Preparing to Win

Train Clean, Stay Clean!

CIS Football Training Manual

Canadian Interuniversity Sport

Canadian Universities Football Coaches Association
Toronto, Ontario, Canada

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Message from the President of the Canadian Universities Coaches Association

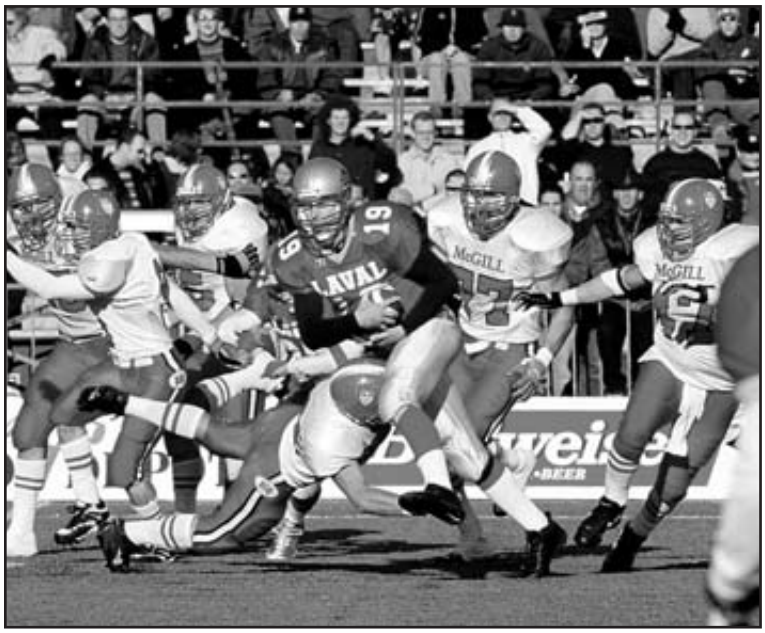
Training for the game of football is a complex adventure. With so many different innovations in the way physical preparation is conducted, it is no wonder that the young players of today are often overwhelmed and confused about proper training methods. Conditioning is not a short term process made easy by short cuts. It is in fact a continuous effort which demands year-round commitment.

The purpose of the CIS Football Training Manual is to help establish a basic understanding, and skill set that will help the high school age football player develop each required component of fitness in a safe, and drug free way.

This manual which is endorsed by the Canadian Universities Football Coaches Association (CUFCA) reflects not only the necessity for constant development, but also the need for the "complete" athlete. If used correctly, this program will highlight ways to develop one's size, speed, strength, power and agility. It is another resource the coaches of CIS Football can advocate in hope of improving our game.

All football coaches in the CIS hope that this manual will help you prepare for the next stage in your football career and we wish you all the success in that great adventure.

Pat Sheahan
President
Canadian Universities Football Coaches Association



Contributors

Editor

Jonathon Fowles is an assistant professor in exercise physiology at Acadia University.

Jonathon received his Masters degree from McMaster University and PhD from the University of Waterloo, serving as the Varsity Strength Training and Conditioning coordinator and strength coach for the football programs at both universities during those years. He is currently Strength Training and Conditioning Coach for Acadia Axemen Football, as well as all other varsity teams at Acadia. Jonathon is the Strength and Conditioning consultant for the National Sport Centre-Atlantic and consults with many national teams as well as professional hockey and football players.

Associate Editor

Bob Laycoe became Head Coach at University of Toronto in 1988 after 19 seasons at U of Saskatchewan and U of British Columbia. Bob holds a Bachelor of Science from Linfield College and a Masters of Physical Education from U of British Columbia. He has spoken at numerous clinics, published many articles, and is a member of the Coaches Working Committee of Football Canada. In 1992 Coach Laycoe was named OUAA Football Coach of the Year. The Varsity Blues won the Vanier Cup, Canada's National University Football Championship, in 1993.

Contributors

Linda Barton is a nutritionist who coaches you to reach, and even surpass, your lifestyle goals. She holds a Bachelor of Applied Science (1991) and a Masters in Applied Human Nutrition (1993) from U of Guelph, and is a Registered Dietitian. Linda provides nutrition consulting to U of Waterloo and area universities. She has lectured extensively on 'Fueling for Performance' to Canadian Fitness, Sport and Health groups and published numerous articles. Linda offers training seminars to local corporations and community groups while coaching a private clientele in her Waterloo office.

Roger Bernardes competed in football and wrestling at the U of Toronto from 1984 - 1991. During that time he received All-Star honors in football. In 1988 he competed in a 4 man Bobsleigh competition at the Calgary Olympics. He has earned Bachelor of Physical and Health Education and Master of Science degrees at the U of Toronto. He was recently the defensive line and strength coach for the U of Toronto and is now teaching high school.

Lynn Lavallée completed her Bachelor of Arts in Kinesiology and Psychology at York University, and her Master of Science in Community Health, Exercise & Sport Science, (Sport Psychology) at the University of Toronto. She attended the first year of doctorate studies at Oregon State University and is completing her Ph.D. at University of Toronto. Lynn is a certified Athletic Trainer and worked extensively with football. Lynn's research involved mental skills training with Football athletes. Lynn played provincial league touch football, ran intercollegiate Track (1500 m & cross-country), and has competed in amateur bodybuilding.

Harley Pasternak, a former competitive hockey player, bodybuilder and golfer is a specialist in the field of nutritional ergogenic aids. He authored a number of sports nutrition articles for fitness magazines and journals, and owns a fitness and nutrition consulting business in Toronto with certifications from the *American College of Sports Medicine* and the *Canadian Society of Exercise Physiology*. After studying kinesiology and nutrition at U of Western Ontario and York University, he continued in graduate studies at U of Toronto where he was involved in sports nutrition research. Harley has guest lectured at a number of universities on the topics of dietary protein for activity, anabolic steroids in sport, creatine and exercise, as well as general sports nutrition.

Jake Sandison completed a Master's degree at U of Toronto in exercise physiology and is now a professor at Loyalist College in Belleville Ontario. His research was on ergogenic aids, specifically creatine supplementation and was supported by the Department of National Defense and Civil Institute of Environmental Medicine. Jake holds an undergraduate degree from Acadia U in athletic therapy and exercise physiology. At Acadia, Jake worked with men's hockey and football teams in a therapy/training role while on the men's rugby team himself. Jake has years of personal training and fitness consultation experience, from children with special needs to elite athletes.

Melody Torcolacci has been the Head Track and Field Coach and Strength and Conditioning Coordinator at Queen's University since September 1988. She is a certified NSCA and NCCP Coach and has been planning training programs for athletes in many sports since 1982. She regularly presents at clinics where the focus is on strength and power development. During the past number of years Melody has planned the training programs for several Canadian Football League players.

Welcome to CIS Football

Football is a sport that demands strength, power, speed and quickness. Physical size and physical ability play an important role in determining an athlete's success in football, and therefore, dictates a focus on preparatory training programs. By opening the pages of this manual, you are looking to maximize your training for:

Size, Power, Speed and Quickness.

Across the country, there are varying approaches to football training, many of which are effective. Herein lies the motivation for the Canadian Universities Football Coaches Association to produce this manual. The CIS coaches were looking for a publication that represented a collection of effective and accepted principles that covered all aspects of training to prepare prospective high school athletes to play in Canadian Interuniversity Sport. The contributors to this manual reviewed programs from across the country and here provide a consensus of the most proven and accepted training techniques as well as new and advanced techniques identified in each of the authors' areas of expertise. Combined with comprehensive information and education to enable high-school and junior level athletes to guide their own training, this 'cutting-edge' manual provides a comprehensive approach to maximizing physical capabilities for university level football.

This manual is intended for high school football players, CEGEP and junior level players to prepare for the rigors of university football. The purpose of this manual is to provide the football athlete with all the tools necessary to improve their physical abilities by combining effective training with practical approaches to diet and mental preparation. This publication, if used properly, provides football players with an arsenal of approaches to develop the strength, power, speed and skills necessary for football. All it takes then, is a commitment to the program and its principles, and a commitment to become the best player one can possibly be.

Doping Free Football: Train Clean – Stay Clean

True Story

Many of us, at one time or another, have thought about breaking the rules to win. In my case, it was steroids. I was a university varsity athlete and wanted more than anything to be the best at my sport. Growing up I was told "to win at all costs" and "only nice guys finish last". I was lucky enough to avoid most of the short-term side effects of using steroids. With the exception of some mild acne, hair loss, insomnia, frequent temper tantrums, and a diminishing bank account, I was generally healthy. My body weight grew and I saw my strength rise significantly. However, everything I accomplished during those years, will forever be tarnished in my mind. I cheated. I cheated myself from learning what it was to strive for a goal based on hard work and smart decisions. I've spent the past ten years of my life thinking about the four years that I played varsity ball. At one time, I thought the years I spent at university were my life and everything after was insignificant. Even though I still workout, I was forever living in the past. Telling others "you should have seen me back then".

Instead of growing as a person and improving in my years since school, I feel my peak occurred at 21 years of age. Cheating the rules of the sport made me think I could cheat my way through life. On more than one occasion, I have been approached by a varsity athlete and asked what I thought about a certain drug. I proceed to regurgitate the often-recited health and legal risks they would be taking should they choose the dark side. However, I go on to tell them that they have a choice. A choice that I never knew I had. Through smart training and eating, they can reap similar physical benefits as those who use drugs while avoiding the mental and physical health, legal, and financial sacrifices associated with drug use. In doing so, they are gaining more than just a performance edge they are learning how to win in life without cheating.

This guide represents the choice no one ever told me about. If used properly, it will allow you to better yourself as an athlete in ways you never thought possible, without cheating. The contributors in this manual have provided you with proven techniques and cutting edge information for you to use in your physical and mental preparation for the game of football.

The Power of Sport

Sport has an incredible power to build character. A 2002 Canadian Public Opinion Survey on Youth and Sport revealed that sport was perceived by Canadians to be second only to the family in its ability to develop and reinforce positive values.

The Use of Performance Enhancing Drugs and Methods is Cheating.

Football, like any sport, is meant to be played within the rules – both the letter and the spirit of the rules.

There is a very important ethical issue related to your progress in football and that is cheating by using performance enhancing substances and methods. It not only affects your participation in football but in other aspects of your life.

Why would players resort to doping to enhance sport performance? The anticipated rewards are fleeting at best – but in the end, the outcome is always the same: tainted results, moral failure, social rejection and unnecessary risk to personal health.

There are no short cuts to excellence, and winning is truly a success only when achieved honestly.

We know that:

- doping shows a lack of respect to oneself, to opponents and to sport as a whole,
- doping has serious health implications,
- doping is against the rules of sport, and
- doping creates an impression that all athletes are cheaters.

Canadian Anti-Doping Program

Programs of detection and enforcement are in place to ensure a 'level playing field' for Canadian athletes. As you move into the next level of football you will be subject to the Canadian Anti-Doping Program. It is Canada's premier tool in the ongoing battle against doping in sport.

The Canadian Anti-Doping Program (CADP) is Canada's application of the World Anti-Doping Agency's (WADA) Anti-Doping Code and its mandatory standards. These include the International Standard for Testing, the International Standard for Laboratories, and the WADA Prohibited List.

Football Canada and the CIS have adopted the CADP. They apply the CADP and recognize suspensions of athletes or others determined to have committed an anti-doping rule violation

The WADA Prohibited List

WADA selects a substance for the Prohibited List if it meets two of the following three criteria:

- enhances sporting performance;
- poses a real or potential risk to health;
- is contrary to the spirit of sport.

Example Substances and Health Risks

The following chart provides example substances and some common health risks for each category of prohibited substances on the WADA Prohibited List. While the category of prohibitive substances and the example of the substance may not mean anything to you today, but take a close look at the Common Health Risks that are associated with these substances.

This list can change at any time. Visit the WADA website at www.wada-ama.org or the CCES website at www.cces.ca for the current WADA Prohibited List.

Category	Example Substances	Common Health Risks
Anabolic agents	Stanozonol	Acne, liver disease, high blood pressure, dependence, depression, increased aggression and mood swings.
Hormones and related substances	Erythropoietin (EPO) , growth hormone (hGH)	Thickened blood, increased risk of blood clots, stroke and heart attacks
Beta-2 agonists	Asthma pump (salbutamol, salmeterol)	Nervousness, dizziness, sleep problems, nosebleeds, upset stomach, muscle cramps, cough, chest pain or discomfort
Agents with anti-estrogenic activity	Letrozole, tamoxifen, cyclofenil	Swelling of the extremities, loss of appetite, fatigue, dizziness, headaches, abdominal pain, constipation
Diuretics and masking agents	Diuretics	Fainting, dizziness, dehydration, nausea,muscle cramps, decreased blood pressure
Stimulants	Ephedrine, cocaine	High blood pressure, stroke, heart attack
Narcotics	Morphine, heroin, codeine	Risk of further or permanent damage to an injury, nausea, decreased heart rate, dependence
Cannabinoids	Marijuana, hashish	Decreased concentration, impaired memory and learning abilities, lung and throat cancer, and chronic bronchitis
Glucocorticosteroids	Asthma inhalers	Osteoporosis, softening of connective tissue, heartburn, gastric ulcer,blood clots, nervous system disorders, insomnia, decreased growth

The WADA Prohibited List also includes prohibited methods, such as:

Method	Example	Common Health Risks
Enhancement of oxygen transfer	Blood doping	Jaundice, circulation overload, blood clots, stroke or heart failure, metabolic shock
Chemical and physical manipulation	Catheterization, urine substitution	n/a
Gene doping	Gene manipulation	Unknown

Doping-control Procedures and Sanctions

When you choose to compete at high levels of football, you become subject to doping control. If you are going to play CIS football you will be subject to testing and sanctions of the CADP.

Generally speaking, violations of the Canadian Anti-Doping Program will result in some form of suspension and in some circumstance loss of financial assistance.

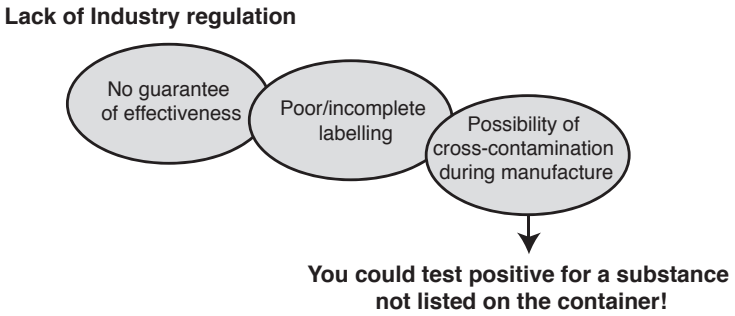
You can find more about the CADP by visiting the CCES website at http://www.cces.ca/pdfs/CCES-POLICY-CADP-E.pdf

Casual or "Recreational" Drug Use

You should be aware of the **consequences of casual drug use**, as all samples collected in competition are screened for cannabinoids and other social drugs (i.e., marijuana, hashish, cocaine, ecstasy, crystal meth). Since cannabinoids can stay in your body for more than a month, athletes could test positive for prohibited substances ingested in situations separate and apart from the locker room, weight room or field of competition.

What About Supplements?

You need to be extremely cautious when considering the use of any supplement product. There have been instances where supplements, including vitamins and minerals, ergogenic aids and herbal remedies, have been found to contain prohibited substances. In Canada, supplements are regulated by different authorities depending on the supplement's function, ingredients, and whether a claim is made. As a result, certain products are not licensed and therefore not subject to the same strict manufacturing and labeling requirements as licensed medicines. As a result, content and accurate labeling of supplements cannot be guaranteed. The contents of particular products may change from batch to batch. Labels do not always indicate all of the ingredients, nor do they always do so in a way that identifies prohibited substances.



In addition to the risks of inadvertent doping, the CCES is concerned about the lack of evidence-based research and clinical studies that indicate that supplements are safe and effective for athletes. There is also little or no evidence that supports a real need for athletes to take supplements.

Presently, there are no fail-safe methods or criteria for reliably identifying good-quality products. Supplements can contain prohibited substances, and under the principle of strict liability, athletes that use them risk providing a sample which leads to an adverse analytical finding and an anti-doping rule violation.

If You Use Supplements

While good nutritional habits are essential for overall health and optimal performance, the CCES does recognize that in certain circumstances supplementation may be warranted. Athletes choosing to use supplements can help to manage the existing risks of supplement use by taking these actions:

1) Look before you leap!

Always seek professional advice before using a supplement. Team physicians and sport nutritionists are excellent resources and can be contacted through your sport organization or Canadian Sport Centre. If these professionals are not available to you, you should seek advice from a pharmacist. Always make sure the professional knows of the risks associated with supplement use and reviews the WADA Prohibited List before providing advice. The CCES' Substance Classification Handbook applies the WADA list to the Canadian market, and can be downloaded at www.cces.ca/pdfs/CCES-PUB-SubstanceClassification-E.pdf.

2) There is usually more than one way to reach your goal!

Consider whether you even need to use a supplement by determining if you have other options such as changes to your diet or nutrition program.

3) Hmmm … What if your team-mate jumped off a bridge?

Never use a supplement just because a teammate or competitor is using it or recommends it.

4) Leave well enough alone!

Don't start or change a supplement regime in the run-up to a major competition unless you've consulted with a professional.

5) If you play with fire, you're likely to get burned!

Supplements fall into a wide spectrum of types with the level of risk being lower at one end of the spectrum and higher at the other. Vitamins and minerals usually warrant less concern than those products that rely on claims related to performance benefits (e.g., muscle building, fat burning). Examples of substances that are prohibited and may appear in supplements from time to time are: DHEA, Ephedrine, Androstenedione/diol, Amphetamines, and Ma Huang.

6) Caveat Emptor (Let the Buyer Beware!)

There is always an increased risk of doping when supplements are purchased through non-traditional means such as: over the internet, through magazines or directly from a non-licensed supplier. Products purchased from a trusted retailer or directly from a reputable manufacturer are likely to be associated with lower risk of inadvertent doping. If possible, determine if the manufacturer produces any products containing substances on the WADA Prohibited List – if so, there will be a higher risk of cross-contamination between products. Given a choice of suppliers, choose a product from a company that also manufactures pharmaceuticals over one that is unknown.

7) If two tablets are good for me, ten must be really good, right?!

Always follow the recommended dosage and route of administration as indicated on the product label. Be especially cautious of potential negative interactions if consuming more than one supplement product at a time. Use supplement products like you would any over-the-counter medication – for example, if the recommended dose is one tablet, two or more may be unhelpful, counter-productive or even dangerous.

8) Let's see … According to my records …

Keep a log of your supplement use (like your training log), including the batch or lot numbers of the product and when they were consumed. Always keep some of the contents from each container of supplements in case a problem arises that requires the product to be investigated. Although keeping this information will not be deemed as a valid defense in the case of an anti-doping rule violation, it may provide you with sufficient evidence to seek compensation from the manufacturer.

9) Oh yeah? Then put your money where your mouth is!!!

Find out if the manufacturer is prepared to stand behind its products if they cause an anti-doping rule violation. Does the manufacturer offer any form of guarantee or compensation? What proof does the manufacturer require to qualify for that compensation? If the manufacturer does offer a guarantee, always obtain a letter of confirmation signed by a senior official from the company.

10) Why not speak up when everyone's listening?

Major events such as the National, International, and Olympic/Paralympic Games are an excellent opportunity to advocate the necessity of safe supplement usage. When possible, use your experience at these events to speak to individuals in positions of influence about the importance of practical and concrete solutions to reduce the risks to athletes.

Resources

Canadian Centre for Ethics in Sport
- Internet www.cces.ca
- InfoLine 1-800-672-7775
- Email substanceinquiries@cces.ca

Canadian Anti-Doping Program
www.cces.ca/pdfs/CCES-POLICY-CADP-E.pdf

Substance Classification Booklet
www.cces.ca/pdfs/CCES-PUB-SubstanceClassification-E.pdf

Substance Quick Reference Card
www.cces.ca/pdfs/CCES-PUB-SubstanceQRC-E.pdf

Doping Control Procedures: An Athlete's Guide
www.cces.ca/pdfs/CCES-PUB-DCProcedures-E.pdf

Doping Control Procedures Video
www.cces.ca/pdfs/CCES-VID-DopingControlProcedures-E.ram

Global Drug Information Database
www.globaldid.com (coming soon)

World Anti-Doping Agency
www.wada-ama.org

True Sport Movement
www.truesport.ca

Manual at a Glance

In order to develop all the qualities required for football success, use this manual to help you prepare for optimal performance. Here is a quick overview of the chapters to follow:

Three-Year Plan: The 'BIG Picture' Diagram

This "BIG Picture" plan is designed for you to perform as you develop throughout your entire high-school career.

One-Year Plan: One-Year Plan Diagram

A detailed one-year plan designed for optimal training and performance in the preparation before CIS football.

Chapter 1: Goal Setting and Testing

Monitor your development as a player. This chapter provides a basis for you to work on your weaknesses and will help motivate you towards your peak potential.

Chapter 2: Physiological Basis

This chapter helps you to understand the important factors of football training – what limits performance and what improves performance.

Chapter 3: Program Components

An explanation of the components of an effective and efficient training program.

Chapter 4: The Program

A day-by-day plan for off-season training which will prepare you for a CIS football camp and football season.

Chapter 5: Nutrition

Learn nutrition facts and fallacies. This chapter helps you to understand how you can fuel your body for peak performance.

Chapter 6: Mental Skills

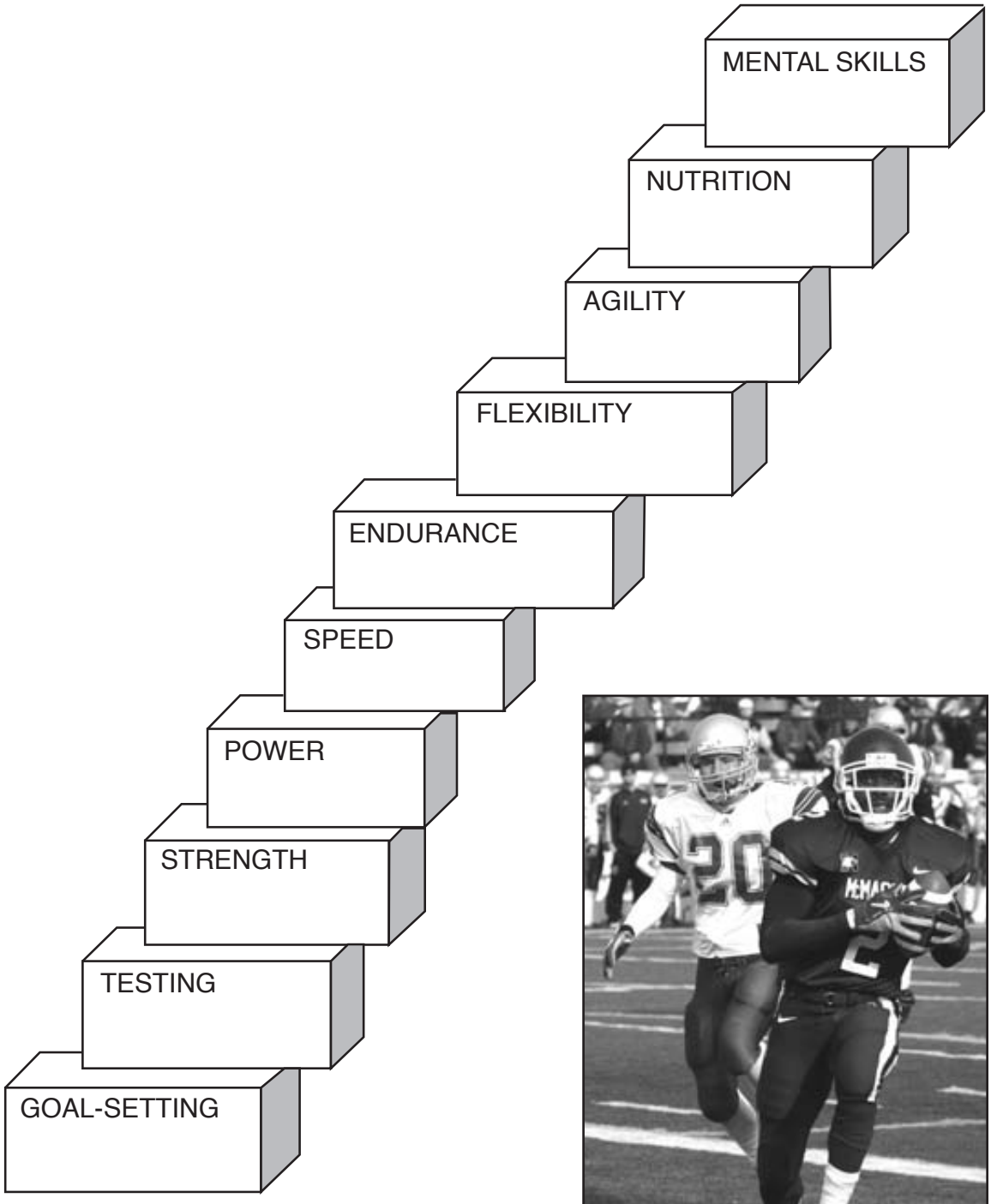
How to be strong mentally and physically. In this chapter you will discover that the final touches of your preparation is to master the mental game.

Appendices

Here you will find reference information for proper exercise technique while training.

Building Blocks for Football Success

Each block builds on the next to develop the complete player. Be sure to include all the components in your training for football success.



The Three Year High School Training Plan

The workout provided in this manual is a 'cutting-edge' football training program for an experienced weight trainer and player, of reasonable fitness, getting ready for university or advanced football. Of course, there are all shapes, sizes and levels of ability for each of the weight training, running or agility portions of the program and each athlete will have to determine their own suitability to complete each part of the training plan.

The program in this manual should be done in your senior year, after one to two years of resistance training under your belt. It is best to seek the advice of qualified trainers and coaches to 'individualize' the program to your needs and your abilities.

This manual is a guide for individual training, to help each athlete achieve their own performance and playing goals to prepare for a successful university career. The program outlined can also be followed in the beginning years of a junior or CIS program with only minor modifications by year to account for increased fitness. Because the program is 'periodized' (meaning that in each part of the year the training is different), each time you go through the program will be like starting it new, just at a higher level of fitness. The way you increase your gains from the program then, is to put more into it. Gradually increasing your weights, your speed and progressively increasing your training volume.

Typically, a three year plan will prioritize a certain training focus for each year. Because the 'cutting-edge' program provided in this manual is the basis for everyone, more emphasis was placed on 'overall development' including all types of training with slightly higher rep schemes and developing technique in each weight training, agility and speed workout.

Some ideas for increasing the level of difficulty of the program are provided. These advanced training techniques should be individualized to the needs of the athlete so the techniques are introduced for reference without elaborate descriptions. Individualized training usually focuses on a major training area of size, strength, speed, or power. So, when you have 'maxed out' your gains from the program provided, probably not until your final year if at all, you can seek the help of coaches and trainers to add levels of difficulty and complexity. Once you get to a CIS team, your varsity strength and conditioning coach may have further techniques to help you improve.

It is important to remember that just because you may be in your senior year with some years of training under your belt already doesn't mean you should jump to higher levels of training provided, straight away. The training program designed for this manual is 'cutting-edge' and will help even the experienced trainer significantly in increasing sport specific size, strength and speed.

Training Emphasis in a Three Year Plan

Year 1: Focus on Basic Development (e.g. Gr. 10)

Develop basic strength and solid technique in resistance training, with inclusion of core stability, flexibility and some agility training. Focus on muscle balance (no weak muscle groups), program balance, and participation in a range of other sports and activities to develop overall athleticism.

Year 2: Focus on Size and Strength (e.g. Gr. 11)

Increase the intensity of your resistance training by working with slightly greater weights and volume. This 'General Adaptation' training (i.e. learning how to push, bringing up weak areas) and more focus on developing muscle size necessary to develop strength and power. This can be done with use of some 'bodybuilding' techniques in the summer, such as split workouts and pyramids.

Year 3: Focus on Overall Development (e.g. Gr. 12)

This is the **current program**. This program promotes development of all areas necessary to play football at an advanced level, including size, strength, speed, agility, core strength, flexibility as well as nutrition, goal-setting and testing. This is a complete package, but one that is necessary to compete at the highest level for junior, CEJEP, or university ball.

Bonus Years: Focus on Size, Strength, Power

Once you have made it to the next level, you still can use this manual to continually improve your size, strength, speed and power. There are options provided in the manual to take each area of training one step further. Your next team will likely help you with this with more intense strength cycles, speed techniques such as resisted running and more intense agility exercises.

By the end of the final year of high school or the first year of your junior program, you developed all areas of your physical game and have all the tools necessary to be the best football player you can be. Following are some examples of what to do in each year of the program.

Example Year 1: Basic Development

When starting out formal training for football, you want to start with the basics such as proper tempo, breathing and balance. It is a good idea to seek out the help of a coach or fitness trainer, to help you master basic weight training techniques and monitor improvements. If your gym has machines, sometimes it is good to start on those, to get used to lifting weights. After a while, you want to progress to free weights, because they help to develop the balance and strength needed for football.

For your training plan, it is best to start out with a full-body routine, done 2-3 times per week. You can include additional core training and/or agility or speed or other sport training on other days of the week. The goal is to 'learn how to push' and slowly adapt your body to the intensity required to increase size and strength. Most individuals will not increase their size very much in junior high; however, strength gains and improvements in balance and athletic ability can enhance your playing performance. **Please see specific sections of the manual for determining intensity and exercises (see appendices for exercise descriptions).**

Full Body Machine Workout	**Beginning**	**Advanced**
	Sets & Reps	*Sets & Reps*
Leg Press	2 x 12 @ 60%	3 x 10 @ 70%
Leg Curls / Leg Extension	2 x 12	3 x 10
Pushups or Chest Press	2 x 12	3 x 10
Seated Row, or Laying down Pull-up	2 x 12	3 x 10
Pulldowns or Chinups	2 x 12	3 x 10
Seated Overhead Press	2 x 12	3 x 10
Bicep Curls	2 x 12	3 x 10
Tricep Press	2 x 12	3 x 10
Abdominal Curls	2 x 12	3 x 10
Cool-down	Core – Stability and Stretch	

Full Free Weight Workout	**Beginning**	**Advanced**
	Sets & Reps	*Sets & Reps*
Body Weight or Barbell Squats	2 x 12 @ 60%	3 x 10 @ 70%
Lunges or Step Ups bodyweight	2 x 12	3 x 10
Pushups or Bench Press	2 x 12	3 x 10
Single Arm Dumbbell Row on a bench	2 x 12	3 x 10
Seated Overhead DB Press	2 x 12	3 x 10
Bicep Curls / Tricep Extensions	2 x 12	3 x 10
Side Lateral Raises	2 x 12	3 x 10
Standing Calve Raise	3 x 15-25	3 x 15-25
Cool-down	Stretches + Back	

Other Core Stability and Agility Exercises		
Front, Side, and Rear Supports	2 x 15 sec each	3 x 20 sec each
Single leg balance exercise on a mat	2 x 15 sec each leg	3 x 20 sec each leg
Vertical Jumps	2 x 5 max jumps	3 x 5 max jumps
Shuttle Runs (5 and back, 10, 15)	2 sets	3 sets

Example Year 2: Size and Strength

To develop the size and strength necessary for football, increased volume in weight training can be accommodated in a two day split in the off-season training (Day 1 – Monday, Thursday ; Day 2 – Tuesday, Friday). This can be done in with pyramid sets (resting 2-4 min between sets for each exercise) and a slightly longer workout (lasting 1.5 hours). The 'pyramid' was combined with a second exercise per major muscle group for a high volume load, like in bodybuilding. You can run track, participate in other sports, or do some of the agility and speed workout suggested on Wednesday's and Saturdays to improve agility and speed.

Day 1 – Chest, Back, Biceps, Abs

	Monday	*Thursday*
2-3 minutes rest between sets; for pyramids, add ~5kg per set		
Bench Press	4 x 12, 10, 8, 6	3 x 8
Incline DB Press	3 x 10	3 x 12, 10, 8
Chinups or Lateral Pulldowns	30 reps total	3 x 12, 10, 8
Bentover Barbell Row	3 x 12, 10, 8	3 x 8
Back Extensions	3 x 10	3 x 8
Preacher Curls or Dumbbell Curl	4 x 12, 10, 8, 6	3 x 8
Abdominal Curls, Leg Lifts	3 x 15-25	3 x15-25
Side, Front, Rear Supports	3 x times to fatigue	3 x fatigue

Day 2 – Legs, Shoulders, Triceps, Calves

	Tuesday	*Friday*
2-3 minutes rest between sets		
Squats	4 x 12, 10, 8, 6	3 x 8
Step Ups or Lunges *with dumbbells, drive*	3 x 10	3 x 8
Hamstring Curls (Single leg)	3 x 10	3 x 8
Overhead DB Press	4 x 12, 10, 8, 6	3 x 8
Barbell Shrugs	3 x 6	4 x 12, 10, 8, 6
Side Lateral Dumbbell Raises	3 x 10	3 x 8
Tricep Pushdowns	3 x 10	3 x 8
Standing Calve Raise	3 x 15-25	3 x 15-25

Other Core Stability, Agility and Speed Exercises

Dynamic Warmup 10 min (light jogging, with various leg drills, lunges etc to limber up) (see program for specific exercises for the warm-up)

Single Arm Front and Side Supports	2 x 15 sec each	3 x 20 sec each
Single Leg Rear Support	2 x 15 sec each	3 x 20 sec each
Single Leg Side to Side Jumps	2 x 15 sec	3 x 20 sec
Vertical Jumps	2 x 5 max jumps	3 x 5 max jumps
Sprints	2 x (2 x 30m)	3 x (3 x 30m)
Shuttle Runs *(5 & back, 10, 15 & back)*	2 sets	3 sets
Chinnies (bicycle abs)	2 x 30	3 x 30
Abdominal Curls	2 x 30	3 x 30

Example Bonus Strength and Speed Focus

After the year of training in this program, you can begin to focus on strength explosiveness, speed and agility to make your football career take off.

At the advanced level, training must be holistic; over emphasizing one component while neglecting another will not lead to the results you desire. The weight room is a means to an end, and it's importance must be kept in proper perspective.

Below are some sample maximal strength & speed development weight room workouts from an advanced program at the university level. This is to serve as a guide as to what to work toward from the current program. This workout includes the weight room 4 times a week. Two of the workouts (Monday & Friday) are Olympic lifting focused and two (Wednesday & Saturday) are more traditional workouts without Olympic lifts included.

Monday

Continuous Warmup

jog with active upper body + Stretch

2 x fast foot carioca + acceleration

side shuffle with arm swings

2 x high knee carioca + acceleration

backwards running + acceleration

Quick Stretch + 10 leg swings front-back and side-to-side

straight legged shuffle + 2 x A skips + acceleration

straight legged shuffle + 2 x B skip + acceleration

straight legged shuffle + 2 x A run + acceleration

straight legged shuffle + 2 x buttkicks + acceleration

Velocity Drills

Fast Foot & Fast Leg: 2 x fast leg your choice

2 x rolling start + sprint for 30 metres

2 x 3 point start + sprint

Speed [95 + %; 300m]

4 x [25 metres + 50 metres] + = 3 minutes; 6 minutes between sets

Footwork: football specific positioning work

Weights: 4-6 minutes between sets

1. Hang snatch: 4 @ 60% + 4 @ 70% + 4 @ 65% + 4 @ 75%
2. Snatch pulls: 5 @ 85% + 5 @ 95% + 5 @ 90% + 5 @ 100%

Cooldown: 5 x [100 metres @ 60% + jog 300 metres] + Stretch

Wednesday

Continuous Warm-Up + Velocity Drills: as Monday

Speed: [95 + %; 240 metres]

4 x [20 metres + 40 metres] + = 3 minutes; 6 minutes between sets

Footwork: football specific positioning work

Weights: 4-6 minutes between sets

1. Squats: 4 x [6 + (DROP + VJ + cut L/R + SLJ + cut R/L) + (DROP + SLJ + cut L/R + VJ + cut R/L)]
2. Bench: 4 x 6 + rep out @ 225
3. Overhead Press: 4 x 6

CIRCUIT:

4. Hamstring Curls: 4 x 10
5. Single Arm Dumbbell Rows: 4 x 10
6. Lat Pulldowns: 4 x 10
7. Back Extensions or Back Stability Exercises: 4 x 10
8. Mega Abdominal Circuit

Cool Down: 5 x [100 metres @ 60% + jog 300 metres] + STRETCH

Friday

Continuous Warmup + Velocity Drills: as Monday

Speed [95 + %; 360 metres]

4 x [30 metres + 60 metres] + = 3 minutes; 6 minutes between sets

Footwork: football specific positioning work

Weights: 4-6 minutes between sets

1. Hang Cleans: 4 x 4 @ 75%
2. Clean Pulls: 4 x 4 @ 105%

Cooldown: 5 x [100 metres @ 60% + jog 300 metres] + **Stretch**

Saturday

Continuous Warmup + Velocity Drills

Weights: 4-6 minutes between sets

1. Squats: 4 x [6 + (DROP + VJ + cut L/R + SLJ + cut R/L) + (DROP + SLJ + cut L/R + VJ + cut R/L)]
2. Bench: 4 x 6 + rep out @ 225
3. Overhead Press: 4 x 6

CIRCUIT:

4. Hamstring Curls: 4 x 10
5. Bent-Over-Rows: 4 x 10
6. Lat Pulldowns: 4 x 10
7. Back Extensions or Back Stability Exercises: 4 x 10
8. 500 chinnies

Cool Down: 5 x [100 metres @ 60% + jog 300 metres] + STRETCH

Yearly Training Plan

Date	Dec.				Jan.				Feb.				March				April				May				June				July				Aug.				Sept.				Oct.				Nov.			
Training Phases	Trans.				General Preparation												Trans.		Camp		Specific Preparation												Trans.		Camp		Competition													
Training Objectives	Active				Strength and Muscle Mass Development												Play Ball				Maximum Sport Specific Strength												Summer Camp				In-Season Training or Maintenance													
	Rest				General Adaptation, Hypertrophy, Aerobic Condition, Reduce Fat%								Strength				Power				Active Rest		Hypertrophy, Aerobic Intervals						Strength				Power				Sport Specific Power													
Microcycles	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Testing																																																		
Flexibility																																																		
Weight Training*																					1/ wk																													
a) Size & Strength Development																																																	
b) Power Development																																																	
c) Maintenance																																																	
Agility																																																	
Plyometrics																																																	
Aerobic Intervals**																																																	
Speed***					Technique												Speed work twice per week																																			

*Weight Training: a) high volume bodybuilding b) lower volume, high speed exercises b) Full body, minimum exercises at least 1 x / week

**Progressing from long, slow training to intervals of 1 minute down to 15 seconds

***Optional for linemen – Progressing from accelerations and speed-endurance to short sprint power (can be done on a bicycle for linemen)

Prepared by Jonathon Fowles

Chapter 1

If You're Staying the Same ... You're Falling Behind

If You're Staying the Same … You're Falling Behind

1.1 Goal Setting

Introduction

Long-term, Short-term, and Shorter-term goals

Your Football Triangle

Realistic and Challenging Goals

Specific and Measurable Goals

Roadblocks

Prepared by Lynn Lavallée

1.2 Testing

Introduction

Testing Guidelines

Testing Procedures

Football Fitness Standards

Prepared by Jake Sandison & Jonathon Fowles

1.1 Goal Setting

Introduction

The basis of a successful training program is the effort that you are willing to put into it. The success of your training is dependent on your attitude. Attitude determines altitude. Before embarking on your training plan for football it will be helpful to define your attitude.

Ask yourself ...

Why are you reading this manual?

What do you want to attain?

What ultimate level would you like to attain in football?

What do you need to do to get there?

Why are you playing football?

How committed are you to football?

How or where does football fit into your other commitments (school, work, family)?

Only after you know the answers to these questions will you truly be able to project the needed attitude and commitment to your training. If you cannot answer why you are in the gym or on the field training everyday, sacrificing your time, eventually you will give up.

Finding your direction can be attained through goal setting. A goal is a personal or group skill or task that one strives to attain. Goal setting provides a long-term vision and short-term motivation. When you are training hard and feel you can't give anything more, thinking about your ultimate long-term goal for football can give you that extra boost. Setting goals gives you direction, preparing you to achieve more. It improves your performance and improves the quality of your training. It increases your motivation and your self-confidence.

Long-Term, Short-Term and Shorter-Term Goals

Many athletes and teams set an outcome goal to win. Goals are more than the outcome of winning, running a 4.4, or benching 225 lbs. Setting an outcome goal is perfectly acceptable but outlining the specific or short-term goals leading to the outcome is essential. Your long-term football goal may be the ultimate level you would like to attain. Your short-term goals may be individual season goals throughout your university or high school career. Your shorter-term goals may be your specific off-season goals. How you get there is based on even shorter-term weekly goals and even daily goals you set during your off-season training. Imagine the triangle pictured below. The star is the pinnacle, your ultimate football goal. This ultimate goal will give you motivation each and every hard day of practice. This is what you are striving towards! Think of your star when you feel like giving up. Now, how do you achieve that ultimate goal? You need to have the base of the triangle in place before reaching the top. This takes direction, hard work, and determination. The star at the top of your triangle should motivate you, not blind you. For instance, a goal of winning that is focused on throughout a game will take away from your specific technical and/or psychological goal/s for that game. You must focus on the base of the triangle. Don't let the shining star of 'winning' or 'going Pro' blind you to what you must do today.

Make Your Goals Both Realistic and Challenging

Realistic and Challenging Goals

The goals you set should be challenging enough to keep you motivated but also realistic to avoid discouragement. You can determine your goals by performing the tests in the testing section of this manual and set realistic, yet challenging goals for each test in one month's time and at the end of the off-season. Check out the standard norms for some of the tests at the end of this chapter. It might be wise to find out exactly what type of testing your school will be performing and add these tests to your goals. You should also set non-physical goals, such as practicing relaxation strategies, working on your visualization skills, and maintaining proper nutrition (see The Winning Edge and Nutrition chapter). Remember your goals should be just that, your goals. If you set a goal to make someone else happy or if you are comparing yourself to others, it is no longer your personalized goal.

