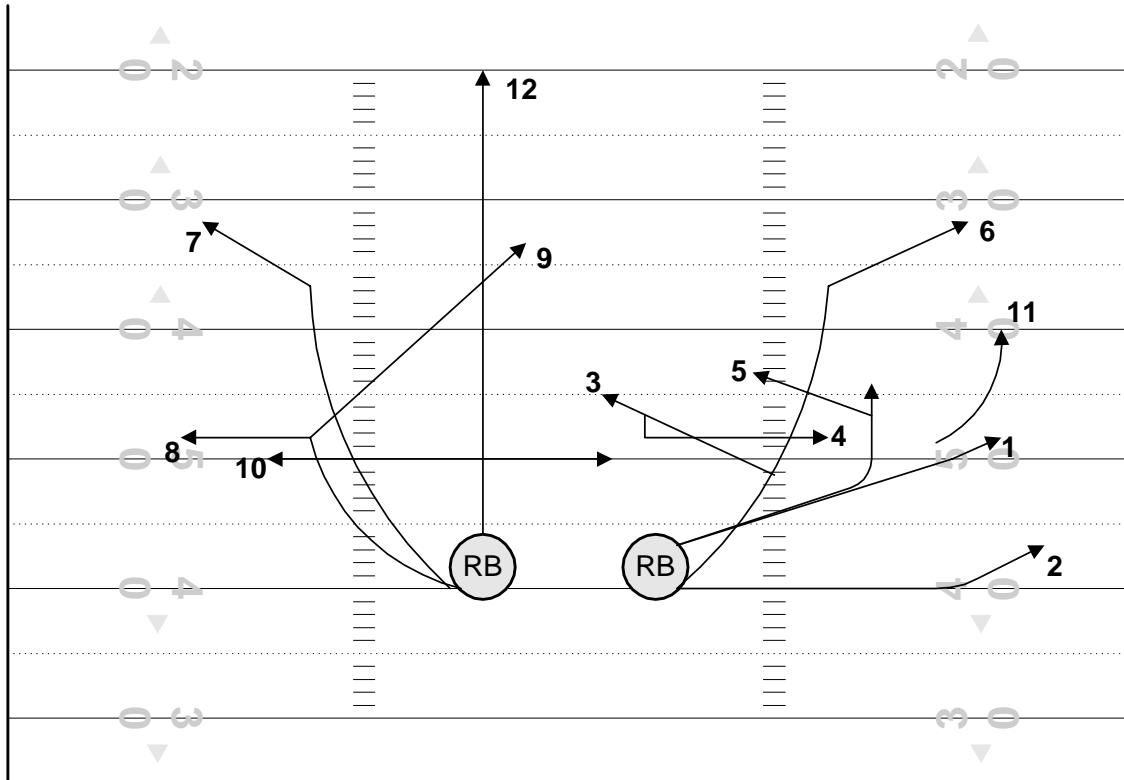
RUNNING BACK SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. flat	veer to the right 2 yards deep - sprint ten yards downfield
2. swing	flare to the right - sprint ten yards downfield
3. cross	2 yds. past TE plant outside foot & flat angle inside - sprint 10 yds.
4. fake cross	same as cross step inside, pivot out parallel - sprint 10 yards
5. post	release 3-4 yds. outside TE, speed cutoff outside - sprint 10 yards
6. corner right	release outside TE, sprint 10 yds., speed cut 14 yds. deep
7. corner left	mirror pattern 6 to the left
8. option man	veer to left 5 yds. downfield, hard break left - turn upfield 10 yards
9. option zone	veer to left 5 yds. downfield, hook inside - turn upfield 10 yards
10. sneak zone	split center/guard 1-2 yards & break left over TE - turn upfield 10 yds.
11. shoot	same as flat pattern, turn upfield halfway between #'s and sideline - turn upfield
12. 40 yd. sprint	sprint 40 yds. from LOS

Skill Set #1: 2,7,9,4,11,6,3,8,5,12

Skill Set #2: 5,8,3,12,9,1,4,7,10,6

Skill Set #3: 1,9,6,10,7,8,2,4,11,3



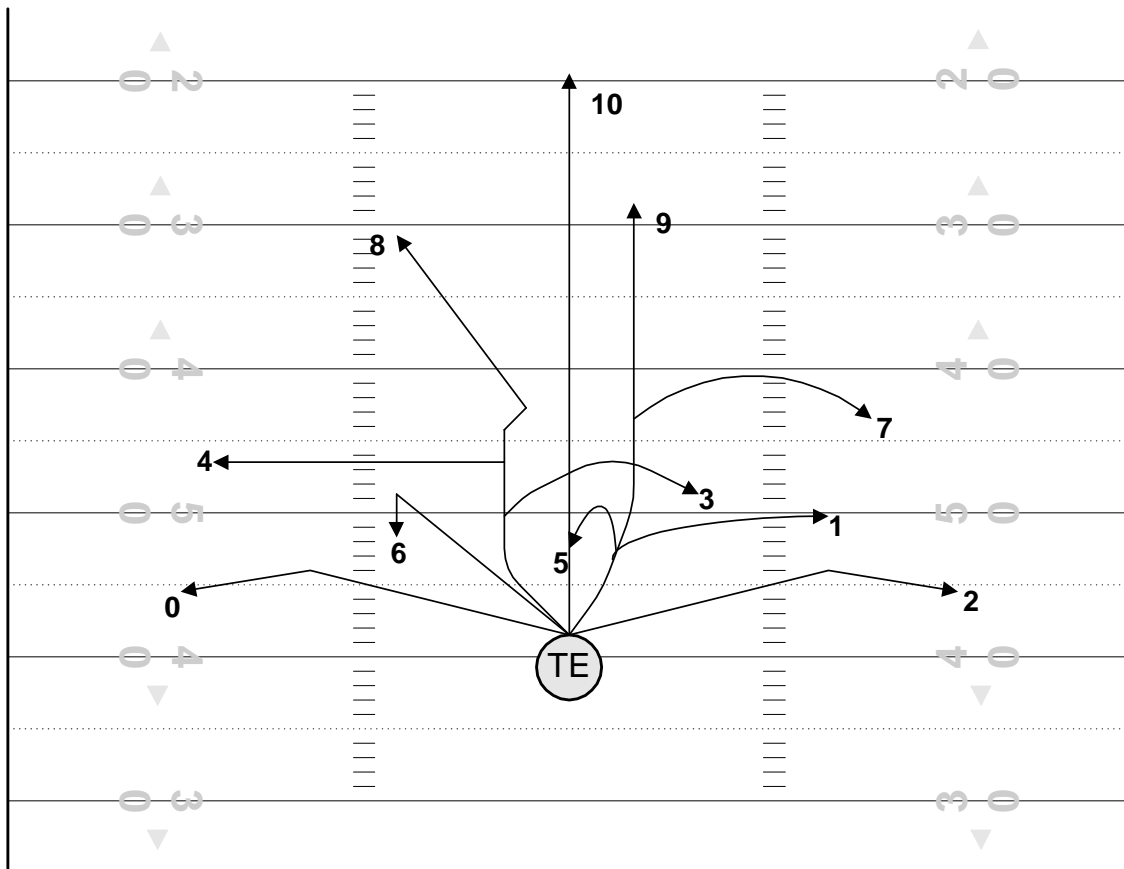
TIGHT END SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
0. 0 route	6 - 8 yard crossing route
1. 1 route	arc release upfield speed out at 5 yards
2. 2 route	6 - 8 yard crossing route (same as "0" route)
3. 3 route	inside release upfield speed out at 8 yards
4. 4 route	inside release upfield 10 - 12 yards in
5. 5 route	outside release upfield toward numbers - curl in at 5 yards
6. 6 route	inside release upfield - middle curl at 8 - 10 yards
7. 7 route	outside release upfield - corner route at 14 - 17 yards
8. 8 route	inside release upfield 12 - 14 yards, post.
9. 9 route	outside release, streak pattern
10. 10 route	40 yard sprint

Skill Set #1: 8,0,1,2,7,3,6,4,5,10

Skill Set #2: 2,8,3,1,5,7,0,9,6,10

Skill Set #3: 7,3,0,4,9,8,2,1,5,10



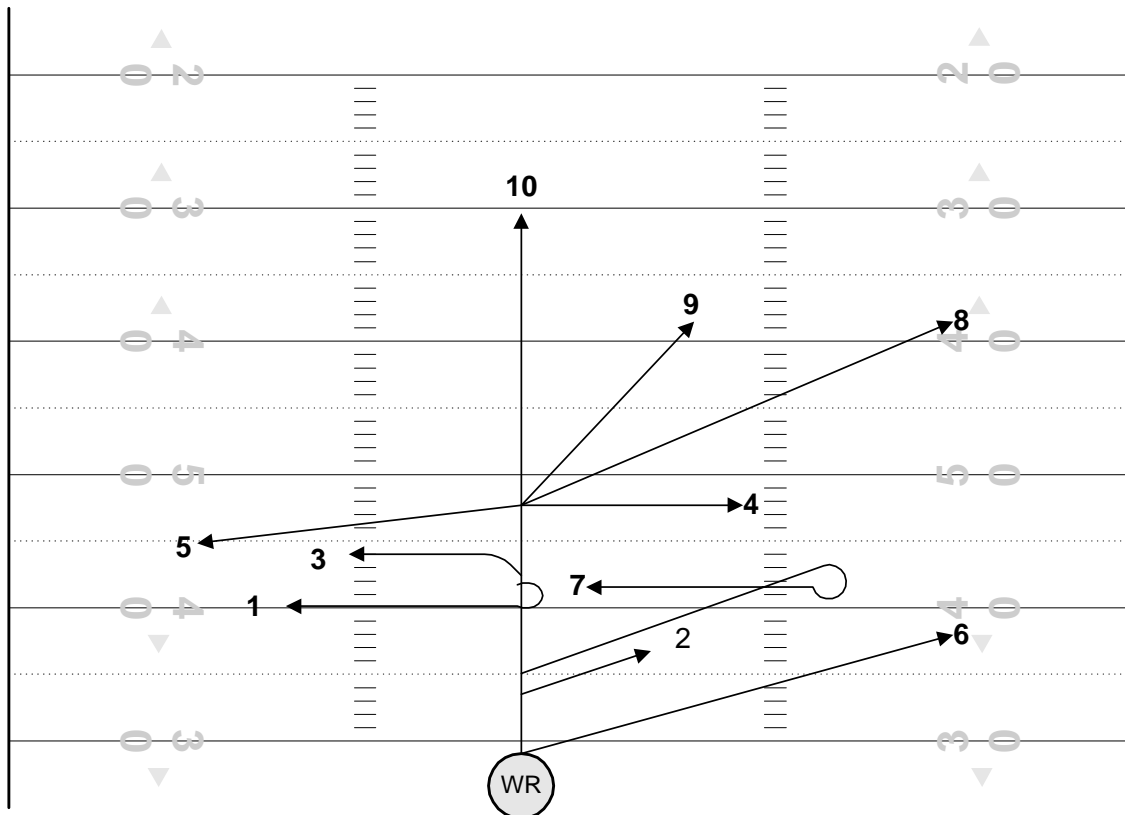
WIDE RECEIVERS SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. 0 pivot	push hard up the field 12 yds. curl inside and out to sideline
2. 2 route	burst for 3 yds. break hard to middle post
3. 3 route	push hard up field 12 yds. break outside to sideline
4. 4 route	push hard up field 18 yds. break inside across middle
5. 5 route	run up the field for 18 yds. break outside and back
6. shallow cross	hard release inside and across the middle
7. cross pivot	start a shallow cross pattern, stop and pivot back toward the sideline
8. opp. flaf	sprint 18 yds. break hard across the field toward the flag
9. post	sprint 18 yds. bread hard across the field toward the post
10. 40 yd sprint	from start sprint 40 yards

Skill Set #1: 3,1,2,9,7,4,8,5,6,10

Skill Set #2: 7,4,1,2,9,3,5,6,8,10

Skill Set #3: 9,5,8,6,1,7,2,3,4,10



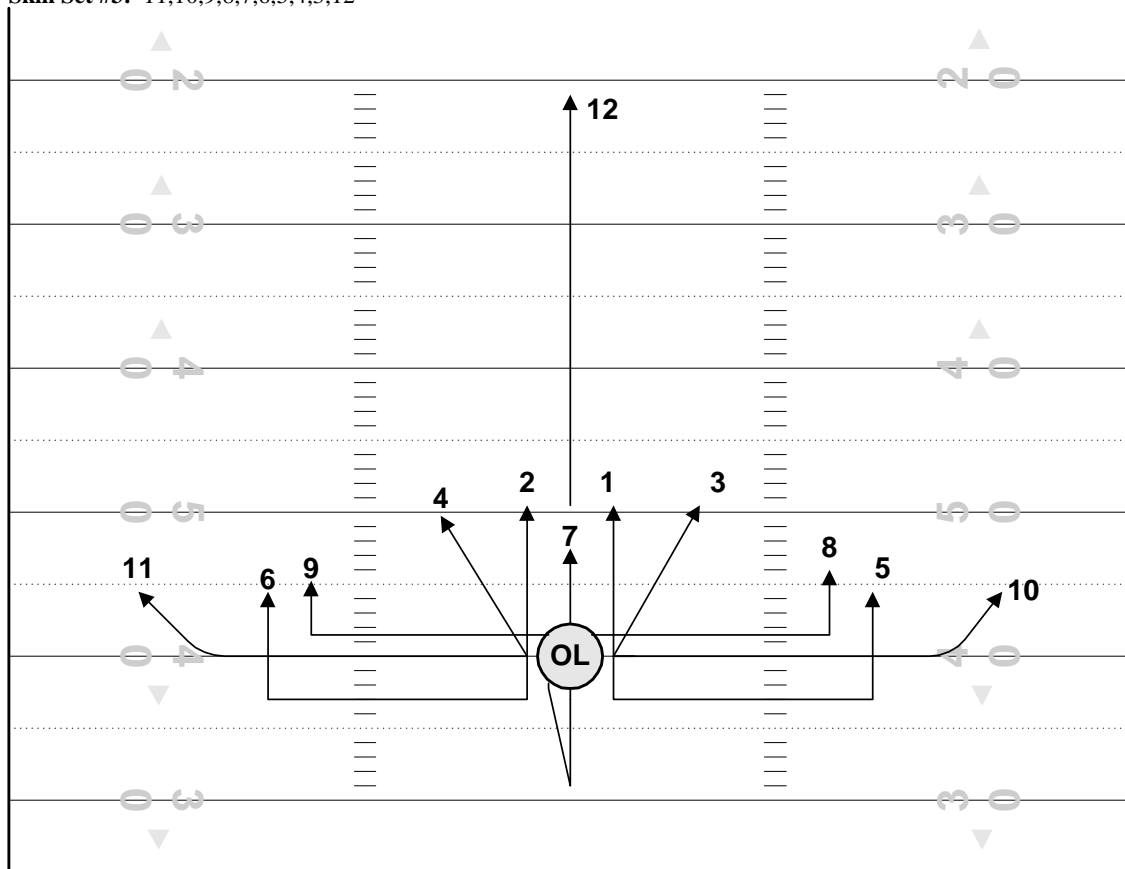
OFFENSIVE LINE SKILL PATTERNS

	<u>PATTERN</u>	<u>DESCRIPTION</u>
1.	sprint 10 yards	sprint straight ahead 10 yards start pushing off <u>left</u> foot
2.	sprint 10 yards	sprint straight ahead 10 yards start pushing off <u>right</u> foot
3.	45 degree start	45 degree angle start pushing off <u>left</u> foot with 2nd step at 45 and sprint upfield 10 yards
4.	45 degree start	same as above but start pushing off <u>right</u> foot
5.	pull right	pull right with 1st step a drop step with right foot & whip right arm - off right foot and sprint parallel to L.O.S. 10 yds & turn upfield 5 yards
6.	pull left	same as above but pull left and whip left arm
7.	pass set	take pass set off ball (7 steps) and sprint 10 yards upfield
8.	pass set	take pass set at L.O.S. & hold for a count of 1001, 1002, then sprint the L.O.S. 10 yards to the right and upfield 5 yards
9.	pass set	same as above but to the left
10.	sweep drill rt	lose 1 1/2 yards initially then turn upfield and block outside support
11.	sweep drill lt	lose 1 1/2 yards initially then turn upfield and block outside support
12.	sprint 40 yards	

Skill Set #1: 1,2,3,4,5,6,7,8,9,12

Skill Set #2: 5,6,7,8,9,10,11,3,4,12

Skill Set #3: 11,10,9,8,7,6,5,4,3,12



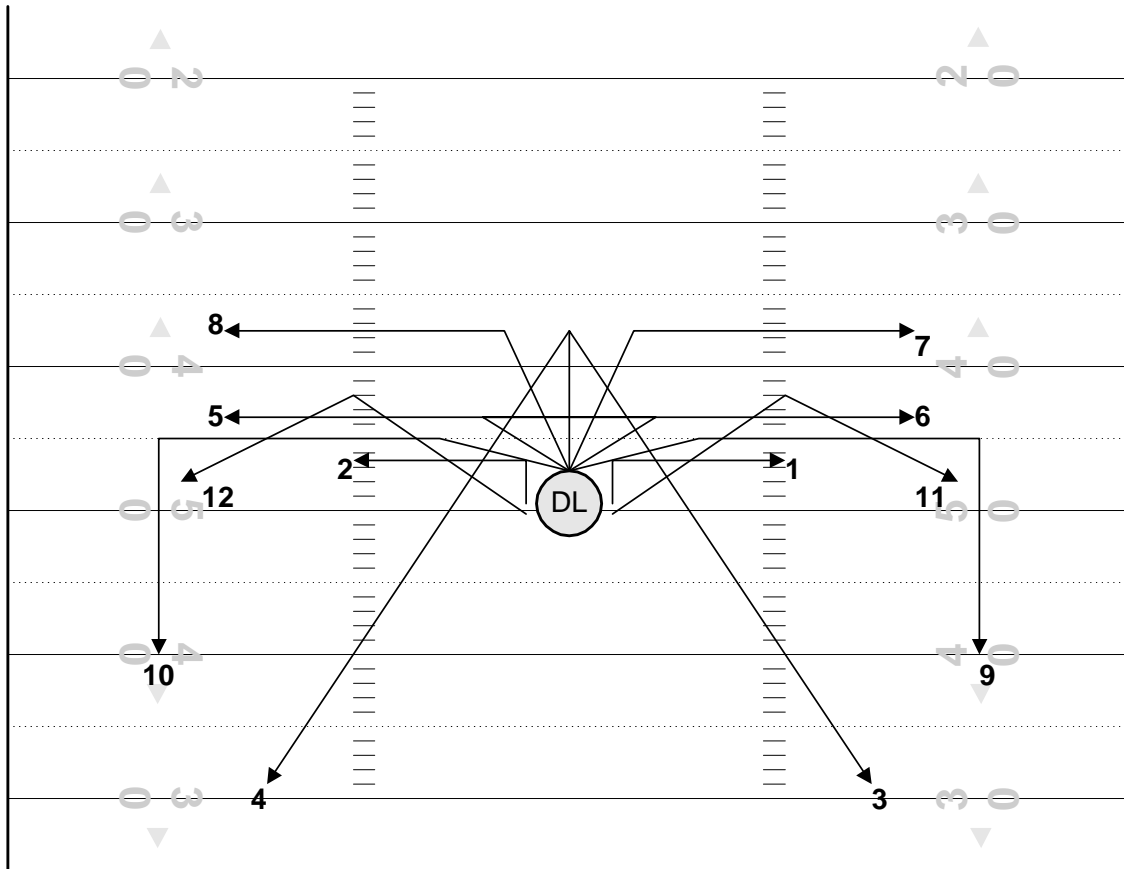
DEFENSIVE LINE SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. pursuit rt	downline pursuit 10 yards to the right
2. pursuit lt	downline pursuit 10 yards to the left
3. rush QB rt	rush the QB right turn and go to the ball 20 yards downfield
4. rush QB lt	rush the QB left turn and go to the ball 20 yards downfield
5. angle rt break lt	off the ball to the right 5 yards break left 15 yards
6. angle lt break rt	off the ball to the left 5 yards break right 15 yards
7. angle rt break rt	off the ball to the right 5 yards break right 15 yards
8. angle lt break lt	off the ball to the left 5 yards break left 15 yards
9. backside chase rt	chase the ball 10 yards right and downfield 15 yards
10. backside chase lt	chase the ball 10 yards left and downfield 15 yards
11. screen rt	screen right 15 yards
12. screen left	screen left 15 yards