Specific and Measurable Goals

Setting a broad goal like, "Do My Best!" leaves room for excuses. You have to determine how you will do your best. Setting specific goals that are measurable allows you to review your goals and ensures you are headed in the right direction. Again, these measurable goals can be set based on the testing you will be required to perform at try-outs or training camp. In addition, your goals should be stated positively. For instance, setting a goal stating, "I will not miss any practices!" should be stated, "I will attend all practices!" Set time guidelines for all your goals along with scheduled intervals to assess your progress. This allows you to provide accurate feedback and reassessment of your goals. Reviewing your goals is an important process. Situations change and you may be required to restructure your goals, particularly if you are not accomplishing them or completing them too easily. Having said this, Be honest with your self! Don't make excuses if you are not attaining your goals. In providing feedback to your goals take into account that the closer you are in attaining your goal, the smaller the gains. Do not compare the progress of your goals with others.

Roadblocks

Being prepared for possible roadblocks to your goals will help you in achieving your ultimate goal. At times you can look at others who have attempted to attain similar goals but were unable to for one reason or another. For example, playing football is contingent upon maintaining good grades in school, therefore developing a plan to maintain your grades should be a basic goal. Without this goal you cannot reach the peak of your triangle.

Examples of Goals

Senior Year Goals

Maintain good grades by developing time management skills at the beginning of the year. Attend a time management seminar. Get help before I need it. Attend essay writing workshops. Learn the plays by visualizing them daily, practicing them in my mind.

Weekly off-season Goals

Do not deviate from training schedule, record all work outs. Develop an eating plan based on nutrition section of this manual, record food intake. Stop procrastinating! Tell my friends I've got to train. They may want to join in.

Post your goals where you can review them regularly.

(e.g. In your locker or on the bathroom mirror.)

1.2 Testing

Introduction

An important and more objective component to goal setting is physical testing. Measuring initial status and subsequent improvement through testing helps assess training progress, and can help the athlete gain motivation and validation from previous hard work. Testing does not predict potential talent or potential improvement in the game, as tests are not football. Performance of any athlete is a composite of many factors and physical performance is just one. The goal of this manual is to optimize performance to maximize playing potential; testing is a way to objectively quantify strengths, weakness, and improvements.

Remember tests have to be reliable and valid to be applicable. In this context, the tests must be relevant to football and possibly specific to the requirements of a position (e.g. performing the pro-agility with a side shuffle for linemen, and turn and sprint for receivers). There must also be strict administration procedures with rigidly controlled pass/fail criteria, warm-up procedures and experimental and tester conditions. Otherwise, the testing itself may be at fault and evaluation of the test results would be difficult to direct future training. It is a good idea to consult your coach to help with testing.

The following tests assess the attributes determining physical potential in football (presented in the chapter: physiological basis for conditioning). Together, these tests provide a good measure of football specific condition and overall fitness level. These tests were chosen for the overall acceptance by football programs and for ease of administration. Tests can be performed during a football season, and are also easy to administer at home or at other facilities for self-assessment by the athlete.

Testing Guidelines

Testing should be at regular intervals and planned ahead so the athlete knows what is expected and when. Generally, tests should represent what is expected for you to train. In football many attributes are required, however, not all are stressed at all times during the year. Therefore, the testing program can be limited to specific tests at certain times of the year (e.g. only strength tests in spring camp if adequate sprint training has not taken place). Optimally, a testing battery would be desired three times per year (January, April – Spring Camp, & August –Fall Camp).

Warm-up

Warm-up should proceed from a general or team warm-up to specific warm-ups on each test. A practice trial in each test is the best specific warm-up. Sprinting 40 yard tests always have a risk for injuries, so it is vital to have a thorough run warm-up (complete with the running drills in this manual) and a few sub-maximal sprints to reduce the risk of muscle pulls; however warm-up can not overcome a lack of physical preparation from not training in the summer conditioning program.

Testing Trials

Normally athletes should get a practice and 2 or three attempts at tests such as vertical jump, max lifts, and agility or sprints. For taxing tests such as anaerobic capacity (300 yard) a single performance is adequate. Normally rest breaks of a few seconds are

required for the vertical jump, to a few minutes for the agility tests and up to 5 minutes for a 3RM or 1RM strength test or sprints. There must be a consistent warm-up for all players and between tests to be accurate (see sequence of tests as well) . The warm-up should be general full body and specific to the test. You are normally 'warmed-up' when you break into a sweat.

Sequence of Tests

Generally, anthropometric tests are first (height, weight, body fat), agility tests should come before fatiguing test that may affect coordination (i.e. T-test before 3RM squat), and endurance tests (12 minute run, 300 yard shuttle), come after strength and agility. Often times, the agility and speed tests are performed on one testing day, the strength tests on another, and the endurance tests on another to keep the athlete fresh for all testing. For tests that assess the anaerobic alactic system (maximum explosiveness; 1-10 second of effort), 2-3 minute rest is required between trials. Tests stressing the lactic acid system (300 yard) can produce elevations of lactic acid lasting ~ 1 hour, so it is best to perform those tests last in a battery.

Reliability

For best results, testers should be experienced at administering the test and testing conditions should be as consistent as possible between athletes, trials and testing sessions. That means the tester, the instructions, motivation and spotting should be the same for each testing session. It is important to remember that for any timed testing using a stopwatch, that depressing the start/stop button should be done by the index finger NOT the thumb.

Testing Procedures

The following are selected tests normally undertaken for football.

Power - Vertical Jump Test

The vertical jump test is a standard test for primarily leg power, but also total body explosiveness. The test is performed near a wall with a good landing area. The difference in standing reach and to maximal jump height determines the score.

Procedures

Stand perpendicular to a wall as close as comfortably possible.

With chalk on the tips of the fingers, reach with the hand closest to the wall and record a baseline measurement with feet flat on the floor.

Place more chalk on fingertips.

Without moving the feet, crouch down and explode up - do not step

Reach

Bottom

into the jump. Use the hand that is closest to the wall and make a chalk mark as high on the wall as possible.

The score is the difference between baseline and highest reach attained.

Key Points

- No step into the jump
- Mark maximum standing reach with chalk before jump
- Take full arm swing with jump

Fail criteria

Anything that allows for movement into the jump or extra reach getting the baseline measurement.

Jump

Agility — T-Test or Pro-Agility Drill

Movement in football is rarely in a straight line. The ability to quickly change directions, accelerate, decelerate is an ear-mark of a successful football player. The agility tests are an assessment of coordination and leg power. The T-test uses the formation of a T with the stem being 10 yards from the center cone. The 'Pro-agility drill' is a modified version of the standard T-test, and is the second portion of the T-test, just side to side between the cones.

Procedures

Place pylons according to the diagram below. Pylons should be 5 yards apart.

Testing should be done on a suitable floor with cross-training shoes, or on turf with cleats - be consistent.

Ensure that athletes have adequate warm-up and stretching

Individual performing the test should face the same direction for the entire test.

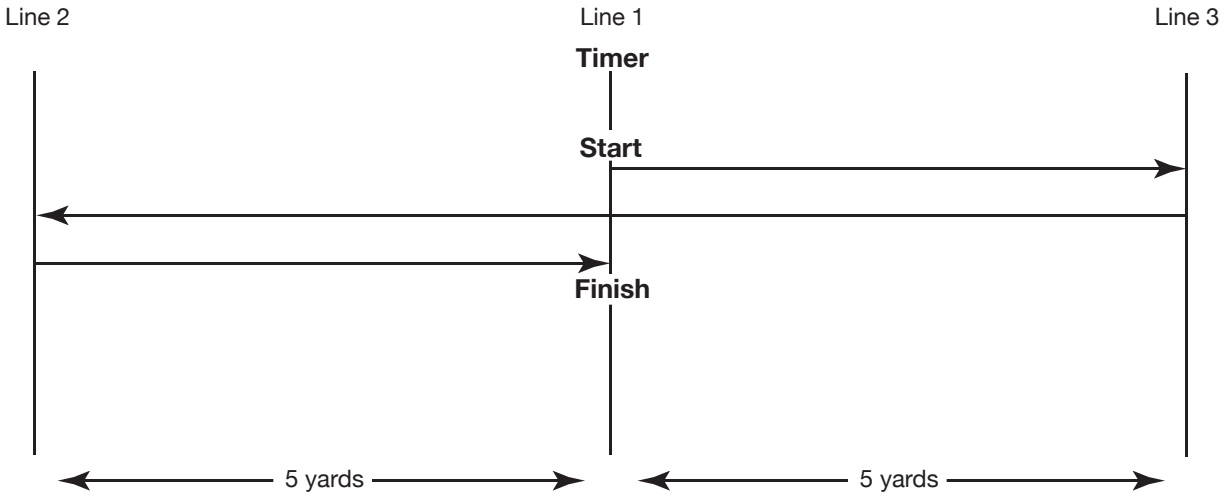
On the 'go' command, the athlete shuffles to point the right and touches the base of the cone with the right hand.

Athlete turns and shuffles to the left cone and touches the base with the left hand, turns and sprints across the center line.

The timer stops the watch when the athlete crosses the center.

For the T-test the athlete starts at the base (10 yards from the centre cone) and sprints to the center cone then once beyond the cone, breaks to the side to complete the pro-agility drill.

Pro Agility Test



Variations of this test are to turn around and sprint between the cones (more specific to running positions).

Two trials should be completed, one breaking to each side and the average of the two is the score for the test.

Key Points

- Face same direction
- Perform to the left and right

Fail Criteria

Athletes fail an attempt if they:

a) false start from the 'go'

b) do not touch the base of any cone,

c) cross the feet when shuffling or

d) fail to face front at all times.

Key Points

- Brief warm-ups first
- Remove shoes
- Slow, controlled movement, hold stretch position for 2 seconds

Power Clean Test

Another test for maximum explosive power is the power clean. This should only be done with a qualified instructor and only after mastering the technique (minimum of 3 months of training). Proper technique is presented in the exercise description chapter of this manual.

Start **2nd Pull** **Catch** **Finish**

A 3-repetition maximum (3RM) score should be used in attaining an assessment for this test although 1RM testing is also possible. This test should be performed on a power rack or platform with suitable flooring (rubberized if possible) and weights with bumper plates and collars. Fail criteria – not attaining a full clean position with each rep (i.e. elbows up and weight at the upper chest).

Strength – Bench Press Test

The bench press is a well-accepted test for upper body strength. It is relatively consistent between testing programs and relatively safe exercise when performed with adequate spotting. This exercise should not be a ballistic movement! The bench press should be smooth and controlled; the bar should be touched to the chest – **do not bounce the bar off the chest**. Bouncing the bar off the chest could cause injury.

Procedures

Assume a stable position on the bench with at least one spotter (behind the bench) and preferably three spotters (also on either end of the bar)

A weight should be chosen to allow a 3 repetition maximum.

The athlete should signal to the spotter for a lift off – the spotter assists to position the bar over the athlete's chest.

The athlete then slowly lowers the weight to the chest at the nipple line, touches the bar to the chest and lifts the weight to lockout three times in succession. The back and shoulders should remain in contact with the bench during all repetitions.

The spotter assists to rack the weight after completion of the third rep or when the athlete signals to take the weight.

The highest weight performed 3 times and not a fourth without spotting will be the score received.

Bench Press Test Variation

Some programs may wish to select a maximum number of reps with a given weight. Standard weights are reps with 135 lbs (60 kg) for smaller players and reps at 185 lbs or 225 lbs (100 kg) for other players. This test has the benefit of ease of administration (no changing weights between tests) and you can test a number of athletes in a single session quickly. However, this test is a test of ENDURANCE for many players – any reps over 10 are not the best assessment of strength and therefore not specific to football, especially for the upper body. Considering that most football training programs (the one in this manual included) primarily focus on low rep strength, significant improvements made in max strength training may not then be identified accurately in a non-specific test of muscular endurance. However there is a high correlation between # of reps and maximum strength (1RM), so it is still an option. Athletes with the highest absolute strength will have the greatest absolute endurance score (# of reps). A suitable option between the two is to allow athletes to select a weight: either 135, 185, 225, 285, 315 to test at. The number of reps (preferably between 5 and 10) should be the best predictor of strength. Although there are number of ways to predict maximum strength (i.e. 1RM) from submaximal repetitions, the general relationship is accepted as follows:

1 reps = 100% of 1RM;

2 reps = 95% of 1RM;

3 reps = 92.5% of 1RM

4 reps = 90% of 1RM;

5 reps = 87.5% of 1RM;

6 reps = 85% of 1RM

7 reps = 82.5% of 1RM;

8 reps = 80% of 1RM;

9 reps = 77.5% of 1RM

10 reps = 75% of 1RM;

11 reps = 72.5% of 1RM;

12 reps = 70% of 1RM

15 reps = 60% of 1RM;

20 reps = 50% of 1RM

These predictions are usually only off the actual 1RM by a few percent.

Key Points

- 3 Rep Max
- Slow and controlled movement
- Do not bounce bar off chest

Fail Criteria

- Excessive hip drive to get the weight off the chest
- Bouncing the bar off the chest
- Assistance by the spotter

Flexibility — Sit and Reach Test

Performed with legs straight, this test is a reasonable measure of low-back and hamstring flexibility. This area is implicated in many football injuries due to a lack of attention from a flexibility standpoint and also un-proportional quads/hamstring strength from an unbalanced training program. This test is best performed with the appropriate testing apparatus although a device can be made by placing a meter stick along the ground or on a bench, with the tape indicating foot position at the 27 cm mark. This test should be performed after a brief warm-up, with shoes removed, legs straight and toes 15 cm apart and perpendicular to the ground.

Procedures

Athletes sit with legs flat along the floor, the feet even with the tape mark, the zero of the meter stick nearest the hips and toes up.

Slide both hands together along the ruler steadily - do not bounce the mark along the ruler.

Take the best of 3 trials.

While stretching we tend to tense up and force a stretch, particularly in a sit and reach test. While reaching forward breathe in. Exhale and release all the tension in your legs (quads and hams). Visualize your muscles relaxing. With each exhalation relax the muscles further. Do the same with your lower back muscles as you reach your arms forward. Use this process with all your stretching.

Shoulder Extension Test

Football players are notorious for lack of upper body flexibility. This can lead to shoulder injuries and affect QB's throwing. An upper body shoulder flexibility test is recommended as part of the comprehensive testing program.

Procedures

- Have the athlete laying face down on the ground.
- The forehead must be in contact with the floor at all times. The athlete grabs a ruler or suitable instrument with 20 cm between first knuckles and extends arms in a straight position.

The athlete lifts the outreached arms as high as possible. The highest distance from the floor is recorded (in cm).

Take the best of three trials.

Fail Criteria

- Lifting head off the ground.
- Bending arms.

Speed — 40 Yard Run Test

The classic measure of speed in football is the 40-yard sprint. The 40 provides a good comparison of speed between players at a specific position, as the requirements for speed are position specific. It is also important to remember that rarely is there the opportunity to run a straight 40 in a football game, so this should not be the sole determinant of a players running ability. This measure is commonly done during camp however some teams may refrain from testing the 40 during January and April testing, because the risk of injury may be higher, if the athlete has not been sprinting consistently prior to testing.

Procedures

Ensure that athletes perform adequate sprinting warm-up and dynamic stretching and have a few sub-maximal practice runs as a specific warm-up.

The start should be a 3-point stance with no movement at the line. After the athlete is readied, the timer(s) (preferably three) should start the stopwatch at the first movement of the hand off the ground and stop the watch as the athlete crosses the 40 yard line.

Record two trials to the nearest hundredth (average of three watches), and record the criterion score to the nearest tenth.

Key Points

- Start in a 3-point stance
- No motion before start, do not 'fall into' the start and use forward momentum through the start line
- Time starts on movement of hand
- Footwear should be standardized – turf shoes or running shoes are recommended (running spikes give certain individuals an unfair advantage)

Fail Criteria

- An athlete will fail if there is motion at the line before hand movement.

Aerobic Capacity — 12 minute Run Test

This test is a measure of aerobic conditioning. During this test, the speed you are able to sustain running will indicate your aerobic system's ability to consume oxygen, deliver it to your muscles and use it for energy. This is indicated by one's 'VO2 max', represented relative to body size in ml O2/kg/min. This test is better for durations exceeding 12 minutes as a true test of the aerobic system; however, for athletes who have difficulty with running distances, the protocol can be modified for shorter times – the running speed is still calculated as meters covered/time. A minimum recommended duration of the test should be five minutes.

Procedures

- The tester should explain the procedures to the athletes and allow a warm-up with a practice run at mild pace.
- A track (300-400 m) with no sharp corners should have defined increments to indicate total distance traveled.

- Athletes can be run several at a time.
- On the 'go' command the athletes run at a comfortable but fast pace for the entire duration of the test – preferably 12 minute.
- The clock starts when the athletes begin running. Using a whistle to indicate the end of the running period, identify where athletes are on the track with spotters and count the total distance traveled during the test.
- Estimate aerobic fitness by the following equation: VO2 max (ml/kg/min) = [running speed (meters covered/time) x 0.2] + 3.5

For example: 3000 metres in 12 minutes

= [(3000m/12min) x 0.2] + 3.5

= [250m/min x 0.2] + 3.5

= 50 + 3.5 = 53.5 ml/kg/min

Key Points

- Keep constant running pace
- Don't run too hard at the beginning
- Wear appropriate running shoes
- Run on a track if possible

Anaerobic Endurance — 300 Yard Shuttle Run Test

This test is a measure of the anaerobic endurance system as well as evaluating aerobic conditioning. During this test, lactic acid will accumulate and success on this test will depend on the individual's ability to delay the accumulation of lactic acid as well as the individual's aerobic system to remove lactate away from the working muscle. This test can be run as 25 yard repeats (i.e. six times 50 yards). An additional 300 can be run at 5 minute post to assess recovery and ability to tolerate fatigue.

Procedures

- The tester should explain the procedures to the athletes and allow a practice run at mild pace
- Coaches should be stationed around the testing area to ensure compliance with line touches.
- Athletes can be run in pairs of similar ability (2 watches). On the 'go' command the athletes complete six repeats of 25 yards forward and back (50 yards X 6 = 300 yards).
- The clock starts with first movement of the hand and stops when any part of the body crosses the finish line. The test will not count if the athlete does not touch the line with each length completed.
- Upon completion of the first trial, record the time to the nearest tenth.
- If completing a second bout, begin a five minute rest period where the athletes can stretch or walk around.

- Complete the 2nd 300 at the five-minute mark and take the average of the two times for future reference.

Key Points

- Time starts on first movement
- Must touch line each and every time
- Time stops when any part crosses finish line

Fail criteria

- The trial does not count if the athlete does not touch the lines on each repetition.

Body Composition

Although the standard assessment of body size in football is height and weight, one of the primary determinants of physical prowess in football is lean body mass. This is calculated as **total mass – fat mass** to get **fat free mass**. The criterion measure for assessment of fat mass is underwater weighing or now DEXA scanning is commonly accepted as a recognized standard (Dual-photon x-ray absorptiometry). These tests are sometimes difficult, cumbersome, and/or expensive, thus assessment of body composition by skinfold technique is often done.

There are many formulas, sites, and/or methods and to assess body composition by skinfolds, and it is important to remember that the calculation of a fat% is based on a number of assumptions. Therefore, the critical factor is to use the skinfold assessment as a means of relative change, or relative to the other players on the team, given a certain measurement technique. As well, tester variability is high with this technique and total error can be as much as 10%. Therefore it is of great importance to have the same qualified tester do all the tests, whether by player or between testing batteries. This issue can make this difficult to include in a testing battery, but valuable nonetheless if done well.

Procedures

It is best to have a qualified tester perform the assessments with the specific sites for the equation that you choose. For each site, repeat measurements should be made. Accepted sites of measurement are the chest, subscapular, suprailiac, triceps, abdominal, thigh and calve (sometimes axilla).

A skinfold method developed on young university students is the Yuhasz (Yuhasz, 1966). The skinfold sites for men are triceps, subscapular, iliac crest, abdominal (a vertical fold to the left of the navel), chest and front thigh.

Percent body fat is calculated by:

% body fat = (sum 6 skinfolds x 0.097) + 3.64.

Body Composition — Skinfold Measurements

Abdominal Site

Subcapular Site

Chest Site

Iliac Crest Site

Front Thigh Site

Triceps Site

Football Fitness Standards

The following testing scores (see page 42) are only guidelines and are provided here for your reference. The most important aspect of measurement and evaluation is that YOU improve from one evaluation to the next. It is this progress that marks the way towards you becoming the best you can possibly be.

Position	Level	Bench x3	Squat x3	Pow Cl x3	Vertical	40 Yard
Backers, Tight Ends, Full backs	All Canada	325	430	280	32.5	4.5
	All Conference	300	400	260	31	4.6
	Starter	275	370	240	29.5	4.7
	Backup	250	340	220	28	4.8
	Scout	225	310	200	26.5	4.9
Defensive Backs, Tailbacks	All Canada	310	400	260	34.5	4.4
	All Conference	290	370	240	33	4.5
	Starter	270	340	220	31.5	4.6
	Backup	250	310	200	30	4.7
	Scout	230	280	180	28.5	4.8
Corners, Receivers	All Canada	295	380	250	35.5	4.3
	All Conference	275	350	230	34	4.4
	Starter	255	320	210	32.5	4.5
	Backup	235	290	190	31	4.6
	Scout	215	260	170	29.5	4.7
Quarterbacks	All Canada	295	380	250	31.5	4.6
	All Conference	275	350	230	30	4.7
	Starter	255	320	210	28.5	4.8
	Backup	235	290	190	27	4.9
	Scout	215	260	170	25.5	5.0
Offensive Line	All Canada	375	465	300	28	4.9
	All Conference	350	430	280	26.5	5.0
	Starter	325	395	260	25	5.1
	Backup	300	360	240	23.5	5.2
	Scout	275	325	220	22	5.3
Defensive Line	All Canada	375	465	300	30	4.7
	All Conference	350	430	280	28.5	4.8
	Starter	325	395	260	27	4.9
	Backup	300	360	240	25.5	5.0
	Scout	275	325	220	24	5.1
Defensive Ends	All Canada	375	465	300	31.5	4.6
	All Conference	350	430	280	30	4.7
	Starter	325	395	260	28.5	4.8
	Backup	300	360	240	27	4.9
	Scout	275	325	220	25.5	5.0

Chapter 2

Bigger, Stronger, Faster, Better

Bigger, Stronger, Faster, Better

2.1 The Basis for Training in Football

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Anaerobic Power Capacity

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Aerobic Power

Flexibility

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Putting it all together – the decision to win

2.4 Principles of Strength Training and Conditioning

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Specificity

Rest & Recovery

Periodization

Diminishing Returns

Consistency

Individuality

Prepared by Jonathon Fowles

2.1 The Basis for Training in Football

Football is a sport requiring maximum strength, explosive efforts of power, and anaerobic energy production (i.e. without oxygen = stored energy). It is obvious that football is a high-impact, violent contact and maximum speed sport where the laws of physics quite logically dictate that the bigger, stronger, faster and better of two counterparts will 'win' the intense battle of a single play. Most plays in football are ~5s and almost all are less than 10s, followed by 20-45s of recovery. There are an average of 3 possessions per quarter and 6 series per possession, for ~60-70 plays per game. This translates to a requirement for whole body, maximum all out efforts of strength and power for 5s every 30s in a block of 6 successive trials followed by ~4 min of rest (accounting for offense-defense changes). This 'set' is repeated 6 times in a half for two halves. Because game requirements dictate how you train, preparation for football should focus toward muscle strength and power with the endurance to repeat these efforts for the duration of a game. This requires development of:

Muscle Strength and Power - in the muscle groups required to perform high force actions of tackling, sprinting and blocking,

Speed, Agility, Quickness & Coordination - to translate the muscle forces in the desired manner in a play or pattern,

Anaerobic Power and Capacity - to deliver 'burst' energy to the muscles for the maximum all out efforts of a play,

Muscle Endurance - to repeat the high force actions and limit fatigue in performing the repeats of the series and possessions,

Aerobic Fitness - to 'recharge' the anaerobic system and effectively recover in the brief rest intervals of a series, and

Flexibility - to reduce the active strain on a muscle during explosive actions and increase the range-of-motion that force is developed.

It is vital to maximize strength and power for increased performance in football, but it is also important to remember that to perform, one must also be in the game. To this end, preparatory training in football must also include methods of injury prevention. 'Pre-habilitation' (as opposed to re-habilitation from injury) techniques are as valuable to keeping you in the game as any other component of the training program.

Strength and Power

Strength identifies the ability to exert force. Power is defined by the strength and the speed of contraction (POWER = STRENGTH x VELOCITY). Power is usually optimal at ~40% of maximum strength when the combination of strength and speed together are optimal (see figure); however, the power can be increased with either more force or more speed. Because power has a speed component, and speed is important in the game of football, power development is normally of greater importance to football performance than just maximum strength.

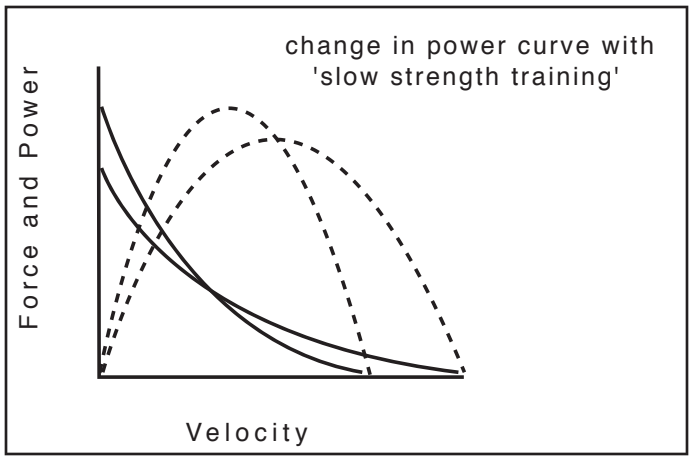
As strength is voluntary, it is dependent upon how well your brain tells your muscle to contract (i.e. neural components – coordination, balance, activation of stabilizers, recruiting all muscle fibers) and how well your muscle contracts. The neural components are primarily dictated by 'muscle memory' (i.e. practice & repetition), whereas force generation is primarily dependent upon the cross-sectional area (size) of the muscle. The force of a movement depends on the neural and muscle factors on a continuum. Strength is therefore specific to each movement and can be defined in terms of low-speed strength & power (important for blocking at the line) and high speed strength & power (for sprinting). As the movement becomes faster, performance relies less on muscle size for force generation, and more so on SPEED.

Just as a power-lifter isn't a good marathoner and vice-versa, strength and speed are also different. This is due to SPECIFICITY of training and the 'muscle memory' that is specific to each movement. This is also why you have to train both strength and speed. The best TRANSFER of strength to speed (to generate power) is from learning to lift a heavy load then learning to lift a lighter load quickly.

The basis for low-speed and high-speed strength comes from how muscle is made up. Motor units (MU's) are what causes muscles to contract and are made of the motor nerve, which sends nervous signals to contract from the brain to the muscle, and the muscle fibers, which causes contraction. MU's are typically broken into two groups; slow and fast. Slow MU's are smaller in size and produce low-moderate amounts of force at low-moderate speeds. Fast MU's are bigger in size and produce moderate-high amounts of force at moderate-high speeds. MU's are involved in a contraction according to size (small to big) and speed (from slow to fast) as the movement force and/or speed increases.

An athlete is born with a certain amount of slow and fast MU's, but training can improve the strength and speeds of contraction. Training MU's depends on the nervous signals they receive from the brain. Whatever the typical use pattern is, the force and speed of that movement gets engrained (muscle memory). This 'memory' is highly specific. If you train slow, the slow MU's and some fast MU's get trained. If you train fast explosive movements more of the fast MU's get trained, which results in more POWER.

Because power depends on strength, and strength depends also on the size of a muscle (bigger muscle develop more force), it is logical to develop muscle size as a base to increase strength, then, lift heavier loads to maximize strength, and then accelerate loads with speed to maximize power. This promotes STRENGTH X SPEED = POWER, and is applied to the year-round football training plan.



It is important to highlight that muscle size is important for any position in football based on the high impact nature of the sport, but the importance is relative. The size continuum goes from linemen (biggest) > linebackers > running backs > defensive backs > receivers. This is because as you require more speed, you want less size to stay fast; although no area of training should be neglected for any football player.

The force-velocity curve, and resultant POWER curve. Note that peak power occurs at ~40% of maximum force. Also note that with only slow strength training (i.e. bodybuilding) there is more force and power, but these adaptations shift the power curve to peak at lower velocities (i.e. 'makes you slow'). It is important then to combine strength training with speed work, and explosive plyometric exercise to maintain high-speed strength and high-power capabilities of muscle.

Speed, Ability and Quickness

Speed, agility and quickness all describe essentially the same thing – the ability to generate lots of force quickly, with coordination. Running speed is dependent upon running stride length and stride frequency. Stride length depends on leg power and range of motion and stride frequency depends on how fast you can get your feet

Speed = stride length (leg power) x stride frequency (leg speed)

back after you planted them. Agility and quickness are determined by one's ability to generate high forces to quickly decelerate one's body from moving one way, then quickly activate the muscles to generate high forces in a new direction. Therefore, high speed strength (activation of a fast MU's) and rate of force development ('muscle memory' to contract at high speed) are important for agility and quickness.

Fast movements in agility drills are typically termed 'ballistic'. Ballistic movements tend to require fast MU's predominantly. These fast MU's are tough to turn on, and require explosive actions that may not get trained in normal 'bodybuilding' type weight training. The brain organizes 'neural traffic' differently for fast and slow movements so agility MUST be practiced (i.e. you have to go to 'muscle memory' school). When training agility, you have to go all out at maximum speed and effort. Otherwise the 'muscle memory' will be less than what you need during a game. **Practice makes permanent**. If you don't train quickness & speed, it won't be there when you need it in a game.

We have a tremendous capacity to increase our training volume (from 300 – 500%), however, our ability to increase speed is more limited. Speed can only be improved ~10-20%, partly because of your genetic motor unit makeup. There are certain limits of contraction speeds or rates of force development for certain body types (i.e. muscle types and body compositions) that may limit potential for speed development, however, speed and agility ARE TRAINABLE for anyone. If anything, any athlete can get better at activating muscle more quickly and in a coordinated way with effective speed and agility training. If you can improve your leg recovery during sprinting by 1/100th of a second, over ~20 steps in 40 yards takes ~ a quarter second off your time.

Speed, agility and quickness typify the need for POWER because of the rate which high forces are exerted. This is why PLYOMETRICS are the 'next-level' of overload in training explosiveness – plyometrics stress a forceful deceleration prior to a maximal acceleration (just like during sport activity). Plyometric training must be undertaken with caution and under the direction of a coach AFTER, and only after, a strength

training program for a minimum of "3" months has been completed . Forces in plyometric exercises can approach 5-10 x bodyweight so minimum strength of being able to squat 1.5- 2 x bodyweight and bench press 1.5 x bodyweight should be a requirement for training or injury will result.

Anaerobic Power and Capacity

In order to be strong and powerful, the muscles must have energy to perform the work. This energy comes in the form of ATP, the energy currency of the muscle cell (i.e. 'the money'). For explosive or burst work, the energy systems that supply energy to the muscles are called anaerobic (meaning without oxygen). This means that oxygen you breathe cannot be used during the activity, and therefore stored energy in the muscle must be used.

Stored ATP in the muscle comes primarily from:

1) the creatine phosphate system (CP system; up to ~ 12-15 seconds), or
2) the lactic acid or glycolytic system (meaning uses stored carbohydrates as fuel; glyco = glucose; lytic = to break down) energy from 30-120s.

A football game, stresses the CP system (~ 12-15s per play) the most; however, both energy systems may be used in games and in training.

Training anaerobic power requires performing all out efforts (5-15 sec), stressing the body's ability to deliver and use the energy quickly. Training anaerobic capacity requires performing intense efforts for a longer period (15-30 sec), and repeatedly (such as in weight training, or sprint training or agility drills). This helps the muscle develop more energy stores and resist fatigue. Note that creatine stores are used in anaerobic sports - hence all the creatine hype. Although creatine supplements have been shown to work in these types of activities, it is important to know that the natural creatine phosphate stores also increase in the muscle with intense training anyway.

The anaerobic energy system can be quickly trained, but also quickly detrained. It is essential that anaerobic training be emphasized in the periods directly before the competitive season to be able to perform in the first game of the season at maximum potential (i.e. so you don't 'suck wind').

Muscle Endurance

Muscular endurance can be defined in terms of repeating contraction over and over without rest until fatigue (as in distance running), or in being able to perform explosive movements repeatedly without getting tired (as in football). 'Football endurance' requires maximum power output and explosive energy repeatedly. This stresses the anaerobic CP energy system primarily to supply the energy for the explosive effort, and the ability to resist fatigue to do it over and over for the length of the game is dependent on overall fitness.

Muscle endurance is typically trained in lower intensities for more repetitions (i.e. 40-60% of 1RM for 50-15 repetitions) but in football, there is rarely a requirement to perform repeated submaximal contractions - everything is all out or nothing. So muscular endurance for football is developed secondarily to the high volume weight

training required in hypertrophy training (~ 70% of 1RM for 10–15 reps) and by the repeated all out reps of strength and power in weight training and repeated speed, agility and quickness drills.

Aerobic Power

Although football is mostly reliant on anaerobic energy, it is important to highlight that the anaerobic system is 'recharged' by aerobic energy supply. Therefore, it is important for football players to develop aerobic fitness to benefit anaerobic endurance. Aerobic training increases cardiovascular fitness (heart and lung efficiency) and the muscle's fatigue resistance and therefore, increases the amount of effort you can maintain throughout a game.

Although aerobic limits are not necessarily taxed in football, aerobic fitness is essential to recover throughout a game (while you are sitting on the bench between plays 'getting your wind'). Aerobic fitness also allows you to train more. It has been shown that in groups of athletes, those with the higher aerobic fitness have less injuries and are out of the line up less often. As well, aerobic exercise in combination with resistance training helps to improve body composition which also relates to playing potential in football.

Flexibility

Flexibility is defined as the range of motion around a joint or series of joints; therefore, it is specific to every joint and muscle in the body. An adequate range-of-motion is thought to reduce the risk of injury, by lowering potential strain on a muscle. There is little controlled research on flexibility and its effect on decreasing injuries; therefore, assumptions are based largely upon observations that 'stiff' athletes may be more prone to muscle pulls.

It has been found that stretching five times per week for 5-weeks will significantly improve flexibility. However, stopping flexibility training can return ROM back to pre-training in two weeks, so you must be consistent with flexibility training. It is better to include flexibility training as often as possible and make it a routine part of your day if you hope to benefit.

New research indicates that extensive static stretching performed directly prior to activity may actually reduce strength. This is because of the static stretching's effect of interfering with the brain telling the muscle to contract, thereby lowering the muscle's force output.

So instead of lots of stretching before games and practices it is better to complete a dynamic warm-up and only lightly 'limber up' before workouts. This can be done with 'PNF' stretching and dynamic stretches such as low lunges and footwork drills. The time to 'stretch-out' to increase your flexibility (i.e. flexibility training) is after workouts when your muscles are warm. The flexibility exercises performed after a workout will help 'quiet' the muscle, and limit the natural increase in muscle stiffness with activity (i.e. prevent being 'muscle bound').

Injury Prevention

The most common acute injury in football is a muscle strain. The amount of strain on a muscle is determined by strength and muscle length and as a result, muscle strain injuries usually occur during eccentric (muscle lengthening) phases of movement (i.e. decelerations). A stronger muscle will be able to resist more force before straining and a shorter, fatigued muscle will not be able to absorb as much energy (i.e. force). Therefore, strength training and conditioning improves strength and muscle endurance and flexibility training will increase muscle length to resist the chances of muscle strain injuries.

Injury prevention (i.e. 'Prehabilitation') is a valuable component to any preparatory football training program. This means doing some exercises that would normally be done in therapy (i.e. 'rehabilitation') before an injury actually occurs. Any coach will tell you that injuries can be the single most determinant factor that dashes hopes to an otherwise potentially successful season. So make sure that your training is complete and comprehensive and includes exercises specific to your position, because to play to compete, you have to play.

2.2 Preparatory Training for Football

Having outlined the areas of focus for training, the next section will identify practical, comprehensive, and 'cutting-edge' methods for attaining the necessary training objectives for football. This approach utilizes recent research findings combined with tried and true methods of strength training and conditioning, integrated with nutritional and mental skills strategies to allow you to reach your fullest potential.

How To Get Bigger

Muscle size is determined by the balance of muscle growth over muscle breakdown. When the muscle turnover favors growth more than breakdown, then net muscle growth occurs. The best ways to ensure muscle growth are:

WEIGHT TRAINING – moderate – high load & intensity, high volume, various exercises

POST WORKOUT MEAL – carbs and protein DIRECTLY after to enhance natural anabolic effect

DEVELOP STRENGTH – to progressively overload your muscles

ADEQUATE REST – muscle builds during rest, not during the workout

PROPER NUTRITION – garbage in, garbage out; adequate protein & carbs, balanced meals

The primary factor for muscle growth is the development of lots of force by the muscle. However, other factors such as training volume, type of training, recuperation and also body type influence one's potential to increase muscle size. High forces are best achieved in training with free weights, although other high resistive activities can produce muscle growth.

To maximize muscle growth, moderate-high training loads and volume are required (loads of 60-75% of MVC, sets of 8-12 repetitions) with appropriate rest and optimal nutrition. The training intensity must be high (i.e. brief rest periods, use of compound exercises) because these types of weight training sessions signal growth to the muscle and produce natural anabolic hormone responses following the training bout which help growth. High training volumes (more exercises, set and reps, training to failure) fatigue the muscles and cause adaptation. Volume should be progressively increased over time to ensure that the OVERLOAD signal keeps telling the muscle it needs more muscle size to keep up with the forces needed in the workout.

Optimal rest is required between workouts (~ 48 hours per muscle group) because it is not the workout itself that produces growth. The workout stimulates the muscle to change its makeup (to become bigger), but the actual 'reconstruction' occurs during periods of rest (especially sleep), and can be reversed (increased muscle breakdown) if another training stimulus is applied to a 'tired' muscle.

Optimal nutrition involves an adequate intake of protein, carbohydrates, fats, vitamins and minerals (more in nutrition section). Nutrition is VERY IMPORTANT, because you can't make a Cadillac from Hyundi parts. Protein intake is required because the muscle

needs the building blocks, to grow and carbohydrates are required to give you energy to train hard in your workout.

The most important nutritional tip for muscle growth is the POST WORK OUT SNACK, a combination of protein and carbohydrates DIRECTLY after your workout. The anabolic hormone insulin increases after eating the snack, and that combined with increased availability of building blocks (protein) and fuel (carbohydrates) increases muscle growth and reduces breakdown after a workout. The combined result, is that there is a larger net increase in growth after each training session. This DOUBLES muscle growth over time when done consistently (i.e. after every workout!!). An average muscle size gain is ~ 5kg per year which translates to growing ~ 5 mg of muscle per day (about as much as the lead on a pencil). If you double the growth response after a workout, you can achieve a net size gain of 10kg or more in a year.

Because forces and volumes of weight training are important for increasing muscle size, muscle growth (hypertrophy) is also dependent upon strength. It is a chicken-and-egg scenario that you need strength to overload the muscle and need size to develop strength. The neural aspect of 'learning how to push' can be developed relatively quickly, whereas increases in muscle size takes time. This is why in the first four to six weeks of resistance training, the dramatic strength gains are primarily due to 'learning how to push', whereas muscular growth occurs after this learning period. This is why a 'General Adaptation' phase precedes heavy weight training in a program, not only to increase tendon and connective strength but to 'learn how to push'.

Muscle growth takes time to develop and requires more training volume to elicit the growth than other forms of training (a good muscle gain is 0.5-1kg per month). This is why size or 'hypertrophy' training is done in the off-season, when you can focus your energies to muscle growth, not only physically but mentally and nutritionally as well. Therefore, bodybuilding type training is initiated after the 'General Adaptation' in a 'Hypertrophy Phase' to increase muscle size. Then it is up to training the whole neuro-muscular system to become stronger, faster and more powerful in later phases of training.

How To Get Stronger

As was stated previously regarding SPECIFICITY, strength is specific to movement. So, to get stronger, you have to 'practice' moving heavier weights. Here are the best ways to increase your strength:

WEIGHT TRAINING - high load, low reps, rest between sets, basic exercises

MENTAL FOCUS - clear your mind, psych up for your sets, focus your breathing

MAXIMUM EFFORTS - brief efforts, rest between sets, no long bodybuilding sessions

AVOID INJURY - good technique, progressive overload

Following general adaptation and size phases of training, moving heavier weight is something your body is not used to. So, you now have to retrain the 'muscle memory' with the newly 'reconstructed' (bigger) muscles. There is a natural safety mechanism in the body called 'neuromuscular inhibition' which is supposed to protect the muscle from injury. This 'circuit breaker' is a reflex that senses high forces in the muscle and tells the brain to shut the muscle down. With high intensity strength training, this response is greatly reduced. This is why early in training 'strength' increases rapidly. This is

also why 'strength' must be trained in the gym – because this 'circuit breaker' has to be turned off before you get on the field. With proper training, developing strength can increase performance eight to twelve times faster than just playing without strength training.

An important training tip is 'psyching up' to increase strength. We all know how important it is to 'get up' for a game. This psyching up is a way to minimize neuromuscular inhibition, and should therefore be 'trained' in the gym with your regular strength training. Don't just save it for big games!! To practice this in the gym, before your lifts, take three long breaths and just center your focus on breathing and relax your body (relieve tension). At the end of the third breath, take a big inhale and attack the bar. Your 'strength' will definitely improve.

Strength is normally trained using 80-95 and up to 100% of your max. These loads stress the 'top-end' of neural activation (signals from the brain), and stress those hard-to-fire fast MU's. Rest breaks between sets should be 3-5 minutes because the 'high-end' motor units are also fast-fatiguing. They need the rest before they can go again in another set. If inadequate rest is taken, then the high-end motor units won't contract and therefore, you won't get as strong. Repetitions are low, in the 2-6 range, for the same reason. The signals from the brain to tell those big MU's to contract can occur for a short time, then must be given time to recover so they can 'get back in the game'.

How To Get Faster

The best transfer of strength to speed (power) is from learning to lift a heavy load then learning to lift a lighter load quickly. Here are the best ways to get faster:

Develop Strength – learn to lift heavy, then lift a lighter load quickly

Develop Technique – correct movement pattern; poor practice = poor performance

Practice Moving Fast – maximum speed each rep! submax training = submax speed

Think Explosively – synchronous muscle fibre recruitment for high-speed strength

Post Workout Snack – replace carbs and improve recovery between workouts

Warm-Up – improve reaction time, strength and coordination when warm

Power training should be as sport- and position-specific as possible as you get close to the competitive season. Once again the principle of SPECIFICITY is important. You must practice this power 'skill' however; because the 'mind-muscle link' must be developed. If all one does is bodybuilding type training, one becomes big but not fast. The nervous system can not tell the difference between practice and games. The nervous system only adapts to what it sees. **Practice slow, be slow**. Not very good for the one time in a game when breaking a tackle or flying the sideline is the difference in a game. If it is not trained, it will not be there.

To optimize POWER, strength must be applied with speed. Power training requires 'all out efforts' for a few contractions. This also relates to 'neuromuscular inhibition' and strength. With high force AND high speed, the inhibition response is greater. Practice helps to relieve the inhibition to allow the true expression of power, speed and agility.

Although SPECIFICITY of training will be explained in other sections, remember that the 'all out efforts' should be position-specific, (i.e. linemen would benefit more from

power cleans, whereas a receiver may benefit more in 'transfer' to doing a single leg vertical jumps to optimize running speed). The Power phases of weight training can be developed with 85-100% of 1RM or ~40% 1RM. The high load power training stresses all MU's to "explode" if done forcefully (including high-end MU's). The low force power training ('peak' power training) stresses STRENGTH X SPEED. This helps to train fast MU's required for such activities.

Power training typically is quite stressful on the tendons, ligaments and joints because of the higher strains and stresses involved with strong, fast movements. This is why it is vitally important to get adequate rest during your workout (for maximum activation but also reduce injury risk), and between workouts (to limit over-training) and to have a sound nutritional plan to help recovery. Because of this greater stress on the connective tissues, and because neural adaptations develop rapidly, POWER phases of training are completed for shorter cycles (~2-3 wks) and generally right before camp or the season.

It is commonly observed in research that the combination of strength and speed training is the outcome that produces muscle POWER. Without the latter component of speed, you only have more force - not more force at speed (remember neural SPECIFICITY). Power training can therefore take the form of higher velocity weight training (power cleans, jump squats, acceleration presses - only under proper supervision from a qualified instructor) and speed, agility and quickness training or plyometrics. For example, research indicates that the best increases in vertical jump (the best indicator of lower body power) are achieved when weight training is combined with explosive training (jump training and/or plyometrics). Weight training provides the force overload and the explosive training enhances the neural activation to produce POWER.

It is important to note that the benefit of plyometric training will not be realized UNLESS the strength has been developed. Otherwise, the excessive overload on the body causes the 'neuromuscular inhibition' reflex activity to inhibit force production to save the joints from injury. These limit the forces and speeds achieved during the training, and reduce gains.

Doing speed, agility, and quickness training, as well as weight training, develops your anaerobic energy systems which will help to resist fatigue during the latter parts of a game. Typically ~5-10 sec of work to 30-60 sec of rest is best, but the work to rest interval can be changed to overload the system and develop recovery (i.e 15s of work for 15s of rest). Creatine phosphate and stored carbohydrates are used with every repetition so nutrition is very important to recover from this type of training. These energy sources may become depleted at the end of a very long game, although training improves the size of these stores.

(see more in nutrition section).

How To Become Better

If it is not already apparent, it is quite a task to be a well-conditioned football player. It seems that the ultimate football player needs to have everything, which is an intimidating thought. It is important to realize that these requirements are specific to football and to the requirements of a position.

SPECIFICITY is an important principle (discussed more in 'Principles of training') that explains that transfer of training adaptations to field performance is better when the training is similar to the game requirements. Therefore, exercises in the weight room

or gymnasium or on the track, and the work:rest intervals for speed, quickness & agility training, should be specific to the actions and requirements of football and your position.

For instance, muscle strength and power in the lower body is generated through the hip (low back, glutes, hamstrings), knee (quadriceps) and ankle (calf muscles) generating ~45, 30 and 25% to leg drive respectively. Muscular power generated in the upper body (chest, shoulders) in tackling, is supported by the legs and stabilized by the torso (abdominals, obliques, low back). These movements are required by all football players, how you train them can be tailored to the needs of your position. Ideas of how to specify your training is presented throughout this manual, although it is also important to seek the advice of coaches or training professionals to make this as beneficial as possible.

Exercises should be selected to stress the desired muscles and maximize strength and power specific to your position. Absolute strength is more important in positions where strength is required against somebody else (e.g. lineman, linebacker), whereas relative strength (strength/body mass ratio) is more important when moving one's own body (e.g. running back, receiver, defensive back). High and low speed strength and power can be developed differently as well; high force power with power cleans; high velocity power with single leg press, agility and sprinting.

Specificity in injury 'pre-habilitation' indicates that quarterbacks should include external/internal rotator cuff training with their shoulder strength training. Likewise, running backs and linebackers should involve supplemental torso rotational strength exercises, and extra hamstring and groin training. Linemen should include knee and low back stabilization exercises. Almost all positions could benefit from single leg balance work, although this is vitally important for running backs and receivers in dodging opponents, and linemen need to improve balance to reduce the risk of knee injury. Specificity in flexibility stresses stretching primarily the low back, glutes, hamstrings, and shoulder where the muscle strains in the hamstrings and low back and injuries to the shoulder are common.

To become a better football player, you must have a dream of what physical achievements you want to attain, and work out a plan to get there. In getting there, you will get there faster if you do all the little things right. That means:

Plan Ahead – to have a post-workout meal after every workout

Make Time – for not only weight workouts, but speed and agility

Rest and Nutrition – to optimize recovery

Mental Focus – to optimize strength and power gains

Warm-Up and Cool-Down – (with flexibility training) to reduce injury risk

'Prehabilitation' – exercises to reduce the risk of injury specific to your position

Efficient and Effective – adhere to strength training and conditioning principles

It is an integrated and comprehensive package, and if you train to achieve it, you will become it … the best player you can be.

2.3 Training Objectives for Football Conditioning

The objective of Strength training and conditioning is:

1) to increase absolute strength and power and improve resistance to fatigue,
2) to increase speed, agility and quickness,
3) to enhance performance in the sport and
4) to reduce potential for injury.

It is important to stress that these qualities take TIME and consistency to develop. The body is very adaptable and can develop what is desired from it, it just takes consistent training and adherence to the appropriate conditioning guidelines. For example, training can produce a 20 mile per day runner or someone who can bench press 400 lbs But, it is impossible to develop these qualities by trying to develop all of these qualities in a three month season. To understand the requirements of football is to understand that football requires and demands a commitment to YEAR ROUND TRAINING.

Putting It All Together — The Decision To Win

Football is one of the few "gladiator-type" sports in our society where success is dictated by a will to win, an effective plan of execution, and primarily by a series of one-on-one confrontations with an opponent where 'only the strong survive'. Granted that the better of two warriors is dictated by a number of factors and skill in execution of a movement is paramount and dependent upon proper technique and coaching, but the meeting of two adversaries in a game situation comes down many times to the simple laws of physics. And the laws of physics apply to everyone, especially in a collision, or a series of them in game that lasts 60 min. So to follow an effective training plan designed at increasing your strength and power for football is not merely a choice to increase your performance, it is a decision to win. To win that one battle in a series of battles alongside your fellow soldiers, so that at the end of the day you can say to yourself " I gave it my best". And giving it your best begins with a commitment to year round training, to make yourself the best football player you can be.

You are the Sum Total of the Decisions You Make

Decide Today to Improve Everyday

2.4 Principles of Strength Training and Conditioning

The following are some basic principles of athletic training used to direct an efficient and effective year round training program with goals that caters to the specific needs of the individual athlete. Many muscle strain injuries in football can be prevented by appropriate and effective preparation. The most common chronic injuries in football usually result from overtraining so adherence to the strength training and conditioning principles in a year round athlete training program maximizes training effectiveness (adaptations) and minimizes the detrimental effects of overtraining (fatigue) while in the preparatory and competition phases of your program.

1. Overload

- To improve, you must do more than what you have done before.

The body develops what is demanded of it, so if you want to become stronger, one must progressively increase the resistance or intensity of training. For muscle endurance, one must focus on increasing the time or repetitions (develop absolute endurance) or load being used (develop relative endurance) or reduce the rest between sets to better adapt to fatigue. Although any parameter of training volume can be manipulated to induce overload (the combination of frequency, intensity/weight, reps, sets), the goal is to do something more each workout, whether 5 more pounds or 1 more rep.

2. Progression

- Overload must be progressive – 10% rule.

Overload should be enough to stimulate adaptation, but shouldn't be excessive to induce overtraining – no more than a 10% increase in training volume per week! Be careful of which components affect volume the most (i.e. If you typically were training three days per week, adding another training day per week is a 25% jump). Exceeding the 10% limit will quickly cause injury or overtraining or both. This is why **you must train consistently** YEAR ROUND to progressively attain the trained state desired for football. Football requires maximal performance in a number physical areas and each can be developed through a progressive overload throughout a training plan. If you have not progressively increased your training intensity and volume to a level similar to that required in camp, your body will not be ready for the physical stresses and pain and injury will result.

3. Specificity

- Improvements are specific to the movements used.

Training must be specific to football and to your position. For instance, training exercises must be similar in movement pattern, velocity and type of movement, repetitions and force, to maximize transfer to sport performance. This is why the use of the basic squat is more applicable to a linemen (two leg supported drive) whereas a single leg squat or lunge may be more specific to a receiver or running back (single leg drive). This also dictates that conditioning exercises should be specific to your position (lineman – shuffle T-drill; running back – sprint T-drill). Also, considering that most developing athletes use weight training for strength development AND for

muscle growth, training may also include non-specific exercises designed to increase muscle mass which is a specific requirement for football.

4. Rest and Recovery

   - You will NOT improve unless you recuperate between workouts.

   The importance of this principle in a training program cannot be understated! Muscle adaptation occurs during periods of rest, not during the training session itself. Training is a stimulus, adaptation during rest causes improvement. A muscle needs ~48 hours of rest from weight training to allow time to 'remodel' for the next workout. More time for higher intensities or greater training volumes. This is explained by the theory of SUPER-COMPENSATION.

   Super-compensation is a process that allows for improvement in performance over time. A training bout reduces performance directly after because of fatigue. If given ample time for recovery and the overload stimulus has been sufficient, the body develops what it needs to get to a new performance level for the next training session. If the timing of the new training session is either too soon (before recovery is complete) or too late (after a loss in adaptation and detraining has occurred) there is no improvement in performance and possibly deteriorating performance from either under-training or overtraining.

   The body can recuperate quite quickly for different workouts (different muscle groups, energy systems, i.e. agility vs weight workout). However, insufficient rest will lead to chronic fatigue, staleness, deteriorating performance and overtraining. The most tell-tale signs of overtraining are reduced motivation, reduced strength, inability to sleep, and aching joints. If you suffer from overtraining, take some time and download your training volume and/or intensity until you have recovered. Remember there will be no improvements if you are overtraining. To perform you must play, and to play you must be injury free. So avoid overtraining injuries by getting adequate rest, adequate sleep and proper nutrition.

5. **Periodization**

   - There is a time for everything.

   There is a paradoxical quality to this principle. Firstly, varying the training helps to avoid a training plateau. On the other hand, the body can better adapt to one stimulus at a time, than a number of varied stimuli at the same time (e.g. strength improvements are greater when not combined with extensive endurance training). Therefore, training should focus to a specific type of training or exercise, and change some aspect of the training program every 2-3 weeks. In addition to physical effects, the psychological effects of doing the same training over and over can cause staleness or burn-out.

   The other side of periodization is that everything has a sequence. In order to get speed and agility you first need muscle power. To get power you must first have strength. In order to get strength you need muscle size. When competition arrives, there has been an 'order' to the YEAR ROUND plan that has developed all the qualities necessary for you in your position, that has maximized the benefits of each training component while limiting injury risk and non-effective training.

6. Diminishing Returns

- The more you've improved, the harder it is to improve.

The closer one gets to their maximum potential (e.g. maximum strength, muscle mass, aerobic capacity, etc.) the harder it is to get there. As a result, beginning trainers will improve faster than experienced trainers, and relatively greater increases in overload (total training volume) are required to get a smaller improvements with increased training.. Experienced trainers must adhere to the principles of training because training volumes and intensities are high enough to risk overtraining, injury and/or decreased performance if training isn't effective.

7. Consistency/Frequency

- Training must be regular.

The body develops what is demanded of it – demand nothing, get nothing. Remember that periods of no training results in detraining. This is why YEAR-ROUND training is essential, to make improvements in all year, not just for 'training camp' (i.e. intensive training PRIOR TO training camp). If you are not training 5 days /week, sometimes 2x/day in the summer, then training camp will be an exercise in pain and injury not in learning to play football. Remember that the goal of strength training and conditioning is also to be healthy, and it is not healthy for the body to fluctuate body weight or go through intense phases of exercise after 'couching it'.

8. Individuality

- Training must be specific to you.

All laws, principles, and plans, don't universally apply to everyone, including this one. Your ability to overload, rest & recuperate, and adapt to your training is in part determined by your genetic makeup. You need to find out what works for YOU, for your body, in your life, given your own playing and performance goals. Normally this is done by trial and error, gaining knowledge and seeking the help of experienced people, but keep working and you can reach your highest potential.

Chapter 3

Training Program Components

Reaching Your Full Potential Drug Free!

Training Program Components — Reaching Your Full Potential Drug Free!

3.1 Strength Training

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Periodization of Strength

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Prepared by Melody Torcolacci, Jonathon Fowles and Roger Bernardes

3.1 Strength Training

"Reaching Your Full Potential … Drug Free."

Introduction

The use of any sort of resistance constitutes strength training. Resistances typically used are individual body weight, partner resistance, medicine balls, elastic tubing or bands, machines, dumbbells, and barbells. Although machines may be beneficial in the beginning stages of training to get someone used to resistance training, the most athletically functional strength gains are more associated with the use of free weights. Machines tend to guide the user through a specific range of motion, which for some users may be restrictive. With the machine dictating the range of motion path, the fixator, stabilizer and synergist muscles tend not to be utilized to as great a degree as they would be in a free weight movement. With free weights forcing more than just the prime mover muscles to work in the execution of a given lift, free weights generally are the preferred method of training utilized by most athletes.

Types of Strength Training

The three training methods classically associated with the development of strength are body-building, power lifting, and Olympic Lifting. Football training has historically focused on the body building approach and to a lesser degree the power lifting approach. Body building has primarily been utilized as it is associated with muscle size, and bigger has often been perceived as better. While bigger is definitely better for some positions, bigger is not always better. The body building approach has a place within a football specific program because of its emphasis on muscle balance and growth. The two phases of training that would utilize this approach would be the ANATOMICAL ADAPTATION PHASE and the HYPERTROPHY (i.e. muscle growth) PHASE.

Power lifting methodologies have been used as power lifting has as its goal to develop the highest level of absolute strength possible. The sport of power lifting includes three component lifts, the back squat, bench press and deadlift. These three lifts have traditionally been included in many football training plans. Power lifting approaches without the use of the various accessories (power suits, knee wraps, etc.) has a place within a football specific program as it helps in the development of high levels of absolute strength. This approach to training would most commonly be utilized in a MAXIMUM STRENGTH PHASE.

Olympic Lifting has been the least utilized approach to training within most traditional football programs. The lifts are highly technical. It can take some time to become proficient at the movements. The time demands to learn proper form have often precluded their inclusion in many programs. The Olympic lifts are an excellent means of developing explosive power. Olympic lifts can be used throughout all phases of training.

The Olympic Lifts may prove especially beneficial in the POWER DEVELOPMENT PHASES of training.

A good football specific program incorporates components from all three strength training approaches (body building, power lifting and Olympic lifting) because of their differing applications to overall strength development.

Periodization of Strength

Periodization simply means planning. The program in this manual is planned for a full year of training, with specific goals for each phase of that training. Failing to plan means you are planning to fail. As discussed in the conditioning principles section, when overload is combined with appropriate rest, supercompensation leads to progressive performance gains. To continue to get gains, training demand would be progressively increased each following year. Training demand is increased by manipulating the variables of reps (number and rhythm), load and rest between sets. For the best possible training effect, these variables must be manipulated in a sequenced manner, hence the importance of periodization.

Tempo of the lift should be defined as one of the variables in training. Tempo typically is recorded using a three digit sequence (i.e. 2-0-1). The first digit refers to the duration of the eccentric or muscle lengthening phase of the lift. The second number denotes whether there is to be a pause in the repetition between the two phases of the lift, while the third digit defines the duration of the concentric or muscle shortening phase. There are several trends you will note occur with the periodization approach. First most programs progress from high volume, low intensity work at the start and conclude with low volume, high intensity work.

As you progress through the various phases of periodization:

a) the number of exercises decreases to a few (2-4) exercises that provide the greatest return on sport specific investment

b) the rest between sets increases with increasing intensity

c) the overall emphasis on weights decreases to allow for increased football specific work.

Progressive Loading

An athlete can be introduced to overload using a progressive approach In the **progressive approach** small changes in intensity, usually 10% or less, are made from one phase of training to the next. This allows a very gradual increase in intensity and is the safest approach with beginners to decrease injury risk. However, if the changes in intensity from one phase to the next are too small, they might not stimulate improvement and a performance plateau will result.

The more **radical progression approach** can be used by athletes who have a strength foundation (at least one year of training) and who have solid lifting techniques. With the load being changed by at least 15% from one phase to another, the load is always stimulating which leads to continued progress. The radical loading approach takes the concept of overload (Stimulus, adaptation, regeneration, new stimulus) to another level placing continued emphasis on specific components (i.e. hypertrophy maximum strength). This style of training is used in this manual to ensure constantly changing overloads without a performance plateau.

Phases of Periodization

Depending on the goals of the program, the level of the athlete, and the needs of the athlete there may be a greater emphasis on certain phases relative to others. For example, a younger athlete with limited training experience will likely benefit from a program that places a greater emphasis on anatomical adaptation and hypertrophy, with only limited, if any, focus on maximum strength development (see Year 2 of three year plan). The greater the foundation (think of it as a base of a pyramid), the higher the ultimate peak will be. With a better foundation, there is less risk of injury. Should an injury occur, those with a better strength foundation tend to lose less strength during their time off and return to their pre-existing strength levels quicker. The ability to maintain a higher level of performance, for a longer period of time, is also associated with a higher level of strength foundation.

While everyone wants to progress as quickly as possible to lifting heavy weights, the time spent in high volume, low intensity work does pay off. If the process is rushed too quickly, injury may result, cutting your athletic career short. Even athletes at the highest performance levels put in at least one anatomical adaptation phase before progressing to higher intensity work. Elite athletes have been using this technique for many years. A further reference for this is Tudor Bompa's 1993 book, "Periodization: the New Wave in Strength Training".

1. The Body Building or Anatomical Adaptation Phase

Given that you are only as strong as your weakest link, it should not be surprising to find that one of the main objectives of this phase of training is to focus on **bringing the weak links up to par**. One area often neglected by many football players is the mid-section or 'core' (abdominal and lower back muscles, and muscles supporting the spine). Working from the **'inside-out'** ensures that the midsection strength is developed. The mid-section or trunk is the connector between the legs and upper body (arms). It is a key stabilizer to transfer all force. If the core is weak, strength development of the extremities will be compromised and the force the arms and legs generate will suffer. With a weak core, tackling, blocking, throwing, kicking, and speed will all be at lower performance levels than they would be with a stronger mid-section.

Functional Movement Screen – One way to determine if you have the appropriate muscle balance, mobility and stability in areas of your body is to have a coach or trainer perform a functional movement screen (Cook, 2001). This is usually a sequence of about seven exercises that indicate if you have the strength, movement and stabilization to perform basic athletic movements. If your form is off during these exercises, then you have restrictions that may limit your development. Some examples of movement screen exercises are the following:

1. **Full-mobility squat** – (**Snatch squat**), holding a dowel above the head, bend down until knees are below parallel, keeping arms in line with ears over head
2. **In-line Lunge** – Dowel held behind the back, do a forward lunge on a 2x6 board, keeping chest up, hips forward, no forward lean or loss of balance
3. **Shoulder Mobility** – Reach one hand over behind your head, one hand behind your back, try to contact hands.
4. **Active Straight leg raise** – Laying on your back, lift one leg straight as high as possible, should be vertical without opposite leg lifting off the ground.

Joint stabilization and a specific focus on common injury sites is another priority. Development of the stabilizing muscles can be enhanced simply by using dumbbells instead of barbells. Given that weak stabilizers inhibit the abilities of prime movers, the use of dumbbells should dominate during this phase of training. One of the primary goals of this phase is to allow the connective tissues (tendons and ligaments) to catch up to the muscular development of the athlete. With training, the connective tissues increase in size and tensile strength. Many over-use injuries and tendinitis problems could be avoided with proper preparation.

With a high volume of work in the weight room and a some focus on cardiovascular conditioning outside of the weight room during this phase of training, a change in body composition often results. Lean body mass (LBM) increases due to an increase in muscle protein while body fat percentage decreases due to an increase in LBM and a change in diet *(see nutrition section)*.

Methodology

The basic recipe for the anatomical adaptation phase is 3-6 sets x 20-10 reps @ 50-70% 1RM with 30 seconds to 3 minutes rest between sets. Many exercises (8-15) are used as total body development is the focus. With **high volume work** combined with short rest periods, this is physically exhausting work that develops primarily muscular endurance. With a high volume of work a rhythm extending the duration the muscle is under tension is not really needed. A normal lifting rhythm (2-0-1) is usually used.

The percentages quoted refer to tables used since 1980. It is important to keep in mind when using tables there will be differences according to the type of exercise done. The guidelines hold truer to form for large multi-joint exercises than for smaller, joint isolated exercises. There will also be individual differences. Some athletes respond better to volume work and handle high intensity work poorly. For example, based on the load the athlete is handling for volume work, the tables predict a 1RM well in excess of what the athlete can actually lift. For those athletes who handle intensity better than volume, they can lift substantially more weight for a 1RM than the tables predict according to their volume work.

Guideline Intensity/Reps (based on 1RM)

20 reps ~ 50%
15 reps ~ 60%
12 reps ~ 70%
10 reps ~ 75%
8 reps ~ 80%
6 reps ~ 85%
4 reps ~ 90%
2 reps ~ 95%

The reader should note there are different percentage tables published and depending on which set you refer to percentages according to reps may differ.

For example, there are tables where 10 reps corresponds to 70%. What ever you use as your reference, it should remain consistent throughout.

There are two basic means of structuring training in this phase - circuit or straight sets (stage training).

Design of the Workout: Straight Sets or Stage Training

This involves doing all sets of a given exercise before progressing to the next exercise. The benefit of this training, is that maximum effort can be put into primary exercises. The difficulty with this format is that it is more time consuming as rest periods between sets must be prescribed and adhered to if work quality is to be maintained. With duration of a training session being an issue (the weight room is only one of the means used in developing a better football player) it is recommended that **all primary work** (Olympic lifts, squats, deadlifts, barbell presses) be done using the **stage format**. To save time everything else can be done using either a circuit training or superset format [Alternate between agonist and antagonist pairings (i.e. Biceps & Triceps)].

Circuit Training

This involves doing one set of an exercise and moving on to do a set of another exercise. Typically exercises are sequenced so that lower body and upper body work is alternated, or opposite muscle pairs are worked. The rationale for the use of a circuit approach is that the quality of work is increased. There is plenty of rest before additional sets of a given exercise are completed. With the other exercises acting as "rest", the overall duration of the workout theoretically should be shorter. The primary drawback of this type of approach is that it does not work well in a busy weight room where a "use it or lose it" mentality exists. Another problem is that care must be taken in sequencing exercises so that injury risk is kept at the lowest possible level. With the injury risk associated with squats, they should always be done before working the upper back, abdominal or lower back muscles. The upper back must support the squat weight and the abdominal and lower back muscles act as stabilizers during the lift.

2. The Hypertrophy Phase

As the name implies (hyper = more; trophy = structure) the objective of this phase is to develop muscle mass. There seems to be a range of reps and intensities that produce muscle growth. Generally moderate volume combined with moderate intensity, and relatively short rest between sets will produce hypertrophy. Most of the literature strongly supports the concept of working the muscle to failure for maximum gains in hypertrophy. While time the muscle is under tension (volume) is important, load (intensity) seems to be the most critical factor in determining muscle growth.

Methodology

The basic recipe for this phase is 4-6 sets x 10-6 reps @ 60-85% 1RM with 30 seconds to 3 minutes rest between sets. A moderate number of exercises (6-8) are typically used. With a moderate volume work combined with relatively short rest periods, this is physically exhausting phase of training. Rhythms that extend the duration the muscle is under tension are typically associated with this phase of training. Caution in the use of high eccentric contraction rhythms such as 4-0-2, should be employed, especially with beginners. It is usually recommended that a strength foundation be established prior to manipulating the eccentric component, as extreme muscle soreness may result. Proper nutrition is essential to benefit from hypertrophy training *(see nutrition section for more details)*.

3. The Maximal Strength Phase

The primary goal of this phase is to promote complete motor unit (MU) activation. The use of heavy loads ranging from 80% to 120%** of 1 RM are used. (**Loads over 100% indicate eccentric only work, assistance through the concentric phase of the movement will be required). With a low volume of work, little, if any hypertrophy occurs during this phase. The primary training adaptations are occurring within the CNS (see physiology section for a more detailed explanation).

Methodology

The basic recipe for this phase is 4-6 sets x 6-3 reps @ 80-120% 1RM with 3-6 minutes rest between sets. Only a very small number of exercises (2-5) are typically used. Long rest periods are needed to ensure full recovery between sets. **Quality not quantity** of work is the focus in this phase of training. With neural adaptations instead of hypertrophy being the training objective for this phase, lifting rhythm tends not to manipulated. A 2-0-1 rhythm is most commonly employed. The heavy loads place tremendous stress on the body, thus full recovery between workouts is imperative. Over exposure to this type of work can quickly lead to over training and diminished performance. With the use of heavy loads, complete mental focus is required to reduce the risk of injury. These workouts are mentally fatiguing. With adherence to the long recovery periods an athlete should be able to walk out of the weight room feeling minimal physical fatigue.

A variety of loading patterns are typically used, which include

a) Continuous loading: i.e. 80-85-90-95%, etc.

b) Step loading: i.e. 80-80-87.5-87.5-95-95%, etc.

c) Pyramid loading: i.e. 80-85-90-95-90-85-80%, etc.

d) Wave loading: i.e. 80-90-85-95-90-100%, etc.

4. The Power Phase

There are a many ways to develop power. Only a few of the approaches will be addressed. The reader is encouraged to review the physiology section of this manual to gain a better understanding of why these approaches are effective. There are several consistencies that will be noted among the different approaches:

a) the volume of work is low,

b) rest periods needs to be long enough to allow for full recovery (2-6 minutes),

c) regardless of load, the focus should always be on trying to move the load as fast as possible - need to “think with fast intentions”,

d) very few exercises are used (2-5)

Maximum Use of Speed

The primary advantage of this approach is that it can be utilized with either beginner or advanced level athletes.

Methodology

The basic recipe for this phase is 4-8 sets x 2-6 reps @ 30-80% 1RM with 2-6 minutes rest between sets.

Peak Power Training

This is another approach to maximum use of speed training where timed work against a light resistance is utilized. With timed work you have two options:

a) doing as many reps as possible at a given load in a given time period, typically ten seconds or less,

b) do a given number of reps at a given load as fast as possible

Within this manual's training program you will see this approach used with exercises such as drive-ups and leg press (4x10@40%). Using light weights with a high movement velocity not only increases peak power but also translates into greater acceleration and explosive power potential.

Ballistic Work

This approach can also be employed with either beginner or advanced level athletes. The main advantage of this type of training is that movements can mimic sport techniques. The objective is to rapidly accelerate a weighted object (medicine balls, etc.) throughout an entire range of motion before releasing it. The distance the object travels will be proportional to the power applied against it.

Caution should be used when prescribing sets and reps as completing the prescribed work with less than maximal speed is counterproductive. Work is performed only as long as speed of movement is maintained. Once speed of movement decreases, work should stop. It is essential that **form is perfect** when performing ballistic or plyometric training. If form is not correct, such as maintaining a proper neutral spine, injury will likely result. It is strongly recommended to seek the advice of a coach or trainer to help you with any type of speed or plyometric training.

Plyometrics

Plyometrics are a type of ballistic or fast training. This approach to training is specifically addressed in a separate section within this manual.

5. The Competitive Phase

The goal of the competitive phase is to maintain the strength and power developed in the previous phases, while focusing on the refinement of technique and team tactics. Football has a moderately long competitive phase, typically three months. If a solid strength foundation has been laid, less time and energy will have to be spent trying to maintain the strength and power gains. One to two workouts a week should be sufficient to maintain strength and power gains. If two workouts are used, it is recommended that one be maximal strength focused and the other power focused.

With Saturday games, workouts are probably best scheduled for Monday and Wednesday or Thursday. Tapering is usually done coming into training camp. While tapering duration can vary, a ten-day taper seems to be employed most often. The key is to come into training camp in peak shape, ready for two-a-days and the

season ahead. Underlining the importance of maintenance work is the fact that first component affected is speed.

6. The Active Recovery or Transition Phase

It takes a lot of physical, mental and emotional effort to peak and compete week after week. Recuperation time post season is critical. If "down-time" is not taken, burnout can result, which may decrease the athlete's potential and future performance. The goal of the phase is to decrease mental and physical stress with minimal detraining. It is recommended that the minimum length of this phase should be three weeks. With the contact involved in football it would not be unreasonable to extend this phase to a maximum of six weeks. Fitness is maintained through participation in other activities (i.e. squash, basketball, etc.). Every effort should be made to try and avoid activities typically done in the off-season training plan. The volume of training during this phase is very low, typically only 30% to 40% of the normal training level.

Customizing Your Training Program

Having more training days or exercises in a program or more training days does not produce better results. The principles of training (overload, recovery, etc.) , laid out with the following training plan, should be adhered to improve. It is the type and number of exercises chosen which determine a program's efficiency. As the number of exercises increase, duration of the training period increases, and the quality of the work done, decreases. Keeping the number of exercises at a manageable level is one of the most difficult aspects of program planning as there is often the urge to want to work everything. Prioritization, focusing on those exercises which produce the biggest return and best develop functional football strength is imperative. In any football program, there should minimally be six primary exercises consisting of a squat variation, a press variation, an upper back (antagonist of the press) variation, lower back work, abdominal work, and neck work. If the athlete has access to knowledgeable instructor for Olympic lifts, the number of primary exercises would increase to seven. Resist the urge to overwork muscles for show (i.e. biceps) that don't significantly contribute to your football performance.

1. Primary Exercise Choices

The following describes the demand of each lift with an intensity rating. It is impossible to provide this as a reference to % of 1RM as theoretically a 1RM can be done for most of these lifts. Where possible, guidelines in addition to the rating scheme, will be provided.

Intensity Rating

SH = super high; H = high; M-H = medium to high; M = medium; L = low

Olympic Lifts

There are a wide number of possible variation, only the ones most commonly seen

used within football training plans are identified. The Olympic lifts require coaching instruction. Make sure technique is accurate before performing them.

Power Cleans (H)

Hang Cleans (M) best hang clean is typically 15% lighter than best power clean

Clean Pulls (SH) best clean pull is typically 15% heavier than best power clean

When the power clean or hang clean are used in combination with jerks, the weight used will be what can be put up overhead. Most Olympic lifters believe that if you can clean it you can jerk it. From experience with the average athlete, the jerk tends to be lighter than what they can clean. Hence the rating would be either the same as for the power clean or hang clean or slightly lighter.

When the power/hang clean is used in combination with squats, the rating would be the same as for the Olympic lift.

Learning the Olympic Lifts. Instruction is required to complete the Olympic lifts properly. The key component for the Olympic lifts is to get the chest over the knees and the knees over the toes. Always keep a neutral spine, with shoulders locked back. Drop under the bar in a clean by pulling up onto your toes with elbows above the bar, and then drop under the bar by lifting up the toes. This can be practiced by learning a **Drop Clean**, which essentially is holding an Olympic bar at chest height with elbows over the bar, then dropping under the bar by lifting the toes, and finishing in a front squat position, with elbows high. A good range-of-motion exercise is also the snatch-squat, which creates balance and core stability for Olympic lifts.

Drop Clean

Snatch Squat – mid-position

Squats

As with the Olympic lifts there are a variety of options available, but only those most commonly seen in football training programs are identified. With squats, the back squat is used as the reference mark. Typical loading percentages are given for the other squats relative to a back squat for the same sets and reps.

Back squats (H)

Front Squats (M-H): 70%-90%

Split Squats (M-H): 0%-90%

Lateral Squat (L): < 30%

Lateral Squat

Note

Exact positioning in the range will depend on how much emphasis is placed on training with the front/ split squat. The more they are done, the more they will approach the loading of a back squat.

Presses

All presses can be done with either a barbell or dumbbells, however many strength coaches recommend using dumbbells with overhead presses, because of less stress on the shoulders and upper back. With presses, the bench press is used as the reference mark. Typical loading percentages are given for the other barbell presses relative to the bench press for the same sets and reps.

Bench press (H) varying hand positions (wide or narrow grip)

Incline press (M-H) 80%-90%

Overhead press (M) 70%-80%

Upper Back

Select the exact opposite movement of your press choice. As with the other exercise categories, there are a side variety of options. Only the most commonly occurring ones within football training plans have been identified.

Shrugs (SH)

Bent-over-rows (H)

T-bar rows (H)

Seated rows (H)

One arm dumbbell rows (L-M)

Chin ups (L-M)

Lateral pulldowns [narrow grip, in front] (M-H)

Lateral pulldowns [wide grip, in front] (M)

Reverse flies or rear deltoid raises (L)

Mid-Section

Lower Back Area

Athletic deadlift (SH)

Stiff legged deadlift (M)

Good Mornings (L-M)

Back extensions (L)

Abdominal Area

Lower, oblique, mid-upper — infinite variations possible.

Core Stability

Bird dog exercise (extend opposite arm, opposite leg)

Side, front & rear supports

Seated balance on a stability ball

Abdominal and back exercises on a stability ball

Supplemental Exercises

These exercises are chosen for various reasons, such as…

a) to strengthen and stabilize around specific joints,

b) isolate and strengthen weak link areas,

c) isolate and strengthen potential injury sites typically associated with the sport,

d) to provide an additional overload to complement the primary exercise choice.

It is recommended that all lifts in a program be selected with body balance in mind. The safest and easiest way to ensure balance is to select exercise pairs using a push-pull or agonist-antagonist approach. If an exercise is added, its opposite should also be added.

2. How many days of Weights?

Although the recommended program is probably the most appropriate training during each phase of the program, the number of training days can be individual. How much time do you want to devote to weights? How much time do you have to train? How important is strength relative to the other training components? You typically see either one, two, three or four days of weights in a football program.

One Day a Week is strictly a maintenance protocol. With maintenance your exercise choice is very limited and is typically kept to big multi-joint lifts such as power cleans, squats and bench press.

Two Days a Week will produce modest gains in individuals with limited training experience, such as in the first year of starting weight training. As you get more trained, two days a week of weights is usually used for maintenance purposes. Exercise choices are somewhat limited. For this approach you can train using the same exercises for both workouts or use different exercises on each training day which is more complicated but more stimulating. Generally, when different exercises are used you do not need to adjust the workout loading (i.e. hard, easy or medium) as each exercise has different loading (i.e. Split squats versus back squats).

Three days a week produces significant gains. With another day of work, more exercises can be selected. This style is chosen in latter stages of the current training program to accommodate more sprint/agility type training. Loading is manipulated so that there are "hard", "easy", and "medium" type workouts. There are different DAY 1, DAY 2 and DAY 3 workouts with different exercises done in each workout. Exercise selection is done so that all "heavy" lifts are done DAY 1, while all "light" lifts are done DAY 2, and the "medium" lifts done DAY 3.

Four Days a Week also produces significant gains and is used in the anatomical adaptation phase, and hypertrophy phases to get greater training volume in weight training. Generally with four days a week in the weight room more than one component will have to be planned for a day (i.e. speed + weights). Football players tend to make the time to do the weights portion of the workout, the other component many times, does not always get done. This may lead to a less than optimally prepared player. Many potential options exist for 4 day workouts. Variations of a DAY 1 and DAY 2 rotation with different exercises done on each day (i.e. Monday and Thursday = DAY 1; Tuesday and Friday = DAY 2) are used in the program as either a simple split routine (i.e. Lower body, Upper Body, Off Day, Lower Body Upper Body) where the same exercises are done in both the lower body and upper body workouts or as a complex split routine where different lower body and different upper body exercises are done in each of the two workouts.

Many of these planning variations are used in some way in the current program to give you the most variety and best program possible. Variation from the program should only be made with consultation with a strength training professional or coach.

3. Lifting Technique Considerations

Stable Positions

By placing the body in the most stable position possible you increase your ability to apply force, allowing you to increase your strength with less risk of injury. When standing in the weight room, feet should be shoulder width apart, knees slightly bent, chest out, shoulders back. This places your back in what is called **'neutral spine'** which is the safest position for it to be in. Any time your shoulders round forward and your spine bends forward reduces your strength and can potentially be dangerous. If a seated position is assumed, feet should be firmly braced on the floor and the back supported whenever possible. When in a prone position, you want four point-contact where the feet are firmly planted on the floor, buttocks, shoulders and head all should remain in contact with the bench.

Control

You need to control the weight. In general the eccentric or lowing phase is performed slightly slower than the concentric phase. If the eccentric phase is performed faster than the concentric phase, bouncing usually results. Bouncing is a classic sign of loss of control and injury risk is significantly increased when control is lost.

Smooth Transition

When you lower the weight under control, bar momentum is eliminated which means you need less force to make the lift. If the bar is lowered too fast, it has downward momentum at the point when you need to change directions. This means you have to overcome both the bar's momentum and the weight. To accomplish a smooth transition between the lowering and lifting phases you need to anticipate the change of direction (i.e. "Think about pushing up, before the bar is all the way down").

Breathing Pattern

In general you want to inhale as the weight is moving towards you, or the midpoint of the body ("suck the weight to you"), then slowly exhale as the weight moves away from you ("blow the weight away"). There are exceptions to this guideline. Another way to conceptualize the breathing pattern is that you want to inhale, to help stabilize the midsection area any time the back is at risk, or needs to be fixated to allow other muscles to work more efficiently. Inflating helps provide support for the vertebral column, decreases erector spinae force and compressive forces on the vertebral discs.

Removing the supportive muscle structure from the vertebral column and the stabilizing effect inflation of the intra-abdominal and thoracic cavities provide, only four to five pounds of force could be tolerated before collapse. With forces on the spine during a heavy squat potentially between two and three thousand pounds, the importance of breathing properly is quickly put into perspective.

Another important function of the breathing pattern is to help set the rhythm for the lift. This allows for full mental and physical concentration to be focused on the execution of the lift. Finally, strength of a muscle contraction is increased when the breath is momentarily held.

The **Valsalva Maneuver** occurs when the glottis (back of the throat) temporarily closes, causing an increase in intra-abdominal and thoracic pressure. This action results in an increase in systemic blood pressure. The Valsalva Maneuver is the safest response on a heavy lift and usually occurs naturally. A Valsalva Maneuver held too long can be very dangerous as venous return is impeded, resulting in decreased cardiac output and low blood pressure (i.e. pass out). Every effort must be made to avoid holding your breath for any longer than necessary.

Range of Motion (ROM)

A complete ROM needs to be worked as this is the only way to develop strength throughout the entire range. For a sport like football where you have no idea where the hit might come from, doing partial range of motion exercises such as half squats is an invitation for injury to occur. Developing strength through an entire ROM also has an impact on your power potential. Power can also be conceptualized as force (F) multiplied by distance (d), divided by the time (t) it takes to execute the rep (i.e. $P = F \times d/t$). The distance in this formula is the ROM through which the weight is moved.

Lifting Aids

Weight Belts

Normally, a weight belt should not be used for football specific weight training. Sometimes a belt use is limited to periodic use when lifting very heavy weights (i.e. 85% + of 1RM), however, use of a weight belt will tend to prevent the mid-section muscles from adapting to and providing support for the lift. Use of a belt helps to give the mid- section muscles something to work against, supposedly promoting increased stability. Wearing a belt will not prevent injury. Some would argue that belts increase the risk of injury as you are likely to out lift what your mid-section strength is actually capable of supporting. There is some evidence that indicates injuries occurring when wearing a belt tend to be more serious than those occurring when a belt is not worn.

Knee wraps

Should NEVER be used as they decrease joint stability. With the wraps doing some of the work, optimal development of tendons, ligaments and muscles supporting the joint is compromised.

Wrist straps

With the possible exception of the Olympic lifts, straps should not be used as they compromise grip strength development, which is important for football. Straps may be used when doing Olympic lifts for safety and technical reasons. The key to these lifts is bar acceleration. There is the potential for the bar to rip out of the hands when accelerating. An excessively tight grip actually inhibits acceleration as a reflexive co-contraction occurs in the elbow flexors. Straps lessen this co-contraction allowing better technique to be utilized.