Skill Set #1: 1,2,5,6,8,7,9,10,11,12

Skill Set #2: 3,4,7,8,11,12,5,6,2,1

Skill Set #3: 11,12,2,9,1,3,4,7,8,5



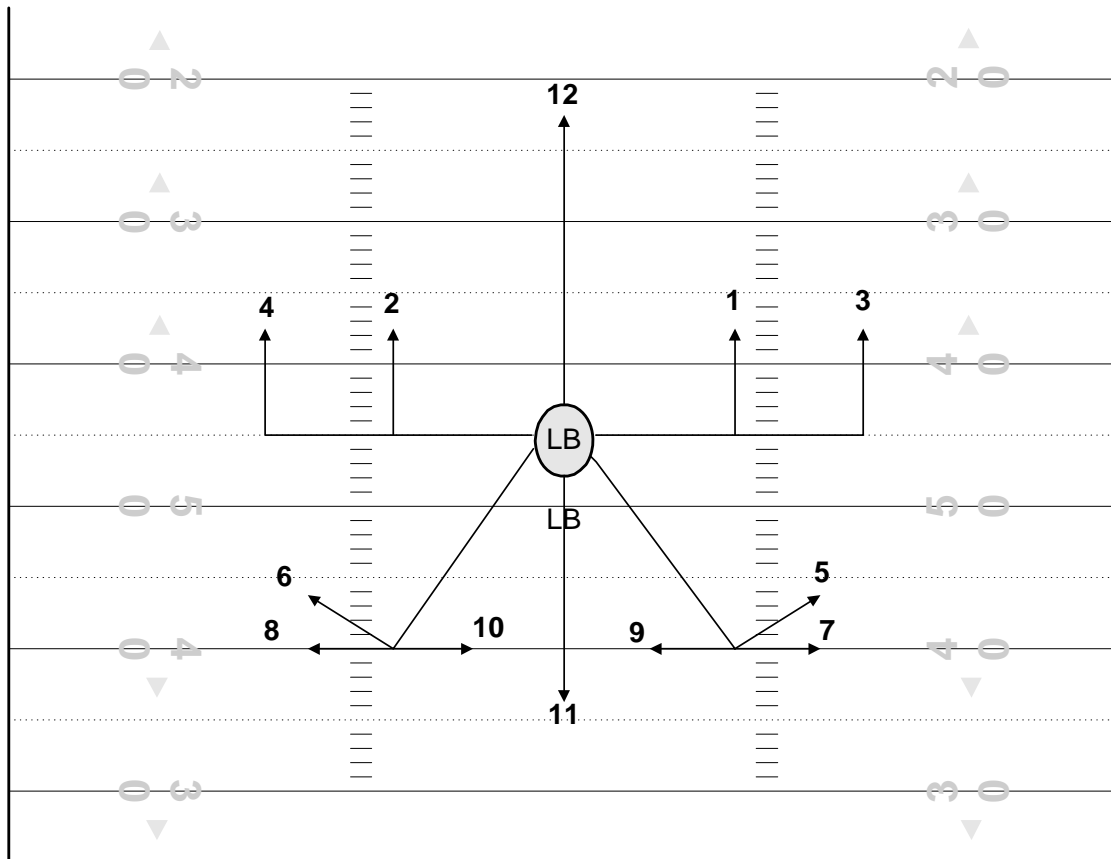
LINEBACKER SKILLED PATTERN RUNNING

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. shuffle right	6 shuffles right 5 yards up
2. shuffle left	6 shuffles left 5 yards up
3. lateral run right	6 step lateral run right 5 yards up
4. lateral run left	6 step lateral run left 5 yards up
5. drop 12 right	drop 12 yards right 7 yards up
6. drop 12 left	drop 12 yards left 7 yards up
7. drop 12 right	drop 12 yards right 10 yards out
8. drop 12 left	drop 12 yards left 10 yards out
9. drop 12 right	drop 12 yards right 10 yards in
10. drop 12 left	drop 12 yards left 10 yards in
11. lateral drop 15 right	lateral run drop right 15 yards
12. sprint 40 yards	

Skill Set #1: 1,2,7,8,4,3,11,12,9,10

Skill Set #2: 3,4,7,8,9,10,5,6,1,12

Skill Set #3: 4,8,1,2,11,12,5,3,9,10



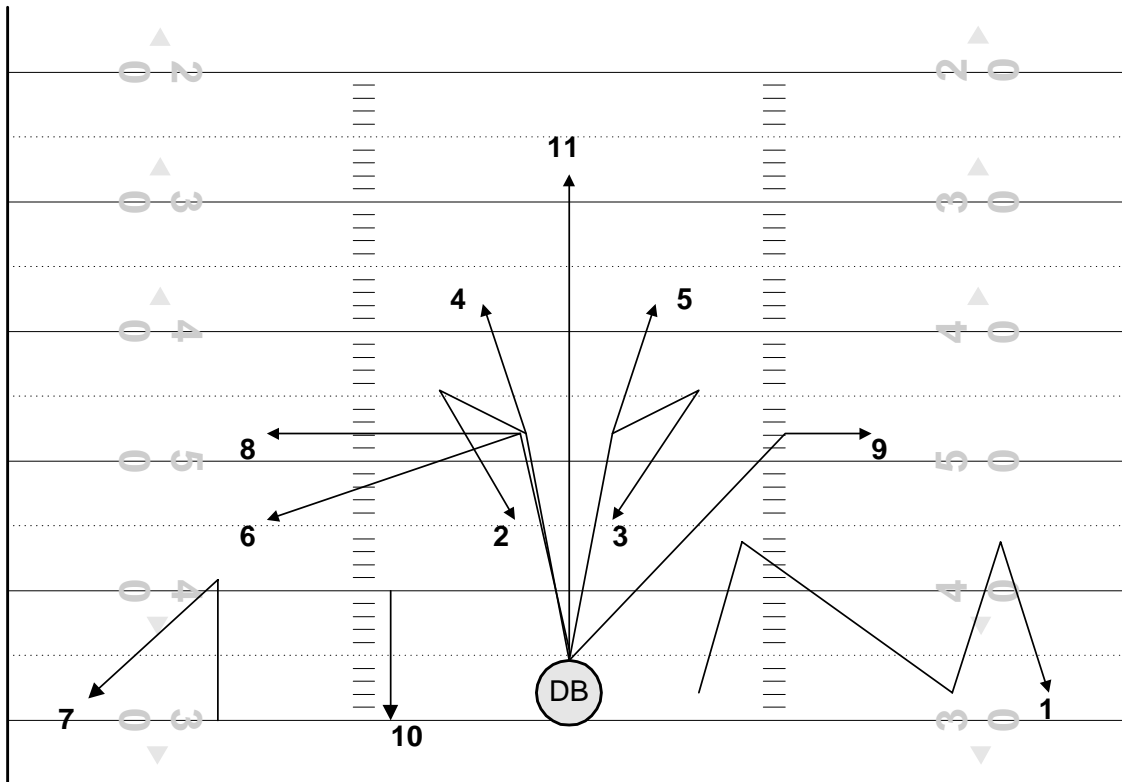
DEFENSIVE BACKFIELD SKILL PATTERNS

<u>PATTERN</u>	<u>DESCRIPTION</u>
1. W drill 7 yds.	backpedal 7 yards change direction 7 yards two times
2. triangle rt	backpedal 10 yards break right 10 and sprint back to start
3. triangle lt	backpedal 10 yards break left 10 and sprint back to start
4. speed turn rt	back pedal 10 yards and speed turn to the right and sprint 10 yards
5. speed turn left	backpedal 10 yards and speed turn left
6. backpedal 45 rt	backpedal 10 yards and break at a 45 degree angle right 5 yards
7. backpedal 45 lt	backpedal 10 yards and break at a 45 degree angle left 5 yards
8. backpedal 90 rt	backpedal 10 yards and break at a 90 degree angle right 5 yards
9. backpedal 90 lt	backpedal 10 yards and break at a 90 degree angle left 5 yards
10. up back 10	backpedal 10 yards and return forward 10 yards
11. backpedal sprint 40	backpedal 10 yards turn and sprint 30

Skill Set #1: 1,2,3,4,5,6,7,8,9,10,11

Skill Set #2: 6,7,8,9,10,2,3,4,5,11

Skill Set #3: 10,9,8,7,6,5,4,3,2,11



KEY POINTS TO REMEMBER

- 1. The aerobic system draws its energy from oxygen.**
- 2. The anaerobic system draws its energy from ATP and glycogen.**
- 3. Sustained aerobic exercise most effectively develops the aerobic system.**
- 4. Interval exercise most effectively develops the anaerobic system.**
- 5. Your heart rate is the key to your training.**
- 6. Your aerobic training zone is between 70% and 85% of your maximum heart rate.**
- 7. Time and intensity of exercise is the key, not the distance covered.**
- 8. While performing interval work use 2 1/2 - 4 times the running time to rest between intervals.**
- 9. The quality of exercise is the key to your running workouts, not the quantity.**

SPEED & QUICKNESS TRAINING

Speed development is the third component of your fitness profile. You've heard the term "**speed kills.**" A more appropriate term for an athlete should be, "**specific sport speed kills.**" For a football player the term should read, "**position specific football speed kills.**"

Too much emphasis is placed upon running in a straight line (40-yard sprint). The speed to play the game of football is specific to the demands of each position (football speed). Football speed is the key to your success not straight-line track speed. Some athletes run fast in a straight line but do not possess the abilities to quickly change direction.

Your goal is to develop the specific speed and quickness you use to play your position, and a level of conditioning to sustain that speed and quickness during a game.

Speed and quickness are abilities you inherit from your genetic pool. There are specific physical and neurological assets you must possess to run fast. These are factors you have no control over.

You can't develop more speed than your genetic potential will allow. Why is it that an elementary school student can sprint faster than anyone in his school? He's had no special training or coaching. He's in no better shape than the other kids.

Invest your training time wisely. Do not invest too much time developing speed for a specific event (40-yard sprint). You are not a track athlete. **Your level of conditioning to maintain football speed and quickness during a game is more important than your ability to run 40 yards in a straight line.**

Speed Gadgets

There are no magical potions, gadgets, or exercises that will miraculously increase your speed. Increases in speed are often obtained in spite of the training regimen employed by the athlete. Unknowingly, coaches and athletes often attribute speed increases to activities that had nothing to do with any improvement in speed.

The **Strength Shoe** is an example. The Strength Shoe is a modified athletic shoe with a thick rubber platform attached to the front half of the sole. Claims have been made that the Strength Shoe will increase speed, power, strength, and explosiveness. High-profile coaches and athletes endorse the product and give glowing testimony of its value. Research however, states otherwise.

The Department of Orthopedic Surgery, at Tulane University, conducted research on the Strength Shoe. The results were published in the American Journal of Sports Medicine. The report states, "*No enhancement of flexibility, strength, or performance was observed for participants wearing the Strength Shoe at the end of an 8 week training program, following the suggested regimen of the manufacturer.*" The study also states, "*The use of the Strength Shoe cannot be recommended as a safe, effective training method for development of lower leg strength and flexibility. In summary, the Strength Shoe was found to provide no training benefit and was associated with increased anterior tibial pain.*"

When tested the Strength Shoe had no significant impact on the track athletes in this study. Yet many athletes and coaches make the shoe part of their running program and give testimony to its benefits. Wear the Strength Shoe if you want to add variety to your training. Don't wear them to increase your running speed.