Safety

If the above guidelines are followed you are working in a reasonably safe environment. Other factors to keep in mind as you train are:

a) Learn proper lifting technique from a certified professional.

b) Use a spotter. You should never lift alone (same rationale as why you never go swimming alone).

c) Leave the ego at home.

You should never lift when you are not mentally into it. All it takes is a momentary lack of concentration for an injury to occur. Stay within your limits. Challenge yourself, but do it intelligently. Avoid comparative thinking. Your program is specific to you, your situation, your needs and your position. The only thing that matters is that you are making progress, not how much someone else is lifting.

One of the objectives of a strength program is to decrease the number of injuries. When you let the ego get in the way, you are likely to find yourself hurt. You cannot improve, if you cannot train.

d) Dress properly (T-shirt, sweats, etc.) and wear proper shoes. No buttons and no jewelry.

e) Always use weight collars.

4. The Planning of the Program

Planning from the Peak Competition Backwards

Theoretically you want to peak for the Championship game, but first, you have to get there. With a short season, every game is important. For this reason most football programs (including this one) gear their peak for the training camp test day. Plan backwards from testing to when you wish to start the off-season training plan (typically three to six weeks after the conclusion of the season).

The Number of Weeks Available

How many weeks are there from when training is scheduled to start to training camp? Note any potential disruptions to training (i.e. Exams, holidays, etc.) as you will have to adjust training to accommodate these disruptions (i.e. a recovery week or phase during exams).

The Phase Plan

Depending on the number of weeks available, schedule disruptions, athlete needs, athlete response to training, the nature of training different phase lengths are used within the program. Programs tend to lose their efficiency after two to three weeks. For this reason, the maximum length of a phase does not exceed four weeks. Four weeks allows volume and intensity to be spread out and because of the more gradual introduction of overload, this approach is recommended with beginners. A beginner is less likely to be in tune with their body and the longer phase ensures adaptation has occurred. More advanced athletes usually use a two or three week phases. This is usually a reflection of the fact they are likely doing higher intensity work. With higher intensity work, you need proportionally longer recovery. Once the foundation has been laid the program uses phases of two and three weeks in duration, to peak performance.

Typical phase lengths used in the program:

2 week phase = 1 week of overload + one week of active recovery (regeneration)

3 week phase = 2 weeks of overload + one week of active recovery regeneration)

4 week phase = 3 weeks of overload + one week of active recovery regeneration)

Active Recovery (Unloading or Regeneration) Weeks

Periodic active recovery is essential for the training gains done to occur. Adaptation only occurs during periods of rest, not periods of heavy work. Work is done but at a substantially reduced volume to allow recovery and supercompensation to occur. A week of recovery work tends to work for the vast majority of athletes. When the new workload of the next phase is imposed, they will be somewhere in a supercompensated state. In the best situation each athlete would be individually monitored and their recovery period personalized. Not every athlete will require a week to recover. Some athletes will be ready to resume training earlier (i.e. after five days), while others may need longer (i.e. nine days), however, sticking with a weekly approach greatly simplifies the planning process.

Guidelines for recovery that have effectively been applied in the program are:

a) For heavy primary exercise weights done with barbells such as the Olympic lifts, squats, presses and deadlifts — cut the sets in half, the reps in half, and keep the load the same **(half set x half reps @ same weight)**.

b) For all other work cut the sets in half, keep the reps the same, and keep the load the same **(half set x same reps @ same weight)**.

Given that all components should be brought up together, they need to be off loaded at the same time if recovery and supercompensation is to occur. All other non-weight room work (speed, agility, speed endurance, etc.) must also have its volume cut during the recovery week. It is recommended that if the work is anaerobic, the volume should be cut in half. If the work is aerobic, the volume should be cut by at least a third. It is also strongly recommended that there be a minimum of one day off per week.

Programs that fail to have planned recovery periods after heavy work periods, carry a risk of overtraining. Programs advocating minimal or no rest may be drug (i.e. Steroid) supported and not appropriate to high school or CIS players.

Intensity/Volume Distribution Within The Phases

For the most part, the loading patterns in this manual are the best recommended; however, different athletes may respond differently to different loading patterns. You should stick with the program as best you can because it is planned over a year to give you the gains, so it takes a while to see the full effects. Having said that, some minor modifications may be necessary. This highlights the importance of you keeping a training diary, to identify where you might need more or less work There really is no right or wrong way to do it, the only thing that matters is some variation of load/volume and what works best for you.

The Microcycle (Weekly) Plan

How the days of the week are planned to accomplish the training objectives depends on a variety of factors. For young or developmental athletes there typically is not more than one peak (hard) day in a week. For older more experienced athletes, two or three peaks (hard) days can be planned. Whether it is two or three peaks, will be determined by the athlete's ability to respond to the overload stress and recover from the workouts. Things must be repeated if there is to be a training effect. Generally, sessions focusing on the development of general endurance, flexibility, and strength for large muscle groups are repeated every other day. Larger muscle groups tend to take longer to recover so longer recovery than smaller muscle groups. The fact that a type of workout (i.e. speed) has to be minimally repeated twice in a week for there to be gains and the recovery patterns of the muscles worked both must be respected while planning the weekly schedule of activity. Generally a hard day is followed by an easy day.

Determination of Training Outcomes

The training outcome is determined by the number of reps done, the intensity of the load when doing the reps, the rhythm of the reps, how much rest is taken between sets, and the number of sets done. The periodization plan addresses all of these issues. The only component that will be specifically addressed here is the **number of sets**. Generally, as training demand increases the number of sets decrease. The number of sets is also a function of the athlete's ability and training potential, the number of muscle groups to be trained (high = few sets), number of exercises (high = few sets), and the phase of training. If the goal of training is to have a higher neural training effect, then more sets (5 +) are required as the number of reps will be low (1–4). If the goal is to promote morphological or biochemical adaptations fewer sets (3–5) will be required as the number of reps will be higher (5 +). A general guideline, excluding warm-up sets is, if ten or more reps are to be done, three sets is sufficient to produce an optimal training effect. If less than ten reps are being done, at least four sets are necessary.

Exercise Sequencing

Olympic lifts must always be done first. These are high coordination lifts which must be done explosively for maximal benefit. If they are not done first, the athlete is risking injury and is not getting the biggest return on their time investment. Squats are usually the next exercise done. This gets them out of the way (because of the injury risk, midsection and upper back exercise can not be done before squats) and allows for the possibility of super-sets, and other method of training to shorten workout duration to be implemented. After doing the Olympic lifts and squats, the recommendation is to order from heaviest loading potential to lightest, which means working from big muscle groups to smallest. If you do change the exercise order, use common sense. You would not do biceps before completing all your pull work as biceps are indirectly worked in all pulling motions. Similarly, you would not work triceps before completing all pressing actions. Because biceps and triceps are indirectly worked in many of the other lifts, there is no need to put much emphasis on isolating these particular movements. Having huge biceps will not make you a better football player.

3.2 Speed Training

Introduction

'SPEED DYNAMICS' is a proven speed training approach used and promoted by many elite track and field coaches, notably former Olympic Head Track and Field Coach Brent McFarlane. What follows has a proven history of practical success.

The central nervous system (CNS) cannot distinguish between the results you desire and what you expose it to. Thus it is imperative that when it comes to speed training that **perfect practice is essential**. For speed development you need to break the old established patterns and get the CNS to function at a new, higher level. The old patterns are broken by training faster. If you want to run fast, you have to train fast. Speed should be worked on starting in the early in the off-season. This does not mean speed is the primary emphasis of training in the early off-season. It simply means that some sort of speed drills (i.e. Velocity drills) are part of the training program. With many programs, speed work has traditionally been left until the summer months. While it is possible to use this approach and still get results — it generally takes time to develop coordination for speed.

With Speed

1. Practice Makes Permanent
2. If train Submaximally, you will perform Submaximally.

Speed, like strength, filters down to other abilities. Acceleration is the key to football success. Speed is most appropriate to receivers and defensive backs. However, improved speed can significantly benefit all players. If speed increases, first step quickness and acceleration are also improved. It is strongly recommended that one of the first drills you focus on are FAST FOOT & LEG DRILLS. While these drills primarily help improve maximum velocity, acceleration potential is also significantly enhanced. Sprinting is a skill and will improve with proper practice. With training you can learn to reduce time spent on the ground or in the air. A '0.01 second" improvement in either ground or air time per every stride taken, can translate into a 0.2 second improvement in your 40 yard time (based on 20 strides used to cover 40 yards).

Speed Analysis

Running Form Mechanical Analysis

Over-striding is a common problem that limits your speed potential and predisposes you to injury. Over-striding occurs when the foot contacts in front of the center of mass (in front of the hips). Have a coach watch and see if this is happening or video tape yourself running and check to see where the foot is contacting. Aside from the acceleration phase of the sprint, where the action is quadriceps dominant with pushing the primary action, all other phases should emphasize the **triple flexor action** (toe up, heel up, knee up) and pulling actions. With a focus on flexibility and improved running mechanics substantial time can be shaved from an athlete's 40-yard time. Depending on

the athlete's initially starting point, it is possible to see a drop of "0.2 to 0.3" seconds by just focusing on improving running mechanics.

To run fast, you need to run tall. On the playing field, maintaining a low center of mass will make it harder to be knocked over and will lead to greater success than running tall. The implication here is that you need to train both. Practice running tall as that is what will improve your 40-yard time. As your sprint speed improves, provided you are also practicing specific football movement patterns, it will carry over into these patterns, enhancing your "football specific" speed.

Determine Your Maximum Speed

Using a 15-25m fly zone and a 30m action zone, have a friend time you from the start of the action zone to the end of it (flying 30m).

Determine Your Acceleration Differential

You can use either a 3 point start or a standing start. Get a time from the start to finish of the action zone (30m) without the benefit of the fly zone. Start the watch as soon as the back foot leaves the ground.

Acceleration differential = 3point or standing start 30m time - flying 30m time

A lower number indicates a good acceleration phase. If you play a position where you need to get off the line quickly or hit holes the better your acceleration differential, the more likely you are to have greater success in your position.

Drills to Improve Phases of the of the Sprint Action

Transition Phase

From ground support to thigh blocked parallel to the ground (when actually sprinting want to cue the thigh to block slightly earlier than parallel, but in training work with the thigh at parallel). If you cannot swing your thigh up to parallel, then you need to work on your flexibility so that this range of motion is developed. Some simple dynamic flexibility movements that will help improve this range of motion are:

Leg Swings (front to back and/or side to side)

You can do either straight legged or with knee bent. Take thigh through as complete a ROM as possible, while keeping your core stable.

Fire-hydrants

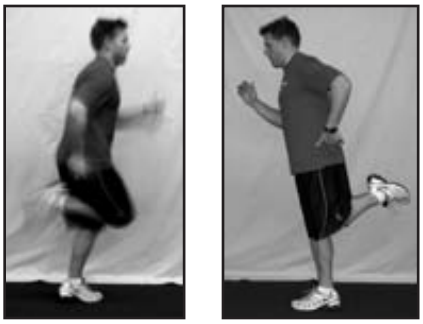
This is done on hands and knees, lifting thigh up to the side, while keeping shoulders square.

Donkey Kicks

This is done on hands and knees bringing knee into chest and then extending the leg out straight so body is in a straight line from head to toe.

From a speed perspective, with greater mobility more force can be applied. A limb that is accelerated over a greater distance produces greater force at impact. Strength without mobility leads to ineffective application of force.

Butt-kicker Drill



Focus on the ankle and keeping it dorsi flexed (toe up). This drill can initially be done with the thigh perpendicular to the track. As you progress, allow the knee to swing forward as it does when actually sprinting.

Fast Claw Drill

This drill emphasizes thigh acceleration. The hamstring must be relaxed. The leg is straight before ground contact. The movement must be cyclical. Upon ground contact the triple flexor action is used to quickly recover the thigh to parallel. To do, stand sideways to a wall or fence. You want to be up on the ball of the foot closest to the wall (heel off ground), in a straight and strong position. Hand closest to wall is used to help maintain balance. The outside thigh is held in a blocked position (up , parallel to the ground). On command, the leg is accelerated downward. Upon contact with the ground, the leg is cycled back up to the blocked position as quickly as possible. Stress tight angles (heel to butt, shortest lever to recover as possible). Some common mistakes to watch for when doing this drill are:

1. Piston action, up and down. The action must be cyclical.
2. Heavy ground contact. If the toe is kept dorsi flexed, at most a light scuff action on the ground should occur. Heavy contact stresses the knee joint and hamstring, which could lead to injury and usually a result of allowing the toe to plantar flex of "sitting down" (failure to keep tall).
3. Thigh goes past the support leg thigh. On contact the thigh of the leg executing the drill should immediately start swinging up. If it goes past the support leg thigh, "dangle time" will be increased and recovery delayed. Want to emphasis front side mechanics.

"A" March & "A" Skip

With the march, you always have ground contact, while with the skip, you momentarily lose ground contact. For both drills, you want to be tall (straight & strong) with tight abdominal muscles. Shoulders are slightly in front of the hips. Initiate the triple flexor movement (toe up, heel up, knee up) with one leg and step over the opposite knee. Emphasis is on the vertical movement, not linear speed. Be sure to keep a tight circular action (as if pedaling a bicycle) to the movement. You should be up on the ball of the foot of the support leg. Perfecting the A March and Skip as well as the Fast Claw drill will lead to faster learning and execution of the FAST LEG DRILL which can be viewed as a hybrid of these two drills.

'A' Motion

'B' Motion

'A' March

Ground Preparation Phase

The most common problem associated with this phase is "sitting down" (lowering of the hips). "Sitting down" is really a symptom of a weak mid-section. The athlete is not capable of handling the forces they are generating and "mush out" (knee buckles + sitting down) when the foot contacts the ground.

Straight-Leg-Shuffle Drill (Scissors)

You need to focus on having tight abdominal muscles, no knee joint, while working on "pull-pull-pull". The object is to have long levers (low leg pick up) that project the hips with every contact. This is a low impact plyometric drill and one of the most specific hamstring strengthening exercises you can do for sprinting.

Straight-Leg-Bounds

By applying a bigger force, more distance is covered. Because leg pick up is higher, this becomes a more advanced level drill (higher intensity plyometric). Set up a 30m course and using a step-in, bound, counting how many bounds it takes to cover the course (i.e. 16). Bound the course again, trying to do it in fewer bounds. You will only be able to do it in fewer bounds if you are generating greater negative foot speed.

Propulsion Phase

Want to keep time spent on the ground to a minimum.

Fast Foot or Ankling Drill

Start with a shuffle and gradually increase speed. There should be no scuffing of the shoes or heavy pounding. Can start isolated on one leg at a time, then progress to alternating left and right, to doubles (i.e. two right, two left, etc.), to triples, to continuous, to on command. Be sure that you stay tall. There is a tendency for athletes to "sit" on this drill. The drill is simply a fast circular step over the opposite ankle. The foot should be dorsi flexed throughout the drill. Keep the circle tight (there is a tendency to kick the foot too far out front. Focusing on the arms, can improve the execution of this drill (quick hands = quick feet). Linear speed is totally unimportant. The emphasis is on the vertical component, getting the foot up and down in a circular action over the opposite ankle. Keep time or distance worked short (i.e. < 4 seconds or 20m).

Ankle Extensions

Fast Leg Drills

This drill focuses on increasing vertical speed. The drill starts with a slow jog (linear speed is totally unimportant) and you execute a "fast claw"/"A" action, quickly stepping up over the opposite knee and quickly returning the foot to the ground. Keep tight leg angles (shortest possible levers). Keep the vertical motion in a tight circle. The same progressions as would be used for fast foot, apply here.

Drills to Improve Acceleration

The whole purpose of acceleration is to get to top speed as quickly and efficiently as possible.

Keys to Acceleration

a) Center of mass must be well ahead of the contact foot. Each step should be driven back behind the hips,

b) The shin should be at an angle of 45 degrees to the ground,

c) The front leg should have tight angles at the hip/knee/ankle joint and the knee should be above parallel as want to accelerate the shin backwards over as long a distance as possible to get maximum impulse upon ground contact,

d) Legs move in a piston like motion,

e) Breath should be held,

f) The torso is kept straight and strong.

One of the first steps to teaching athletes how to improve their acceleration capacity is to teach them how to fall. Most athletes have a natural fear of falling, so naturally take a long first step out of their stance, landing with the shin perpendicular to the ground. When this occurs the athlete stands straight up, losing the ability to continue to accelerate.

Wall Drills

Face a wall, placing arms straight out in front of you against the wall and move feet back away from the wall until you assume a 45 degree lean. Keeping the body straight (buttocks tucked under) and one leg recovered up to the thigh parallel position with ankle dorsi flexed, on command, switch which leg is up (marching in a piston like fashion). You need to hold the abdominal muscles tight as it is very easy to cheat, by sneaking the feet forward on this drill. Placing a marker that the feet have to always return to may help decrease the amount of cheating. Your breath should be held throughout the drill. Begin with 1-3-5-7-10 step progressions. Once these have been mastered you can shift to doing as many full ROM leg switches as possible in five to ten second time periods. This drill develops an appreciation of the position you need to be in coming out of your three or four point stance.

Partner Holds

One athlete holds their partner from behind at the hips. The person doing the drill should be in the acceleration ready position (one leg up, arms counterbalanced, straight and strong forward lean) so when they are released they can react and accelerate.

The partner can also resist from the front, as in the wall drill. The partner stands in front and places hand on the inside of the shoulders, at the top of the chest. The athlete starts the leg pumping and then the partner steps out of the way so the athlete can accelerate away.

Towing

Watch that you do not sneak you feet under your hips too soon (stand up). Work on keeping a straight and strong forward lean, with the feet driving back behind the hips for at least eight steps. Dragging tires is a cheap and excellent way to improve acceleration. When towing, the resistance should be through the shoulders (use a shoulder harness) as it will better enforce the straight and strong body position.

Workouts to Develop Acceleration

400m the Hard Way

A fun and effective way to improve acceleration . Can split the team into groups of five athletes. Place two teams of five opposite to each other 40m apart. An athlete from one team sprints 40m. When they pass the other team's start line the first athlete in the line then sprints to the other side, getting into the back of the line. This type of relay continues until each athlete has completed ten reps. This is a great early season workout as you are not worried about mechanics. As the fitness levels improve you could go as high as twenty reps. In addition to working on acceleration mechanics, this is also a simple speed endurance workout.

Hill Training

Start at the bottom with a marker in hand and sprint up the hill as fast as you can for a given period of time, counting the number of strides you take. Wherever you are when the time is up, put the marker down and record how many strides you took. The objective when you repeat the task is to travel further in the time period using the same number of strides. Workout progressions could be 6x 4 seconds, reps on 40 seconds; 6x 6 seconds, reps on the minute. In acceleration with every stride both stride frequency and stride length should be increasing.

Stadium Stairs

Uses the same concept as the hill training above. Run as fast as possible up a flight of stairs, being sure to touch every step. Repeat the process trying to finish with the same time, but this time taking two stairs at a time.

Front Heaves & Sprint

Squat and jump, heaving a weight, medicine ball or shot put forward and sprint out after the object. Be sure to hold your breath throughout the execution of the squat-jump acceleration sequence. Heaves are a terrific way to develop specific angle speed-strength. Proper joint loading is also occurring as you have to develop a large impulse and land plyometrically.

Maximum Velocity Training – Progression for Speed Development

Fast Legs

Modifying motor behaviour so spend less time on the ground and in the air. These drills were addressed under the propulsion section.

Fly-In-Sprints

These can be started after at least 4 weeks into the sprint training plan and can be done twice a week. Set up a fly-in zone 15m to 20m in length and mark an action zone 20m to 30m in length (beginners would use a 20m action zone). After an extensive warm-up do the fly-in sprints. Fly-in sprints are done by accelerating through the fly-in zone so that when the first action zone marker is hit, you are at top speed. You should gradually inhale through the fly-in zone and hold your breath upon hitting the first action zone marker and through the first part of the action zone. The action zone is broken into two phases an IN phase and an OUT phase. During the "IN" phase, which is the first part of the action zone, the breath is held and you are sprinting as fast as you can for 10m.

Once you hit the OUT (10m) phase of the action zone, breathe normally and try to maintain speed. If someone is observing they should not notice a change in speed. Ananalogy would be riding a bicycle. You pedal as hard and fast as you can (an IN) and then stop applying force but keep the feet on the pedals which continue to go at the generated speed without effort being expended (an OUT). The change in focus allows intensity to remain high (burst-ease-burst-ease, etc.). You always want to finish the rep with an IN. When working on speed, you want to keep the work to six seconds (60m) or less.

3-4 sets x [3 reps @ 20m] 3 min btw reps; 10 min btw sets

A Possible Workout Progression

a) 2-3 weeks using a 20m action zone (10m IN + 10m OUT)

b) 2-3 weeks using a 30m action zone (10m IN + 20m OUT)

c) 2 weeks using a 30m action zone (15m IN + 15m OUT)

d) 2 weeks using a 30m action zone (20m IN + 10m OUT)

e) 2 weeks using a 40m action zone (10m IN + 25m OUT + 5m IN)

f) 2 weeks using a 40m action zone (10m IN + 20m OUT + 10m IN)

g) 2 weeks using a 40m action zone (15m IN + 10m OUT + 15m IN)

h) 2 weeks using a 40m action zone (20m IN + 10m OUT + 10m IN)

Contrast Training

With this type of work you always want to finish with normal work. If acceleration is the focus tend to have resisted work followed by normal work. If maximum velocity is the focus you can have either:

a) Resisted - Assisted - Normal, or

b) Assisted – Normal

The concept behind this type of work is to disrupt and re-organize the CNS firing patterns. Resistance changes the whole dynamic of the sprint action. Forms of resistance can range from running into the wind (parachute), wearing weighted pants, to running up the crown of a football field (slopes should not exceed one to three degrees of incline).

If the resistance is too great sprint mechanics may be altered. With added resistance ground contact time is increased. Thus the time it takes you to travel through the action zone will be slightly increased (3.3 seconds versus 3.0 seconds). It is important to time how long it takes to do work as more than a 10% variance in times indicated that the resistance is too great. The resistance should be such that you hardly feel a change. Typically contrast work is done using a 15-20m applied (resistance or assistance) zone followed by a 30m fly zone. With each effort being maximal, at least 3 minutes between reps should be taken, as well as at least 6 minutes between the 2-3 sets.

Speed Endurance Training

Short Speed Endurance is work that lasts up to six seconds. It is signified by maximal efforts with full recovery. Fatigue occurs mostly at the neurological level with some metabolic fatigue also occurring due to the high levels of lactic acid produced.

2-4 sets x 2-4 reps [< 6 sec or < 60m] @ 95 + %; 15 sec - 1 min btw reps; 8-10 min btw sets

Long Speed Endurance

Is work that lasts between six and twelve seconds. Fatigue occurs mostly at the metabolic level due to the very high levels of lactic acid produced.

2-4 sets x 2-5 reps [7-12 seconds or 60m - 120m] @ 95 + %; 1-3 min btw reps; 8-10 min btw

Some Speed Endurance Examples

2-4x [3-4x 40m @ 95%] 15 seconds btw reps; 8-10 btw sets

2-4x [3-4x 40m @ 95%] 1 minute btw reps; 8-10 btw sets

2-4x [3-4x 60m @ 95%] 1 minute btw reps; 8-10 btw sets

2-4x [3-4x 80m @ 95%] 1 minute btw reps; 8-10 btw sets

NOTE: recovery times are vary from person to person.

Metabolic Pattern Work

Based on position, specific patterns are covered either with a jog or walk back recovery depending upon whether the work is more conditioning or quality oriented. A set of work contains between 7-10 patterns. Each individual pattern is performed with maximal effort and correct technique. Rest initially starts at around 3 minutes and gradually works down to one minute between sets. You can initially start with 2 sets and build to four sets over time. The advantage of this work is that not only does it duplicate the conditioning needs of the game, it also allows for specific position rehearsal.

Re-acceleration

It is believed that the skill of re-acceleration differs from acceleration, as a change in pace always requires a change in form. The ability to shift gears is what sets great players apart form good ones. For skill position players this is a critical component. Even linemen can benefit from re-acceleration work as it comes into play when covering kick-offs and punts.

A Sample Re-acceleration workout

A = acceleration; C = coasting

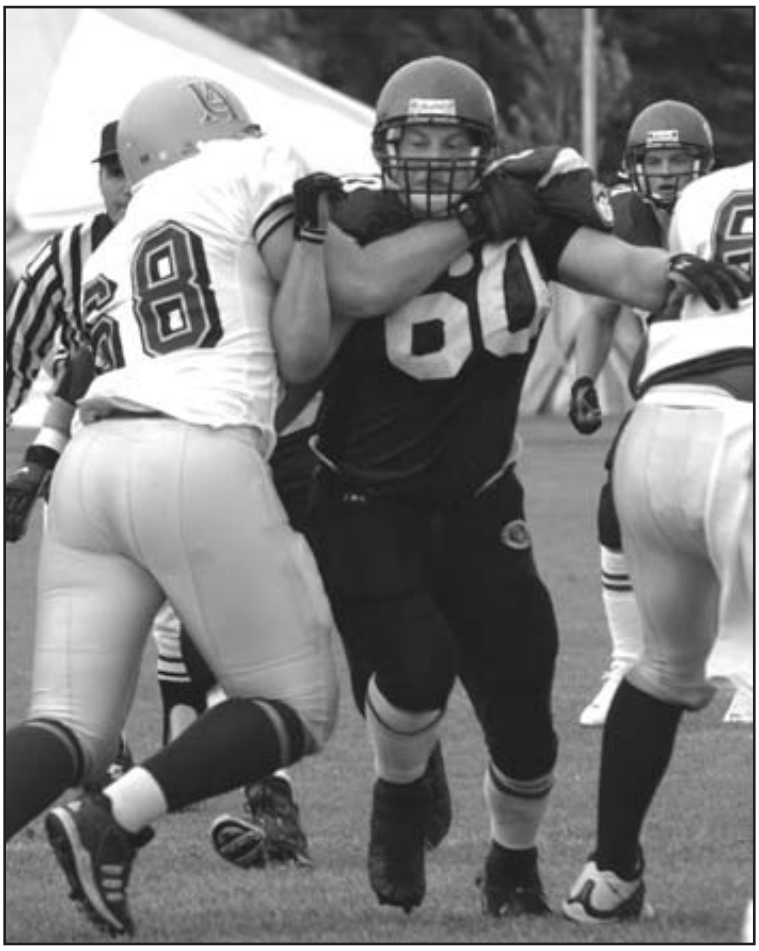
2x [2x (15m A - 10m C - 15m A)] 1 min btw reps; 6 min btw sets

As you progress you can:

a) Increase the acceleration and/or coast phase lengths

b) Add another A-C-A sequence separated by a short jog i.e. 2x [2x (15m A - 10m C - 15m A - 20m jog - 15m A - 10m C - 15m A)]

This work should be introduced in the later preparation phases after you have done some speed work. It should occur immediately after an extensive warm-up. This work places substantial stress on the hamstrings. It is important to listen to your body and not to over do it. An extensive cool down with stretching will play an important role in keeping hamstring soreness to a minimum.



3.3 Plyometric Training

Introduction

A plyometric is any movement which loads the muscle in an eccentric contraction and immediately follows this with a concentric contraction. The muscle action is best described as the stretch-shortening cycle. Muscles can briefly store the tension developed by rapid stretching (potential elastic energy). A muscle that is stretched before contraction will contract more forcefully and rapidly. The muscle's response is similar to a rubber band put on stretch. This myotatic, reflex responds to the rate at which a muscle is stretched. The more rapid the pre-stretch, the more forceful the concentric contraction. The response is very fast due to a direct connection from sensory receptors in the muscle to cells in the spinal cord and back to the muscle fibers responsible for contraction. During a stretch-shortening cycle the muscle undergoes a contraction faster than in any other method of contraction. While the response time of the stretch reflex remains about the same even after training, training increases the strength of muscle contraction. Plyometric training can result in the development of explosive power and quicker reactions based on improved reactivity of the central nervous system. The other benefit of plyometrics is the improved ability of the body to handle increased eccentric or deceleration loads, which is important for agility, speed, and quickness

Correct technique must be emphasized. The athlete should land in a pre-stretched or bent legs (arms) position. When doing jumps the athlete should land with the ankle flexed. The landing can either be on the ball of the foot or flat footed. Some coaches prefer the use of a flat footed landing as it better elicits the catapult (stretch-reflex) effect and decrease the risk of foot injuries. The shortening contraction should occur immediately after the completion of the pre-stretch phase. The quicker the athlete gets off the ground the greater the training effect. If reactivity is the primary goal, plyometrics should never be done with weighted belts or vests. Use of weighted belts or vests decrease the reactivity of the neuro-muscular system as amortization (ground contact) time is increased. Use of weighted belts or vests may be appropriate if the focus of training is on improving the athlete's ability to handle eccentric loads. Typically, even when eccentric load tolerance is the primary focus of training, loading is such that the speed of response suffers minimally.

Plyometrics need to be introduced gradually and progress very slowly. Having a strong abdominal unit is critical as it acts as the body's shock absorber. A good strength base is strongly recommended. Low level plyometrics such as skipping can be introduced very early in the training plan, whereas, higher impact plyometrics should be delayed until the strength base is developed. **A test of readiness** that could be done to determine if an athlete is ready for plyometric work is to have the athlete do squats with a weight equal to 60% of their body weight for 5 reps. If the athlete can do 5 reps, in 5 seconds, they are ready for plyometrics.

The type of landing surface and footwear are two areas of controversy. Normally it is recommended that a solid **surface** with some give (grass, spring loaded floors, wrestling mats) be used. If the surface is too soft will absorb too much energy and athlete will take too much time getting off the ground. In such a circumstance, injury risk is decreased as well as the stretch-reflex. If the surface is too hard there is significant joint

stress. In such a circumstance injury risk is increased, but so is the stretch-reflex. It is most ideally to train on a surface similar to that which you compete on. Many injuries are due to surface changes.

The European and Oriental approach to plyometrics is to have the athlete do as much work as possible in bare feet. It is theorized that by doing work in bare feet promotes the development of the tendons and ligaments of the foot and ankle. The North American approach is to wear good shoes with solid support and cushion for shock absorptions. The mixture of philosophies is probably the most beneficial. Low impact plyometric work done in sand or on grass in bare feet could be incorporated in the early preparation phases to promote the tendon and ligament development of the foot and ankle. As the program progresses to higher impact work, use of quality footwear is recommended.

Plyometric **intensity** is usually directly proportional to the height and/or length of the exercise. Single leg work is more intense than double leg work. Debate exists as to whether single leg work is appropriate for heavier athletes (i.e. Linemen). While undoubtably, with the proper preparation single leg work could be done with heavier athletes, the injury risk potential versus any potential gains, ratio likely favours sticking with double leg work only for those athletes over 250 pounds.

One rating of intensity is as follows. It is important to become proficient at each level, before moving to any exercises in the next level.

Jumps

Jumps-in-Place (Level 1)

These are jumps where you land in same spot as started. They are relatively low in intensity. These jumps can be done consecutively with a short amortization phase.

Standing Jumps (Level 2)

These are single maximal effort, either horizontal or vertical jumps. Full recovery is recommended between each effort.

Multiple Hops & Jumps (Level 3)

These jumps require maximal efforts, repeated consecutively. They can be done alone or with a barrier. They are typically done for distances of less than 30m.

Bounding (Level 4)

These jumps alternate legs, typically using an exaggerated sprint stride. Their primary purpose is to improve stride length and frequency. Bounding is usually done for distances greater than 30m.

Box Jumps (Level 5)

This type of plyometric, combines multiple jumps with depth jumps. They can be low intensity or extremely stressful depending on box height. They can be done incorporating both horizontal and vertical components.

Depth Jumps (Level 5)

This type of plyometric uses the athlete's body weight and gravity to exert force against

the ground. Depth jumps are done by dropping off a box, landing and immediately exploding up to at least the height of the box. The box height that is optimal for one athlete may not be appropriate for another. A stronger athlete will require a slightly greater drop height to obtain an elastic effect in the shortening phase compared to a weaker athlete. Generally a drop height of 15-30cm for beginning athletes, and 30-45 cm for more advanced athletes is sufficient. Some very explosive (and light) athletes may need a 60 cm height.

Volume

The volume of plyometric work is dictated by intensity. Volume is measured by the number of contacts or impacts. For bounding in early conditioning work is usually 30m per rep progressing to 100m per rep during the pre-season.

Season	**Level**			
	Beginning	*Intermediate*	*Advanced*	*Intensity*
Off-Season	60-100	100-150	120-200	low-moderate
Pre-Season	100-250	150-300	150-450	moderate-high
In-Season	Regardless of level, depends on the sport moderate			
Championship	Recovery only	recovery only	recovery only	moderate-high

Plyometrics not only create local fatigue in the muscles being worked but also in the CNS. The rest interval is a function of the load and type of plyometric training being performed. The higher the intensity of the exercise the longer the rest interval. **Work to rest ratios** in the 1:5 to 1:10 range are appropriate. If rest is too short, quality is significantly sacrificed. Depending on the intensity of the exercise, plyometric sessions should be scheduled 48 to 72 hours apart.

Typically, two plyometric sessions stressing legs are planned a week, with the maximum being three sessions per week. It is recommended that plyometrics be done before any other activity or integrated into a weight program (complex training). A plyometric training session (warm-up and cool down excluded) likely should not exceed 20 to 30 minutes. Quality not quantity should be the primary concern. When it comes to plyometrics, more is not better.

Other considerations to keep in mind are that 80% of total foot contacts should be sport specific, whereas only 20% should be used for general conditioning. Off-season training could involve general gross motor exercises such as skipping for coordination or simple jumping without specific skill training like change of direction. As the pre-season approaches, there should be an increase in specificity. The sequencing of plyometric work with strength work, **complex training**, has been demonstrated to produce superior gains in vertical jump height when compared to either plyometrics or weights done in isolation. The effectiveness of complex training lies in the fact that it combines maximal contraction with maximal speed of contraction. Typically when doing complex training the number of impacts would correspond with the number of reps performed (i.e. 10 reps, 10 impacts).

Intensity Value	Type of Exercise	Intensity of Exercise	Number of reps & sets	Number of reps per session	Rest Btw Sets
5	shock tension high reactive jumps > 25" or > 60 cm	maximal	5-8 x 10-20	120-150 (200)	8-10 min.
4	drop jumps > 25-48" or 80-120 cm	very high	5-15 x 5-15	75-100	5-7 min.
3	bounding exercises 1 & 2 legs	submaximal	3-25 x 5-15	50-250	3-5 min.
2	low reactive jumps 8-20" or 20-50 cm	moderate	10-25 x 10-25	150-250	3-5 min.
1	low impact jumps on the spot	low	10-30 x 10-15	50-300	2-3 min.

From, Bompa, T. (1993). *Power Training for Sport – Plyometrics for Maximum Power Development*. P.44.

Note: the numbers quoted above are for advanced level athletes. Volumes for beginners must be adjusted if injury is to be avoided. It should be a very gradual process to move from level one up through to level five.

3.4 Agility Training

Introduction

Agility is the combination of strength, power, quickness and coordination. An agile athlete is able to quickly change directions without a loss of balance or speed; this requires tremendous strength to decelerate the body moving in one direction, then power to re-accelerate it in another.

The balance and quickness comes from practicing the movement pattern so that the timing, rhythm and efficiency of movement is optimal. Agility work compliments the overall purpose of the training plan; essentially the goal of all the training in the gym and track is to be 'agile' and quick on the field. The relationship between training for strength, speed, plyometrics, flexibility, and agility is symbiotic; meaning that training for each component helps the other and vice versa.

The time devoted to agility does not have to exceed 1.5 hours a week, however, the emphasis is quality of training. Once the movement pattern has been practiced, the drills should be performed at maximum intensity to produce gains. Remember that if you do your agility at 3/4 speed, then that is the movement pattern that will result on the field. Practice makes permanent. Agility work can be incorporated into warm-ups to develop coordination, however to improve quickness and footspeed you have to train the neural pathway to activate as fast as possible.

Part of training 'explosiveness' is to include adequate rest between drills so that fatigue does not hamper your quickness. An appropriate work: rest interval is 1:5 + . Another way to achieve this is to do the drills with 5 others, each rep will be separated by 5x the rest interval. This interval also stresses the metabolic energy systems required for a game (each play is ~5s separated by ~30s of rest) Rest breaks between sets should allow recovery of the PCr system (i.e. 3-5 minutes), similar to a change of possession during a game.

As agility performance is so dependent on the 'neural component' (i.e. coordination) specificity is the key training principle to apply. Not only are the energy requirements similar to a game, but the actual agility drills that you practice should be specific to your position and your goals for improvement.

Basic patterns can be used by all athletes with subtle modifications to mimic the requirements of each position. Because agility training is so specific to the game situation, they are an essential component of the final stages of training before camp.

Agility Drills Terminology

Imagination is the only limiting factor in designing agility drills. Many teams will have their own 'sets' that they are accustomed to doing. There is no right or wrong with selection - if you are doing your own specific set for your team, then you are applying the 'specificity principle', if you choose different agility drills you can improve your 'non-specific' athletic ability which definitely improves overall agility.

Football Position

Basic general stance for any playing position. Feet are just outside the hips, waist and knees are bent, back is flat, arms are bent but hang loosely from the shoulders, head and chest is up.

Stance

This is the football position specific to your position on the field (i.e. lineman in 3pt, QB's in stance from the snap). Begin agility drills in your football stance for specificity of training.

Fast Feet

From your football position, quickly move your feet up and down while your body stays stationary. Trains you to be 'light-on-your-feet' and improves footspeed.

Shuffle

Basic pattern for agility drills. Moving from a 'football position', shuffle to the side without crossing over your feet. Think to push without outside leg more than pulling with the lead leg (pushing is stronger than pulling), but stay light on your feet.

Carioca

Similar to the positioning and movement for the shuffle, however your trailing leg crosses over in front of, then behind your lead leg. This can be done two ways, one with feet close to the ground (fast feet carioca - more specific for linemen) and one where the trail leg comes up into an 'A' running position (fast leg carioca - toe up, knee at 90, ankle behind the knee tight to the leg) to improve leg speed for running positions (DB's, receivers, backs).

Backpedal

From a football position, shuffle feet along the ground behind you. Important to keep your arms bent but move your whole arm (for more power), keep your back flat and head up, and don't overreach. If you pick up your feet instead of shuffling you will be decelerating every time you plant slowing you down.

Sprint

From your football position, accelerate explosively by throwing the lead arm (bent at 90) to your forehead, lean into the direction you want to move, quickly plant your feet (knee up but running over your opposite ankle). Important to take small steps to get your feet moving, if you take a big step you just stand up and lose your power.

Hit

This is where you drop to the ground into a FOUR POINT STANCE (i.e. pushup position), then pop back up on to your feet. This is a plyometric for your upper body (prepares for 'bumps' at the line) and improves full body agility.

Spin

Usually from running forward in a sprint, you break down to your football position and plant on the inside foot (closest to the direction of the spin) and spin around that plant foot away from your original running direction. Important to break down and plant two feet first, as it is faster than doing a two-step spin.

Tuck Jump

With feet under your hips, quickly explode up and tuck your knees into your chest, your legs in an 'A' position (ankle cocked). The goal is a short contact time with the ground and fast knees into your chest to improve leg recovery and speed and is more specific for running positions.

Vertical Jump

With feet under your hips, do a countermovement and generate maximum vertical jump force for maximum height, then land softly. This is more specific for generating maximum power for linemen and linebackers.

2 Point Stance

Basically a beginning ready position with only your feet on the ground, also called the football position.

3 Point Stance

Two legs and one hand in contact with the ground. For positional stance, the free hand's arm is bent but hanging down from your shoulder or leading from your shoulder. For a '40' 3pt stance, trail forefoot is in line with the heel of the lead foot, the hand is the same distance in front (to form an equilateral triangle) and hips are high with weight balanced slightly forward. Free hand should be 'in your holster' at your hip.

4 Point Stance

A football position on the ground (both hands and toes touching the ground). Arms are bent at 90 and legs are bent as if you were in your football position standing up, however, the ground position involves a strength and plyometric component for the upper body.

2 Point Wave

From a football position, side shuffle in the direction indicated, keeping your head up and back flat.

4 Point Wave

From a FOUR POINT STANCE on the ground, side shuffle in the direction indicated, keeping a four point football position (don't straighten your legs and stick your butt way up in the air!) and not crossing over.

Side Roll

From your football position, you drop and hit, THEN tuck one arm into your body and push off with the opposite arm, quickly roll your body over in the direction desired, popping up into the four point stance. Very important not to do a 'seat roll' where you sit up while rolling as this can hurt your back if not done correctly. Helps to think of maintaining eye contact ahead of you while rolling to maintaining good tight body position. This improves whole body agility.

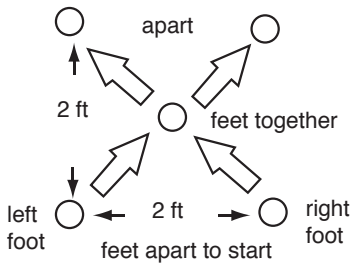
Forward Roll

From a football position, bring your arms in front to decelerate your body, then tuck your head under and roll forward making sure not to land on the rear of the neck. This improves whole body agility and balance.