To determine if any activity has a positive impact on your speed, first get in great running shape. Lift, stretch, condition, and practice running fast. Periodically time yourself electronically. Eventually your increases in speed will level off. You simply can't run any faster.

At this point add one new activity to your training that you believe will improve your speed. After a short period of time you should observe an increase in your speed. If you do not, it's obvious the new activity had no impact on improving your speed.

Continue experimenting with only one activity at a time, until you've tried all the activities that purportedly improve speed. Don't expect to begin the off-season out of shape and then perform a multitude of activities and expect to know which, if any, actually had an impact.

Plyometrics

Plyometric exercises incorporate a wide range of bounding, hopping, jumping, throwing, and explosive activities. The literature is quite specific on the effects of transfer. Skills do not transfer. Quickening exercises performed do not transfer from one task to another. You can become proficient at one-legged bounds by practicing one-legged bounds. Do not expect this skill or activity to transfer to movement performed on the football field.

The game of football includes an endless number of explosive movements too numerous to document. The specific explosiveness used to perform each of these movements can only be developed by practicing these exact movements. If any plyometric exercise enhanced a skill or ability to play the game, it must be performed regularly during summer camp and throughout the entire season.

Many of the explosive plyometric movements performed are quite stressful to the joints. Four preseason games, sixteen regular season games, and possibly four playoff games, are more stress than most athletes can absorb. You do not have the time or the energy to expend additional time and energy performing plyometric exercises during the season. If you are not going to perform them during the season...why perform them at all?

The formula is a simple one for a football player--and it doesn't include any of the speed gadgets on the market.

Speed training should not be confused with **strength training, conditioning, or practice.**

- * **Use the weight room to develop muscular strength.**
- * **Use an interval running program to condition the heart, lungs, and muscles.**
- * **Practice the skills needed to run fast (stance, start, running technique).**
- * **Practice the skills used to play your position.**

You develop and maintain your specific football speed, quickness, and conditioning during summer camp and a 16-game season. The specific conditioning adaptations are developed by the activities you perform during practice and games.

You don't have the time or energy during the season to perform many of the activities often recommended to increase speed and explosiveness. You barely have enough time to recover between games.

You can't alter your genetic pool or those characteristics you've inherited from your parents. But you can develop the potential speed you do possess by exploiting those factors you can control.

Listed below are some of the items you can control that contribute to your ability to play fast:

- * **Eliminate excess body fat.**
 - * **Strengthen the muscles used to run.**
 - * **Develop adequate flexibility.**
 - * **Refine stance/start techniques.**
 - * **Develop sound running techniques.**
 - * **Develop a level of fitness to maintain speed and quickness for an entire game.**
- ⇒ *Practice running fast.*

The items that can have an immediate impact on running times are your **stance**, **start**, and running **techniques**. More importantly, you must practice running fast.

Stance

Your stance has been developed through many years of repetition. An adjustment in your stance may or may not help you. Review the guidelines we use. Experiment with one technique at a time. This will allow you to evaluate what influence (good or bad) a technique has on your time. Use an electronic timer while experimenting with techniques.

Listed below are the techniques we emphasize:

- ◆ assume a three-point stance
- ◆ feet less than shoulder width apart
- ◆ the distance from the back foot to the front foot will vary with the individual
- ◆ toes should be pointing straight ahead
- ◆ place the ankle of the front leg directly under the hip
- ◆ adjust the head to a position that allows your eyes to focus on the ground approximately three feet ahead
- ◆ place the hand on the ground directly under your shoulder, positioned just outside of the rear leg (most of your weight is on the front hand and leg)
- ◆ the opposite arm should be bent at 90 degrees with the upper arm parallel to the ground

Start

Your start has also been developed through many years of repetition. Your sprint start will vary from your football start. It will require some practice to develop an effective start.

Due to the nature of the position, linebackers, defensive backs, and quarterbacks seldom start from a stance during a game or practice. Therefore it may require additional time to refine this skill.

Experiment with one technique at a time. Decide which, if any, prove more effective.

An explosive start requires several coordinated actions to occur rapidly and simultaneously. You can save hundredths of a second by developing a good start.

Listed below are the techniques we emphasize to improve your start:

- ◆ rapidly move the down arm rearward (scrape the ground hard and fast)
- ◆ rapidly rotate the bent arm forward (throw fist in the direction you are running)
- ◆ gain as much ground as possible on your first step
- ◆ step forward in a straight line (the first step many players take is away from the centerline of the body)
- ◆ each succeeding step must be in a straight line
- ◆ reach the torso erect position as soon as possible (get up and out of your stance)

Running Fast!

Kevin McNair, a respected speed development expert, states, **“You don’t get speed through the air, you get it through the ground. Speed is down hard, back, and prolonged. Everything is behind the body.”**

When McNair says speed is down hard, he is referring to the front leg driving down toward the ground. Once the foot touches the ground it drives rearward, propelling the body forward. The longer (prolonged) the foot stays on the ground the greater the opportunity to propel the body forward.

Speed is gained from the point the foot touches the ground until it leaves. The longer it stays on the ground behind you the better. Stride length is increased behind you, not in front of you.

Vertical Displacement

Any vertical lift will force you to spend more time in the air, less on the ground, and slow you down. Eliminate the vertical component and you’ll increase speed.

Fast runners often appear to run effortlessly. Their heads remain level once they have reached the upright position. The term we use to describe this condition is **vertical displacement**. Your vertical displacement can be measured while you run. It is the distance that your head moves up and down above and below your standing height. The greater the curve, the more the vertical lift. Minimize vertical lift and you’ll run faster.

Listed below are tips to eliminate vertical lift:

- * rotate at the shoulder, do not shrug as you swing the arm forward
- * while rotating the arm forward keep your arm flexed at 90 degrees
- * while rotating the arm forward do not bring your hand higher than the sternum
- * while rotating your arm rearward do not bring the thumb beyond the hip
- * throw the knee in the direction you are running (upper leg reaches a position parallel to the ground)
- * do not land with your front foot beyond your hip (over striding will force you to pole vault up and over the landing leg)
- * keep your upper body erect (run tall), do not rock forward at the waist

Rotary Forces

Rotary forces that are misdirected will slow you down. One of Newton’s Laws of Motion states, *“For every action there is an equal and opposite reaction.”* **You will compensate with an equal action on the opposite side of the body if any body part rotates away from the direct line that you are running in.** This will have a negative impact on your straight-ahead speed.

Listed below are tips to eliminate excessive compensation on the opposite side of the body:

- * Keep the head erect and motionless (don't move head side to side).
- * Do not rotate the torso (side to side) as you run.
- * Do not allow your arms to cross the body.
- * Maintain a closed fist (open hand will rotate outward as the arm extends downward and rearward).

Running Techniques

There may be some techniques you can use to help you run fast in a straight line. However there is minimal application of these techniques to the specific skills and techniques you use to play your position.

Listed below are the key points we emphasize:

- * Run tall with torso erect and shoulders back (forward lean can shorten stride).
- * Keep head stationary with eyes focused straight ahead.
- * Rotate arms forward and rearward close to the body.
- * Be sure to land the plant foot directly under the hip.
- * Increase your stride length by fully extending your hip and leg behind you, not by over striding (rear leg must be fully extended - do not prematurely pull your foot off the ground).
- * During the recovery phase keep the lower leg relaxed and flexed at 90 degrees
- * During recovery forcefully drive the knee in the direction you're running (do not lift knees upward).
- * Drive the leg down and back-- (speed comes from the force you apply to the ground downward and backward).

Practice Running Fast

The most important variable to realizing your full speed potential is to **practice running fast**. Running fast is a specific skill. The neurological system and the muscular system must learn to coordinate a network of sophisticated actions both chemically and physically. To fully develop these systems they must be trained at maximum speeds.

It sounds simple and it is yet some athletes never practice running fast (all out). Once you've developed a requisite level of strength and conditioning, you must practice running as fast as you can.

Periodically, set aside a workout to practice running fast. You must be completely rested. You can only run a few sprints all out. Rest until you feel recovered between each sprint. It may require that you rest for 10 - 15 minutes between sprints.

Skills and Drills

There are dozens of books and videotapes that display hundreds of skills and drills that are used to complement speed training. Track athletes traditionally have time and energy performing skills and drills. They don't have to recover from hitting during practice all week and playing 20-25 games a year.

We've discussed the formula to running your fastest. There is no need for a football player to spend any additional time on speed drills. Time doesn't allow it during the season when you need to be you're fastest.

You'd be wiser to spend that time on conditioning, running pass routes, covering a receiver, perfecting your pass rushing skills, throwing the football, catching a football, or any other skill used to play the game. Remember, the activities you perform during the season are the activities that develop and maintain your football speed and quickness from July through January.

There is nothing better for a football player to improve position specific speed and quickness than practicing fast and playing fast.

KEY POINTS TO REMEMBER

- 1. Football speed is the key to your success, not straight-line track speed.**
- 2. Speed and quickness are abilities you inherit from your genetic pool.**
- 3. You can't develop more speed than your genetic potential will allow.**
- 4. Increases in speed are often obtained in spite of the training regimen employed.**
- 5. There are no magical potions or gadgets to increase speed.**
- 6. Items that can have immediate impact on speed are stance, start and running technique.**
- 7. An explosive start requires several coordinated actions to occur rapidly and simultaneously.**
- 8. You don't get speed through the air; you get it through the ground.**
- 9. Eliminate the vertical component and you'll run faster.**
- 10. You must practice running fast.**

SKILL DEVELOPMENT

The fourth component of your fitness profile is Skill Development. The execution of any skill requires a sophisticated series of signals sent from the brain to the muscles. Muscle fibers must be activated in the proper sequence to perform a skill with any proficiency. An increase in proficiency will occur if that specific skill or parts of that skill is practiced. At the higher levels most skills are hard to develop.

Do not confuse the terms skills and abilities. **Skills** are the actual movements you perform. A skill is learned through practice. Throwing a football, punting a football, serving a tennis ball, shooting a basketball, pass protecting and rushing the passer are all skills.

Abilities are the physical qualities used to perform the skill. Abilities include speed, power, strength, flexibility, balance, timing, explosiveness, agility, reaction time, coordination and endurance.

Make minor changes to a skill and a different combination of abilities will change. The amount of those specific abilities to perform the skill will also change to meet the specific demands of that new skill.

Skill transfer is a term used to describe the impact that the practice of one skill has on another. There are three types of transfer: **Positive, negative, and neutral.**

Positive transfer occurs by rehearsing the exact skills used to perform a task. Motor learning experts agree that it is impossible to reproduce the neuromuscular pattern used to perform a skill, unless that specific skill is performed. This is best defined by the specificity of motor learning principle. Motor learning expert John Drowatzky states, “transfer occurs only when the practice units or parts are identical to those contained in the criterion task.”