Agility Drills

Footwork Drills

Footwork Drills (Dots)



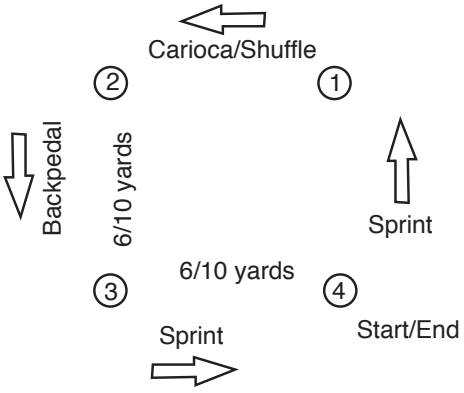
Dots: These are essential to improving footspeed, coordination and balance. The basic set for footwork drills are the 'DOTS'. This is where you have marked on the ground (with tape or imaginary) 5 points in the shape of a 5 point dice, each point ~ 1.5 feet from the others. When doing the DOTS, you practice the pattern first, then try and do it as fast as possible (AFAP). Have a little game with yourself or your teammates to do the most reps in a given time period. Variations of the DOT drills are the following:

1. **Forward and Back** - Begin with one foot on each of the rear dots. Start by bringing your feet together at the center dot, then touching the furthest dots, back to center together and touching the rear dots again; always facing forward (see figure).
2. **One Leg** - Balance on R leg. Begin at the rear R dot for the R leg or L for L leg. Begin by touching the center then forward L, forward R, centre, rear L, rear R. Repeat the same hour-glass pattern with the L leg. Reverse patterns for variation.
3. **180** - Begin in same position as for 'Forward and Back' with the same first sequence to the far dots. At the end, you spin 180 degrees landing on the same dots. Do the forward and back now, except spinning 180 at each end (turning to the same side so you don't get dizzy).
4. **Reaction Time** - stand on the centre dot. Have a partner call out the dot number you have to jump to with one foot or both feet.

Box Drills

Agility Square

Box Drill
(Agility Square)



Set up a box or square with cones. The dimensions of the 'AGILITY SQUARE' are determined by the area an athlete would normally expected to cover in their position (Linemen typically ~6 yards, Linebackers & QB's ~8 yards, Receivers & DB's ~10 yards). The athlete then executes various movements (i.e. forward sprint fast foot carioca, side shuffle, back pedal, etc.) using the outside of the square and the inside of the square for diagonal patterns. The basic pattern is at right, and modified agility squares for each position are as follows (remember to reverse directions every other rep):

Agility Square

Offensive-Line

a) Sprint forward to 1, side shuffle across to 2, backpedal to 3, side shuffle to 4

b) Sprint forward to 1, drop and hit, up and side shuffle to 2, backpedal to 3, drop and hit, up and side shuffle to 4.

c) Sprint forward to 1, drop and 4 point wave across to cone 2, up and backpedal to 3, drop and 4 point wave to cone 4.

Defensive-Line

a) Sprint forward to 1, side carioca across to 2, backpedal to 3, carioca to 4

b) Sprint forward to 1, drop and hit, up and carioca to 2, backpedal to 3, drop and hit, up and carioca to 4.

c) Sprint forward to 1, drop and 4 point wave across to cone 2, up and backpedal to 3, drop and hit, up and sprint to cone 4.

Linebackers (can also start these as backpedal to 1)

a) Sprint forward to 1, side carioca across to 2, backpedal to 3, plant, turn and sprint to 4

b) Sprint forward to 1, drop and hit, up and side carioca to 2, backpedal to 3, drop and hit, up and sprint to 4.

c) Sprint forward to 1, drop and 4 point wave across to cone 2, up and backpedal to 3, drop and hit, up and sprint to cone 4.

Defensive Backs

a) Backpedal to 1, side carioca across to 2, sprint to 3, plant, turn and sprint to 4

b) Backpedal to 1, drop and hit, up and side carioca to 2, drop and hit, up and sprint to 3, plant, turn and sprint to 4.

c) Backpedal to 1, drop and 4 point wave across to cone 2, up and sprint to 3, plant, turn and sprint to cone 4.

Receivers

a) Sprint forward to 1, side carioca across to 2, backpedal to 3, plant, turn and sprint to 4

b) Sprint forward to 1, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around foot closest to the square) and sprint forward to 2, breakdown at the cone and side carioca to cone 3, inside spin to face cone 4 (spin 90 degrees) and sprint to 4.

c) Sprint forward to 1, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around foot closest to the square) and sprint forward to 2, breakdown at the cone, drop and hit, up and side carioca to cone 3, outside turn (plant on outside foot) to face cone 4 and sprint to 4.

Offensive Backs

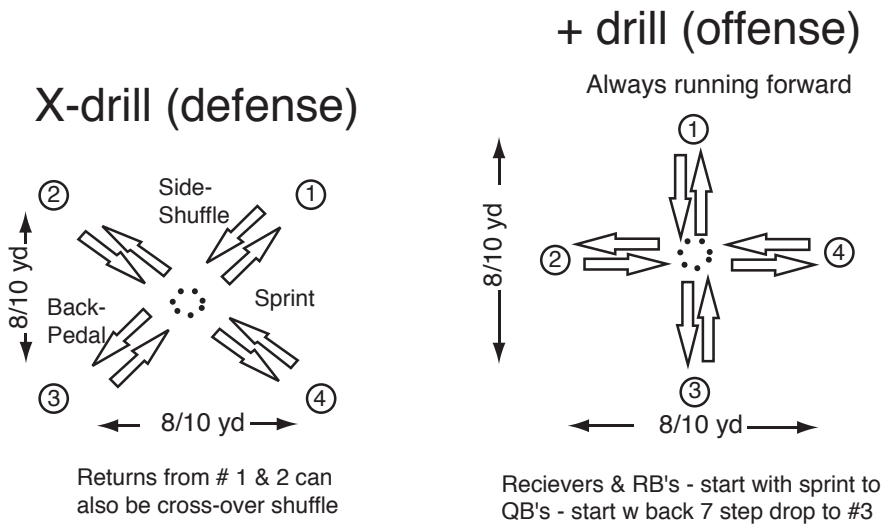
a) Sprint forward to 1, side carioca across to 2, backpedal to 3, plant, turn and sprint to 4

b) Sprint forward to 1, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around foot closest to the square) and sprint forward to 2, breakdown at the cone and side carioca to cone 3, inside spin to face cone 4 (spin 90 degrees) and sprint to 4.

c) Sprint forward to 1, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around foot closest to the square) and sprint forward to 2, breakdown at the cone, drop and hit and 4 point wave to cone 3, get up and outside turn (plant on outside foot) to face cone 4 and sprint to 4.

X and + Drills

These box-drills are again specific to the movement area required for your position. The cone in the middle can be removed so that it doesn't get in the way. O-Line should always face forward but side shuffle to cones 2 & 4.



Offensive-Line

a) Standard offensive + pattern starting with a sprint forward, except side shuffle to the cones 2 & 4. Always face forward

Defensive-Line

a) Standard defensive X pattern starting with a sprint forward to 1, side shuffle back to centre and sprint to 2. Side shuffle to centre back pedal to 3, sprint to centre, backpedal to 4, sprint forward to finish. Always face forward.

Linebackers

a) Same as D-line

b) Instead of side shuffle back to centre from 1 & 2, do a cross-over angle drop.

Defensive Backs

a) Same as Linebackers

b) Same as Linebackers.

Receivers

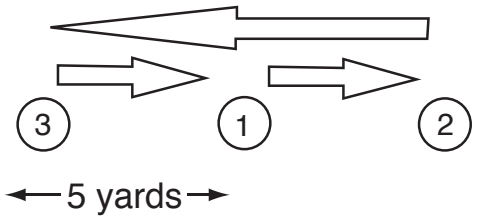
a) Standard offensive + pattern starting with a sprint forward to 1, turn at each cone so that you are always running forward.

Offensive Backs

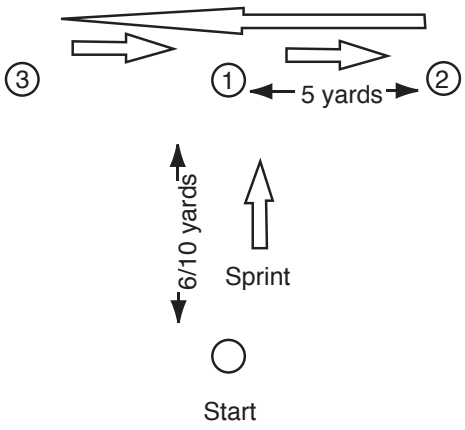
a) Same as Receivers.

Line Drills

The classic line drill is the side-to-side PRO-AGILITY DRILL (20 meter shuttle, standing at the centre facing forward, break right 5 yards, across 10 yards, back to centre 5 yards). Another classic is a forward-back shuttle run (end line sprint to the 5 yard, back to the endline, out to the 10 yard, back to the endline, out to the 15 yard, back to the endline). The possibilities are endless as are the variations on the drills. Remember that specificity is the key in training agility, so remember to tailor the drill to you and your position. Some basic patterns for a few line drills with variations per position are:



T-Drill



This use similar dimensions to the box set up, except there are markers demark a "T". Generally, one begins at the base and sprints to the centre marker, quickly breaking right or left and completing a pro-agility pattern. Remember to repeat each direction. Position-specific variations of the T-drill are as follows:

Offensive-Line (the exception to sprinting forward first is the pattern for the O-line who do the side shuffle first, then sprint forward to finish the drill)

a) Side shuffle to 1 (right 3 yards), side shuffle across to 2 (across 6 yards), shuffle back to the centre (3 yards), sprint forward (6 yards).

b) Side shuffle to 1 (right 3 yards) drop and hit, up and side shuffle across to 2 (across 6 yards) drop and hit, shuffle back to the centre (3 yards), sprint forward (6 yards).

c) Side shuffle to 1 (right 3 yards) drop and hit, 4pt wave to 2 (across 6 yards), 4pt wave back to the centre (3 yards), get up and sprint forward (6 yards).

Defensive-Line (all remaining patterns with a sprint forward to the centre of the "T")

a) Sprint forward to centre of T (forward 5 yards), break right and sprint to 2 (right 5 yards), turn and sprint back across centre to other side of T (10yds), turn and sprint through centre (5 yards).

b) Sprint forward to centre of T (forward 5 yards), drop and hit, get up and break right and sprint to 2 (right 5 yards), drop and hit, turn and sprint back across centre to other side of T (10yds), drop and hit, get up and sprint through centre (5 yds).

c) Sprint forward to centre of T (forward 5 yards), drop and hit with a body roll to the right, 4 pt wave to 2 (right 5 yards), get up and sprint back across centre to other side of T (10 yards), drop and hit, get up and sprint through centre (5 yards).

Linebackers (can also start these as backpedal to centre of T)

a) Sprint forward to centre of T (forward 5 yards), break right and sprint to 2 (right 5 yards), turn and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

b) Sprint forward to centre of T (forward 5 yards), drop and hit, get up and break right and sprint to 2 (right 5 yards), drop and hit, turn and sprint back across centre to other side of T (10 yards), drop and hit, get up and sprint through centre (5 yards).

c) Sprint forward to centre of T (forward 5 yards), drop and hit with a body roll to the right, 4 pt wave to 2 (right 5 yards), get up and sprint back across centre to other side of T (10 yards), drop and hit, get up and sprint through centre (5 yards).

Defensive Backs

a) Sprint forward to centre of T (forward 5 yards), break right and sprint to 2 (right 5 yards), turn and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

b) Backpedal to centre of T (forward 5 yards), break right and sprint to 2 (right 5 yards), turn and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

c) Backpedal to centre of T (forward 5 yards), drop and hit, get up and break right and sprint to 2 (right 5 yards), drop and hit, turn and sprint back across centre to other side of T (10 yards), drop and hit, get up and sprint through centre (5 yards).

Receivers

a) Sprint forward to centre of T (forward 5 yards), break right and sprint to 2 (right 5 yards), turn and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

b) Sprint forward to centre of T, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around right foot) and sprint to the right (2), turn and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

c) Sprint forward to centre of T, break down and plant with both feet at the cone and inside spin 270 degrees (rotate around right foot) and sprint to the right (2), drop

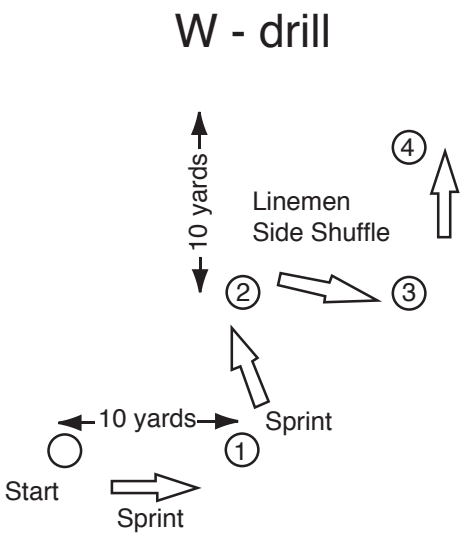
and hit, get up and sprint back across centre to other side of T (10 yards), turn and sprint through centre (5 yards).

Offensive Backs

a) Same as Receivers.

W-Drill

This can be used as sprinting drill with a wide "W" or more of a forwardback drill with a narrow "W". As a sprinting drill, is named a 'football 40' because it mimics sprinting used in a game. Very rarely does any player ever reach top speed in a game except in an all out run/chase situation. The W-drill mimics the changes of direction usually incurred during a 'sprint' in a game completing hard cuts throughout the run. Cones are set up in a 'W' formation with 6, 8, or 10 yards between each cone for line, linebackers, and offensive backs respectively. Each side is at 90 degree corners. For the basic pattern, sprint forward to the first cone, break down and hard plant on your OUTSIDE leg for each cut, going to the outside of each cone.



Offensive-Line (the exception to sprinting forward first is the pattern for the O-line who do the side shuffle first, then sprint forward to the next cone):

a) Side shuffle to 1 (right 6 yards), sprint forward to 2 (6 yards), side shuffle across to 3 (6 yards), sprint forward (6 yards).

b) Side shuffle to 1 (right 6 yards) drop and hit, up and sprint forward to 2 (6 yards) drop and hit, side roll and 4 pt wave across to 3 (6 yards), up and sprint forward (6 yards).

Defensive-Line (defensive patterns begin with a backpedal to cone 1)

a) Backpedal to 1, turn and sprint to 2, hard plant and turn to the right and sprint, hard plant at cone 3, sprint through 4.

b) Backpedal to 1, break down and drop and hit at the cone, up and sprint to 2, drop and hit, up and sprint, hit at cone 3, sprint through 4.

Linebackers (defensive patterns begin with a backpedal to cone 1)

a) Backpedal to 1, turn and sprint to 2, hard plant and turn to the right and sprint, repeat at cones 3, sprint through 4.

b) Backpedal to 1, break down and drop and hit at the cone, up and sprint to 2, drop and hit at cone 2, up and sprint, hit at cone 3, sprint through 4.

Defensive Backs (start all with a backpedal)

a) Backpedal to 1, plant and footwork turn and sprint to 2, hard plant and backpedal

back to 3, plant and footwork angle turn and sprint to 4.

b) Backpedal to 1, turn and sprint to 2, break down and hard cut at 2 and sprint toward cone 3. Hard cut at cone 3, sprint through 4.

Receivers (Start all offensive patterns with a forward sprint)

a) Sprint forward to 1, hard plant on outside leg, cut and sprint to 2, hard plant and on outside leg and turn and sprint to cone 3, hard cut at cone 3, sprint through 4.

b) Sprint forward to 1, break down and inside spin (270 degrees) to sprint toward cone 3. Inside spin at cone 3, sprint through 4.

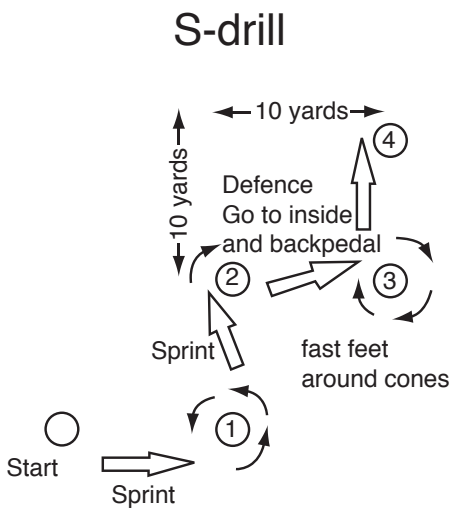
Offensive Backs

a) Sprint forward to 1, hard plant on outside leg, cut and sprint to 2, hard plant and on outside leg and turn and sprint to cone 3, hard cut at cone 3, sprint through 4.

b) Sprint forward to 1, break down and inside spin (270 degrees) to sprint toward cone 3. Inside spin at cone 3, sprint through 4.

S-Drill

The S-drill is really a variation of the 'W-drill' and uses the same cone formation as the 'W-drill' except at each cone the goal is to run around the cone as quickly as possible and sprint onto the next cone. Offensive backs run to the outside of the cone and run around the cone. Defensive players run to the inside of the cone and backpedal around the cone - always face forward during the drill. This is not typically a linemen drill, but can be done to improve footwork. A good idea is for the offensive players to run with a ball and to change hands during the drill, practicing your ball transfers.



Mirror Drills

Mirror drills are an 'open' agility drills - meaning that a coach or player signals the agility movements to the players in the drill. Generally, one, two, or three players are in a square and face the 'mirror'. The mirror player can side shuffle, forward sprint, backpedal, tuck jump, drop and hit, drop and roll, 4-pt wave to 'lose' the other players in the drill. This can also be done using hand signals. This is as close to a game situation as it gets and requires all the basics fundamentals to be able to do it effectively. A good work to rest is 5-10s during the drill with up to 1 min rest

3.5 Flexibility Training

Introduction

Flexibility refers to the ability to move muscles and joints through a full range of motion (ROM). The benefits from stretching are to maintain adequate range-of-motion to perform many skilled athletic movements. Stretching helps to return the muscle to its normal resting length after workouts and may help to reduce muscular soreness and speed recovery. One misnomer about stretching and flexibility is that it does not decrease the risk of injury. Only a quality warm-up can decrease the risk of injury. Those individuals at the extremes of flexibility, either completely inflexible or hyper flexible, may however, have twice the risk of injury, but acute changes in range-of-motion caused by stretch before activity has been shown to reduce strength and may even therefore, increase risk of injury if done aggressively prior to exercise.

Flexibility develops day to day. Flexibility must be specific to the prime movers and joints used in the sport. Stretching in combination with a good warm-up prepares the body for work. All flexibility work should progress from general to specific. When stretching you never want pain. The concept of "no pain, no gain" has no place in a training program, but especially a flexibility program. Pain is usually associated with over-stretching, the mechanism of which, is very similar to "pulling" a muscle. For a muscle to retain the flexibility gains from stretching, each stretch must be repeated at least twice per muscle. The type and amount of stretching done before and after activity should be different to get the most benefit.

Types of Stretching

Static Stretching

This involves holding a position for fifteen to thirty seconds. It is the safest form of stretching. A stretch held for a longer time is more beneficial than one held for a shorter period of time. Static stretching can be done assisted or unassisted. The advantages of static stretching include the fact that it requires little energy expenditure, it allows time to reset the sensitivity of the stretch reflex, permits semipermanent change in length, and promotes muscular relaxation. Static stretching is best done at the end of a workout or exercise session.

Passive Stretching

The athlete is relaxed and makes no contribution to the ROM. An external force (i.e. partner assistance) is created which takes the muscle/joint through the ROM. This type of stretching is advantageous when the agonist is too weak to respond and when attempts to inhibit tight muscles (i.e. antagonists) are unsuccessful. It allows stretching beyond one's active range. The major disadvantage is the increased risk of soreness or injury that can occur if the partner over stretches the muscle. The stretch reflex may also be initiated if force is applied too quickly. Injury risk increases as the difference between active and passive flexibility increases.

Dynamic (Active) Stretching

This involves taking the muscle and joint actively through its range of motion (ROM). While the movement is active, there is no bounce. From an athletic point of view this is the most important type of stretching. Dynamic stretching should be done in conjunction with a structured warm-up. The ROM's worked and the specific actions of moving the muscle and/or joint must relate to the activity. The key to avoiding injury is to start easy and progress to more dynamic movements.

Dynamic Active: ROM in a strong, fast muscular contraction (i.e. leg swings)

Static Active: ROM is slow controlled muscular activity (i.e. gymnastic back walk-over)

Proprioceptive Neuromuscular Facilitation (PNF)

This is also called muscle energy technique. There are two approaches to PNF stretching.

Contract-Relax Technique

This technique starts by putting the tight muscle on stretch (lengthening it). Following a gentle stretch, the muscle is then contracted isometrically by pushing against a partner or against the ground or oneself, for six to fifteen seconds, then allowed to relax (shake out) . You or your partner then gently stretches the muscle trying to take it through a greater ROM prior to repeating the process. This stretch, resist, relax, stretch process should be repeated at least three times. Partners must effectively communicate if over stretching and injury is to be avoided. This strategy tends to have rapid improvements in range-of-motion, and because of the contraction phases possibly contributing to muscle temperature, may be beneficial before exercise.

Contract-Relax-Contract Technique

This is similar to the contract-relax technique except that after the relaxation phase the antagonist (muscle opposite to the one you are stretching) is contracted. The whole process should be repeated at least three times.

PNF appears to be the most effective at developing flexibility. It significantly enhances active flexibility. It is strongly recommended that PNF stretching only be used in the cool down portion of the workout.

Ballistic Stretching

This technique involves taking a muscle to its end range in a quick aggressive fashion (i.e. 'bouncing). It is very controversial as it can cause soreness and injury if done too aggressively. The disadvantages of ballistic stretching are that it fails to provide adequate time for the tissues to adapt to the stretch and it initiates the stretch reflex, increasing muscular tension; however, ballistic stretching may prepare the muscle for the ballistic nature of a collision game such as football. If ballistic stretching were to be done, it should only be done at the end of a full dynamic warm-up and only on the advice of a strength or track coach.

One of the most common myths is that strength training will make you muscle bound. Only athletes who have not employed a structured flexibility program can become muscle bound when strength training. Flexibility is a critical component to a football players overall success. Flexibility can affect a player's speed/power potential. With

improved flexibility, force can be applied longer, thus allowing more work to be done. An example of a tremendously successful CIS football player who was also highly flexible is Ron Herman. Ron Herman was an ALL CANADIAN center with the Queen's Golden Gaels. Ron was a big man, 6'4" and approaching 300 pounds. Despite having superior strength numbers (600 pound squat, 400 pound bench press and 350 pound power clean) he could still do the splits to the floor in both directions and could touch both hands together flat behind his back.

When to Stretch ...

When starting a workout, as part of a quality warm-up stretching should be done. It is recommended that the stretching be primarily dynamic in nature. Doing static stretching prior to activity may have a detrimental effect on that activity as static stretching shuts down the alpha motor neurons, the big nerves that you need primed for explosive movement. If you feel the need to do some sort of static stretching prior to initiating the workout, you can do so, by not holding the stretch longer than six seconds. You can repeat the static six second hold as many times as necessary to feel loose without shutting down the alpha motor neurons.

Limiting static stretching prior to working out is a difficult concept for many to buy into. Those athletes who have tried this approach have found their speed and strength performances significantly improved. Remember, it is the warm-up, not the stretching that helps to prevent injury and prepare you to perform. Should you feel the need to hold static stretches longer than six seconds prior to the work out, it is recommended that you try and structure the warm-up such that following the static stretching, at least 20 minutes of warm-up activities are scheduled before getting into any speed or strength oriented activities. Recent research indicates that it would takes about twenty minutes for the alpha motor neurons to become re-activated following extensive static stretching.

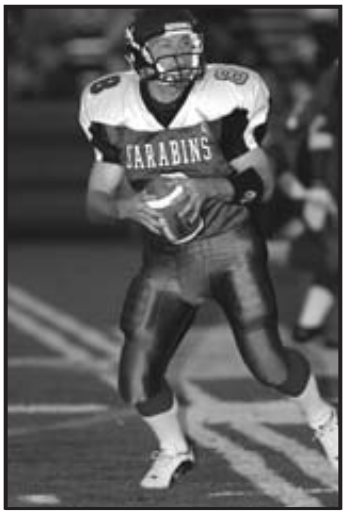
Once the workout is initiated the primary purpose of stretching is to maintain the muscle's ROM. Dynamic stretching or static stretching held for less than six seconds are both appropriate. Rather than stretching the prime mover, try stretching the antagonist. If the antagonist is relaxed the efficiency of the prime mover is improved.

At the completion of the workout you want to shut down the alpha motor neurons as this would help promote relaxation. Stretching returns the muscle to its normal resting length which enhances the speed of recovery. It is in the post workout period that the biggest gains in flexibility can occur. Use of both static and PNF stretching are recommended during the post workout period.

Stretching Guidelines

1. Warm-up prior to stretching.
2. Move slowly and smoothly into the stretch to avoid initiation of the stretch reflex.
3. Breathe normally and freely, but accentuate the exhalation when moving deeper into the stretch.
4. Concentrate and feel the stretch. Feeling slight discomfort is okay. Feeling pain is never okay.
5. Come out of each stretch slowly and smoothly.
6. Repeat each stretch at least twice.

3.6 Core and 'Dynamic Stability' Training



A recent craze in the world of strength training and conditioning has emphasized the importance of the 'core' muscles in generating athletic movement. The 'core' muscles are basically the muscles that stabilize the spine (deep spinal muscle) and support the trunk (abdominals, erector spinae, obliques) to provide a stable support for the arms an legs to generate force. The use of stability balls and unstable surfaces has become commonplace in the overall training package of athletes, to develop 'dynamic stability' or the ability to stabilize the trunk with movement.

There is growing scientific and empirical evidence about the effectiveness of core stability training in the quest for increased athletic performance. Many strength training coaches attribute much of the development of their athletes to dynamic stability tools such as stability balls, wobble boards and the like; however, it is important to keep in mind that core stability training is one component of the overall training package. In the overall development of a well-rounded football player, core strength and endurance and dynamic core stability are essential, however; not to the detriment of basic size and strength gains using basic free weight exercises in the gym. Generally, a developing athlete should begin with more stable exercises and use them to develop size, strength and endurance while slowly incorporating unstable training tools such as stability balls, wobble boards and medicine balls, and balance, coordination and strength improves.

It is important to know that the use of unstable tools should be progressive. Basic stabilization of the spine should be developed first with a few 'core' exercises, then further 'dynamic stability' exercises can be incorporated to increase athletic gains.

Back Stabilization — Level 1

A common chronic complaint for many football players is low back pain. This is especially evident during training camp, where the intense demands of two-a-day practices takes its toll on under-trained back and abdominal muscles and inflexible hamstrings. Previous back problems become worse, as previous back instability sets the stage for back pain and stiffness once intense activity (i.e. training camp) begins. These symptoms are signals that the core muscles that stabilize the back are undertrained for the needs placed upon them.

The low back is very sensitive twisting and compressive forces and requires a rigid, stable lumbar curve (i.e. normal curve in standing posture) for proper functioning. Unfortunately, many players disregard 'core' training in favor of a better bench press and heavier squat, neglecting the integrity of the core region which repeatedly translates the high forces produced by either muscle group. Although the football requires all out efforts of strength for a few brief contractions, back health is more associated with endurance in the muscles stabilizing the back. Because these muscles are 'always on', especially when repeatedly getting in and out of a football stance, they must be trained to keep the back stable for longer periods of time. When proper neutral back positioning is compromised, the back is at greatest risk of injury. Hamstring flexibility is essential

for hip mobility and relief of tension on the low back, however primary relief of back pain will result from increasing back stability.

The initial back stabilization program provided here are exercises developed by Dr. Stuart McGill at the University of Waterloo, who is regarded as a world expert on low-back function. These exercises train strength and endurance in the low back and abdominal muscles to maintain proper lumbar posture while limiting compressive loads to the spine, and prepare the back for further 'dynamic stability' exercises to enhance athletic potential.

The objective of the exercises are to train the back to maintain a neutral 'stable' position and therefore reduce subsequent pain and stiffness. The five exercises are the cat stretch, the 'superman', the side support, the supported lower abdominal single leg raise, and abdominal curl-up (i.e. not crunch). Each of these exercises maintain the back in a stable position while training the deep muscles of the low back that support the lower spine.

Cat Stretch

The 'cat stretch' is performed by slowly cycling from full spine flexion to full spine extension. Spine mobility is emphasized rather than pressing at the end range of motion. This exercise provides motion for the spine with very low loading on the disks.

Superman or 'birdog'

The 'birdog' is performed by extending a single arm with a contralateral leg to neutral spine position (do not hyperextend at the low back). Perform slowly and contract in the lower abs to support this position. This exercise works the muscles deep in the low back across the spine so you develop your own internal 'weightlifting belt'.

Side Support

The horizontal isometric 'side support' is performed by supporting the lower body at the feet and keeping a perfectly rigid body position (as if your spine is a straight bar). Begin from a position at the elbows. Supporting the lower body with the knees on the floor is an easier version if unable to do the full position. If you are unable to do at least 90 sec of contraction in the full position, this may indicate a lack of endurance in the low back and therefore, possible susceptibility to injury.

Side Support

Rear Support

Single Leg Raise

With hands folded in the low back to support neutral spine position, begin by tilting your pelvis (and pressing low back to your hands). Lift the straight leg to the height of the opposite knee. This exercise works the lower abdominal area to develop your own internal 'weightlifting belt'. It is difficult to 'feel' this exercise, so concentrate on the pelvic tilt and proper positioning and do the movement slowly.

Supported Abdominal Curl-up

Cross your hands and place them in the lower back, and bend one leg up to properly position hips to train your abdominals. Contract your abs by pulling your belly button down, then lift head and shoulders to the ceiling keeping a rigid body position. Don't use your elbows to lift yourself up. This trains the 'stable core' region required for maximum power transfer from the legs during agility and speed work.

The five exercises should be completed for 2-3 sets; the goal is to gradually increase your endurance (number of repetitions or time of contraction) in the exercises. Although a good option is to complete them with the circuit portions of the weight workout as prescribed in the manual, you can also do them as part of your cool-down and stretch, or as a simple set of exercises done every day.

Remember to maintain back stability and a proper lumbar curve when weight training. The back is very strong in its neutral position, but becomes very weak when the back becomes rounded.

Dynamic Core Stability – Advanced Levels

Now that you can perform the basic back stabilization exercises, there are variations of these exercises that work each of the 'core' muscles from a different direction –These are done with variations of hand and leg positions, and finally incorporating the stability ball to these basic exercises. 'Dynamic core stability' is achieved by incorporating core stabilization holds with some movement of the arms or legs.

Level 2 – Supports from straight arm position

The birddog is the same. The supports are done with straight arms from a pushup position. Then side with one arm, front, side, then rear with both feet. Hold each for 15-20 sec without resting between. Straight leg raise, and abdominal curl-up are the same.

Level 3 – Straight arms, one leg

Birdog same. Supports are the same, except lift one leg off the ground for each of the front, side, front, side, rear supports. Increase time of each hold from 15 – 25 seconds. Perform single leg raise from a 'hips up' single leg rear support position. Curl-up is done lifting straight leg off the ground.

Level 4 – Single arm, single leg

Birdog the same. Supports are done with only one arm and one leg support. Side support is the 'star' position. Leg raise can be done with two legs, as long as lower back is supported and strong. Curl-up with one hand above your head.

Level 5 – Stability ball exercises

Once you can do all these on a stable surface, then you can begin at level one (2 arm support from the elbows, 2 leg support) and perform all exercises while **on a stability ball**. The birddog is on a ball, the elbows are on the ball in the supports, and the feet are on the ball in the rear support. Work your way up through the levels doing the exercises on the ball.

Further 'dynamic' exercises using a stability ball should be done under the supervision of a coach or fitness trainer.

Dynamic Core

3.7 Other Essential Training

The following exercises complete your training package. These training techniques are termed 'prehabilitation' – training 'rehabilitation-type' exercises in areas of previous injury or at higher risk of injury BEFORE an injury occurs.

Remember that to perform at your peak, you have to be in the game, and to be in the game you have to be injury free.

The four major sites of injury in football are the low back, neck, shoulder, and knee. Using pre-habilitation exercises to improve the integrity of these areas can reduce your risk of injury and enhance your performance.

Neck Strengthening Exercises

It is important to strengthen the neck in four planes of movement; forward, back, and side-to-side. When beginning neck training you can do so isometrically (don't move your head) resist your own force (i.e. push against your own hands) resisting forward, back, and side-to-side. Generally, training for 5-10 s x 2-3 sets per plane of movement is good for each neck training session. As you develop strength it is more important to resist while moving (because football impacts are not only isometric), and this is better performed with a partner or using a neck machine (nautilus or universal type machine – see exercise descriptions). At least 2-3 sets of 6-10 reps 2-3x per week is recommended.

Shoulder External Rotation

The shoulder rotator cuff muscles are a group of muscles which contract to hold the upper arm tightly in the shoulder joint so the big muscles of the chest and back can translate high forces to the arms. Much of heavy weight training emphasizes the shoulder internal rotator cuff (e.g. bench press, lat pulldowns, shoulder presses) as well as any throwing movement (i.e. quarterbacks). If the external rotator cuff is not adequately strong, then the shoulder can track out of alignment and cause pain and weakness and shoulder instability. For optimal shoulder strength (i.e. bigger bench press) shoulder external rotator cuff exercises should be included with shoulder workouts.

Shoulder external rotator cuff can be strengthened using a low cable/pulley or a dumbbell. In both exercises the goal is hold your elbow in tight to your body with your arm flexed at 90˚; begin with your arm against your body and externally rotate until your arm is at least through 90˚ of movement. If using a low pulley, stand or sit so the cable comes across your body. If using a dumbbell, lay flat on your side on a bench and externally rotate with a light dumbbell. 2-3 sets of 8-10 reps with your shoulder workout is good to develop strength. Once you have developed shoulder external rotation strength, repeat the exercises once per week to maintain it.

Another important aspect of should stability, is also the ability to 'turn on' your upper shoulder muscle quickly during sudden impacts such as during collisions and tackles. Certain injuries may be caused, not by weak shoulder muscles, but by an inability to react to an external force fast enough to protect the shoulder from injury. From this standpoint, upper body agility exercises (see agility section) and upper body plyometric

exercises (using medicine balls and fast pushups) are essential to protect the shoulders from injury in a high-collision sport such as football.

Knee Stability

Two major contributors to knee injury are a lack of strength in the small muscle group on the inside and top of the knee (the vastus medialis – part of the quadriceps group), and a lack of balance. Many injuries are caused because something happens during a game to bring the knee out of alignment (tackle, hard break) and because balance is underdeveloped or sensory input telling your brain your knee is 'going out' is underdeveloped – your knee 'goes'. So not only do knee strengthening exercise help, but incorporating single leg training where you need to balance your body weight (single leg lunges, step ups, single leg squats). When doing single leg training, it is important to keep the knee in line with the ankle over the foot. For step-ups and lunges, keep the knee in line and stabilize your hips so that no internal or external rotation occurs a the knee that may expose the knee to possible injury.

Single leg training has been incorporated into the training program in this manual but if you are at risk, you can supplement your training with single leg balance training. If you don't do it before an injury, you definitely will be doing it after your injury. Single leg balance training can be done using a wobble board, BOSU trainer or even a cushy athletic mat. Basically, anything that gives an unstable surface under the foot while doing balance work will help to improve knee balance and therefore stability.

Chapter 4

The Program— Step by Step

The Program — Step by Step

4.1 Week by Week Plan

4.2 Day by Day Plan

4.3 In Season Training

Prepared by Melody Torcolacci, Jonathon Fowles and Roger Bernardes

4.1 Week By Week Plan

Phase 1: General Adaptation #1; Weeks 1 - 5

Phase 2: GENERAL Adaptation #2; Weeks 6 - 8

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

Phase 3: Hypertrophy #1; Weeks 9 - 11

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

Phase 4: Hypertrophy #2; Weeks 12 - 13

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

Phase 5: Bulk Strength #1; Weeks 14 - 16

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB) Wts #1	Warm-up #3 Velocity Drills 5 Pt Dots Drill Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #2	Rest	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Running Workout

Phase 6: Power – Max Strength & Speed #1; Weeks 17 - 18

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB)Wts #1	Warm-up #2 Velocity Drills Speed Agility Running Workout	Warm-up #1 Velocity Drills FB Wts #2	Warm-up #3 Velocity Drills Dot Drills Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Agility Running Workout

Phase 7: Power – Max Strength & Speed #2; Weeks 19 - 20

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB)Wts #1	Warm-up #2 Velocity Drills Speed Agility Running Workout	Warm-up #1 Velocity Drills FB Wts #2	Warm-up #3 Velocity Drills Dot Drills Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Agility Running Workout

Phase 8: Maintenance & Camp Preparation; Weeks 21 - 22

schedule as possible

Phase 9: Hypertrophy #2; Weeks 23 - 25

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Lower Body (LB)	Warm-up #1 Velocity Drills Upper Body (UB)	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills LB Wts #2	Warm-up #1 Velocity Drills UB Wts #2	Warm-up #3 Velocity Drills Speed Agility Football Pattern Intervals	Rest

Phase 10: Bulk Strength #2; Weeks 26 - 28

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Lower Body (LB) Wts #1	Warm-up #1 Velocity Drills Upper Body (UB) Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Velocity Drills Speed Agility Football Pattern Intervals	Rest

Phase 11: Max Strength & Speed #2; Weeks 29 - 31

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Football Specific Intervals	Warm-up #1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Agility Football Specific Intervals

Phase 12: Max Strength & Speed #3; Weeks 32 - 34

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Football Specific Intervals	Warm-up #1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Agility Football Specific Intervals

Phase 13: Sport Specific Power Camp Prep; Weeks 35 - 36

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility Football Specific Intervals	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Agility Football Specific Intervals	Warm-up #1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Agility Football Specific Intervals

Summer Camp; Weeks 37 - 39

Repeat phase 13 or begin phase 14.

Phase 14: In-Season Training; Weeks 40 - 52

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Wts #1 (Heavy)	*Line drills	Warm-up #1 Wts #2 (Power) *Medium Distance Intervals	*Short Sprints	*OFF	Varsity Game Day Non-Varsity Wts #3 (Heavy) Speed, Agility & Intervals	Rest

***Suggested running workout with your team**

See section 4.3 for suggested workout.

Warm-Ups For All Workouts

It is important to perform a proper warm-up before every workout to improve the effectiveness of your training.

Below are 3 variations of a basic warm-up to get you ready for training.

Warm-up #1 for Weight Training Workouts

This warm-up should precede a weight training workout. It is designed to elevate body temperature, reduce the risk of injury, heighten activation of your nervous system and improve contractile speed. It will take approximately 5 minutes.

Set/Rep	Description	Purpose
~ 5 min	Light Jog	Raise body temperature
2x 10m	FORWARD & BACKS – light jog up to 10m, stop, shuffle side step 1m and backpedal back	Raise body temperature, warm up quads, hams
2x 10m	MARCHING A's – Leg recovery action form (lift toe, cock ankle up, bring knee high up to 90 deg & drive down). Each leg performs the A, keep chest up and arms pump at 90 deg. Return.	Train proper leg action and leg recovery
2x 10m	FRONT LUNGE WALK – Bring one leg up with proper leg action (toe up, heel up, knee up to 90) then step forward into a deep lunge. Keep your knee over your foot. Pop up with proper leg action with the other leg and step forward into a deep lunge. Return.	Train proper leg action. Warm-up hamstrings, glutes, groin, and quads, increase ROM hip
2x 10m	SIDE LUNGE WALK – Get down into your football position facing sideways to the running line. Take a side stride out as wide as you can, keeping your butt and body position down. Slowly side shuffle staying as low as possible. Return face same.	Increase ROM in the hip, and ankle. Warm up the adductors.
2 x 15m	SIDE SHUFFLE – Down in the football position and side shuffle with some speed. Repeat back facing same way.	Warm-up adductors, abductors and groin
2 x 15m	HIGH KNEE HOPPING A's – Leg action (toe up, ankle up, high knee to 90 and drive down) except with a hop and faster pace, driving down with alternating legs. Keep chest up and arms at 90. Think fast recovery and fast drive down.	Warm-up quads, hip-flexors and ankle muscles; trains proper leg recovery action
2 x 15m	HIGH KNEE HOPPING B's – Leg action high knee A except at the top of the high knee, extend the toe out, and sweep the leg back in a quick acceleration/ pull.	Warm-up and increase ROM on hamstrings; trains fast leg recovery
5 min	STRETCHING – hamstrings, quads, glutes, hip flexor (shoulder), calves; hold each stretch for 5-10 seconds repeat each side 1-2x.	Reduce muscle stiffness
	WHEN IN THE WEIGHT ROOM:	
2 x 8	STABILITY T- PUSHUPS – from a push up position, press up and stretch 1 arm to the ceiling into a T position, lower down, then extend the other arm up	
2 x 10	THE BEAR – with a normal olympic bar, perform a barbell row, deadlift, clean, front squat, and push press; one exercise directly following the other in a mini-circuit to warm-up all important areas	Works core muscles, dynamic warm-up of prime movers

Warm-up #2 for Running Workouts

This warm-up should precede a running workout, either Speed, Agility or Plyometrics. It is designed to reduce the risk of injury, increase contractile speed, and train running technique. Use strict running form. Improper practice technique leads to poor running mechanics.

It will take approximately 15 minutes.