Brian Sharkey, in his text, *Physiology Of Fitness*, states, “Skill is achieved by practice. Every skill is specific; therefore each must be learned individually. Ability in tennis doesn’t assure success in badminton, squash, or racquetball; **skill doesn’t transfer** as readily as was once thought.”

Neutral transfer describes a different skill or activity that won’t help or hurt the development of another skill. Neutral transfer results in no transfer, good or bad. You periodically hear of an athlete touting the positive impact an activity had on his performance. The activities might include karate, judo, ballet, aerobics, juggling, hitting a speed bag, jumping rope, and many others. Noted author and exercise physiology expert Brian Sharkey states, “*The recent fad of basketball players in ballet classes is likely to result in a profound cultural experience - both for the players and the ballet teacher - and it is sure to make the athletes better dancers.*”

Coaches and athletes often credit the positive impact one skill has on the improvement of another. We’ve all heard, “jump rope to improve foot speed and hit the speed bag to improve hand speed.” Jumping rope will improve your skill to jump rope and hitting a speed bag will improve your skill to hit a speed bag. These skills do not transfer to the skills used to play football.

Jump rope to develop aerobic fitness and the skills to jump rope...not to improve your foot speed. Improve your ability to back pedal and change direction while reacting to a receiver running a route... by actually covering a receiver.

According to Sage **negative transfer** can occur “when the learning of one task impairs or inhibits learning a second task.” Do not add resistance to a skill. Shooting a weighted basketball is similar to shooting a conventional ball, but it is a different skill. It is so similar that it can confuse the brain and disrupt the skill pattern developed when shooting a conventional ball.

Shoot a weighted basketball for a week without touching a conventional basketball. After a week of practice with the weighted ball try shooting a conventional ball. Your

accuracy with the regular ball has been negatively affected. You must now reestablish the specific neuromuscular pattern used to shoot a regular ball.

Adding any resistance to a skill makes it a new skill. Add enough resistance to a skill (a heavy medicine ball instead of a basketball) and it becomes exercise. Drowatzky states, “No support was found for the practice of using added weight during practice to facilitate improved performance in motor skills.”

Strengthen the muscles used to perform a skill in the weight room. Do not confuse skill with exercise.

In his text, Introduction to Motor Behavior: A Neuropsychological Approach, author George Sage states, “Practice of nonspecific “coordination” or “quickenings” tasks will not produce transfer to specific sport skills.”

Motor learning experts classify skills as “open” or “closed.” Closed skills require the same movement pattern in an unchanging environment. Examples include a foul shot in basketball, shot put, golf, diving, and performing a power clean.

Open skills are performed under varying environmental conditions each time they are executed and require a flexibility of movement response. Open skills include activities similar to fielding and throwing a baseball, throwing a football on the run, tackling an opponent or blocking a defensive lineman.

Skill transfer from **task-to-task** does not occur according to the motor-learning experts. A closed skill like the power clean will not transfer to the many open skills used to play the game of football. Motor skill transfer studies have been conducted to determine the transfer of one skill to another. This is called task-to-task transfer.

Sage states, “Studies of motor skill transfer from one task to another are not numerous but they do consistently support the notion that there is little transfer from one task to another. In summarizing data on task-to-task transfer with motor tasks it appears that there is typically little transfer of any kind.”

Intra-task transfer is a term used by motor learning experts to describe several tasks performed in sequence to complete a skill. Transfer does take place with intra-task transfer if the **exact** tasks are practiced separately and then practiced together in sequence to complete the entire skill.

Intra-task transfer can be observed when the offensive lineman practices his footwork coming out of his stance and his hand placement. From his stance the offensive lineman practices his first step over and over. He will then practice his hand placement, and finally the footwork used to complete the entire skill of pass protection.

Each task is practiced individually and eventually put together and practiced from beginning to end at full speed. Each of these individual tasks when practiced independently will transfer to the whole task at hand.

How do you best develop the skills used to play the game of football? The answer is easy. Improve the skills used to play football by practicing those skills. Practice those skills under game conditions whenever possible. Quarterbacks should throw in shoulder pads whenever possible. Long snappers should practice snapping in pads, with a helmet on. Linebackers should practice covering running backs, and so on.

The Motor Learning Community agrees that **Skill Development** is very specific. Athletes must practice the **exact** skills they use to play the game to refine those specific skills. It’s impossible to duplicate any of those skills in the weight room unless we clear an area and have players put on pads and scrimmage at full speed. Skills are specific. We

can't imitate football skills in the weight room. Skills in the weight room do not transfer to the field.

Do not attempt to mimic or imitate a skill in the weight room. It can't be done. Strengthen the muscles in the weight room, develop a high level of conditioning, and practice the skills used to play the game. It's that simple!

KEY POINTS TO REMEMBER

- 1. The execution of a skill is a very sophisticated neurological process.**
- 2. Skills are very specific.**
- 3. High skill levels are hard to develop.**
- 4. Do not confuse skills and abilities.**
- 5. There are three types of transfer (positive, negative, neutral).**
- 6. Add some resistance to a skill and it becomes a new skill.**
- 7. Add enough resistance to a skill and it becomes exercise.**
- 8. Do not attempt to mimic a skill in the weight room.**

FLEXIBILITY

The fifth component of your fitness profile is Flexibility. Flexibility is a term used to define joint mobility and muscular range of motion. At birth you are blessed with an abundance of flexibility as a protective mechanism. Inactivity and the aging process erode the natural elasticity of muscles.

Stretching exercises have been implemented into most conditioning programs as insurance against injury; specifically muscle pulls. There is no study or support from the scientific community to substantiate that an increase in flexibility will prevent any injury. The degree of flexibility has little if anything to do with muscle pulls. Pulls usually occur when an athlete is in a fatigued state, not fully recovered from a previous game or practice, not warmed up, out of shape, or forced through an abnormal range of motion.

Stretching is a low intensity exercise used to increase flexibility. The amount of time you spend stretching should be proportionate to your degree of flexibility (or lack of). Some athletes are naturally blessed with a high degree of flexibility and some are not.

Stretching is not a warm-up. An exercise is considered a warm-up if core body temperature is increased by two degrees or you break a sweat at room temperature. Stretching does neither. Stretch to become more flexible, not to warm up. Perform appropriate activities to warm up and then stretch.

The best activity you can use to warm up is the activity itself. If you're going to run pass routes all out, begin running slowly and gradually increase your speed. Stretching will not warm you up to run pass routes all out.

There are a large number of stretching exercises to choose from. Like any other form of exercise, it must be performed with some regularity. Select a group of exercises designed to stretch the major muscles in the upper and lower body.

Use the following guidelines while stretching:

- * **Do not bounce**
- * **Stretch statically (hold the stretched position without bouncing)**
- * **Place the muscle into a position where you feel a mild stretch**
- * **Hold that position for 10 - 30 seconds**
- * **Accelerated breathing and a burning sensation are signs of over stretching**

The specific movements you perform on the field will develop the range of motion of the muscles used to perform those activities. You develop a range of motion while performing a stretching exercise that is specific to that stretch, and the limited number of fibers recruited at that point.

The range of motion of the muscles used to play the game of football is radically different from the range of motion developed from stretching. Other differences include the number of muscle fibers recruited, the violence of the movements, and the many different arcs the muscles use to change direction, stop, and backpedal.

This phenomenon can be observed in the off-season while running on the treadmill. Run intervals at 10 mph each day until your muscles adapt to this speed and range of motion. You'll experience a new soreness in the legs when the speed is increased to 11 mph. This small increase in speed will increase the range of motion of your stride and is enough to take your muscles through a new range of motion. The same soreness occurs when you increase the speed to 12 mph.

You've spent weeks stretching and running at slower speeds. Soreness wasn't experienced until you forced your muscles through a new range of motion. It is not lactic acid accumulation if only a few reps were performed. It is the soreness from stretching the muscle beyond its current range of motion.

Play basketball and a new soreness is experienced. Change activities (racquetball) and there's a new range of motion and soreness. Go to summer camp and the range of motion to cover receivers, run pass routes, and rush the passer, will demand a new range of motion and soreness. After several days, your muscles will adapt to the violent range of motion these movements require.

Regardless of how much you stretch or how flexible you are, you'll experience this new soreness each time you perform a new activity that takes your muscles through a

different range of motion. **Range of motion of the muscles involved is dictated and developed by the activity you perform, not from a low intensity static stretching exercise.**

The aging process and inactivity erode your flexibility. Some lower back problems can be attributed to poor hamstring and low back flexibility. Inactive adults can benefit more from stretching exercises than active athletes. As you grow older you may notice a decrease in the range of motion of your muscles. At this point in your career you may have to invest more time stretching.

Discipline yourself to stretch daily. Muscle imbalance and low back problems can be helped with better flexibility. Stretching purportedly helps alleviate muscle soreness. No equipment is necessary. However do not use stretching as a warm-up.

KEY POINTS TO REMEMBER

- 1. Stretch to become more flexible, not prevent an injury.**
- 2. Stretching is not a warm-up.**
- 3. The movements you perform on the field will develop the range of motion of the muscles used to perform those activities.**
- 4. Select a wide range of exercises.**

MUSCULAR FITNESS

The sixth component of your fitness profile is muscular fitness. The two primary objectives of the Texans strength program are to prevent injury and enhance the abilities you use to play the game. Those abilities include strength, speed, power, explosiveness, and the ability to sustain these qualities for an entire game.

All muscles are used to protect the body and play the game of football. For this reason every major muscle group must be developed to its full potential.

Our strength program is designed to develop the best gains, in the least amount of time, in the safest manner possible. It is also our goal to develop your muscular system in a manner that is compatible with the muscular demands of playing the game of football...not competing as a competitive weight lifter, body builder, or track athlete.

The demands of the muscular system to compete as a power lifter or shot-putter are different from the energy demands used to play football. The strength program of a

football player must be intense, brief, and generate the type of muscular gains that are most functional in playing the game.

Lifting Skills

There is a specific skill used to bench press with a barbell. This skill does not transfer to any other skill. If you stop bench pressing with a barbell and use a machine instead, you'll lose the specific skill to bench with a bar.

The same gains in strength and size can be developed with a machine that were developed with a barbell, if the effort exerted remains the same. If you like benching with a bar, use a bar. If you like benching with dumbbells, use dumbbells. If you like benching on a machine, use a machine. For variety we suggest using any or all of them. Your success as an NFL football player will not be determined by the equipment you use.

Some experts claim that the skill and balance developed bench pressing a barbell is missing while performing the bench press exercise with a machine. This is true. It is also true that a higher degree of skill and balance is needed to bench press with dumbbells.

When you ask the barbell enthusiast, "Why don't you use dumbbells to bench?" the response is usually, "There's more skill needed to balance two dumbbells and I can use more weight with a bar." With that logic it becomes an advantage to remove as much skill as possible from an exercise and concentrate more on developing strength, not the skill needed to perform the movement.

Bench-pressing with a barbell will not develop the skills to bench press with dumbbells. There is also a difference between the skills used to bench press and incline press with a barbell. Both require different neuromuscular patterns and skills. Developing the skill to bench press with a barbell will not develop the skill to perform the incline press with a barbell. Each must be developed separately.

Use a wide range of equipment. You'll take advantage of what each piece has to offer and add variety to your training.

PROGRAM ORGANIZATION

Balance is the key to our Texans strength program. Total body development is essential for a football player. You must develop every major and minor muscle group to its fullest potential. If too much time is spent performing one exercise, or developing a specific area of the body, it's usually at the expense of other areas. Many young players come into our program having spent endless hours bench pressing.

They've become good at bench pressing. They have well developed pecs. However, many are deficient in other areas of the body. Deficient areas often include the neck, the rotator cuff, the upper back, the posterior deltoid, the hamstrings and midsection.

The Texans strength program is designed to develop every major muscle group in the body. We place an equal value on every exercise performed. This is essential if injury prevention and total body development is our goal.

The Rep

The foundation of all strength programs is the repetition (rep). It's how you perform each rep that stimulates gains. We divide the rep into two phases: the **raising** phase and the **lowering** phase. Strict attention must be paid to each.

Why? The muscles that raise a weight are the same muscles used to lower the weight. One half of an exercise is the raising of the weight. The other half of the exercise is the lowering of the weight. You gain strength from both lifting and lowering the weight.

In the past we placed a premium on the lifting phase. "How much can you bench?" was the battle cry of many weight programs. Little emphasis was placed on the lowering phase. You never heard anyone ask, "How much can you lower?" Through experience we have learned that both the raising and the lowering of a weight can be equally productive.

You can only accomplish this by paying strict attention to the execution of each rep.

Listed below are the techniques we use to perform each rep:

- * Force the muscles to perform all of the work while raising the weight.
- * Pause momentarily in the muscles' contracted position.
- * Emphasize the lowering of the weight.

Raising the Weight

The brain is a sophisticated and highly sensitive mechanism. It will only recruit as many muscle fibers as are needed to raise the weight. No more, no less. You can't fool it.

For maximum gains you must **raise the weight at a speed that forces the muscles to perform all of the work**. There can be no sudden movements that cause a rapid change of speed or the use of momentum. No bouncing, jerking, or shifting body position. If you do, the message sent to the brain is *recruit fewer muscle fibers*.

After raising the weight at a speed that allows the muscles to perform all of the work, pause momentarily, in the contracted position. Movement must stop for a count before beginning the lowering phase. To develop strength through a muscle's full range of motion, you must pause in the contracted position.

For example, while performing the leg extension you must pause (stop) momentarily when the legs are fully extended. If there is any bounce in this position you have raised the weight too fast. Or it is too heavy, and the only way you can lift the weight is to incorporate some momentum.

Another example is the leg curl. While performing the leg curl pause (stop), in the legs' flexed position. Any bounce indicates that the muscle performs little or no work through that range. The muscle will not be fully developed through any range where momentum contributes to the action. This may be the cause of some hamstring problems. The hamstring develops significant strength at some points and little to none at others.

Emphasize the Lowering of the Weight.

After you've paused in the contracted position, **emphasize the lowering of the weight**. The muscles used to raise the weight are the same muscles used to lower the weight.

Due to gravity it is easier to lower a weight. You can lower significantly more weight than you can lift. It's possible to perform little or no work by letting the weight fall

effortlessly. Fewer muscle fibers are used to lower the same weight raised unless you observe one or both of the following:

- * Take longer to lower the weight.
- * Add more weight during the lowering phase.

Ideally you should have spotters add more plates when you lower a weight, and then take off the extra plates when you raise it. A more pragmatic approach is to take more time during the lowering phase. By taking more time you make the exercise harder.

How much time is best to lower the weight? Who knows? But common sense and logic dictate that for maximum gains, more time **must** be taken to lower a weight than was used to raise it.

How Many Reps?

In our program you will perform somewhere between 6-12 reps. Most of our upper body routines use **eight to ten** reps as the ideal rep range. You will perform 12 reps on all neck and leg exercises.

Your muscles don't have a little rep counter that clicks each time you do a rep. More important than the number of reps performed is the amount of **time** a muscle is exposed to an exercise and the **intensity** of the exercise. Time and intensity are the stimulus.

Perform an isometric contraction. Exert as much force (**intensity**) as you can against an immovable object. In a short period of **time** you will fatigue rapidly...yet you didn't complete one rep.

We don't recommend isometrics but it does demonstrate that it isn't the number of reps performed that dictates the quality of work, it's the amount of time a muscle is exposed to exercise and at what level of intensity. It is time and intensity of exercise that determines the degree of inroad made on your existing strength level.

Time and intensity is the key to maximum gains regardless of the equipment used or the methods employed. At the end of a workout you must ask, "how much time and at what level of intensity did you expose your muscles to quality exercise?" Not enough intensity and no progress is made. Too much volume of exercise and you will not recover.

Rep Reproduction

A term we use in our facility is **rep reproduction**. Each rep should look identical. If you add weight to an exercise make sure it's because you've gotten stronger. The last rep or two must be a struggle and the speed of the raising phase may be slightly slower but the lowering phase of each rep should be identical (you can always lower more weight than you can raise).

If we videotape a set of ten reps and edit the tape by exchanging the first rep and the sixth rep, we shouldn't observe a noticeable difference when we view the tape.

Rep reproduction while performing an exercise, and **rep consistency** between workouts, is crucial if strength gains are going to be monitored in a reliable manner.

Concentrate only on the rep you are performing. Think only about the raising phase of a rep until the weight is lifted. At that point, think only about lowering the weight properly.

If the weight is too heavy you'll be tempted to sacrifice form just to complete the set. Record only the good reps performed. If a spotter helps you complete a rep it can be the

most productive rep you do. However only record the reps you complete in good form on your own.

It is impossible to document gains if you don't pay strict attention to the raising and lowering phase of each rep. Add weight because you've gotten stronger, not because you performed your reps differently from your last workout.

I want to "Bulk up!"

Doesn't a few heavy reps add more bulk and mass? The answer is no! It's not the number of reps that determines how a muscle develops. Our entire team uses the same combination of sets and reps; the difference is how each player responds to the same stimulus.

In the past we had linemen perform sets of only a few reps with heavy weights. The quarterbacks, receivers and defensive backs performed sets with higher reps and lighter weights. We assumed we could change how muscles respond by the number of reps performed.

Experience has taught us that you can't change a muscle's capacity to grow simply by altering the number of reps performed. Genetic potential and the intensity of exercise stimulate muscular development, not the number of reps.

When someone says, "I want to bulk up," what do they mean? What is bulk? Bulk is either fat, muscle, or bone. What else is there but your organs, skin and hair, and teeth?

You add muscle by lifting and add fat by eating too much. Your genetic assets, not the number of reps you perform or the equipment you use, determine how much muscle you can add.

Observe the body types of competitive weight lifters. The 132-pound lifter uses the same system of heavy weights and as few reps as the 165-pound lifter, the 198-pound lifter, and the super heavyweight lifter. Each has a specific body type and amount of muscle mass.

Why isn't the 132-pound lifter bulky like the 198-pound lifter, or the super heavyweight? They all perform the same exercises and combination of sets and reps. The amount of muscle mass each lifter develops is different because it has nothing to do with the number of reps they perform. The amount of muscle mass each athlete develops is dictated by their genetic predisposition for adding muscle.

How Much Weight?

To generate maximum gains you must use as much weight as you can properly raise and lower. However it is how you lift the weight that safely and effectively develops maximum gains in strength, not how much you lift. A muscle will only adapt to the stress it is exposed to.

Some athletes are more concerned with how much weight they lift, rather than how they lift the weight. There are many ways to make an exercise easier (and less productive) and lift more weight. Make no mistake about it. To gain strength you must constantly try and lift more weight and/or more reps each exercise and every workout.

Each workout try to use more weight, perform more reps, or both. Use as much weight as you can safely and properly handle. However, do not sacrifice how you perform a rep in an effort to increase the amount of weight used. Find a way to make an exercise harder and it will be more productive.

Documentation

To ensure strength gains from workout to workout, document any information having an impact on your development. Record the following information:

- * **Number of good reps completed.**
- * **The amount of weight used.**
- * **Reps and weight for each set performed.**
- * **The type of equipment used.**
- * **Adjustable seat settings.**
- * **Rest interval between exercises and/or sets.**

How Many Sets?

In the past we assumed that the number of sets you performed determined whether or not you produced the best results. Through experience we've learned it's not how many sets you perform. The key is how you perform each set.

You can gain strength completing one set or ten sets. It's also possible to gain no strength regardless of how many sets you perform.

During the season most athletes barely have enough energy to recover from game to game. Your goal must be to perform as few sets as possible while stimulating maximum gains. **It must be a priority to eliminate non-productive exercise.** Once you have warmed up, why perform a set that is not designed to increase or maintain your current level of strength.

Multiple Sets

For those athletes that want to perform more than one set the same rules apply. Perform ten sets if you must but don't change how you perform a rep or complete the set. Record the amount of weight used and the number of good reps performed for each set. Add weight whenever possible. Don't pace yourself by holding back and saving your energy for the next set you perform.

Do not decrease the intensity or effectiveness of an exercise when more than one set is performed. Sub-maximal efforts will produce less than maximum gains in muscular strength. Listed below are several examples of less effective techniques used when more than one set is performed.

Example # 1 - (a sub-maximal effort)

If you can use the same weight for three sets of eight reps (or whatever number of reps are selected), the weight is too light on the first set. In the past we have used a similar set/rep protocol. If an athlete can use the same weight on the third set as he did on the first set, the weight is too light. Logic dictates that the weight must decrease each succeeding set... if an all out effort is being exerted each set. If you exert an all out effort on the first set, the weight must decrease each succeeding set. In the example below the athlete uses the same weight each set indicating that the first two sets were sub-maximal efforts.

Set # 1 - 100 lbs. x 8 reps

Set # 2 - 100 lbs. x 8 reps

Set # 3 - 100 lbs. x 8 reps

After you have warmed up use as much weight as you can properly handle each set. Select a weight that causes a maximum effort to complete the 8th rep (or whatever number of reps you selected). The weight must decrease each set if a maximum effort is exerted the previous set.