Set/Rep	Description	Purpose
~5 min	Light Jog	Raise body temperature
2x 10m	FORWARD & BACKS - light jog up to 10m, stop, shuffle side step 1m and backpedal back	Raise body temperature, warm up quads, hams
2 x 10m	MARCHING A's - Leg recovery action form (lift toe, cock ankle up, bring knee high up to 90 deg & drive down). Each leg performs the A, keep chest up and arms pump at 90 deg. Return.	Train proper leg action and leg recovery
2 x 10m	FRONT LUNGE WALK - Bring one leg up with proper leg action (toe up, heel up, knee up to 90) then step forward into a deep lunge. Keep your knee over your foot. Pop up with proper leg action with the other leg and step forward into a deep lunge. Return.	Train proper leg action. Warm-up hamstrings, glutes, groin, and quads, increase ROM hip
2 x 10m	FRONT LUNGE TOE-TOUCH - Walking slowly bending to touch the outside of each foot each step.	Warm-up hamstrings and calves, ROM for hamstrings, improve balance
2 x 10m	SIDE LUNGE WALK - Get down into your football position facing sideways to the running line. Take a side stride out as wide as you can, keeping your butt and body position down. Slowly side shuffle staying as low as possible. Return face same.	Increase ROM in the hip, and ankle. Warm up the adductors.
2 x 15m	SIDE SHUFFLE - Down in the football position and side shuffle with some speed. Repeat back facing same way.	Warm-up adductors, abductors and groin
2 x 15m	CARIOCA - Sideways to the running line, right leg goes high knee up and down in front of your left, push out and then right leg behind your body and recover. Keep chest and shoulders high. Repeat back facing the same way using left as carioca leg.	Warm-up hip-flexors, adductors, glutes, and abdominals
2 x 15m	CARIOCA FAST LEG ACTION - Same as above, except when carioca leg comes up to high knee, drive the leg down as hard as possible. Repeat back facing the same way using other leg as the carioca leg.	Warm-up hips and train fast leg drive & recovery
2 x 15m	STRAIGHT LEG PULLS - With legs straight, toe off and extend the straight leg out with big strides. Pull back with the leg with each stride and extend again. Keep arms at 90 and chest high.	Warm-up calves & hip flexors
2 x 15m	HIGH KNEE HOPPING A's - Leg action (toe up, ankle up, high knee to 90 and drive down) except with a hop and faster pace, driving down with alternating legs. Keep chest up and arms at 90. Think fast recovery and fast drive down.	Warm-up quads, hip-flexors and ankle muscles; trains proper leg recovery action
2 x 15m	HIGH KNEE HOPPING B's - Leg action high knee A except at the top of the high knee, extend the toe out, and sweep the leg back in a quick acceleration/ pull.	Warm-up and increase ROM on hamstrings; trains fast leg recovery

Warm-up #2 for Running Workouts (continued)

Set/Rep	Description	Purpose
2 x 15m	BUTT KICKS - body and chest high, arms at 90, quickly flick legs up to hit your butt, driving high knees up in a pumping action. Stay up on your toes.	Warm-up hamstrings and calves
5 min	STRETCHING - hamstrings, quads, glutes, hip flexor (shoulder), calves; hold each stretch for 5-10 seconds repeat each side 1-2x.	Reduce muscle stiffness
2x 20m	FORWARD & BACKS - light jog up to 10m, stop, shuffle side step 1m and backpedal back	Get you moving again.
2 x 8	HIGH KNEE A SKIPS - Skip into a high A vertical jump off of one leg. Excites the nervous system and gets you ready for activity	Explosive activation
2 x 8	Double A & B SKIPS - Skip into a high A vertical jump off of one leg. Excites the nervous system and gets you ready for activity	Explosive activation
2 x 20m	FORM BUILDUPS - start with 4 marching A's, then break into 4 jogging A's, then into 8 butt kicks, then drive into a stride and accelerate up to 3/4 speed and decelerate smoothly. Jog back to start and repeat. Perform straight leg swings as dynamic stretch	Puts it all together to get you ready to fly.
2 x 40m	ACCELERATIONS - from a rolling start, slowly buildup to 75, 80% of top speed. Stay relaxed and think of quickness. Perform straight leg swings as a dynamic stretch for the hamstrings in-between each rep. REMEMBER: Stretch just to stay limber or loosen up any tight areas. Don't stretch intensely before your running workouts; FLEXIBILITY training is best done after your workouts when stretching is essential to avoid increasing muscle stiffness.	Speed development

Warm-up #3 for Running Workouts

This warm-up is another variation for a running workout, either Speed, Agility or Plyometrics. It is designed to reduce the risk of injury, increase contractile speed, and train running technique. Use strict running form. Improper practice technique leads to poor running mechanics.

It will take approximately 15 minutes.

Set/Rep	Description	Purpose
~5 min	Light Jog	Raise body temperature
2x 10m	FORWARD & BACKS - light jog up to 10m, stop, shuffle side step 1m and backpedal back	Raise body temperature, warm up quads, hams
2 x 10m	MARCHING A's - Leg recovery action form (lift toe, cock ankle up, bring knee high up to 90 deg & drive down). Each leg performs the A, keep chest up and arms pump at 90 deg. Return.	Train proper leg action and leg recovery
2 x 10m	FRONT LUNGE WALK - Bring one leg up with proper leg action (toe up, heel up, knee up to 90) then step forward into a deep lunge. Keep your knee over your foot. Pop up with proper leg action with the other leg and step forward into a deep lunge. Return.	Train proper leg action. Warm-up hamstrings, glutes, groin, and quads, increase ROM hip
2 x 10m	FRONT LUNGE TOE-TOUCH - Walking slowly bending to touch the outside of each foot each step.	Warm-up hamstrings and calves, ROM for hamstrings, improve balance
2 x 10m	SIDE LUNGE WALK - Get down into your football position facing sideways to the running line. Take a side stride out as wide as you can, keeping your butt and body position down. Slowly side shuffle staying as low as possible. Return face same.	Increase ROM in the hip, and ankle. Warm up the adductors.
2 x 15m	SIDE SHUFFLE - Down in the football position and side shuffle with some speed. Repeat back facing same way.	Warm-up adductors, abductors and groin
2 x 15m	CARIOCA - Sideways to the running line, right leg goes high knee up and down in front of your left, push out and then right leg behind your body and recover. Keep chest and shoulders high. Repeat back facing the same way using left as carioca leg.	Warm-up hip-flexors, adductors, glutes, and abdominals
2 x 15m	CARIOCA FAST LEG ACTION - Same as above, except when carioca leg comes up to high knee, drive the leg down as hard as possible. Repeat back facing the same way using other leg as the carioca leg.	Warm-up hips and train fast leg drive & recovery
2 x 15m	STRAIGHT LEG PULLS - With legs straight, toe off and extend the straight leg out with big strides. Pull back with the leg with each stride and extend again. Keep arms at 90 and chest high.	Warm-up calves & hip flexors
2 x 15m	HIGH KNEE HOPPING A's - Leg action (toe up, ankle up, high knee to 90 and drive down) except with a hop and faster pace, driving down with alternating legs. Keep chest up and arms at 90. Think fast recovery and fast drive down.	Warm-up quads, hip-flexors and ankle muscles; trains proper leg recovery action
2 x 15m	HIGH KNEE HOPPING B's - Leg action high knee A except at the top of the high knee, extend the toe out, and sweep the leg back in a quick acceleration/ pull.	Warm-up and increase ROM on hamstrings; trains fast leg recovery

Warm-up #3 for Running Workouts (continued)

Set/Rep	Description	Purpose
2 x 15m	BUTT KICKS - body and chest high, arms at 90, quickly flick legs up to hit your butt, driving high knees up in a pumping action. Stay up on your toes.	Warm-up hamstrings and calves
5 min	STRETCHING - hamstrings, quads, glutes, hip flexor (shoulder), calves; hold each stretch for 5-10 seconds repeat each side 1-2x.	Reduce muscle stiffness
2x 20m	FORWARD & BACKS - light jog up to 10m, stop, shuffle side step 1m and backpedal back	Get you moving again.
2 x 20m	ANKLING DRILLS - begin with single leg ankling, then double hop	
2 x 20m	FORM BUILDUPS - start with 4 marching A's, then break into 4 jogging A's, then into 8 butt kicks, then drive into a stride and accelerate up to 3/4 speed and decelerate smoothly. Jog back to start and repeat. Perform straight leg swings as dynamic stretch between reps	Puts it all together to get you ready to fly.
2 x 40m	ACCELERATIONS - from a rolling start, slowly buildup to 75, 80% of top speed. Stay relaxed and think of quickness. Perform straight leg swings as a dynamic stretch for the hamstrings in-between each rep. REMEMBER: Stretch just to stay limber or loosen up any tight areas. Don't stretch intensely before your running workouts; FLEXIBILITY training is best done after your workouts when stretching is essential to avoid increasing muscle stiffness.	Speed development

4.2 Day By Day Plan

Phase 1: General Adaptation #1; Weeks 1 - 5

> "People with goals succeed because they know where they're going."

This is immediate post season. The goals here are:

1. To recuperate from the competitive season,
2. To catch up academically as exams are occurring very soon,
3. To set goals to be achieved in the new year,
4. Training is limited. It is mostly "play-time" with a body building focus.

Fitness is maintained through fun activities such as squash, pick-up basketball, etc. No serious training should take place during this time, this is meant to be a relaxed preparatory phase for the real training which begins in the new year.

Phase 2: General Adaptation #2; Weeks 6 - 8

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

15 reps ~ 60% of 1 RM

Rhythm of the primary exercises should be 2-0-1; 2 seconds down, no pause, 1 second up

1-2 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "Success doesn't discriminate. It's an equal opportunity employer, available to everyone willing to pay the price."

Monday

Warm-up #1 + Lower Body Weights #1

Primary Exercises	Circuit Exercises
1. Hang pulls: 4x6 @ 60% 2. Squats: 3x[15 + 30 sec skipping] 3. Single leg, leg press: 2x[15 + 30 sec skipping] (incline or straight or vertical) 4. Drop Cleans (with bar) 2 x 10	1. Standing calf raises: 3x15 2. Hamstring curls (hams): 3x15 3. Back extensions or birdog: 3x15 4. Bench leg tucks (abs): 3x15 5. Side supports (elbows L2): 2 x 30sec 6. Curl ups (abs): 3x10

Cool Down: stretch

"No Deposit, No Return!"

All champions have made great sacrifices to win their victories. Talking about goals and dreams, is one thing, but … **What are you willing to do about it?!**

Tuesday

Warm-up #1 + Upper Body Weights #1

Primary Exercises	Circuit Exercises
1. Bench press: 3x[15 + 10 seconds push-ups] do as many push ups in 10 seconds as you can, record number completed 2. Overhead Press: 3x15	1. T-bar rows or bent-over-rows: 3x15 2. Lateral deltoid raises: 3x15 3. Lat pulldowns (lats) [NF - narrow front] 3x15 4. Chinnies (bicycle abs): 50 5. External rotation work: 3x15 6. Biceps & triceps (your choice): 3x15

Cool Down: stretch

Wednesday

Rest

"Average, is your enemy."

Thursday

Warm-up #1 + Lower Body Weights #2

Primary Exercises	Circuit Exercises
1. Hang pulls: 4 x 6 @ 60%	1. Seated Calf Raises: 3x15
2. Split Squats: 3x[15 + 30 sec skipping]	2. Hamstring Curls : 3x15
3. Back Extensions: 3x[10 + 5 Body wt (BW) squat jumps]	3. Bench leg tucks (abs): 3x15
4. Drop Cleans (with a bar) 2 x 10	4. Side supports (elbows L2): 2x failure
	5. Curl ups (abs): 3x10

Squat Jumps — explode as high as possible, land, absorb, control the landing and hold 2s, explode up, pulling toes ups each time.

Cool Down: stretch

Friday

Warm-up #1 + Upper Body Weights #2

Primary Exercises	Circuit Exercises
1. Incline bench press: 3x15	1. Dumbbell bench press: 3x15
2. Dumbbell shoulder press: 3x15	2. Single arm DB rows: 3x15
	3. Barbell Shrugs: 3x15
	4. Lat Pulldowns [WF-wide front]: 3x15
	5. Chinnies (bicycle abs): 50
	6. External rotation work: 3x15
	7. Biceps & triceps (your choice): 3x15

Cool Down: stretch

Saturday

Warm-up #3 Fast foot drills 2 x 20m each leg

Speed [95 + %; 80m]
2x[20m + 20m] use 3 point stance; + = 1 min rest btw reps; 3 min rest btw sets

Agility + Fitness
20 minutes of movement activity such as squash or basketball

Cool Down: stretch

Sunday

Rest

Week 8 - Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

> "You pay a price for getting stronger. You pay a price for getting fitter. You pay a price for getting faster. You pay a price for staying just the same."

Phase 3: Hypertrophy #1; Weeks 9 - 11

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

10 reps ~ 70% of 1 RM; be sure to add ~ 5% to your lifting weights

rhythm of the primary exercises should be 3-0-1; 3 seconds down, no pause, 1 second up 1.5-2.5 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "We are what we repeatedly do. Excellence, then, is not an act but a habit."

Monday

Warm-up #1 + Lower Body Weights #1

Primary Exercises	Circuit Exercises
1. Hang cleans: 4 x 4 @ 65% 2. Squats: 3x[10 + 10 BW squat jumps] 3. Single leg, leg press: 3x[10 + 10 BW squat jumps]	1. Standing calf raises: 3x10 2. Hamstring curls: 3x10 3. Bench leg tucks (abs): 3x15 4. Side, front, side, rear supports from straight arms: 15 sec each no rest 5. Curl ups (abs): 3x15

Cool Down: stretch

Tuesday

Warm-up #1 + Upper Body Weights #1

Primary Exercises	Circuit Exercises
1. Incline bench press: 3x10 2. Dumbbell shoulder press: 3x10	1. Dumbbell bench press: 3x10 2. Single Arm DB Rows: 3x10 3. Barbell Shrugs: 3x10 4. Lats [WF]: 3x10 5. Chinnies: 40 6. External rotation work: 3x10 7. Biceps & triceps (your choice): 3x10

Cool Down: stretch

Wednesday

Rest

Thursday

Warm-up #1 + Lower Body Weights #2

Cool Down: stretch

Friday

Warm-up #1 + Upper Body Weights #2

Primary Exercises	Circuit Exercises
1. Incline bench press: 3x10 2. Dumbbell shoulder press: 3x10	1. Dumbbell bench press: 3x10 2. Single Arm DB Rows: 3x10 3. Barbell Shrugs: 3x10 4. Lats [WF]: 3x10 5. Chinnies: 40 6. External rotation work: 3x10 7. Biceps & triceps (your choice): 3x10

Cool Down: stretch

"Winners in life are motivated to give a little more than is required and they do it without hesitation."

Saturday

Warm-up #3

Speed [95 + %; 120m]
2x[40m + 20m] use 3 point stance; + = 1 min rest btw reps; 3 min rest btw sets

Agility + Fitness
30 minutes of movement activity such as squash or basketball

Cool Down: stretch

Sunday

Rest

Week 11 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 SETS for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

> "Every job is a self-portrait of the person who did it. Autograph your work with excellence."

Phase 4 Hypertrophy #2; Weeks 12 & 13

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Lower Body (LB) Wts #1	Warm-up #1 Upper Body (UB) Wts #1	Rest	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Speed + Agility + Fitness	Rest

8 reps ~ 75% of 1 RM; be sure to add ~ 5% to your lifting weights

Rhythm of the primary exercises should be 3-0-2; 3 seconds down, no pause, 2 seconds up 2 - 3 minutes rest btw sets of primary exercises; no rest btw circuit exercises

Monday

Warm-up #1 + Lower Body Weights #1

Primary Exercises	Circuit Exercises
1. Power cleans: 4 x 4 @ 70%	1. Standing calf raises: 3x8
2. Squats: 4x[8 + 8 Drop jumps with 4sec hold at parallel]	2. Hamstring curls: 3x8
3. Single leg, leg press: each leg 2 x[8 + 8 Drop jumps with 4 sec hold at parallel before exploding up]	3. Bench leg tucks (abs): 3x20
	4. Single arm front, side, front, side support, single leg rear supports: 1 x 15s each position, no rest btw holds
	5. Curl ups (abs): 3x20

Cool Down: stretch

Tuesday

Warm-up #1 + Upper Body Weights #1

Primary Exercises	Circuit Exercises
1. Bench press: 4x8	1. T-bar rows or bent-over-rows: 3x8
2. Overhead Press: 4x8	2. Lateral deltoid raises: 3x8
	3. Back extensions or birddogs: 3x15
	4. Lats [NF]: 3x8
	5. Chinnies: 50
	6. External rotation work: 3x8
	7. Biceps & triceps (your choice): 3x8

Cool Down: stretch

Wednesday

Rest

Thursday

Warm-up #1 + Lower Body Weights #2

Primary Exercises	Circuit Exercises
1. Power cleans: 4 x 4 @ 70%	1. Seated Calf Raises: 3x8
2. Split Squats: 4x[8 + 8 Drop jumps with 4 sec hold	2. Hams: 3x8
3. Deadlifts: 4x[4@80% + 4 BW squat jumps]	3. Bench leg tucks (abs): 3x15
	4. Single arm front, side, front, side support single leg rear supports: 1 x 15s each

Cool Down: stretch

Friday

Warm-up #1 + Upper Body Weights #2

Primary Exercises	Circuit Exercises
1. Incline bench press: 3x8 2. Dumbbell shoulder press: 3x8	1. Single arm DB row: 3x8 2. Lats [WF]: 3x8 3. Chinnies: 100 4. Curl Ups (abs): 3 x 20 5. External rotation work: 3x8 6. Biceps & narrow grip bench: 3x8

Cool Down: stretch

Saturday

Warm-up #3

Speed [95 + %; 160m]:
2x[40m + 40m] 3 point stance; + = 1 min rest btw reps; 3 min rest btw sets

Agility + Fitness
40 minutes of movement activity such as squash or basketball

Cool Down: stretch

Sunday

Rest

> "The biggest gap in the world is between 'I should' and 'I did'. All champions share this one rule: to finish the task."

Week 13 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

Phase 5: Bulk Strength #1; Weeks 14 -16

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB) Wts #1	Warm-up #3 Velocity Drills 5 Pt Dots Drill Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #2	Rest	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Running Workout

6 reps ~ 85% of 1 RM; be sure to add ~ 15% to your lifting weights

rhythm of the primary exercises should be 2-0-1

3 - 5 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "Victory comes at a price. The question you must ask yourself is: What are you willing to pay?"

Monday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill Right Side only every 3 steps
2x20m Fast Foot Drill Left Side only every 3 steps

Weights #1

Primary Exercises	Circuit Exercises
1. Hang cleans: 4 x 3 @ 75% 2. Squats: 4x[6 + 6 Drop, hold & jump] 3. Bench press: 4x6	1. Seated rows or bent-over-rows: 4x6 2. Hams (single leg at a time): 4x6 3. Lateral deltoid raises: 4x6 4. Single arm, single leg support, front, side, front, side, rear x 20 sec each x 4 5. Curl-ups 1 hand behind head 4 x 15

Cool Down: stretch

Tuesday

Warm-up #3

Velocity Drills:
2x30m Fast Leg Drill Right Side only every 3 steps
2x30m Fast Leg Drill Left Side only every 3 steps

5 Point Dots Drill

1. Outline 5 points in a pattern as would appear on a dice, each dot 1 foot from the next.
2. Begin with your feet on rear two dots, jump forward to bring feet together to the single dot, then split to the double and repeat back always facing forward (do 5 times, rest 15 sec)
3. Now complete the dots with a 180 degree turn at each end (do 5 times, rest 15 sec)
4. Now complete the dots with each single leg, centre front, front, centre, back, back facing forward the whole time.
5. Move your feet as fast as you can to develop foot speed

Bench Hops:
Both feet together back and forth over the bench as fast as possible 4x 15 seconds; 15 seconds rest btw sets

Skipping Workout
10 min; focus is on quick feet and fitness
Any order of skipping sequences, vary for best measure
Begin with regular two-leg jumps and alternate to singles, crossovers, side-to-sides
Good progression after warm-up is single leg hops increase reps/foot by one each
Try double jumps and increase number of doubles by 1 per workout
Best to have fun with it.

Cool Down: stretch

Wednesday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill Right Side only every 3 steps
2x20m Fast Foot Drill Left Side only every 3 steps

Weights #2:
Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Clean Pulls: 4 x 3 @ 95%	1. Lats [WF]: 4x6 or chin-ups (30 reps)
2. Lateral Squats: 4x[12 + 12 side to side hops]	2. Hams (single leg at a time): 4x6
3. Overhead Press: 4x6	3. Dumbbell bench press: 4x6
	4. Reverse flies (rear deltoid raise): 4x6
	5. External rotations: 2x10
	6 Chinnies: 2 x 50

Cool Down: stretch

Thursday

Rest

Friday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill Right Side only every 3 steps
2x20m Fast Foot Drill Left Side only every 3 steps

Weights #3

Primary Exercises	Circuit Exercises
1. Power Cleans: 4 x 3 @ 85%	1. T-bar rows: 4x6
2. Incline bench press: 4x6	2. Hams (single leg): 4x6
3. Split squats: 4x[6 + 6 Drop, hold, jumps]	3. Lateral deltoid raises: 4x6
	4. Single arm, single leg support, front, side, front, side, rear x 20 sec each x 4
	5. Curl-ups 1 hand behind head 4 x 15

Cool Down: stretch

Saturday

Rest

Sunday

Warm-up #2

Velocity Drills
2x30m Fast Leg Drill Right Side only every 3 steps
2x30m Fast Leg Drill Left Side only every 3 steps

Speed [95 + %; 120m]
3x[20m + 20m] use 3 point stance; + = 1 min rest btw reps; 3 min rest btw sets

Workout
Linemen: 8 x 100m (60-65%) walk back recovery
Linebackers: 10 x 100m (65-70%) walk back recovery
All Others: 12 x 100m (70-75%) walk back recovery

Cool Down: stretch

"Nothing is more expensive than a missed opportunity."

Week 16 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

> "Excellence is never an accident; It is always the result of high intention, determined effort, and the skilled execution."

Phase 6: Power - Max Strength & Speed #1; Weeks 17 & 18

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB)Wts #1	Warm-up #2 Velocity Drills Speed Agility Running Workout	Warm-up #1 Velocity Drills FB Wts #2	Warm-up #3 Velocity Drills Dot Drills Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Agility Running Workout

4 reps ~ 90% of 1 RM; be sure to add ~ 10% to your lifting weights

Rhythm of the primary exercises should be 2-0-1

4-5 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "Great opportunities come to all, but many do not know they have met them. The only preparation to take advantage of them is doing what you can each day to the best of your ability."

Monday

Warm-up #1 + Velocity Drills
2x20m Fast Foot Drill Right Side only every 3 steps
2x20m Fast Foot Drill Left Side only every 3 steps
2x20m Fast Foot Drill alternating sides every 3 steps

Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 2x[4@80% + 2@90%]	1. Seated rows or bent-over-rows: 3x10
2. Squats: [4 @ 80% + 4 @ 85% + 4 @ 90% + 4 @ 95% + 4x(Drop jumps with immediate vertical jump)	2. Hams (two legs up, one leg down): 3x10
3. Drive ups (hold DB, drive up on a bench): 4x6	3. Single arm, single leg support, front, side, front, side, rear x 20 sec each x 3
4. Bench press: 4@80% + 4@85% + 3@90% + 3@95%	4. V-sits 3 x 10

Cool Down: stretch

Tuesday

Warm-up #2

Velocity Drills:
2x30m Fast Leg Drill Right Side only every 3 steps
2x30m Fast Leg Drill Left Side only every 3 steps
2x30m Fast Leg Drill alternating sides every 3 steps

Linemen

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x Mirror Drill

SPEED [95 + %; 100]
2x[30m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [70-75%]:
2x [4x40m] 1 min btw reps; 6 min btw sets

Linebackers

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x modified T Drill [same as normal T Drill, but back pedal back to start] 2x W drill

SPEED [95 + %; 120]
2x[40m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [75-80%]:
2x [4x60m] 1 min btw reps; 6 min btw sets

Defensive Backs

AGILITY:
30 seconds btw reps; 3 minutes btw drills
1) 2x modified T Drill [same as normal T Drill, but back pedal back to start
2) 2x W Drill

SPEED [95 + %; 120]
2x[30m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
2x [4x80m] 1 min btw reps; 6 min btw sets

All Other Positions

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x T Drill

SPEED [95 + %; 140]
2x[50m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
2x [4x80m] 1 min btw reps; 6 min btw sets
Cool Down: stretch

> "The difference between ordinary and extraordinary is the little extra."

Wednesday

Warm-up #1 + Velocity Drills:

2x20m Fast Foot Drill Right Side only every 3 steps

2x20m Fast Foot Drill Left Side only every 3 steps

2x20m Fast Foot Drill alternating every 3 steps

Weights #2:

Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Push Press: 4 x 6 @ 70% 2. Clean Pulls: 4 x 4 @ 90%	1. Lats [WF]: 3x10 2. Lateral Deltoid Raises: 3x10 3. Dumbbell incline press: 3x10 4. Reverse flies (rear delt raise): 3x10 5. Birdogs (opp arm/leg ext); 3 x 15 6. Chinnies: 3 x 50

Cool Down: stretch

Thursday

Warm-up #3

Velocity Drills
2x30m Fast Leg Drill Right Side only every 3 steps
2x30m Fast Leg Drill Left Side only every 3 steps
2x30m Fast Leg Drill alternating sides every 3 steps

5 Point Dots Drill:
Do 6 reps of each drill; 15 seconds rest btw drills

Bench Hops:
4x30 seconds; 15 seconds rest btw sets

Skipping Workout:
20 min

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills
2x20m Fast Foot Drill Right Side only every 3 steps
2x20m Fast Foot Drill Left Side only every 3 steps
2x20m Fast Foot Drill alternating sides every 3 steps

Weights #3

Primary Exercises	Circuit Exercises
1. Hang Cleans: 3 @ 70% + 3 @ 80% + 3 @ 75% + 3@ 85% 2. Split Squats: [3 @ 80% + 3@ 85% + 3 @ 90% + 3 @ 95% + 4x 4 Drop jumps] 3. Single leg, leg press: 2x10 seconds @ 50% do as many reps as possible in 10 seconds 4. Narrow grip bench: 4x6	1. Seated rows: 4x10 2. Hams (two legs up, one leg down): 4x10 3. Hammer grip front deltoid raises: 4x10 4. Single arm, single leg support, front, side, front, side, rear x 20 sec each x 3 5. V-sits 3 x 10 6. Seated Medball Twist (holding a medball in front, touch to each side, while keeping legs bent in front of you) : 4x10

Cool Down: stretch

Saturday

Rest

"Talent can't take the place of persistence. Nothing is more common than unsuccessful people with talent."

Sunday

Warm-up #2

Velocity Drills
2x30m Fast Leg Drill Right Side only every 3 steps
2x30m Fast Leg Drill Left Side only every 3 steps
2x30m Fast Leg Drill alternating sides every 3 steps

Linemen

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x Mirror Drill

SPEED [95 + %; 140]
2x[40m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [70-75%]:
4x [3x40m] 1 min btw reps; 6 min btw sets

Linebackers

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x mod. T Drill [same as normal T Drill, but back pedal to start]
2x W drill

SPEED [95 + %; 160]
2x[50m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [75-80%]:
4x [4x60m] 1 min btw reps; 6 min btw sets

Defensive Backs

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x mod. T Drill [same as normal T Drill, but back pedal back to start]
2x W Drill

SPEED [95 + %; 180]
3x[40m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
4x [4x80m] 1 min btw reps; 6 min btw sets

All Other Positions

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x T Drill

SPEED [95 + %; 200]
4x[30m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
4x [3x80m] 1 min btw reps; 6 min btw sets

Cool Down: stretch

WEEK 18 – RECOVERY

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

"Excellence is the result of caring more than others think is wise; risking more than others think is safe; dreaming more than others think is practical and expecting more than others think is possible."

Phase 7: Power - Max Strength & Speed #2; Weeks 19 & 20

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Full Body (FB)Wts #1	Warm-up #2 Velocity Drills Speed Agility Running Workout	Warm-up #1 Velocity Drills FB Wts #2	Warm-up #3 Velocity Drills Dot Drills Bench Hops Skipping Workout	Warm-up #1 Velocity Drills FB Wts #3	Rest	Warm-up #2 Velocity Drills Speed Agility Running Workout

Rhythm of the primary exercises should be 2-0-1

4-5 minutes rest btw sets of primary exercises; no rest btw circuit exercises

"We can ask for more opportunities or we can decide to make the most of those we already have. The latter course always produces results."

Monday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 2x3@85% + 2x2@95% 2. Squats: [2x3@85% + 2x2@95% + 4x(Drop + VJ + lateral bound R/L] 3. Drive ups: 4x8 4. Bench press: 2x3 @ 85% + 2x2 @ 95%	1. Seated rows or bent-over-rows: 3x8 2. Hams (two legs up, one down): 3x8 3. Front, side, front, side, support both elbows on a stability ball (SB) 3 x 15 s each + rear support both feet on SB 4. Curl-ups on SB 3 x 10 5. Medball rotations on SB 3 x 10

Cool Down: stretch

Tuesday

Warm-up #2

Velocity Drills
4x30m Fast Leg Drill alternating sides every 3 steps

Linemen

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x Mirror Drill

SPEED [95 + %; 120]
2x[35m + 25m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
2x [4x40m] 1 min btw reps; 6 min btw sets

Linebackers

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x modified T Drill 2x W drill

SPEED [95 + %; 140]
2x[40m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [85-90%]:
2x [4x60m] 1 min btw reps; 6 min btw sets

Defensive Backs

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x modified T Drill 2x W Drill

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [4x60m] 1 min btw reps; 6 min btw sets

All Other Positions

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x T Drill

SPEED [95 + %; 140]
2x[50m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [4x60m] 1 min btw reps; 6 min btw sets

Cool Down: stretch

Wednesday

Warm-up #1 + Velocity Drills
4x20m Fast Foot Drill alternating every 3 steps

Weights #2:
Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Push Press: 4x4 @ 80%	1. Lats [WF]: 3x8
2. Clean Pulls: 4x2 @ 105%	2. Lateral Deltoid Raises: 3x8
3. Lateral Squats: 4x[6 + 6 side to side hops]	3. Dumbbell incline press: 3x8
	4. Reverse flies (rear delt raises): 3x8
	5. Birdogs on a SB: 3 x 10
	6. Chinnies: 3 x 60

Cool Down: stretch

Thursday

Warm-up #3

Velocity Drills:
4x30m Fast Leg Drill alternating sides every 3 steps

5 Point Dots Drill:
Do 6 reps of each drill; 15 seconds rest btw drills

Bench Hops:
4x30 seconds; 15 seconds rest btw sets

Skipping Workout:
20 min

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Weights #3

Primary Exercises	Circuit Exercises
1. Hang Cleans: 2x3 @ 80% + 2x2 @ 90% 2. Split Squats: [2x3 @ 85% + 2x3 @ 95% + 4x (Drop jumps + lateral bounds] 3. Single leg, leg press: 2x10 seconds @ 50% 4. Narrow grip bench: 4x8	1. Seated rows: 3x8 2. Hams (two up, one leg down): 3x8 3. Underhand grip front delt raises: 3x8 Front static hold (abs): 2 sets to failure 4. Front, side, front, side, support both elbows on a stability ball (SB) 3 x 15 s each + rear support both feet on SB 5. Curl-ups on SB 3 x 10

Cool Down: stretch

Saturday

Rest

> "Where you end up isn't the most important thing. It's the road you take to get you there. The road you take is what you'll look back on and call your life. Not reaching success isn't the end of the world. Not trying to reach it is."

Sunday

Warm-up #2

Velocity Drills
4x30m Fast Leg Drill alternating sides every 3 steps

Linemen

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x Mirror Drill

SPEED [95 + %; 140]
2x[40m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [80-85%]:
4x [3x40m] 1 min btw reps; 6 min btw sets

Linebackers

AGILITY:
30 seconds btw reps; 3 minutes btw drills

2x modified T Drill 2x W drill

SPEED [95 + %; 160]
2x[50m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [85-90%]:
4x [4x60m] 1 min btw reps; 6 min btw sets

Defensive Backs

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x modified T Drill 2x W Drill

SPEED [95 + %; 180]
3x[40m + 20m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
4x [4x80m] 1 min btw reps; 6 min btw sets

All Other Positions

AGILITY:
30 seconds btw reps; 3 minutes btw drills
2x Pro-Agility 2x W Drill

Week 20 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

"The will to win is important, but the will to prepare is vital."

Phase 8: Maintenance & Camp Preparation; Weeks 21 & 22

Schedule as possible

> "The road to success is a toll road."

School takes priority. To play you must be academically eligible. Do what you can when you can. Try to do two weight workouts and one running workout a week. Keep in mind you have spring camp at the end of this phase and want to go into it in reasonable shape.

Day 1

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 4x3 @ 90% 2. Squats: 4x [3 @90% + 4x(Drop + VJ + lateral bound] 3. Bench press: 4x3 @ 90%	1. Seated rows or bent-over-rows: 3x5 2. Hams (two up, one leg down): 3x5 3. Side support elbows on a stability ball (SB) 3 x 15 s each + rear support both feet on SB 4. Curl-ups on SB 3 x 10 5. Medball rotations on SB 3 x 10

Cool Down: stretch

> "Success stops when you do."

Day 2

Warm-up #2

Velocity Drills:
4x30m Fast Leg Drill alternating sides every 3 steps

Linemen:

AGILITY:
30 seconds btw reps 2x Pro-Agility

SPEED [95 + %; 120]
2x[30m + 30m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [3x40m] 15 seconds btw reps; 6 min btw sets

Linebackers:

AGILITY:
30 seconds btw reps 2x W drill

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [3x40m] 15 seconds btw reps; 6 min btw sets

Defensive Backs:

AGILITY:
30 seconds btw reps 2x W Drill

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [3x40m] 15 seconds btw reps; 6 min btw sets

All Other Positions:

AGILITY:
30 seconds btw reps 2x Pro-Agility

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

WORKOUT [90-95%]:
2x [4x60m] 15 seconds btw reps; 6 min btw sets

Cool Down: stretch

Day 3

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Weights #3

Primary Exercises	Circuit Exercises
1. Hang Cleans: 4x3 @ 80% 2. Split Squats: 4x[3 @ 90% + 4x (Drop jumps + lateral bounds] 3. Hammer grip front deltoid raises: 3x5	1. Seated rows: 3x5 2. Hams (two up, one leg down): 3x5 3. Narrow grip bench: 4x5 4. Side support elbows on a stability ball (SB) 3 x 15s each + rear support both feet on SB 5. Curl-ups on SB 3 x 10 6. Medball rotations on SB 3 x 10

Cool Down: stretch

"You owe it to yourself to make your days here count. Have fun. Dig Deep. Stretch. Dream big. Things worth doing seldom come easy. There will be good days. There will be times when you want to pack it up and call it quits. Those times tell you that you are pushing yourself, That you are not afraid to learn by trying. Persist."

Phase 9: Hypertrophy #2; Weeks 23 - 25

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Lower Body (LB)	Warm-up #1 Velocity Drills Upper Body (UB)	Warm-up #2 Velocity Drills Speed Agility	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills UB Wts #2	Warm-up #3 Velocity Drills Speed Agility Football Pattern Intervals	Rest

12 reps ~ 70% of 1 RM; weights should be ~ 15 % heavier than phase 3

Rhythm of the primary exercises should be 2-0-1

1:30-2:30 minutes rest btw sets of primary exercises; no rest btw circuit exercises

"Never miss an opportunity to risk being great."

Monday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Lower Body Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 4x6 @ 80% 2. Squats: 4x[12 + 5x (drop jumps 2xVJ] 3. Single leg, leg press or Lunges: 4x[12 + 5x (drop jumps as above)]	1. Standing calf raises: 4x12 2. Hams: 4x12 3. Side supports elbows on SB 4 x 15 sec 4. Curl-ups on SB hands at ear 4 x 12 5. Medball rotations on SB 4 x 12

Cool Down: stretch

Tuesday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Upper Body Weights #1

Primary Exercises	Circuit Exercises
1. Bench press: 4x12 2. Overhead Press: 4x12 3. Lateral deltoid raises: 4x12	1. T-bar rows or bent-over-rows: 4x12 2. Lats [WF]: 4x12 3. Birdogs on SB: 4 x 12 4. Chinnies: 4 x 12 5. External rotation work: 4x12 6. Biceps & triceps (your choice): 4x12

Cool Down: stretch

Wednesday

Read body & rest if necessary

Warm-up #2

Velocity Drills:
4x30m Fast Leg Drill alternating sides every 3 steps

Linemen:

AGILITY:
2 each Dots (forward & back, single leg, 180) 10s on/off
2 x 2 T-drill (variation 'a'-side shuffle) brief rest btw reps,
2min btw sets
2 x 2 + drills (o-line) or X drill (d-line)

SPEED [95 + %; 240]
4x[40m + 20m] + = slow walk back; 3 min btw sets

Linebackers:

AGILITY:
2 each Dots (forward & back, single leg, 180) 10s on/off
2 x 2 T-drill (variation 'a') brief rest btw reps, 2min btw sets
2 x 2 X-drill

SPEED [95 + %; 240]
4x[40m + 20m] + = slow walk back; 3 min btw sets

Defensive Backs:

AGILITY:
2 each Dots (forward & back, single leg, 180) 10s on/off
2 x 2 T-drill (variation 'a') brief rest btw reps, 2min btw sets
2 x 2 X-drill

SPEED [95 + %; 320]
4x[40m + 40m] + = slow walk back; 3 min btw sets

All Other Positions:

AGILITY:
2 each Dots (forward & back, single leg, 180) 10s on/off
2 x 2 T-drill (variation 'a') brief rest btw reps, 2min btw sets
2 x 2 X-drill

SPEED [95 + %; 320]
4x[40m + 40m] + = slow walk back; 3 min btw sets

Cool Down: stretch

Thursday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Lower Body Weights #2

Primary Exercises	Circuit Exercises
1. Hang cleans: 4x6 @ 70% 2. Split Squats: 4x[12 + 4x (drop + 2xVJ] 3. Deadlift: 4x[8@70% + 8 tuck jumps]	1. Seated Calf Raises: 4x12 2. Hams: 4x12 3. Side support elbows on SB ball (SB) + rear support both feet on SB 4 x 20 s 4. Curl-ups on SB 4 x 12

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating sides every 3 steps

Upper Body Weights #2

Primary Exercises	Circuit Exercises
1. Incline bench press: 4x12 2. Dumbbell shoulder press: 4x12	1. Bench flys: 4x12 2. Single arm DB row: 4x12 3. External rotation work: 4x12 4. Lats [NF]: 4x12 5. Birdogs x 2 to a front walkout, feet on SB x 10 x 4 sets 6. Chinnies: 4 x 40 7. Biceps & triceps (your choice): 4x10

Cool Down: stretch

Saturday

Warm-up #3

Note: Be sure to refer to the specific pattern sheets according to position when doing football intervals.

Velocity Drills:
4x30m Fast Leg Drill alternating sides every 3 steps

Linemen:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
2 x 2Agility Square (position specific 'a') 15s btw reps,
2min btw sets

SPEED [95 + %; 120]
2x[40m + 20m] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
2 sets (1 & 2), jog back; 3 minutes btw sets

Linebackers:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
2 x 2Agility Square (position specific 'a') 15s btw reps,
2min btw sets

SPEED [95 + %; 120]
2x[40m + 20m] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
2 sets (1 & 2), jog back; 3 minutes btw sets

Defensive Backs:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
2 x 2Agility Square (position specific 'a') 15s btw reps,
2min btw sets

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (1, 2 & 3), jog back; 3 minutes btw sets

All Other Positions:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
2 x 3 Agility Square (position specific 'a') 15s btw reps,
2min btw sets

SPEED [95 + %; 160]
2x[40m + 40m] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (1, 2 & 3), jog back; 3 minutes btw sets

Cool Down: stretch

Sunday

Rest

Week 25 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

"Pride is a personal commitment; It is an attitude which separates excellence from mediocrity."

Phase 10: Bulk Strength #2; Weeks 26 - 28

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Lower Body (LB) Wts #1	Warm-up #1 Velocity Drills Upper Body (UB) Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 LB Wts #2	Warm-up #1 UB Wts #2	Warm-up #3 Velocity Drills Speed Agility Football Pattern Intervals	Rest

6 reps ~ 80% of 1 RM; weights should be ~ 20% heavier than phase 5

Rhythm of the primary exercises should be 4-0-2

3-4 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "Don't talk about what you have done or what you are going to do; Do it! And, let it speak for itself."

Monday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill alternating sides every 3 steps
2x20m Fast Foot double left, double right, every 3 steps

Lower Body Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 4 @ 75% + 4 @ 85% + 4 @ 80% + 4 @ 90% 2. Squats: each set is done slightly differently **set 1**: [6 + 3x(drop jumps six sec hold parallel] **set 2**:[6@15-20% less wt with six sec lower, 2 sec up + 2x(drop jumps 2xVJ] **set 3**: [6@15-20% less wt, 2 sec down, six sec hold at parallel, one sec up + jumps as set 2] **set 4**: [6 + 3x(drop jumps six sec hold at parallel]	1. Standing calf raises: 4x6 2. Hams: 4x6 3. Side supports straight arm on SB 4 x 15 sec each side 4. Curl-up on SB hands overhead 4 x 12 5. Medball rotations on SB 4 x 12

Cool Down: stretch

Tuesday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill alternating sides every 3 steps
2x20m Fast Foot double left, double right, every 3 steps

Upper Body Weights #1

Primary Exercises	Circuit Exercises
1. Bench press: each of the 4 sets is slightly different **set 1:** [6 with 4 down, 2 up rhythm] **set 2:** [6@15-20% less wt, six sec, 2 sec rhythm] **set 3:** [6@15-20% less wt, 2 sec down, six sec hold one inch off chest, one sec up **set 4:** [6 with 2 down, one up rhythm] 2. Overhead Press: 4x6	1. T-bar rows or bent-over-rows: 4x6 2. Lateral deltoid raises: 4x6 3. Lats [WF]: 4x6 4. Birdogs with walk out on SB 4 x 6 5. Chinnies: 4. x 60 6. External rotation work: 4x6 7. Biceps & triceps (your choice): 4x6

Cool Down: stretch

Wednesday

Read body & rest if necessary

Warm-up #2

Velocity Drills:
2x30m Fast Leg Drill alternating sides every 3 steps
2x30m Fast Leg double left, double right, every 3 steps

Linemen:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
3 x 2 T-drill ('a') 15s rest btw reps, 2min btw reps
3 x 2 X-drill (d-line) or + drill (O-line)

SPEED [95 + %; 240]
4x[30 + 30] + = slow walk back; 3 min btw sets

Linebackers:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
3 x 2 T-drill ('a') 15s rest btw reps, 2min btw reps
3 x 2 X-drill

SPEED [95 + %; 240]
4x[30 + 30] + = slow walk back; 3 min btw sets

Defensive Backs:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
4 x 2 T-drill ('a') 15s rest btw reps, 2min btw reps
4 x 2 X-drill

SPEED [95 + %; 320]
4x[50 + 30] + = slow walk back; 3 min btw sets

All Other Positions:

AGILITY:
2 each Dots (forward & back, single leg, 180) 15s on/off
4 x 2 T-drill ('a') 15s rest btw reps, 2min btw reps
4 x 2 + drill

SPEED [95 + %; 320]
4x[50 + 30] + = slow walk back; 3 min btw sets

Cool Down: stretch

Thursday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill alternating sides every 3 steps 2x20m Fast Foot double left, double right, every 3 steps

Lower Body Weights #2

Primary Exercises	Circuit Exercises
1. Hang cleans: 2x[4 @ 70% + 4 @ 80%]	1. Seated Calf Raises: 4x6
2. Split Squats: 4x[6 + 4x(drop — 2xVJ + lateral jump)]	2. Hams: 4x6
3. Deadlifts: 4x[5@85% + 5 tuck jumps]	3. Side supports straight arm, rear supports ground, feet on SB 4 x 15 sec
	4. Curl-ups on SB hands at ear 4 x 12
	5. Medball rotations on SB 4 x 12

Cool Down: stretch

"It's not necessarily the amount of time you spend at practice that counts; It's what you put into the practice."