Example # 2 - (a sub-maximal effort)

Another less effective technique we used in the past was to add weight after each set was performed. Why use 100 pounds on set number one, if you were able to use 120 pounds on the third set?

Set #1 - 100 lbs. x 8 reps

Set #2 - 110 lbs. x 8 reps

Set #3 - 120 lbs. x 8 reps

If you can lift 120 pounds for eight reps on your third set, lifting 100 pounds for eight reps during your first set is a waste of time and energy. Use as much weight as you can properly handle each set. A sub-maximal effort will produce sub-maximal gains.

Example # 3 - (a maximum effort)

For maximum gains, use as much weight as you can handle on the first set, the second set, the third set, and for each additional set you perform.

Each succeeding set the weight must decrease, if the first set was an all out effort.

Set # 1 - 140 lbs. x 8 reps

Set # 2 - 120 lbs. x 8 reps

Set # 3 - 95 lbs. x 8 reps

Why perform a set that is not as productive as it could be? If you can perform another rep but stop, you limit how productive that set can be. Once you have warmed up, make each set as productive as possible. Don't waste time and energy on non-productive exercise.

Order of Exercise

We divide the body into five major segments. Perform all exercises for one segment before progressing to the next segment. The five major segments include:

- * **Neck**
- * **Hips and Legs**
- * **Midsection**
- * **Torso**
- * **Arms**

There are reasons why we place some exercises in the order that we do, but the order of exercise is not the highest priority. How you perform each repetition and finish a set is, and always will be, the most significant factor in generating strength gains.

We stress the importance of neck development and emphasize it by performing all neck exercises before anything else. We place a premium on neck development for obvious reasons. The neck muscles help serve as a protective mechanism for the spinal cord and the nervous system.

Successive collisions over time can accumulate and erode the structural integrity of tendons, ligaments, and ultimately the joints. The only thing left is bone.

Your muscles serve as shock absorbers. Your protective gear and the strength of your muscles are all that you have to absorb the impact of a collision. It's not just one collision, but the accumulative effect of many. If it isn't already, be sure to make the muscles of the **neck your number one priority**. As a Texan your neck routine will include the following:

1. Shrugs
2. Neck Flexion (machine or manually)
3. Neck Extension
4. Lateral Flexion (right & left)
5. Shrugs

After all of the neck exercises are completed you will move to the **hips and legs**. We have a well-equipped facility and will incorporate a wide range of variety in our routines. A sample Texans leg routine will include the following exercises:

1. Leg Press or Squat
2. Leg Curl
3. Hip Extension
4. Leg Press or Squat
5. Leg Extension
6. Leg Press or Squat
7. Adduction
8. Hip Flexion
9. Calf Raises (Straight-Leg & Bent-Leg)

Once started, you will complete all lower body exercises before moving to the **midsection**. Exercises are then performed for the trunk flexors, the trunk rotators, and the lower back.

All **upper body exercises** are then performed followed by exercises for the arms.

Which Exercises?

The facility and type of equipment available will dictate which exercises you perform. Football involves every muscle in the body. You must perform a wide range of exercises to develop each. If you ignore any one of these muscles you will leave yourself underdeveloped and more vulnerable to injury. Every exercise performed is equally important.

Do not make the mistake of performing only those exercises you like or excel at. Do not ignore any body part. It's those exercises you like least, or those body parts you've ignored, that you stand to gain the most from.

Multi-Joint Exercises

In the Texans strength program we classify exercises into two different categories. **Multi-joint** exercises and single joint (**isolation**) exercises.

A multi-joint exercise involves more than one joint. The major *advantage* of a multi-joint movement is that more than one muscle group is brought into play. Strength is developed collectively by a group of muscles.

An example of a multi-joint exercise is the leg press. The hip, knee, and ankle joint are involved. Each of the muscles crossing these joints is directly or indirectly involved in the execution of the exercise.

The *disadvantage* of a multi-joint movement is that some muscles perform more work than others. The muscles performing the most work receive the greatest benefit, while others receive less.

Another disadvantage of the multi-joint exercise is that the smaller muscles involved can serve as a weak link and limit how strong the bigger muscles become.

For example, while performing a chin-up or bent-over row, the lats and biceps are the prime movers. The biceps are smaller and weaker than the lats. The biceps will fatigue faster, limiting the amount of work the lats can perform.

Pushing vs. Pulling Multi-Joint Exercises

Technically all muscles pull. To simplify our description of upper body multi-joint exercises, we classify them into **pushing** or **pulling** movements. The only lower body multi-joint movements are squats, leg presses, and lunges.

The upper body pushing movements primarily incorporate the pectorals, deltoids, and triceps. Examples of a pushing movement are the bench press and seated press. More emphasis can be placed on one of these muscles by changing the position of the body, or the angle used to push.

For example:

<u>Position:</u>	<u>Exercise:</u>	<u>Muscles Used:</u>	<u>Muscles Emphasized:</u>
1. lying down	bench press	pecs-delts-triceps	pectorals
2. seated	seated press	pecs-delts-triceps	deltoids

The upper body pulling movements primarily involve the upper back muscles to include the latissimus dorsi (lats), rhomboids, posterior deltoid, and the biceps. Examples of a pulling movement are the seated row and the lat pulldown.

There are four basic upper body planes you can exercise through. You can push and pull through each of these four planes. Each of these planes should be incorporated frequently (not necessarily every workout) to ensure total body development and variety.

The four standard upper body planes include the following:

- 1. Vertical** (above and below the shoulders)
- 2. Incline**
- 3. Horizontal**
- 4. Decline**

Listed below are examples of the pushing and pulling movements that can be performed through the four upper body planes:

<u>Exercise Plane</u>	<u>Pushing</u>	<u>Pulling</u>
Vertical (above shoulders)	seated press	lat pulldown, chin-up, pull-up
Incline	incline press	seated high row
Horizontal	bench press	seated row, bent-over row
Decline	decline press	seated low row

Vertical (below shoulders)

dips, seated dips

upright row

When organizing an upper body workout, perform exercises through each of the planes listed above. Also take advantage of the variety offered from using different equipment and changing the order of exercise.

ISOLATION EXERCISES

An **isolation** movement targets a muscle group or an area of the body. The *advantage* of an isolation movement is that the muscle group executing the exercise is forced to perform all of the work. The muscle group or area of the body isolated is developed to its full potential without other muscles assisting or limiting its development.

Isolation movements for all major muscles are a must for a football player to insure maximum development and protection. The amount of equipment available will determine how many different arcs of the body can be isolated. In our Texans weight room we have at least one piece of equipment designed to isolate each major muscle group. **A well-rounded program must include multi-joint and isolation movements.**

How Much Time Between Exercises?

When a muscle is exercised to near exhaustion it takes approximately 90 seconds to restore depleted energy supplies. We allow one minute and thirty seconds recovery time between exercises (unless we are pre-exhausting a muscle with an isolation movement to be followed immediately followed by a pushing or pulling movement). This rest interval allows adequate recovery once you adapt to the pace.

Initially you may need more time but once you adapt, one minute and thirty seconds will be all you'll need to stimulate the best gains. It also better prepares your muscles for the intense metabolic muscular demands of four quarters of football.

If you truly want to reliably monitor your strength gains, you must eliminate as many variables as possible. Allowing less time between exercises than your last workout may cause a decrease in the number of reps performed, because you've had less time to recover. The opposite is also true. More time between exercises than your last workout may allow you to lift more weight or do more reps.

To maintain consistency between workouts some consideration must be given to recovery between exercises. From trial and error, we have determined that one minute and thirty seconds is most compatible for a football player.

Explosive Training

Dr. Bob Christina, renowned motor learning expert, states, "It is the **intent** to raise a weight fast that is the key to developing explosive power, not that the weight itself is lifted fast."

Observe the raising speed of a power lifter attempting to bench press a heavy weight. He pauses momentarily (as the rules demand) with the bar touching his chest and then tries his earnest to "explode"--raising the weight as fast as he can. It is the power lifter's "**neurological intent**" to raise the weight fast. The bar however, moves in a smooth and controlled manner. This occurs because the weight is heavy enough, and the form required strict enough, to eliminate momentum.

How your muscles connect to the nervous system is the primary factor determining the potential magnitude of your explosiveness...not how fast you can lift a weight.

The term “explosive power” was popularized in the early 1970’s. Manufacturers of isokinetic exercise used the term to promote the benefits of their equipment. Cybex and Mini-Gym were the two major players. The Leaper was a popular isokinetic squatting device that could be found in many high schools.

The isokinetic manufacturers claimed “accommodating” resistance set their equipment apart from isotonic strength building equipment (barbells, dumbbells, machines). The isokinetic device provided maximum resistance at every point during the raising phase of an exercise.

The harder the lifter pushed, the more resistance the isokinetic machine gave in return. With traditional free weight equipment and most machines, the weight remains constant throughout the execution of an exercise. The isokinetic advocate claimed this was a major limitation.

Manufacturers of isokinetic equipment claimed you had to “train fast to be fast,” and that isokinetic exercise allowed you to train explosively. The raising speed of any isokinetic exercise is actually predetermined. The harder the athlete pushed or exploded, the more resistance the equipment provided, and the slower the raising speed. It eliminated the use of any momentum while raising the weight. The isokinetic device dictated and actually controlled the raising speed.

During the early 1970’s we all wanted our athletes to be explosive. The training mantra became “train fast to be fast.” The problem was many of us didn’t have isokinetic equipment that controlled the speed of exercise and eliminated momentum. We simply applied the isokinetic concept with isotonic equipment (barbells, dumbbells, machines).

The brain is a very sophisticated and highly sensitive mechanism. It will only recruit as many muscle fibers as are needed to raise the weight. No more, no less. You can’t fool it. Curl an 80-pound barbell and your brain will recruit 80 pounds worth of muscle fibers if you allow the targeted muscles to do all the work.

It’s possible to curl the 80-pound barbell and recruit fewer than 80 pounds worth of muscle fibers. How? Use the hips and legs to help swing the bar upward. Some momentum will be used to help raise the weight, decreasing the number of muscle fibers needed. The more momentum used the fewer the muscle fibers recruited.

We can’t recreate the thousands of different movement patterns used to play the game of football or the many different speeds at which these movement patterns are performed. Motor Learning experts agree on the Theory of Specificity. It’s impossible to recreate these speeds in the weight room.

Use a heavy weight and eliminate momentum (strict form) and the speed of exercise becomes more regulated. Add more weight to any exercise and the speed of the exercise changes. The sequence and volume of muscle fibers recruited also change (size principle). Video or high-speed film can be used to accurately measure this.