Friday

Warm-up #1 + Velocity Drills:
2x20m Fast Foot Drill alternating sides every 3 steps
2x20m Fast Foot double left, double right, every 3 steps

Upper Body Weights #2

Primary Exercises	Circuit Exercises
1. Incline bench press: 4x6 2. Dumbbell shoulder press: 4x6	1. Dumbbell bench press: 4x6 2. Single Arm DB Rows: 4x6 3. Birdogs with walkouts on SB: 4x6 4. Lats [NF]: 4x6 5. Chinnies: 4 x60 6. Biceps & triceps (your choice): 4x6

Cool Down: stretch

Saturday

Warm-up #3

Velocity Drills:
2x30m Fast Leg Drill alternating sides every 3 steps
2x30m Fast Leg double left, double right, every 3 steps

Linemen:

AGILITY:
2 each Dots (forward & back, single leg, 180); 15s on/off
3 x 2 Agility Square 'a'; 15s btw reps, 2 min btw sets

SPEED [95 + %; 120]
2x[30 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (2, 3 & 4), jog back; 3 min btw sets

Linebackers:

AGILITY:
2 each Dots (forward & back, single leg, 180); 15s on/off
3 x 2 Agility Square 'a'; 15s btw reps, 2 min btw sets

SPEED [95 + %; 120]
2x[30 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (2, 3 & 4), jog back; 3 min btw sets

Defensive Backs:

AGILITY:
2 each Dots (forward & back, single leg, 180); 15s on/off
4 x 2 Agility Square 'a'; 15s btw reps, 2 min btw sets

SPEED [95 + %; 160]
2x[50 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (2, 3 & 4), jog back; 2:45 btw sets

All Other Positions:

AGILITY:
2 each Dots (forward & back, single leg, 180); 15s on/off
4 x 2 Agility Square 'a'; 15s btw reps, 2 min btw sets

SPEED [95 + %; 160]
2x[50 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (2, 3 & 4), jog back; 2:45 btw sets

Cool Down: stretch

Sunday

Rest

Week 28 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

Phase 11: Max Strength & Speed #2; Weeks 29 - 31

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Football Specific Intervals	Warm-up #1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Agility Football Specific Intervals

3 reps ~ 95% of 1 RM; be sure to add ~ 15% to your lifting weights

Rhythm of the primary exercises should be 2-0-1

5 - 6 minutes rest btw sets of primary exercises; no rest btw circuit exercises

Monday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot double left, double right, every 3 steps

Weights #1

Primary Exercises	Circuit Exercises
1. Clean Pulls: 2x[4@100% + 2 @ 110%] 2. Squats: 2x[4 @ 85% + 2 @ 95% + 2x(drop — VJ + lateral bound + VJ + lateral bound)] 3. Bench press: 2x[4 @ 85% + 2 @ 95%]	1. Seated rows or bent-over-rows: 4x10 2. Single arm deadlifts (hams): 4x10 3. Lateral deltoid raises: 4x10 4. Front, rear holds w feet on SB, side supports straight arms (abs): 2 x 30 sec 5. Curl-up on SB, hands holding Medball overhead 4 x 10 6. Medball rotations on SB 4 x 10

Cool Down: stretch

Tuesday

Warm-up #2 + Velocity Drills:
4x30m Fast Leg double left, double right, every 3 steps

Linemen:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
2 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
2 x 2 X-drill (d-line) or + drill (O-line)

SPEED [95 + %; 280]
4x[40 + 30] + = slow walk back; 3 min btw sets

Linebackers:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
3 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
3 x 2 X-drill

SPEED [95 + %; 280]
4x[40 + 30] + = slow walk back; 3 min btw sets

Defensive Backs:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
4 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
4 x 2 X-drill

SPEED [95 + %; 360]
4x[60 + 30] + = slow walk back; 3 min btw sets

All Other Positions:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
4 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
4 x 2 + drill

SPEED [95 + %; 360]
4x[60 + 30] + = slow walk back; 3 min btw sets

Cool Down: stretch

Wednesday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot double left, double right, every 3 steps

Weights #2:
Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Hang cleans: 2x[4 @ 72.5% + 2 @ 82.5%]	1. Lats [WF] or Chinups: 4x10
2. Lateral Squats: 4x[10 + 10 side to side hops]	2. Alternating DB bench press: 4x10
3. Overhead Press : 2x[4 @ 85% + 2 @ 95%]	3. Reverse flies (rear delt raise):4x10
	4. Birdogs w walkout, then knee-ins with 2 feet on stability ball : 4 x10
	5. External rotation work, or cross-chop from high/low pulley: 2 x 10 each way

Cool Down: stretch

Thursday

Warm-up #3

Velocity Drills:
2x30m Fast Leg Drill alternating sides every 3 steps
2x30m Fast Leg double left, double right, every 3 steps

Linemen:

SPEED [95 + %; 140]
2x[40 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (3, 4 & 1), jog back; 2:45 btw sets

Linebackers:

SPEED [95 + %; 140]
2x[40 + 30] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (3, 4 & 1), jog back; 2:45 btw sets

Defensive Backs:

SPEED [95 + %; 180]
2x[50 + 40] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (3, 4 & 1), jog back; 2:30 btw sets

All Other Positions:

SPEED [95 + %; 180]
2x[50 + 40] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
3 sets (3, 4, & 1), jog back; 2:30 btw sets

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot double left, double right, every 3 steps

Weights #3

Primary Exercises	Circuit Exercises
1. Power Cleans: 2x[4 @ 82.5% + 2 @90%] 2. Split Squats: 2x[4 @ 85% + 2 @ 95% + 2x(drop — VJ + lateral bound + VJ + lateral bound)] 3. Incline bench press: 2x[4 @ 85% + 2 @ 95%]	1. Single leg balance, single arm DB rows: 4x10 2. Hams (single leg deadlifts): 4x10 3. Lateral deltoid raises: 4x10 4. Side static hold one leg, one arm (abs): 2 sets each side to failure 5. Chinnies: 4x40

Cool Down: stretch

Saturday

Rest

Sunday

Warm-up #3

Velocity Drills:
2x30m Fast Leg Drill alternating sides every 3 steps
2x30m Fast Leg double left, double right, every 3 steps

Linemen:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x 2 T-drill 'a'; 10s rest btw reps, 2 min btw sets
2 x 2 W-drill (0-line side shuffle, sprint, d-line back-pedal sprint); 20s rest, 2min
2 x side-to-side line touch; 10s each, 1 min rest btw sets

FOOTBALL INTERVALS:
3 sets (4, 1 & 2), jog back; 2:45 btw sets

Linebackers:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x 2 T-drill 'a'; 10s rest btw reps, 2 min btw sets
3 x 2 W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 2 min sets
3 x 2 S-drill (back-step around cones); 20s rest btw reps; 2 min rest btw sets

FOOTBALL INTERVALS:
3 sets (4, 1 & 2), jog back; 2:45 btw sets

Defensive Backs:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x 2 T-drill 'a'; 10s rest btw reps, 2 min btw sets
4 x 2 W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 2 min sets
4 x 2 S-drill (sprint around each cone); 20s rest btw reps; 2 min rest btw sets

FOOTBALL INTERVALS:
3 sets (4, 1 & 2), jog back; 2:30 btw sets

All Other Positions:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x 2 T-drill 'a'; 10s rest btw reps, 2 min btw sets
4 x 2 W-drill 'a'(all sprint); 20s rest btw reps; 2 min sets
4 x 2 S-drill (sprint around each cone); 20s rest btw reps; 2 min rest btw sets

FOOTBALL INTERVALS:
3 sets (4, 1 & 2), jog back; 2:30 btw sets

Cool Down: stretch

Week 31 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

Phase 12: Max Strength & Speed #3; Weeks 32 - 34

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Football Specific Intervals	Warm-up #1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Agility Football Specific Intervals

3 reps ~ 95% of 1 RM

Rhythm of the primary exercises should be 2-0-1

4 - 6 minutes rest btw sets of primary exercises; no rest btw circuit exercises

> "Refuse to let anything detract you from your goal! Always assume a now or never attitude! Think, and, do it — Now!"

Monday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill continuous left/right

Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 3 @ 85% + 2x2 @ 95% + 3 @ 85% 2. Squats: [3@ 80% + 3 @ 85% + 3 @ 90% + 3 @ 95% + 2x(drop — VJ + lateral + VJ + lateral] 3. Drive ups w DB : 4x64. Bench press: 3 @ 80% + 3 @ 85% + 3 @ 90% + 3 @ 95%	1. Seated Rows: 4x5 2. Front, side, rear supports w SB 4 x 20 sec 3. Curl-ups on SB holding Medball in one hand overhead, lift opposite leg 4 x 10 4. Holding a Medball with 2 hands, single leg deadlift, touching medball to outside of each foot 4 x 5 each way 5. Chinnies 4 x 50

Cool Down: stretch

> "Wisdom is knowing what to do next, Skill is knowing how to do it, and virtue is doing it."

Tuesday

Warm-up #2 + Velocity Drills:
4x30m Fast Leg continuous left/right

Linemen:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
2 x 1 Agility Square 'a'; 15s rest btw reps, 2 min btw sets
2 x 1 Agility Square 'b' (w drop & hits); 30s rest btw reps, 2 min btw
2 x 2 X-drill (d-line) or + drill (O-line)

SPEED [95 + %; 320]
4x[40 + 40] + = slow walk back; 3 min btw sets

Linebackers:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
2 x 1 Agility Square 'a'; 15s rest btw reps, 2min btw sets
2 x 1 Agility Square 'b' (w drop & hits); 30s rest btw reps, 2min btw sets
4 x 2 X-drill

SPEED [95 + %; 320]
4x[40 + 40] + = slow walk back; 3 min btw sets

Defensive Backs:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
2 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
2 x 2 Agility Square 'b' (w drop & hits); 30s rest btw reps, 2min btw sets
4 x 2 X-drill

SPEED [95 + %; 400]
4x[60 + 40] + = slow walk back; 3 min btw sets

All Other Positions:

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 2 min btw sets
2 x 2 Agility Square 'a'; 15s rest btw reps, 2min btw sets
2 x 2 Agility Square 'b' (w spins); 15s rest btw reps, 2min btw sets
4 x 2 X-drill

SPEED [95 + %; 400]
4x[60 + 40] + = slow walk back; 3 min btw sets

Cool Down: stretch

Wednesday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill continuous left/right

Weights #2:
Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Push Press: 4 @ 65% + 4 @ 70% + 4 @ 75% + 4 @ 80% 2. Clean Pulls: 4@95% + 2@105% +4@100% + 2@110% 3. Lateral Squats: 4x[6 + 6 side to side hops]	1. Towel chin-ups: 2 sets to failure 2. *Hammer grip dumbbell incline: 4x5 * everyone except QB'sQB's: lying pullovers: 4x5 3. Lateral deltoid raises: 4x5 4. Birdogs w holding medball 4 x 5 5. Walkout with knee-ins on SB 4 x 5 6. Medball rotations on SB 4 x 10

Cool Down: stretch

Thursday

Warm-up #3 + Velocity Drills:
4x30m Fast Leg continuous left/right

Linemen:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
4 sets (4, 2, 3 & 1), jog back; 2:30 btw sets

Linebackers:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
4 sets (4, 2, 3 & 1), jog back; 2:30 btw sets

Defensive Backs:

SPEED [95 + %; 160]
2x[40 + 40] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
4 sets (4, 2, 3 & 1), jog back; 2 min btw sets

All Other Positions:

SPEED [95 + %; 160]
2x[40 + 40] + = slow walk back; 3 min btw sets

FOOTBALL INTERVALS:
4 sets (4, 2, 3 & 1), jog back; 2 min btw sets

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill continuous left/right

Weights #3

Primary Exercises	Circuit Exercises
1. Hang Cleans: 3@70% + 3@80% + 3@75% + 3@85% 2. Split Squats:[3@80% + 3@85% + 3@90% + 3@95% + 2x(drop — VJ + lateral + VJ + lateral jump 3. Single leg, leg press: 4x10 @ 40% AFAP 4. Narrow grip bench: 3x[6 + 10 sec@50% AFAP]	1. Single leg balance, single arm DB rows : 4x5 2. Ham curls (2 up + 1 down): 4x5 3. Hammer grip front deltoid raises + jab lateral bounds] 4. V-lift, opposite arm/leg on SB: 5. Birdogs on SB 4x10

Cool Down: stretch

Saturday

Rest

Sunday

Warm-up #3 + Velocity Drills:
4x30m Fast Leg continuous left/right

Linemen:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1:30 min rest
2 x T-drill 'b' (w drop & hit); 20s rest btw reps, 2 min rest
2 x W-drill 'a' (0-line side shuffle, sprint, d-line back-pedal sprint); 20s rest, 2min
2 x W-drill 'b' (w drop & hit & 4pt wave); 20s rest, 2:30 min
3 x side-to-side line touch; 10s each, 1 min rest btw sets

FOOTBALL INTERVALS:
4 sets (2, 1 , 3 & 4), jog back; 2:30 btw sets

Linebackers:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1:30 rest
2 x T-drill 'b' (w drop & hit); 20s rest btw reps, 2 min rest
2 x W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 2 min rest
2 x W-drill 'b' (w drop & hit); 20s rest btw reps; 2:30 min rest
2 x S-drill (back-step around cones); 20s rest btw reps; 3 min rest

FOOTBALL INTERVALS:
4 sets (2, 1 , 3 & 4), jog back; 2:30 btw sets

Defensive Backs:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1:30 min rest
2 x T-drill 'b' (backpedal & turn); 20s rest btw reps, 2 min rest
2 x W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 2 min rest
2 x W-drill 'b' (w plant & spin); 20s rest btw reps; 2:30 min rest
2 x S-drill (back-step around cones); 20s rest btw reps; 3 min rest

FOOTBALL INTERVALS:
4 sets (2, 1 , 3 & 4), jog back; 2 min btw sets

All Other Positions:

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, !:30 min rest
2 x T-drill 'b' (w spin); 20s rest btw reps, 2 min rest
2 x W-drill 'a' (all sprint, hard plants); 20s rest btw reps; 2 min rest
2 x W-drill 'b' (w plant & spins); 20s rest btw reps; 2:30 min rest
2 x S-drill (sprint around cones); 20s rest btw reps; 2:30 min rest

FOOTBALL INTERVALS:
4 sets (2,1, 3 & 4), jog back; 2 min btw sets

Cool Down: stretch

Week 34 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

"There is an infinite difference between a little wrong and just right, Fairly good and the best, between mediocrity and superiority."

Phase 13: Sport Specific Power Camp Prep; Weeks 35 & 36

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Velocity Drills Wts #1	Warm-up #2 Velocity Drills Speed Agility Football Specific Intervals	Warm-up #1 Velocity Drills Wts #2	Warm-up #2 Velocity Drills Speed Agility Football Specific Intervals	Warm-up#1 Velocity Drills Wts #3	Rest	Warm-up #3 Velocity Drills Speed Agility Football Specific Intervals

3 reps ~ 95% of 1 RM

Rhythm of the primary exercises should be 2-0-1

4 - 6 minutes rest btw sets of primary exercises; no rest btw circuit exercises

Given that every team starts their camp at slightly different times, we recommend this as a 1:1 phase which may be repeated twice if necessary. Adjust this to make it fit to your camp scenario, so you go into camp and testing off a recovery week.

Week 35

> "Success has always been easy to measure. It is the distance between one's origins and one's final achievement."

Monday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill continuous

Weights #1

Primary Exercises	Circuit Exercises
1. Power Cleans: 2@90% + 1@95% + 1@100% 2. Squats: [4@85% + 2x2@95% + 4@85% + 2x(drop — 2xVJ + lateral + VJ + 2xVJ + lateral bounds] 3. Drive ups with leg exchange: 4x10 seconds3. Bench press: 2@90% + 1@95% + 1@100% + rep out @ 225 pounds or 70% 1RM	1. Seated Rows: 4x8 2. Front, side, rear supports w SB 2 x 20 sec 3. Curl-ups on SB holding Medball in one hand overhead, lift opposite leg 2 x 10 4. Holding a Medball with 2 hands, single leg deadlift, touching medball to outside of each foot 2 x 5 each way

Cool Down: stretch

Tuesday

Warm-up #2 + 4x30m Fast Leg continuous

Linemen:

SPEED [95 + %; 180]
3 x [40 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'a'; 15s rest btw reps, 1:30 min rest
2 x Agility Square 'b' (w drop & hits); 15s rest btw reps, 2 min btw
2 x Agility Square 'c' (w drop, hit, 4pt wave); 30s rest btw reps, 3 min
2 x 2 X-drill (d-line) or + drill (O-line)

FOOTBALL INTERVALS:
3 sets (3, 2 & 1), jog back; 2:15 btw sets

Linebackers:

SPEED [95 + %; 180]
3 x [40 + 20] + = slow walk back; 3 min btw sets

AGILITY:

FOOTBALL INTERVALS:
3 sets (3, 2 & 1), jog back; 2:15 btw sets

Defensive Backs:

SPEED [95 + %; 240]
3 x [40 + 40] + = slow walk back; 3 min btw sets

AGILITY:

FOOTBALL INTERVALS:
3 sets (3, 2 & 1), jog back; 2 min btw sets

All Other Positions:

SPEED [95 + %; 240]
3 x [40 + 40] + = slow walk back; 3 min btw sets

AGILITY:

FOOTBALL INTERVALS:
3 sets (3, 2 & 1), jog back; 2 min btw sets

Cool Down: stretch

"Where you find success, you find sacrifice."

Wednesday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill alternating left/right every 3 steps

Weights #2:
Do not add extra leg work, the objective of this day is to off-load the legs

Primary Exercises	Circuit Exercises
1. Push Press: 2x[4@75% + 2@85%]	1. Towel chin-ups: 2 sets to failure
2. Clean Pulls: 3@100% + 3@105% + 3@110% + 3@115%	2. *Hammer grip dumbbell incline: 4x8*everyone except QB'sQB's: lying pullovers: 4x8
3. Lateral Squats: 4x[6 + 6 side to side hops]	3. Lateral deltoid raises: 4x8
	4. Birdogs w holding medball 4 x 8
	5. Walkout with knee-ins on SB 4 x 8
	6. Medball rotations on SB 4 x 8

Cool Down: stretch

Thursday

Warm-up #3 + Velocity Drills:
4x30m Fast Leg continuous left/right

Linemen:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'a'; 15s rest btw reps, 1 min rest
2 x Agility Square 'b' (w drop & hits); 20s rest btw reps, 1:30 min rest
2 x Agility Square 'c' (w drop, hit & 4pt wave); 30s rest btw reps, 2 min
2 x 2 X-drill (d-line) or + drill (O-line)

FOOTBALL INTERVALS:
3 sets (1, 3 & 4), jog back; 2:15 btw sets

Linebackers:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'a'; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'b' (w drop & hits); 20s rest btw reps, 1:30 min
2 x Agility Square 'c' (w drop, hit & 4pt wave); 30s rest btw reps, 2min
4 x 2 X-drill

FOOTBALL INTERVALS:
3 sets (1, 3 & 4), jog back; 2:15 btw sets

Defensive Backs:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'a'; 15s rest btw reps, 1 min btw sets
2 x Agility Square 'b' (w drop & hits); 30s rest btw reps, 1:30 min rest
2 x Agility Square 'c' (w drop, hit & wave); 30s rest btw reps, 2 min rest
4 x 2 X-drill

FOOTBALL INTERVALS:
3 sets (1, 3 & 4), jog back; 2 min btw sets

All Other Positions:

SPEED [95 + %; 120]
2x[40 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 each Dots; 15s on/off
2 x 2 Pro-Agility; 15s rest btw reps, 1 min btw sets
2 x 2 Agility Square 'a'; 15s rest btw reps, 1 min btw sets
2 x 2 Agility Square 'b' (w spins); 20s rest btw reps, 1:30 min btw sets
2 x 2 Agility Square 'c' (w spins & hits); 30s rest btw reps, 2 min btw sets
4 x 2 X-drill

FOOTBALL INTERVALS:
3 sets (1, 3 & 4), jog back; 2 min btw sets

Cool Down: stretch

Friday

Warm-up #1 + Velocity Drills:
4x20m Fast Foot Drill double left/right

Weights #3

Primary Exercises	Circuit Exercises
1. Hang Cleans: 4x3@85%	1. Single leg balance, single leg DB rows : 4x8
2. Split Squats: 4x[3@90% + 2x(drop — VJ + lateral + VJ + lateral bounds]	2. Hams 2 leg up/ 1 down: 4x8
3. Single leg, leg press: 4x6 seconds @ 50% do as many reps as possible in 6 seconds	3. Hammer grip front deltoid raises withjab.step footwork: 4x[8 + 6 seconds @10-25 pounds doing as many reps as possible]
4. Narrow grip bench: 4x[5 + 6@50% AFAP] time how long it takes to do six reps	4. V-lift, opposite arm/leg on SB: 4 x 8
	5. Birdogs on SB 4 x 8

Cool Down: stretch

Saturday

Rest

Sunday

Warm-up #2 + Velocity Drills:
4x30m Fast Leg continuous left/right

Linemen:

SPEED [95 + %; 100]
2 x [25 + 25] + = slow walk back; 3 min btw sets

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1:30 min rest
2 x T-drill 'b' (w drop & hit); 20s rest btw reps, 2 min rest
2 x T-drill 'c' (w drop, hit& wave); 20s rest btw reps, 2:30 min rest
2 x W-drill 'a' (0-line side shuffle, sprint, d-line back-pedal sprint); 20s rest, 2min
4 x W-drill 'b' (w drop & hit & 4pt wave); 30s rest btw reps, 2 min rest
4 x side-to-side line touch; 10s each, 1 min rest btw sets

FOOTBALL INTERVALS:
5 sets (2, 4, 3, 1 & 2), jog back; 2:15 btw sets

Linebackers:

SPEED [95 + %; 100]
2 x [25 + 25] + = slow walk back; 3 min btw sets

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1 rest
2 x T-drill 'b' (w drop & hit); 20s rest btw reps, 2 min rest
2 x T-drill 'c' (w drop, hit& 4pt wave); 30s rest btw reps, 2:30 min rest
2 x W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 2 min rest
4 x W-drill 'b' (w drop & hit); 30s rest btw reps; 2:30 min rest
4 x S-drill (back-step around cones); 20s rest btw reps; 3 min rest

FOOTBALL INTERVALS:
5 sets (2, 4, 3, 1 & 2), jog back; 2:15 btw sets

"The price of success is hard work , dedication to the job at hand, and the determination that whether we win or lose, we have applied the best of ourselves to the task at hand."

Defensive Backs:

SPEED [95 + %; 120]
3 x [20 + 20] + = slow walk back; 3 min btw sets

AGILITY:
2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, 1 min rest
2 x T-drill 'b' (backpedal & turn); 20s rest btw reps, 1:30 min rest
2 x T-drill 'c' (backpedal & hit); 20s rest btw reps, 2 min rest
2 x W-drill 'a' (back-pedal, sprint, rpt); 20s rest btw reps; 1 min rest
4 x W-drill 'b' (w plant & spin); 30s rest btw reps; 2:30 min rest
4 x S-drill (back-step around cones); 20s rest btw reps; 3 min rest

FOOTBALL INTERVALS:
5 sets (2, 4, 3, 1 & 2), jog back; 2 min btw sets

All Other Positions:

SPEED [95 + %; 120]
3 x [20 + 20] + = slow walk back; 3 min btw sets

AGILITY: 2 sets each Dots; 10s on/10s off
2 x T-drill 'a'; 10s rest btw reps, ! min rest
2 x T-drill 'b' (w spin); 20s rest btw reps, 1:30 min rest
4 x T-drill 'c' (w spin, & hits); 20s rest btw reps, 2 min rest
4 x W-drill 'a' (all sprint, hard plants); 20s rest btw reps; 2 min rest
4 x W-drill 'b' (w plant & spins); 20s rest btw reps; 2:30 min rest
4 x S-drill (sprint around cones); 20s rest btw reps; 2:30 min rest

FOOTBALL INTERVALS:
5 sets (2, 4, 3, 1 & 2), jog back; 2 min btw sets

Cool Down: stretch

Week 36 — Recovery

1/2 Sets & Reps for **Primary** exercises;

1/2 Sets for all other exercises

1/2 Sets for all speed, agility, running drills

Do not add weight; Lift only as heavy as last week for sets X reps listed, maintain intensity.

> "All worthwhile goals come at a price, and the coins with which we pay are concentration, persistence and desire."

Summer Camp; Weeks 37 - 39

4.3 In Season Training

Phase 14: In-Season Training; Weeks 40 – 52

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Warm-up #1 Wts #1 (Heavy)	Off	Warm-up #1 Wts #2 (Power)	Off	Off	VARSITY Game Day NON-VARSITY Wts #3 (Heavy) Speed, Agility & Intervals	Rest

After training camp it is important to get back into the gym so you can maintain your gains throughout the season. Strength can decline by as much as 30% if you stop training entirely. Training at a minimum of once a week can maintain most of your gains throughout the season. Keep in mind most of your sport-specific training developed with plyometrics and speed training in the off-season is maintained by practicing hard during the week, and by the intense physical work during a game.

The best day to workout is generally the day after a game or on the Monday after a game. This workout may be considered a recovery workout to an extent, but should really be the heavy training day for the week, so your muscles can recover for next game. The second workout should be on the Wednesday or Thursday, and can be lighter and possibly more sport specific. A common complaint is 'sore shoulders' after a game, so heavy pressing is saved until the second workout, whereas leg work is focused to the Monday workout so that there is time to recover during the week.

The suggested workout plan has a rep scheme pyramid of 15, 10, 5 for primary exercises at ~65%, 75%, and 85% of 1RM respectively. The reason for this is the high rep set maintains volume to allow connective tissues to recover and allows you to 'work out' the stiffness and soreness from the game. The medium intensity set maintains the volume/intensity required to maintain muscle mass. The low rep/high intensity set maintains maximum strength, which is so vital to maintaining power throughout the season. Remember that high-end strength is a neural adaptation that must be practised.

For non-varsity players (non-dressers), it is very important to do an intense workout and running/agility session in place of the game. A game situation offers true training stress, which helps maintain many adaptations during a season. Those who don't dress risk becoming out of shape by the end of the season, when the team may need you the most to fill in for injured players. It is up to those non-dressers to workout intensely the day of the game to stay in shape during the season.

During the week training with your team, it is important to maintain your 'running fitness'. It is suggested to do intensive line running drills (i.e. 5, 10, 15, 20m x 4) on the Tuesday (so your legs can recover for game day), medium-distance (4 x 200m) intervals on Wednesday to maintain your aerobic fitness, and short sprints (4 x 20m) on Thursday to maintain your speed. The day before your game should be a day off conditioning.

Suggested Workouts

The suggested weight training workouts for in-season training are as follows:

Day 1: Heavy Workout (Monday)

Take full recovery (~2-3min) between primary exercises

Tempo is moderate (2-0-2) for all exercises

Single Leg Squats or Leg Press (running positions) or Squats for linemen	3 sets: 15 @ 65%, 10 @ 75%, 5 @ 85%
Incline DB Bench Press	3 sets: 15 @ 65%, 10 @ 75%, 5 @ 85%
Lateral Pulldown (medium grip front for all positions) or wide for quarterbacks	3 sets: 15 @ 65%, 10 @ 75%, 5 @ 85%

Circuit Remaining Exercises (no rest between each exercise)

Side Lateral raises	3 sets x 10
Single Leg Hamstring Curls	3 sets x 8-10
Rear Delt Flys/Front DB raise	3 sets x 10 (superset these exercises)
Arm Curls/Tricep Pushdown	3 sets x 8-10 (superset these exercises)
Back Extensions	3 sets x 10-15
Abdominal Lifts	3 sets x 10-15

Day 2: Moderate Workout (Wednesday or Thursday)

Take full recovery (~2-3min) between primary exercises

Tempo is moderate (2-0-2) for all exercises, you can do power reps on primary exercises if desired

Bench Press or Hammer Press (all positions) or Flat DB Press for quarterbacks	3 sets: 10 @ 70%, 6 @ 80%, 4 @ 90%
Overhead DB Press	3 sets: 10 @ 70%, 6 @ 75%, 4 @ 90%
One-arm Rows or Bentover Rows if back is ok	3 sets: 10 @ 65%, 6 @ 75%, 4 @ 90%

Circuit Remaining Exercises (no rest between each exercise)

Hang Cleans or Shrugs	3 sets x 10 (quarterbacks - side lateral raises)
Step Ups	3 sets x 10
Triceps Pushdowns	3 sets x 8-10
External Rotator Cuff	3 sets x 10 (superset these exercises)
Back Stabilization Exercises	3 sets each of cat, superman, side support, single leg raise, abdominal lifts

Day 3: Non-Varsity Workout for non-dressers (instead of the game)

Take full recovery (~ 2-3min) between primary exercises

Tempo is moderate (2-0-2) for all exercises, you can do power reps on primary exercises if desired

Power Cleans	3 sets: 5 @ 65%, 5 @ 75%, 5 @ 85%
Squats (linemen) or Split Squats (running positions) [+5 tuck jumps each]	3 sets: 15 @ 65%, 10 @ 75%, 5 @ 85%
Bench Press or DB (quarterbacks)	3 sets: 15 @ 65%, 10 @ 75%, 5 @ 85%
Deadlifts	3 sets: 5 @ 65%, 5 @ 75%, 5 @ 85%
or Chinups	3 sets x max reps

Circuit Remaining Exercises (no rest between each exercise)

Seated Rows or bent-over rows	3 sets x 10
Side lateral raises	3 sets x 10
Arm Curl/ Triceps extension	3 sets x 8 (superset)
Calve Raise	3 sets x 15-20

Running & Agility (on same day as weights or on Sunday)
- Warm-up routine (form running, A's, B's etc.)
- 4 x 5 maximum vertical jumps
- 4 x 40 sprints (walk back each)
- 4 x 400m (sprint 100, jog 200, walk 100)
- Jog 10 min cool down
- Stretch

Set goals you have direct control over for each training phase. For example, setting the goal to be a starter may not always be within your control. Being a starter may be the outcome of the process or steps you take in achieving this goal. Goals such as sticking to your conditioning program may give you the results you desire.

Chapter 5

Nutrition for Optimum Performance

Nutrition for Optimum Performance

5.1 The Nutrition Advantage

Energy needs of athletes

5.2 Quick and Easy Tips

Tip 1 1-2-3 Energy

Tip 2 It's all in the timing

Tip 3 Power Snacks

5.3 Make Nutrition Work for You

Canada's Food Guide Explained

Weight Gain, Weight Loss

5.4 Are You Eating Enough?

Food Diary

Fuelling tips for active people

5.5 Design a Meal Plan For You

Steps 1-4

Nutrient Analysis of Football Player Case E

5.6 Sports Nutrition Explained

Carbohydrate, Protein, The Fat Nutrient, Vitamins, Minerals

Water balance, Carbohydrate beverages, Alcohol

5.7 Nutritional Ergogenic Aids

Amino Acids, Branch Chain Amino Acids (BCAA) , Caffeine, Chromium, Creatine Monohydrate, Ginseng, Protein Powder, HMB

5.8 Recipes

Power Shake

Power Cookies

Prepared by Linda Barton and Harley Pasternak

5.1 The Nutrition Advantage

Introduction

An optimal nutrition strategy can be specific to sport, position played, body composition, conditioning level and many other factors. According to Short (1994) coaches, trainers and especially the athletes need more effective nutrition education. Not only do they need to know more about appropriate nutrition for fitness and sports, but also they need to be warned about buying useless, or even dangerous, pills and other products.

This chapter will investigate the key components of sport nutrition and show you, step-by-step, how to use nutrition to your best training advantage. For the most part, a balanced nutritional plan works very well for the athlete, although we will also explore nutritional supplements and ergogenic aids and decide what, if any, supplements will be helpful to you. Each section is peppered with real-life examples from university athletes and includes practical tips to help you do your best. If there is one take-home message from this chapter, it is to choose real food first, and limit your intake of fast food and 'filler foods' such as chips, candy bars, pizza and other foods that take away your from your performance.

Energy Needs of Athletes

The special demands of intense activity training means athletes require extra energy; however, most need much the same nutrient balance as other healthy persons. A daily energy intake of 55-65% carbohydrate, 15-20% protein, 20-35% fat is recommended for athletes, compared to a carbohydrate:protein:fat ratio of 55:15: < 30 for Canadian adults.

Athletes can use *Canada's Food Guide to Healthy Eating* but may need to increase the number of servings in each food group to meet their higher energy requirements. They also need more fluid and electrolytes for water balance.

The following guidelines are used to design your ***Optimal Performance Meal Plan.*** A Sport Dietitian can help you create a personalized meal plan to suit your fueling needs, training schedule, food likes and dislikes, and performance goals.

1) energy to prevent depletion of fuel stores
2) carbohydrate (6 -10 g/kg BW/day) to maintain muscle glycogen stores
3) protein (1.0 -1.8 g/kg BW/day) to maintain lean body mass
4) fat (15 - 35% total energy intake) for energy and vitamins
5) fluid and electrolytes to maintain optimal water and electrolyte balance
6) vitamins and minerals for optimal energy expenditure

Let these recommendation guide the meal plan - your job is eating the food!

5.2 Quick and Easy Tips

Try these tips for a quick start to fuelling on the right track. It seems simple, but some people make nutrition too complicated, when a balanced and 'real food' approach is all that is required. Sometime the simplest advice works best!

Tip 1: 1-2-3 Energy

For maximum energy and performance power try a '1-2-3 Energy Pack' at each meal and snack. Using *Canada's Guide to Healthy Eating*, choose 1 a Fruit & Veggie, 2 a Grain, and 3 a protein food from Milk Products and/or Meat & Alternatives groups, as you prefer. Here's how the '1-2-3 Energy Pack' helps you achieve optimum fuelling:

1. Fruit or Vegetable

Vegetables and Fruits provide a quick, short-acting energy boost lasting about 1 hour, along with fiber, vitamins and minerals and great taste!

2. Grain Product

Grain Products provide longer-lasting energy, about 2 hours. Go for whole-grains whenever possible for maximum fibre, vitamins and minerals.

3. Protein Food

Include a Protein food and experience a longer-acting energy source. Together with Choices from 1 and 2 these foods provide energy for about 3 hours, as well as vitamins and minerals.

The simple '1-2-3 Energy' tool helps you choose foods in balance. The 'fat' component of your plan is important as well but is usually part of the 1-2-3 components. Leave the numbers to your nutritionist - they'll only drive you crazy!

Tip 2: It's All In The Timing

It's best for most of us to eat every 3-4 hours, or 5-6 meals through the day. Use this meal pattern along with the '1-2-3 Energy Pack' pack to help you choose the right foods at the right time for optimal fuelling through the day.

In an effort to lose body weight, you might be eating too little protein and too little fat. Eating out of balance means you will get hungry and eventually give in to those high-sugar, high-fat, high-salt cravings. Be sure to include enough of the protein and fat nutrients in your meals and snacks!

Eat smaller meals more often to experience longer-lasting energy. Avoid "out of control" hunger leading to eating too much too fast!

Tip 3: Power Snacks

Snacking on high carbohydrate (high sugar) snacks gives you a quick energy boost, but robs you of lasting energy. High fat snacks can make you sleepy. Make snacks work best for you by including a protein food or drink. Meal replacement foods might help.

Pre-workout snack

Fuel your activity with a pre-workout snack 1 to 2 hours before you train. Food choices should provide complex carbohydrates, include protein and be low in fat. What you eat depends on individual preference and tolerance. Aim for a 200-500 kcal snack.

* Try a sandwich (tuna, sliced lean meat, cheese, hummus or peanut butter), yogurt shake, rice and beans, or cereal and milk. Include fluids!

Post-workout snack

A snack after your workout is key to building muscle mass and speeding up recovery time. Research shows that your recovery may be improved by 100% by getting a 150-300 kcal snack containing carbohydrate and protein (about 3 times the carbo's) 15-30 minutes after activity. Enjoy the energy boost!

* Try yogurt, 1/2 sandwich and fruit, 1/2 bagel with cheese and juice, a meal replacement drink like Sport Boost, or Linda's Power Shakes and Power Cookies (recipe at end of chapter).

It's All About Choice — Your Choice

The key to optimal nutrition is the choices you make. Consider what you're eating, timing of meals and snacks, and why you are eating.

What? What you eat affects your energy level, body composition and health.

When? Timing is everything! When you eat is key to feeling energetic all day long. Think of food as your fuel for optimum performance.

Why? Ask yourself why you are eating - nutritious meals to fuel your mind and body or snack foods to fill cravings? Make choices you feel good about, now and later.

5.3 Make Nutrition Work For You

Sold on the benefits of a balanced meal plan? Let's take a look at what this actually looks like. *Canada's Food Guide to Healthy Eating* can be used to choose the right foods in the right amounts for the balance and variety we need to achieve our goals.

Grain Products 5-12 Servings per day

Example of 1 serving: 1 slice bread, 30 g cereal, 1/2 bagel or pita, 1/2 cup rice or pasta

Choose **whole grain** foods more often. Grains are rich in carbohydrates and fibre, and offer us B vitamins (riboflavin, thiamine and niacin), vitamin E, iron, zinc, calcium, selenium and magnesium. They are a source of low-fat protein although "incomplete" (they lack some essential amino acids).

Vegetables & Fruit 5-10 servings/day

1 serving: 1 banana, 1 potato, 1 carrot, 1 cup salad, Ω cup broccoli, Ω cup juice

By far the best source of **antioxidant vitamins** which help you recover. Sweet tasting, low in calories and good for us! Veggies and fruits are an excellent source of soluble **fibre**, which helps to lower blood cholesterol levels. They also supply us minerals such as potassium, iron, calcium and magnesium. Yellow and orange choices are our best vitamin C and betacarotene sources.

Milk Products &
Calcium-rich foods 2-4 servings/day

1 serving: 1 cup milk, 1/2 cup yogurt, 2 slices processed cheese, 50 g hard cheese

Or try *2 tbsp sesame tahini, 3 tbsp almond butter, 1/3 c almonds, 1 cup cooked kale, bok choy or broccoli, 1/4 cup tofu, 1 cup legumes, 1 cup fortified soy beverage.* A high-quality protein and excellent source of calcium, milk also supplies vitamins A and D, riboflavin and other B vitamins, phosphorus and magnesium. . Low-fat milk has just as much calcium. If choosing calcium-rich foods other than milk regularly include tahini, almond butter, dark green leafy vegetables and tofu with calcium.

Meat & Alternatives 3 servings/day

1 serving: 50-100 g meat, fish or poultry, 1-2 eggs, 1/2-1 c beans, 1/3 c tofu, 2 Tbsp peanut butter

Lean meat and poultry may contain less fat than you think! 90 g (3 oz) of turkey contains 3 g fat - compare to 20 g fat in a regular muffin! Meats are excellent sources of iron, zinc, and protein. An egg is an easy snack with 5 g of fat, iron and vitamin E.

Weight Gain

Gaining weight or maintaining a high weight is important to optimal performance for many athletes. A meal plan that provides several meals and "mini-meals" or snacks through the day is essential.

* The most common limiting factor for athletes wanting to increase their muscle mass is eating too few calories - it is not just protein intake! Try to add one extra 1-2-3 Snack to your day to increase your energy intake by 500 kcal/day to add that 'good weight'.

Weight Loss

No where is there more misguided effort than in the attempts to lose weight! Let's clear up the most widespread myth right away - eating very low dietary fat does not mean your body will lose body fat. Likewise, eliminating all of your carbohydrates will not last in your efforts to perform as an athlete. Any "quick-fix" weight loss strategy can compromise your fluid balance, strength, and leads to rebounding weight gains!

There is a way to lose body fat while maintaining lean muscle mass, strength and power. ***Decrease your energy balance by 500 kcal/day.*** Nutrient balance and timing of meals and snacks through the day are key to successful and lasting body composition changes. It is important to maintain a balance of whole foods while losing weight, to continually provide your body with needed nutrients to continue training while losing weight. A 'diet' is just a nutritional plan like a 'workout' is a training plan. Stick to the plan of balanced eating and you will achieve your goals.

* Expect a body fat loss of 1-2 lbs or 0.45-0.90 kg per week. If you are losing more than that the weight is likely water or muscle.

5.4 Are You Eating Enough?

It's time to take a look at your own eating habits. First, record what you ate yesterday in the space below. Then compare what you ate with fuelling guidelines.

Food Diary	
Breakfast	
Snack	
Lunch	
Snack	
Supper	
Snack	

Handy Serving Guide

Thumbs up! A thumb is about 25 g of cheese, so 2 thumbs equals 50 g or 1 serving.