Find a volunteer capable of bench-pressing 350 pounds for a one max rep. Ask your volunteer to perform several sets (total of 11 sets of one rep each) of one repetition of the bench press exercise. Rest as much as necessary between attempts to guarantee complete recovery. Allow days if necessary.

The first attempt will be performed with a 100-pound barbell. Instruct the lifter to lower the bar to his chest and pause. At your command ask the lifter to raise the weight

as fast as possible. Use videotape or high-speed film to measure the exact speed of the barbell from the chest to the arms extended position.

The 100-pound barbell will be lifted very fast, but this weight is too light to generate strength gains for a lifter capable of bench-pressing 350 pounds.

Give the lifter adequate recovery time and add 25 pounds to the bar. The bar now weighs 125 pounds. Using the same protocol outlined above, time how long it takes to raise the weight. Add another 25 pounds (barbell now weighs 150 pounds) and again time how long it takes to raise the weight from the chest to the arms extended position.

Continue this process (adding 25 pounds) until the lifter eventually performs the bench press with 350 pounds. The lifter will attempt to explode with this heavy weight yet the speed used to raise the weight will be smooth and controlled, and much slower than the speed used to raise the lighter weights.

The speed of the exercise will be affected each time you add weight. The lifter will perform 11 sets of one rep each (100 lbs. to 350 lbs. w/25 lb. increments) and you will record 11 different speeds.

Which one of these training speeds is best for a football player? Add only 10 pounds each set instead of 25 pounds and you'll have 35 different speeds to choose from.

On the field we ask our players to perform the various skills they use to play the game at game speed. This will incorporate hundreds of different speeds of movement and thousands of different skill patterns.

Some of these patterns are rehearsed and some are spontaneous. It's impossible to recreate any of these specific physiological and neuromuscular skills and abilities in the weight room.

Your goal must be to recruit every available muscle fiber if maximum strength gains are to be achieved. Our advice is to raise the weight at a speed that forces the muscles to perform all of the work. Eliminate momentum and any cheating movements. During the raising phase it must be your neurological intent to raise the weight fast.

The strength and explosiveness gained in the weight room will be applied in a practical setting on the field. The degree of strength and explosiveness demonstrated on the field is determined by how effective your muscular system is innervated by your nervous system.

Some players have the neurological ability to rapidly recruit a high percentage of their muscle fibers in the right sequence while performing a skill on the field. These athletes possess a high degree of neurological efficiency. We call this practical strength and explosiveness.

Some athletes have the ability to lift heavy weights in the weight room but "play weak." They don't have the neurological efficiency to transfer the strength developed in the weight room to a practical skill on the field.

The analogy is the typical engine in a car. You can have a big eight-cylinder engine (large and strong muscles) but two of the spark plugs are disconnected from the distributor cap. Only six of the eight cylinders are working. You have a big engine that looks like it should perform with a high degree of speed and power. However it can only perform with the power of a six-cylinder engine.

If you are an athlete that has the neurological ability to recruit most of your muscle fibers (all eight cylinders) you will demonstrate more strength and explosiveness on the field while performing football skills. At the moment of impact you have a neurological

advantage over an athlete with less neurological efficiency. You play strong with a high degree of explosiveness.

The efficiency of your neuromuscular system is determined at conception by your parents. We can't change how your muscles are connected to the nervous system.

In the weight room your intent must be to raise the weight fast. How fast you are capable of lifting a weight or performing an explosive movement on the field is ultimately determined by your genetic makeup.

Give your parents the credit for your genetic makeup. You should take the credit (not your Texans NFL strength coaches) for working hard to develop the physiological and neurological assets you possess to perform any movement in an explosive manner.

In-Season Training

Strength losses are rapid. Significant amounts of strength and muscular body weight are lost unless **meaningful** strength work is performed at least twice a week from the first day of summer camp until the last game of the season. Our off-season strength program mirrors our in-season strength program.

The NCAA has implemented a twenty-hour a week rule restricting the number of hours a week a college athlete can be required to engage in football related activities. In some programs the amount of time devoted to in-season lifting has been reduced or labeled voluntary.

Coach Capers has designated training times during the week set aside exclusively for strength training. Regardless of your past experience you must be prepared to work you're hardest during these in-season weight workouts. If you haven't in the past be prepared to exert your best effort from the first day of summer camp until the last game of the season. In-season training is the foundation of our Texans strength program.

Monday after a game you will be stiff and sore. Using sub-maximal weights will result in a rapid decline in strength and a corresponding decrease in muscular body weight. Maintaining near maximum strength levels for the entire season can become an advantage as the season progresses.

Near maximum strength levels can be maintained if:

1. You are fortunate enough to avoid serious injury.
2. You are willing to train hard in spite of minor bumps and bruises.
3. If you are injured you train those areas of the body that are unaffected.
4. You enthusiastically perform meaningful, intense, and productive exercise every workout.
5. You work hard to regain any loss in strength (due to injury, summer camp, etc.).
6. You keep accurate records to prevent sub-maximal efforts.
7. You develop consistent and sound eating habits for the entire season.
8. You must avoid alcohol abuse.
9. You get the necessary amount of sleep and rest to insure full recovery by game day.

Training the day after the game is hard. You will probably be sore and tired. However it is the best day to lift during the season. It will help alleviate muscle soreness. You will

physically feel better at the end of your total body weight workout and you'll be less sore on Tuesday. It will also prepare you for a second productive workout on Wednesday, Thursday, or Friday.

Most players will be assigned an early morning lifting time on Wednesday, Thursday, or Friday. Plan on a good nights sleep and come to the weight room ready to work. You must try to be at your "peak" every day in practice and for every game until the season is over. **It makes little sense to lift hard in the off-season and not work equally hard when it can make the most difference (during the season).**

KEY POINTS TO REMEMBER

- 1. Your potential to gain strength and muscular body weight is inherited.**
- 2. The key to maximum gains is not what equipment you use...the key is how you use the equipment.**
- 3. The foundation of all strength programs is the rep.**
- 4. Raise the weight at a speed that forces the muscles to lift the weight.**
- 5. Allow more time to lower the weight.**
- 6. Do not waste time and energy performing non-productive exercise.**
- 7. Use as much weight as you can properly raise and lower.**
- 8. It is the quality of the work performed that produces results ... not the quantity.**
- 9. You must perform a wide range of exercises to develop each major muscle group.**
- 10. You are a football player, not a weightlifter, bodybuilder, or track athlete.**
- 11. The muscles of the neck must be your number one priority.**
- 12. The most important period of the year to work you're hardest and try to maintain maximum strength is during the season.**

REST

Rest is the seventh and final component in the fitness formula. It is often overlooked because we have been led to believe that more exercise is better. The key to maximum gains is the proper amount of quality exercise and adequate rest.

Exercise does metabolic damage to the body. This damage is repaired during the recovery phase. You don't get stronger from lifting a weight-- overload is the necessary stimulus. Gains in strength however, are made during the resting phase. If lifting by itself generated strength gains, you could lift seven days a week. You could perform an unlimited number of exercises and continue to make gains. You could run endless intervals and improve conditioning.

There is one energy system used to recover from exercise. The same energy system is used to recover from lifting, running, practice and games. The energy available to recover from exercise is limited.

The ability to recover from exercise varies with the individual. Don't waste energy. Perform quality work when you run and lift. Your training partner may have the ability to recover from more exercise than you do.

Find out how little exercise you can perform to stimulate the best gains, not how much. You are a professional football player, not a bodybuilder, weight lifter, or track athlete. Your physical preparation is paramount. You must spend additional energy practicing and playing the game of football.

After warming up make every exercise you do in the weight room count. Do not waste a set on non-productive exercise. Run as few quality intervals as are needed to stimulate the best gains. Why run fourteen 110's if twelve will produce the same (or maybe better) results?

Maximum gains can be obtained with the right amount of quality exercise combined with the proper amount of rest. Exercise should make you feel better and perform better. If you don't, you may be doing too much exercise and/or not allowing adequate rest.

There are indicators that can be used to determine recovery. Sophisticated urine and blood tests can be administered. Some experts claim that blood pressure and resting heart rate can be used. Feeling lethargic, losing strength, or experiencing unusual soreness, going into a typical workout are also signs of over training.

We've stressed the need for keeping accurate records in the weight room. If you don't make steady progress each workout, you may be over training (or not exerting the necessary effort). As you gain strength and become more fit, you should be lifting more weight and improving your level of conditioning. You will also be performing more

work. The amount of energy you have available to recover from exercise doesn't change significantly from an untrained state to your most fit condition.

As you become more fit, you may need more time to recover, or, must perform less exercise each workout. If you stop making gains before reaching a level of fitness you think you should reach, cut back on the amount of exercise, don't add more.

You can enhance the body's ability to fully recover from exercise. Good eating habits are essential. Try to eat meals and snacks at approximately the same time every day. Develop normal and regular sleep patterns. A lack of a normal daily routine can disrupt the systems in the body used to help the recovery process. As you grow older you may need more rest than your younger teammates.

The ability to increase strength, speed and conditioning levels, is dependent upon quality work, sound nutrition, your genetic makeup, and the **proper amount of rest**.

KEY POINTS TO REMEMBER

- 1. The key to maximum gains is the proper amount of quality exercise and adequate rest.**
- 2. Too much rest results in lower fitness levels.**
- 3. Not enough rest prevents full recovery.**
- 4. Find out how little exercise you can perform to stimulate the best gains.**

CONCLUSION

There are several key factors that make up the composite of a successful football player. The most significant factor is the position-specific physical characteristics needed to compete in the National Football League. Equally important are intelligence, discipline, and long-term commitment. There are many well-skilled players that never make it in the NFL because they lack these qualities.

Sound coaching is the next most important factor contributing to the overall success of a player and a team. Poor preparation and techniques can reduce a talented player to a non-factor on game day. You must study the game and develop sound techniques. The game plan must be executed individually and as a team. Quality coaching will accomplish this.

The next most important factor is a high level of fitness. Each of the components of your fitness profile must be elevated to the highest level possible. You will not reach your fullest potential as a Texans player if you lack the discipline to prepare yourself physically.

The Texans conditioning program is founded upon the safest, the most effective, and the most efficient methods available. There are no gadgets or gimmicks. No pills or potions.

We have a conditioning program that will allow you to reach your full potential. We are prepared to help you. It is your responsibility to make the necessary commitment to reach that goal.

The formula is an easy one. Make a commitment to hard work. It will require an unrelenting approach to reaching your full physical potential in all areas and sustaining those work habits under less than ideal conditions during the season.

To become a Super Bowl Champion it requires a monumental sacrifice from every individual in the Texans organization. As a member of this Texans team, are you willing and prepared to make the necessary sacrifice to become a World Champion?

Roberta Anding R.D.
Dan Riley
Ray Wright

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