A fist A fist is about 1 cup (250 ml) or 1 serving of salad, milk or pasta.

A thumb-tip A thumb-tip is about a teaspoon, or 5 ml. Three thumb-tips make a tablespoon, or 15 ml.

A palm A palm is the same size as a serving of meat, about 50-100gm.

Watch your portions!

Fuelling Tips for Athletes

Different people need to eat differently. How much depends on your age, body-size, conditioning level and any special concerns you might have. The food guide recommends a range of servings from each of the 4 groups. You need AT LEAST THE MINIMUM AMOUNT OF EACH FOOD GROUP for balanced eating!

Your optimal number of servings depends largely on your energy needs. See below:

	Grains	Veggies & Fruit	Milk& Calcium	Meat & Alternates
Low Energy activity	5	5	2	2
Most Activity	8	8	2	2
High Activity	15	15	4	4

* Check your food intake against the guidelines FOR ACTIVE PEOPLE below. Remember to consult your dietitian and trainer for personal guidance.

Grain Products **5-15 servings/day**

Vegetables and Fruit **5-15 servings/day**

Milk Products & Alternates **2-4 servings/day**

Meat and Alternatives **2-4 servings/day**

5.5 Design a Meal Plan for You

Using the chart below, follow these simple steps to design your personal meal plan for optimum performance.

Step 1

Consider your training schedule first. If you are juggling work and other commitments, your (precious) workout time may be inflexible. For the example below, let's say you train from 5:00-6:30 p.m.

Step 2

Start with a pre-workout snack. It is best to eat one to two hours before your workout. The snack should include a fruit or vegetable, grain and low-fat protein. Remember to include water before and during activity.

Step 3

Plan a post-workout snack. For best results prepare a snack that contains carbohydrate and protein. See Case E's meal plan for ideas. Drink water.

Step 4

Now build your breakfast, lunch and supper into the pattern. Construct '1-2-3 Energy Packs' at each meal during the day. Use *Canada's Food Guide* and the information above to decide how much food to plan.

Example Meal Plan

AM	Snack	Noon	Snack	Training	Snack	PM
Fruit/Veg Grain Protein* Fluid	Fruit/Veg Grain Protein* Fluid	Fruit/Veg Grain Protein* Fluid	Pre-workout Snack Fluid	Workout 5:00-6:30 Fluid	Post-workout Snack Fluid	Fruit/Veg Grain Protein* Fluid

*choose foods from Milk Products and/or Meat & Alternative food groups = Protein

Your Meal Plan - fill in the chart below.

AM	Snack	Noon	Snack	Training	Snack	PM

Nutrient Analysis of Football Player, Case E

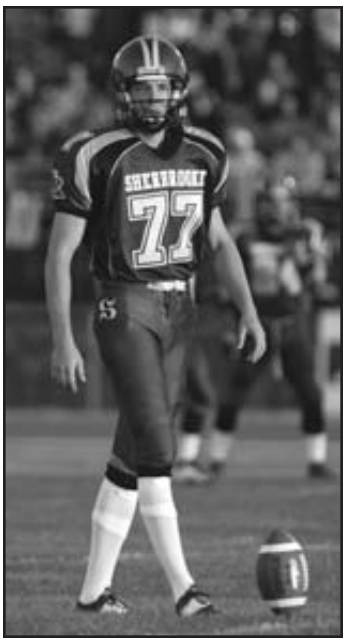
Using nutrient analysis software, we can explore the nutrition, or fuelling plan, of a Football Player. Case E is 20 years, 6 ft. 1 inch and 224 lbs, or 102 kg. His goals are to decrease body fat, while increasing energy, strength and power. His eating habits were terrible – coffee and muffin for breakfast, skipped lunch most days, a large dinner with friends after practice, then snacks in the evening.

Case E consulted with his sport dietitian to learn about food and fuelling strategies, and to develop his optimal nutrition strategy. After just one meeting he ate better and felt better! Take a look below:

Breakfast	2 pouches 83 ml 250 m 500 ml 6	2 cups 1/3 cups 1 cup 2 cups individual	oatmeal cereal, raisins and spice prepared All Bran cereal 2% milk grapefruit juice whole almonds
Snack	1 175 g 250 ml 250 ml 250 ml	.74 cup 1 cup 1 cup 1 cup	Apple low fat yogurt, fruit bottom coffee 2% milk water
Lunch	4 slices 1 can 15 ml 30 ml 1 500 ml	 6 oz. 1 Tbsp 2 Tbsp 2 cups	7-grain bread tuna, water packed light mayonnaise chopped onion grapefruit water
Snack	1 2 slice 30 ml 250 ml	 2 Tbsp 1 cup	Orange whole wheat bread peanut butter water
Dinner	500 ml 250 ml 120 g 15 ml 500 ml	2 cups 1 cup 4 oz 1Tbsp 2 cups	cooked white rice frozen mixed vegetables, steamed eye-of-round steak olive oil water
Snack	500 ml 125 ml 250 ml	2 cups 1/2cup 1 cup	shreddies cereal granola 2% milk

Case E is right on track! Eating 3228 kcal, he is achieving a fuel mix of 22% fat, 20% protein and 58% carbohydrate. Taking in 177g protein, he falls within the recommended 102-204 g protein/day range. Remember – extra protein can become body fat! His fibre intake is excellent at 40 g. He reports feeling energetic and is training well. Good Work, Case E.

5.6 Sports Nutrition Explained



Carbohydrate

Carbohydrates are the body's primary fuel, and are essential for performance and recovery. Carbohydrates are classified by how quickly they provide energy to the body (see Glycemic Index), and by how much fibre they provide. Athletes need to eat about 55-60% of their total daily energy from carbohydrates. WARNING: low carbohydrate diets are not for athletes. They leave you feeling drained and you risk overtraining because you need carbs for energy for training.

'Carbo' foods are broken down into simple sugars and carried to the liver where they are converted either into glucose or glycogen. Glucose that is not used as energy or stored as glycogen is converted to fat and stored as a reserve energy source.

Glycogen is stored in the liver (about 320 kcal) and muscles (1,400 kcal) where it can readily be reconverted into glucose when required by activity. Muscle glycogen is the primary fuel source at the onset of activity. A regular intake of carbohydrate during prolonged activity prevents fatigue by providing fuel directly to the brain and working muscles, sparing muscle and liver glycogen stores.

The *glycemic index (GI)* helps us describe carbo foods. Choosing low GI foods (absorbed more slowly) up to an hour before an event helps maintain the body's energy levels as activity begins. During and after activity, foods with a higher GI (those supplying glucose quickly to the blood and muscles) prolong activity and restore muscle glycogen levels.

Fibre is key to good health and is often lacking in 'Grab 'n Go' foods. Choose high-fibre carbs like whole grain bread, bran, peas, corn, potato with skin, fruit with peel, baked bean, split peas and lentils. Most of us need 25-40 grams of fibre each day.

Glycemic Index (GI) of Some Common Foods

High Gl > 85	Mid GI 60-85	Low GI < 60
Glucose	All-Bran	Fructose
Sucrose, table sugar	Banana	Apple
Maple syrup, honey	Grapes	Applesauce
Bagel	Oatmeal	Kidney beans
Candy	Orange Juice	Navy beans
Corn flakes	Pasta	Chick-peas
Carrots	Rice	Lentils
Crackers	Whole-grain rye bread	Dates
Potatoes	Yams	Peaches
Raisins	Corn	Plums
Bread, white, whole wht.	Baked beans	Ice cream
Soda, non-diet	Potato Chips	Milk
Powerade		Yogurt

Protein

Called "building blocks" of the body, protein is used to build and maintain lean muscle tissue and our tendons, ligaments, skin, hair, organs and blood. Protein is also used for energy during prolonged exercise. An athlete needs about 15% of total daily energy from protein, and can easily meet this requirement using food. Choose high-protein, low-fat sources such as lean meat, poultry, fish, eggs, and legumes and grains.

Not all proteins are created equal - there are essential and non-essential amino acids. Amino acids are absorbed from the intestine and transported through the bloodstream to the various parts of the body. When amino acids are broken down, they have the ability to form glucose and be used as energy during exercise.

The nitrogen component of protein is the key element for growth and repair of body tissues. Our body rids of excess nitrogen through our kidneys which is why excess protein can be harmful to our bodies. When consuming higher protein intakes, it is very important to drink more water to help the body flush the excess through the kidneys. Excess protein can also be stored as body fat.

Many athletes take amino acid supplements or adopt high-protein diets based on the mistaken notion that they need huge amounts of protein to build muscle mass. Studies show that protein intakes higher than 15% daily energy ***do not*** lead to increased muscle size or strength during intensive weight training.

For the average fitness participant 1 g protein per kg BW is recommended, for strength athletes 1.4 kg protein per kg BW, for endurance athletes 1.7 g per kg BW, and for muscle "bulking" no more than 2.0 g protein per kg BW. A strength trainer weighing 180 pounds or 82 kg needs no more than 82-164 g protein per day, related to training goals.

Most of us can easily obtain our complete protein needs from our food. Using the 180 pound or 82 kg trainer above, discover what he eats to meet his daily needs:

Breakfast	2 2500 ml 500 ml	Eggs whole wheat toast oatmeal milk	12 g 5 g 9 g 16 g
Lunch	6 oz 1	tuna bagel	50 g 10 g
Snack 1	175 g 15 ml	yogurt peanut butter	7 g 4 g
Snack 2	750 ml	yogurt shake	24 g
Dinner	250 ml 500 ml	beans pasta	15 g 12 g
		TOTAL	**164 g**

The Fat Nutrient

Fat is important for our energy metabolism, and it is important that we eat enough! It is the body's most concentrated energy source, yet it is not an efficient source of fuel during activity. Fat takes longer to metabolize than carbohydrate and protein, so is used during sustained activity . Fat provides fuel and vitamins essential to activity and health.

As athletes, we need 20-35% of daily calories from fat. Exactly how much depends on your energy needs. For a moderately active young woman a minimum of 45 grams might be recommended; for a football player perhaps 75 grams and for a larger or more active football player perhaps 95 grams!

Most fat should come from unsaturated fats such as vegetable oils and other plant sources, with no more than 10% from saturated fats (mostly animal fats and tropical oils) and trans fatty acids (formed from hydrogenation and found in processed food and shortenings) combined.

Saturated fats can elevate blood cholesterol levels, and thus their intake is limited. Monounsaturated fats are found in poultry, olive, peanut safflower oils and most nuts. Polyunsaturated fat apparently lower the blood cholesterol level and are found in fish, and soybean, corn, canola and flax oils and foods.

For many high-fat (> 30% fat) eating lacks the variety need for optimal nutrient intake, since it is displacing important food groups, such as grain products, and fruits and vegetables. Further, a high fat diet increases blood cholesterol levels and is linked to risk of cardiovascular disease, diabetes and cancer. A diet too low in fat (< 20%) can lead to vitamin deficiency, especially of vitamin E, and leaves you feeling hungry and weaker. Meal plans too low in fat can cause your body to use lean muscle mass as an energy source.

- Simple changes in food choices can dramatically reduce the fat you eat!
- Fats provide two essential fatty acids and vitamins important to health. Omega 3's are found in fish, seafood, algae, and Omega-3 enriched eggs. Omega 6's are found in flax seed oil, canola oil, soybean oil, wheat germ, soy products (tofu, soy milk, soybeans), walnuts and a little in green leafy vegetables.

Vitamins

Vitamins are organic compounds that are found in small amounts in most foods.

Although not sources of energy, they are essential for the optimal functioning of many different body functions. There is a dramatic increase in activity levels of many body functions during and after physical exercise. We need vitamins!

Vitamins are associated with the structure and function of many body enzymes. These chemicals are involved in food digestion, muscle contractions, blood clotting, and many other processes. Some vitamins are purported as ergo-genic aids, or substances, which may enhance one's physical performance.

Vitamins may also operate as hormones or antioxidants. For example, vitamin D, in its active form, functions as a hormone. Vitamins C, E, and beta-carotene may serve as anti-oxidants. These antioxidants serve as bodyguards, protecting us against any damage free radicals may impose on our health or sport performance.

Vitamins are usually identified as either fat-soluble or water-soluble. The four fat-soluble vitamins are A, D, E, and K. As they are found in fat but not water, they are in foods with some fat content, such as grains, oils, nuts and seeds. Unfortunately, some athletes try to eliminate fat from their diets, placing them at risk for energy and vitamin deficiencies. Other athletes overdose on vitamin supplements leaving some vulnerable to toxicity. Once again balance is important.

There are nine water-soluble vitamins, including the eight in the vitamin B complex and vitamin C. The B complex vitamins include thiamin, riboflavin, niacin, B6, B12, folic acid, biotin, and pantothenic acid. It was thought that excess water-soluble vitamins are excreted from the body and considered harmless, although new research is pointing out cautions to this thinking.

It is best to obtain vitamins and minerals **from food** rather than from supplements. Whole foods supply other micronutrients which make the vitamins and minerals more effective. If supplements are to be used, they should not provide more than 100% of the RNI for any nutrient, since there is a risk of toxicity for certain nutrients. Consult your Sports Dietitian for the latest info on recommended nutrient intake information for vitamins.

- Whole foods, especially the fruits and vegetables, contain key compounds not seen inside a vitamin bottle – phyto-chemicals. Vitamins E, D and minerals iron and calcium are most often recommended on campus.

Minerals

Minerals are inorganic elements found in nature. Minerals serve as building blocks for body tissues such as bones, muscles, teeth, blood. They are also involved in regulating the metabolism of muscle contraction (calcium), oxygen transport (iron), blood glucose regulation (chromium, and vanadium), maintenance of fluid balance (sodium), and heart function (potassium). Unlike macronutrients, minerals and vitamins do not act as a source of energy.

Originally from the soil, minerals make their way into the human diet via plant and animal sources as well as drinking water. Because minerals are excreted daily via sweat, feces and urine, it is important they be replaced. Aside from the health implications associated with mineral deficiencies such as osteoporosis, anemia, tooth decay, and cancer, mineral deficiencies can also have negative repercussions on athletic performance.

There are risks in over-consuming minerals. Toxic quantities can normally be obtained only through the use of supplements, not through dietary sources.

* Be sure to include food sources of iron and calcium. Choosing foods other than red meat and milk without replacing iron, calcium and protein can leave you tired, craving carbos and mineral deficient.

Water Balance

Water, one of the three prime necessities of life, is the most plentiful component of the human body. Most of it is digested in the daily foods either as fluid (i.e. water, juice, milk) or as the fluid elements contained in solid foods (i.e. fruits, vegetables, soups).

Approximately 65% of the water in our bodies is contained in our cells, the intracellular fluid. It provides a medium for transport and exchange of nutrients, metabolic by-products, gases, and heat. The rest of the water in our bodies is outside the cells, the extra-celluar fluid, providing form, and a medium for biochemical reactions.

During exercise, athletes may lose significant amounts of water through sweat and exhaled air. Losses of 2.7 to 3.6 kg (6 to 8 lb) of sweat are not uncommon among athletes, and can result in decreased performance. Water loss can adversely effect muscle strength, endurance, and coordination and increases the risk of cramps, heat exhaustion, and life-threatening heat stroke.

To maintain water balance, measure body weight before and after your workouts.

For each 0.45 kg (1 lb) lost, replace with 500 mL (2 cups) fluid. Ideally, athletes should learn to consume adequate fluids during activity so that body weight remains relatively constant before and after exercise.

Healthy adults are encouraged to drink 2-3 L or 8-12 cups of water a day. An athlete might need to drink even more due to fluid losses from exercised induced sweat. Check out the following provides guidelines for fluid replacement:

Guidelines for fluid replacement

Before activity	2 hrs before 5-20 min before	500 ml 500 ml	2 cups 2 cups
During	every 20 to 30 min	250-500 ml	1-2 cups
After	for every lb lost	250 ml	1 cup

- Weighing yourself before and after a workout indicates fluid balance, not body fat change! Drink up before you are thirsty!

Carbohydrate Beverages

Carbohydrate beverages are useful for prolonged bouts of exercise, such as a game. Also known as sport beverages, drinks like Powerade are useful for maintaining blood glucose levels during an event, and for replenishing previously depleted glycogen stores after a long exercise session.

A good sports drink should be approximately 6-9% carbohydrate, which is usually present in the form of glucose, glucose-fructose, or glucose polymers (maltodextrin), and contain a small amount of sodium. These drinks are absorbed quickly and help maintain the blood glucose levels during exercise. Read labels and dilute your beverage if necessary.

Beverages that use fructose as the main carbohydrate source may cause gastric distress in some athletes. Further, it takes more time before they can be used by muscles as a fuel because of the necessary conversion of fructose to glucose. Fruit juice contains mostly fructose sugars!

* Guidelines for how much to drink are the same as those given for water. Taste is an important component of a good sports drink. The better it tastes, the more you will drink! **For exercise lasting less than 1 hour, water is best.**

Alcohol

Many athletes mistakenly believe that once the "high" from drinking is over, so are the effects of alcohol on the body. Alcohol interferes with a multitude of chemical reactions in the body. These negative effects linger long after your alcohol blood concentration has fallen to zero. Reaction time, balance, co-ordination, strength, power, and speed are a few of the physical responses compromised the morning after a night of drinking, even when the drinking is moderate.

How much is a drink? A drink is considered one beer, a 5 ounce glass of wine, or a 1 ounce shot of liquor. To prevent intoxication, a person needs to absorb less alcohol than they can metabolize. For most people, their liver can metabolize approximately 0.5 - 1 ounce of alcohol per hour, which is the amount in one drink.

Do you drink more than one drink per hour? Alcohol that cannot be metabolized right away is sent to the liver. The body stores this alcohol as fat!

* One drink is 5 oz. glass wine = 1 oz. liquor = 1 beer More than one drink per hour results in body fat storage!

5.7 Nutritional Erogogenic Aids

The term ergogenic refers to the process of enhancing work output. Thus nutritional ergogenic aids are natural foods or nutritional supplements which may **possibly** increase exercise performance. Today, we are willing to try almost anything that might help us run faster, last longer, or be stronger. From bee pollen to cows hoofs and from creatine to carnitine, nutritional ergogenic aids are more popular now than ever.

The past ten years has seen an explosion of new research studies attempting to prove or disprove the efficacy of various amino acids, minerals, vitamins, fatty acids, and carbohydrate supplements. Unfortunately, many do not realize that many of these purported aids are unproven, enhanced only by anecdotal and testimonial evidence.

Ask these questions when deciding if a nutritional aid or supplement is for you:

1. Can the supplement in question be attained from a natural food source?
2. Is there any scientific research validating that this aid works and is safe?
3. Is the actual action of the ergogenic supplement useful to your activity goals?

For example, creatine monohydrate has been shown in scientific research to enhance anaerobic performance and various strength measures. Therefore a sprinter may benefit from the supplement while a marathoner will not experience any ergogenic effect.

The following is a list of some of the most popular nutritional ergogenic aids used among university athletes and other groups of active people.

Amino Acids

Amino acid supplements are sold with the promise of increased strength as well as gains in lean muscle mass. In reality, the amount of amino acid supplements, specifically arginine, lysine, and orthinine necessary to cause any elevation in growth hormone are so massive that they often cause diarrhea in research subjects.

Branch Chain Amino Acids (BCAA)

These are a specific group of amino acids which are used for energy during prolonged activity. They include leucine, isoleucine, and valine. Studies show they may be effective at delaying fatigue and increasing time to exhaustion in aerobic activity. However, they might not be effective for your training or competition because they have shown to be useful at activities greater than 90 minutes in length. Dairy sources, such as milk and yogurt, are abundant in BCAAs. No side-effects.

Caffeine

Caffeine is by far the most popular and widely used nutritional ergogenic aid. It can be found in coffee, tea, cocoa, and various carbonated sodas (Did you know Dr. Pepper has more than Coca Cola or Pepsi?). While caffeine has a cascade of effects on the body, its primary actions are stimulation of the central nervous system and fat-oxidation.

It has been proven to be effective in both short-term anaerobic activity as well as longer duration aerobic exercise As of yet, controversy still exists regarding its ability to enhance strength performance.

Caffeine effects everyone differently. Some of the side-effects people may experience include headaches, tremors (the shakes), gastrointestinal distress, insomnia, and addiction. Caffeine is not prohibited by the CIS but is a monitored substance. It is recommended not to consume more than 400mg or 4 medium cups of coffee prior to any game.

Creatine Monohydrate

Creatine is by far the most controversial and well publicized ergogenic aid of the last decade. Although many athletes in a variety of sports swear by it, very few know what it actually does. Simply put, creatine enhances the body's high energy system, which is responsible for fuelling short, explosive, and repetitive exercise up to 30 seconds in duration.

Most studies have used 5 grams of creatine taken 4 times daily for 5-7 days, followed by a single 2 gram daily dose taken indefinitely. A recent study found that individuals taking 3 grams/day for a month and by-passing the loading phase, can reach the same muscle creatine saturation levels as if they loaded for 5 days.

To date, no studies have shown any side effects other than water retention. Ironically, this lone side effect is the primary reason many athletes become hooked. Most, if not all of the immediate weight gain associated with creatine consumption comes from water retention. While creatine is not an equal replacement for anabolic steroids, short-term studies has shown it to be a safe and effective ergogenic aid.

Ginseng and Green Tea

Ginseng, is a very ancient herb that has been used in the Orient for hundreds of years for various medicinal purposes. Its use as an ergogenic aid however, has yet to be proven. Studies have used doses of up to 4g/kg/day for up to 100 days without any side effects (or without any performance effects). Green tea is similar to ginseng and caffeine because it is a mild stimulant. Studies show health benefits but no performance benefits associated with drinking green tea. No side effects are known.

Protein Powder

It is not difficult for an athlete to attain all of the protein they need in their normal diet. In fact, most athletes consume more protein than they actually need. You might use protein powder for a number of reasons:

First, protein powder is convenient. Second, many vegetarian athletes find it difficult to consume enough quality protein to fulfil their needs. Third, the high biological value of most protein supplements, mostly whey protein, ensure the athlete is meeting the body's requirements. Allergies, aversions, and religious practices might also make it logical for an athlete to use a quality protein supplement.

If price is of no concern, try to find a cold air filtered whey powder or, for the more fiscally restrained students, look for whey concentrates whey isolates, egg albumin, or lacto-albumin. Milk and skim milk powder provide excellent protein and are less expensive. Always try to choose food first, and choose something like a protein powder if it fits as part of your overall nutritional plan. Protein powders should not be a replacement for healthy eating.

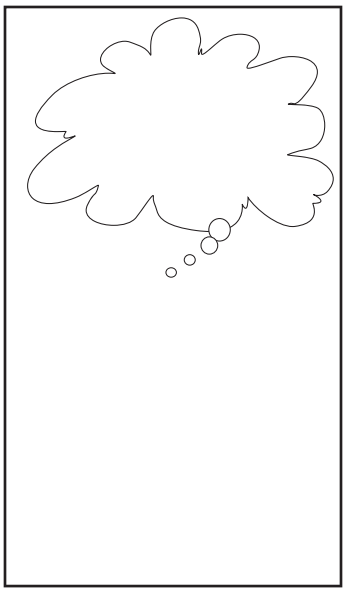
HMB

Beta-hydroxy-beta-methylbuterate, or HMB as it is known, has been gaining more and more popularity due to anecdotal claims and some scientific evidence. Some studies have shown increases in strength and lean body mass with 3 grams a day for 4 weeks, whereas other studies have indicated no benefits associated with its use. For the cost to benefit ratio, it does no seem worth it to invest your money or energy in any speculative claims.

Conclusions

All athletes should realize that nutritional supplements are exactly that, supplements. If they are to be consumed, they should only be consumed as an addendum to, **not in replacement of** a healthy, well balanced diet. Most of your improvements in performance will come from attaining healthy eating practices and planning your nutrition as you would plan your training plan. It does not sound like a 'magic bullet' but there are no magic bullets, only sound eating practices that allow you to train hard and develop as an athlete. Nutritional supplements may be effective if there is some sort of nutritional deficiency or if an athlete has plateaued and is trying to get to that next level; however, no elite athlete gets to the top level without sound, healthy eating. Furthermore, even the most potent nutritional ergogenic aid cannot replace proper training.

5.8 Recipes



Power Shake

1 cup	250 ml	low-fat milk (skim, 1% or 2%) or soy beverage
1/4 cup	63 ml	skim milk powder or protein powder
1 cup	250 ml	low-fat fruit flavoured yogurt
1/2 cup	125 ml	fresh or canned fruit
2 TBSP	60 ml	wheat germ or flax seeds or 1 tbsp flax seed oil

Add ice cubes if desired. Frozen strawberries, peaches and bananas work well. The varieties of this shake are endless – add your favourite fruits and flavours.

Blend together with a power mixer. Makes three 1 cup servings.

Nutrient analysis per serving: 140 cal, 11 g protein, 22 g carbohydrate, 1-10g fat, 1g fibre

Power Cookies

1 cup	250 ml	margarine
1/4 cup	63 ml	wheat germ
1/2 cup	125 ml	peanut butter
1/2 cup	125 ml	skim milk powder
1 cup	250 ml	brown sugar, packed
1 tsp	5 ml	salt
1		egg, beaten
1tsp	5 ml	baking powder
1 tsp	5 ml	vanilla
1 tsp	5 ml	baking soda
1 2/3 cup	190 ml	whole wheat flour
1 cup	250 ml	raisins
1 cup	250 ml	rolled oats
1/4 cup	63 ml	liquid skim milk

Cream margarine until smooth. Add peanut butter, sugar, egg, and vanilla. Beat well. In a separate bowl, combine flour, wheat germ, dry milk, salt, baking powder, and baking soda. Add dry ingredients to the wet ingredients and stir well. Blend in liquid milk, oats, and raisins. Drop cookies onto a non-stick cookie sheet. Bake at 375 F (190C) for 10-12 minutes.

Makes 24 cookies.

Nutrient analysis per cookie: 140 cal, 4 g protein, 24 g carbohydrate, 4 g fat, 2 g fibre

From Nutrition Works: Make it Work for You: Skills, Tips & Recipes by Linda Barton, RD

Chapter 6

The Winning Edge

The Winning Edge

6.1 Introduction to Mental Skills

6.2 Relaxation and Centering

Progressive Muscular Relaxation (PMR) (10–15 min)

Body Scan for Unwanted Tension (2–5 min)

Focusing Strategies (less than 1 min)

6.3 Visualization

6.4 Self-Talk and Self-Motivation

6.5 Examples of When and How to Use Mental Skills

Running Patterns

Vertical Jump Testing

Weight Training or Performing a Maximum Lift

Plyometric Training

Nutritional Goals

Training Goals

Prepared by Lynn Lavallée

6.1 Introduction to Mental Skills

Introduction

Football may be a sport where the bigger, stronger and faster typically prevail, but many football games have been won by the underdog with the right attitude. On the flip side, many football games have been lost through mental mistakes.

Mental skills can give you the right attitude. Mental skills are ways of focusing, thinking, feeling and behaving that enhance your readiness, performance and satisfaction.

The following chapter briefly outlines three basic mental skills, all of which you have probably practised at one time or another. The fourth basic skill is goal setting which is discussed in the chapter, "If You're Staying the Same, You're Falling Behind." Successful athletes practice these mental skills regularly and make them part of their routine.

Becoming aware of the mental skills you already use and enhancing how you use them will set you apart from other athletes. You will be more focused and motivated. You will have self-confidence and you will be ready for any situation that may arise.

This chapter offers a brief and simple introduction to mental skills. Throughout the manual you will notice mental strategies indicated by clouds.

6.2 Relaxation and Centering

What is it?

Relaxation and centering is the ability to control physical and mental intensity achieving the appropriate level of intensity for your particular sport.

When is it used?

There are different forms of relaxation ranging from achieving a very restful, relaxed state (not optimal just before a game) to centering which can be used quickly during a game to refocus or in weight lifting prior to performing a maximum lift.

What is achieved?

Relaxation teaches the difference between tense and relaxed muscles. Relaxation may help you identify where you hold your tension. For example, many people hold tension in the shoulder region or jaw area.

Practice

Practice is required in order to perfect relaxation and increase body awareness. This increased body awareness will allow you to identify areas of tension in your body and may help you when you need to relax or focus quickly during testing or a game.

Deep Relaxation (10-15 Minutes)

Progressive Muscular Relaxation (PMR)

PMR helps you learn what tense muscles feel like and allows you to identify areas of increased tension. You can practice this when you have 10–15 minutes, perhaps before bed. You should be in a quiet place free from distraction and in a comfortable position. PMR involves the tensing and then relaxing of each muscle group. Tension is held for 5–8 seconds. Don't worry about counting, just feel the tension and then let it go. Notice the difference between the relaxed and tense state.

Note:

If you have an injury or a problem area you may not want to tense this area with excessive force.

- Slowly count up to five breathing in, fully expanding your chest and stomach, hold it briefly, and slowly exhale counting down from five – REPEAT TWICE
- Think about one word that relaxes you and repeat this word, eliminating all other thoughts from your mind (e.g. serene)

- Think about a place where you feel very relaxed and imagine yourself there (e.g. by the ocean)
- Begin with your right leg – tighten all the muscle in your leg and point your toe, (5–8 seconds) feel the tension, and relax. Notice the difference between the relaxed and tense state – REPEAT TWICE
- Tense your left leg, hold it then relax – REPEAT TWICE
- Tighten your stomach and lower back muscles, relax – REPEAT TWICE
- Shrug your shoulders, relax – REPEAT TWICE
- Flex your right arm, tightening the biceps, then relax – REPEAT TWICE
- Flex the left arm, tighten it then relax – REPEAT TWICE
- Clench your jaw, wrinkle your forehead, and relax – REPEAT TWICE
- Repeat your relaxing word and take yourself to your relaxing place.
- Take a slow deep breath, counting up to five, hold and exhale counting down from five – REPEAT

You may find it helpful to focus on your breathing, a single word or comforting scene in order to free your mind from intrusive thoughts.

Body Scan for Unwanted Tension (2-5 Minutes)

Many people are uncomfortable with the above noted PMR form of relaxation. Alternatively you can perform a body scan, progressing through as above from head to toe but omitting the tensing aspect. The breathing component is still a crucial part of this body scan. Practising this form of relaxation is important in developing body awareness. You will soon be able to do a quick body scan, think of a relaxing word and release unwanted tension taking yourself to your optimal level of intensity for each performance.

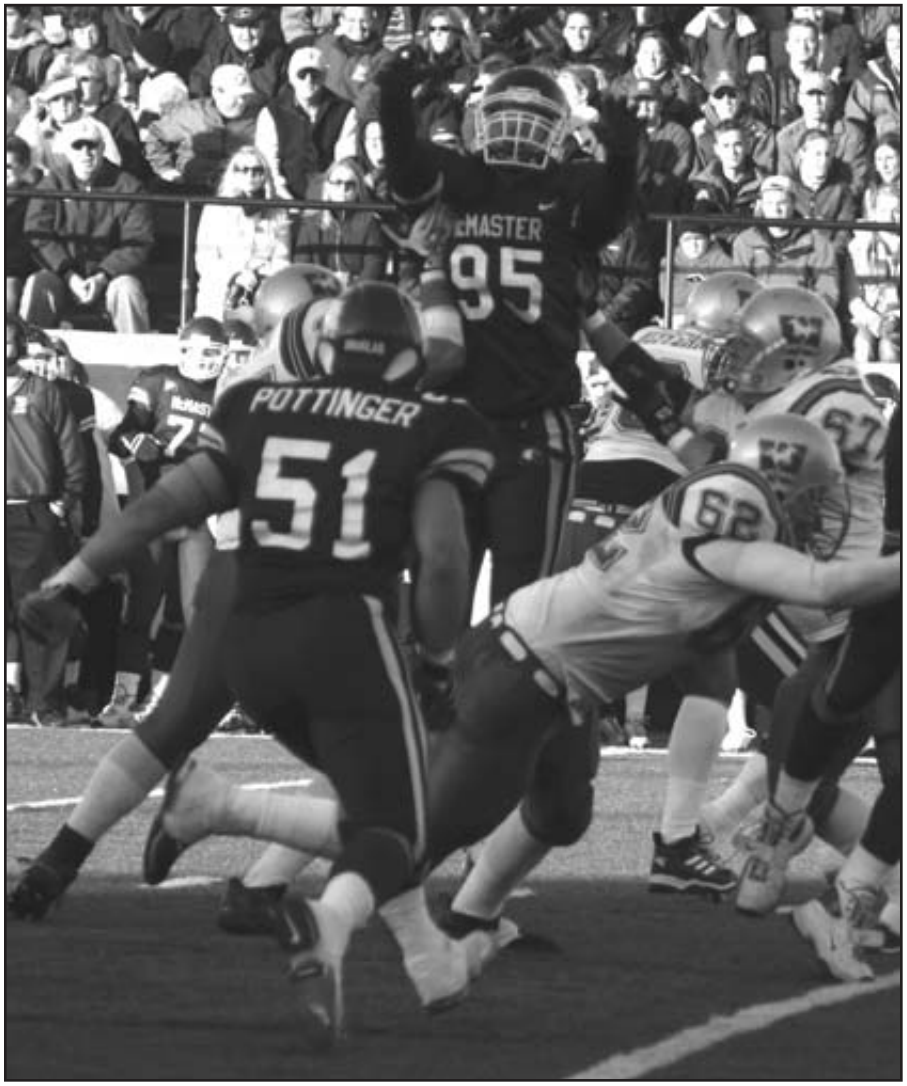
Focusing Strategies (Less Than 1 Minute)

Centering to calm down

- Focus on your breathing, taking deep slow breaths, counting up while breathing in, hold, then count down while breathing out slowly.
- Scan your body for tension, feel the tension leaving your body.
- Repeat a word or thought that relaxes you.
- Think about the task at hand.

Centering to increase energy

- Focus on your breathing, this time taking strong full breaths.
- Imagine energy flowing into you when you inhale, working its way through your body, preparing you to play. Using your imagination, come up with your own personal image to prepare yourself to play. This skill can be used prior to performing a maximum lift in weight training, or during interval speed work.



6.3 Visualization

What is it?

Visualization is practising a skill or event in your head.

More than likely you have already visualized to some extent to prepare for football. You may have rehearsed a play in your head or gone through the techniques of football fundamentals, such as catching or blocking. Most athletes do visualize, but more successful athletes report a more elaborate use of visualization. These athletes imagine a situation as though they are actually performing it. They not only see it, they feel it within their bodies, they hear the sounds associated with specific situations and they smell the fresh air if outside. They imagine the emotions they experience in certain situations.

Here is an example of a corner back who visualized a play going deep into his zone. He practices this play over and over to gain control over his 'panic stricken' state during a play such as this.

"It's 3rd and 20 on the 30 yard line. I know the play is coming my way. I'm ready. The ball is snapped. I can feel myself turning, running fast as my cleats dig into the grass. I hear my team-mates yelling, "Ball! Ball! Ball!" My heart kicks in, the adrenaline rush, almost panic, but I'm in control. I'm stride for stride with the receiver! He's looking. I'm on the inside. I turn my head. Interception!"

Here are a few guidelines to follow when visualizing:

- In order to get comfortable with imagery you have to practice it regularly.
- Try to incorporate all your senses (see it, feel your body moving, feel the emotions, hear the sounds, smell the smells).
- Always visualize the perfect performance, perfect physical and mental practice makes perfect.
- Imagine an event in the actual time it takes to execute. If you are visualizing your 40 yard run imagine it in the time you want to attain it.

Throughout the manual you will see clouds which contain examples of how you can use visualization throughout your training.

6.4 Self-Talk and Self-Motivation

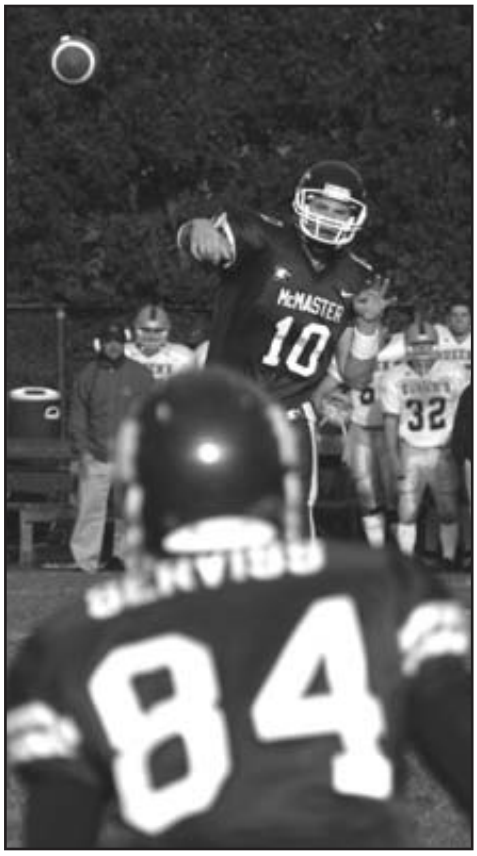
Thoughts influence our actions and how we feel more than most people believe. Think about a situation that really irritated you, and you'll find yourself getting angry. Similarly, think about a situation that has made you really happy, and you'll find yourself feeling pleased. If you allow negative thoughts to dominate without countering them, you will fulfil that thought into feeling and action.

Everyone has negative thoughts. What distinguishes the successful athlete is how the thoughts are dealt with. Negative thoughts are important in sport, particularly in the analysis of skill. For example, if you make an error during a game you may think about what you could have done to correct it, then move on. If you dwell on a mistake it will distract you. If you learn to let go you will be better able to focus on the task at hand.

As with goal setting, you cannot simply make a general positive affirmation such as, "We're going to win!" **You have to believe it!** If you simply repeat something that you do not truly believe, if you do not believe in your abilities, you will not succeed.

Throughout this manual you will see clouds, which contain examples of how you can use self-talk throughout your training.

Remember that after a bad play there is nothing you can do about it – except focus on not making the same mistake twice.



6.5 Examples of When and How to Use Mental Skills

Running Patterns

As you become more proficient with running the patterns try this. Think EXPLODE! Say it to yourself. Then imagine your team-mates and/or opponents while running the pattern. You hear and see only what is relevant to executing the pattern correctly. Take it one step further and imagine a game situation.

Vertical Jump Testing

Close your eyes just before attempting the jump. Take a deep breath and imagine transforming yourself into a rocket or a super hero with incredible jumping power. Find an animated analogy that works for you. As you explode off the ground and reach up imagine yourself as your animated creature EXPLODING UP!

Weight Training or Performing a Maximum Lift

Before attempting a maximum lift, focus yourself. Close your eyes, taking full breaths. Imagine strength seeping into you with each breath, going to your chest and arms. When you're ready lift the bar, controlling it on the way down and imagine the energy that you inhaled pushing out through your chest and arms on the way up. Imagine this energy flow with each repetition.

Plyometric Training

Find a word that you can repeat to yourself that will help you explode with each bound. It could be EXPLODE or POWER. It can even be a sound. Imagine yourself as a kangaroo or some other creature. Combine this animation with your word. Well a kangaroo doesn't really explode, but you get the picture!

Nutritional Goals

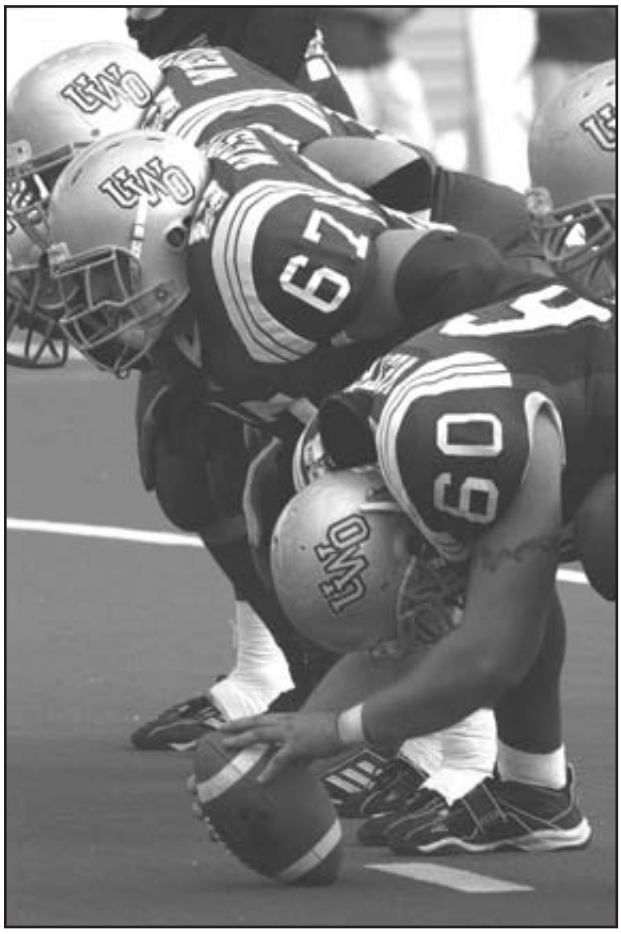
Set a goal for a daily minimum intake of water! Make designing your meal plan one of your off-season goals!

Training Goals

Set goals that you have direct control over for each training phase. For example, setting a goal to be a starter may not always be within your control. Being a starter may be the outcome of the steps you take in achieving this goal. Goals such as becoming a master of all the plays at camp and sticking to your off-season conditioning lead to the outcome goal of starting.

Chapter 7

Game Day Preparations



Game Day Preparations

7.1 The Final Touches

Now is the time. Its moments before kickoff. You are ready. You have trained hard in the off-season and came into camp in shape. You improved your strength in the gym, and improved your speed, quickness and agility with plyometric, sprints and sport-specific drills. You worked on your flexibility, shoulder external rotator cuff and back stabilization exercises and feel more solid than you ever have in your life. You worked on your nutrition to increase your lean mass and reduce your fat levels, and now you feel fit and powerful on your feet. You worked on your speed during the week in practice and maintained your strength with some brief intense workouts in the gym. You feel bigger, stronger, faster and better than you ever have.

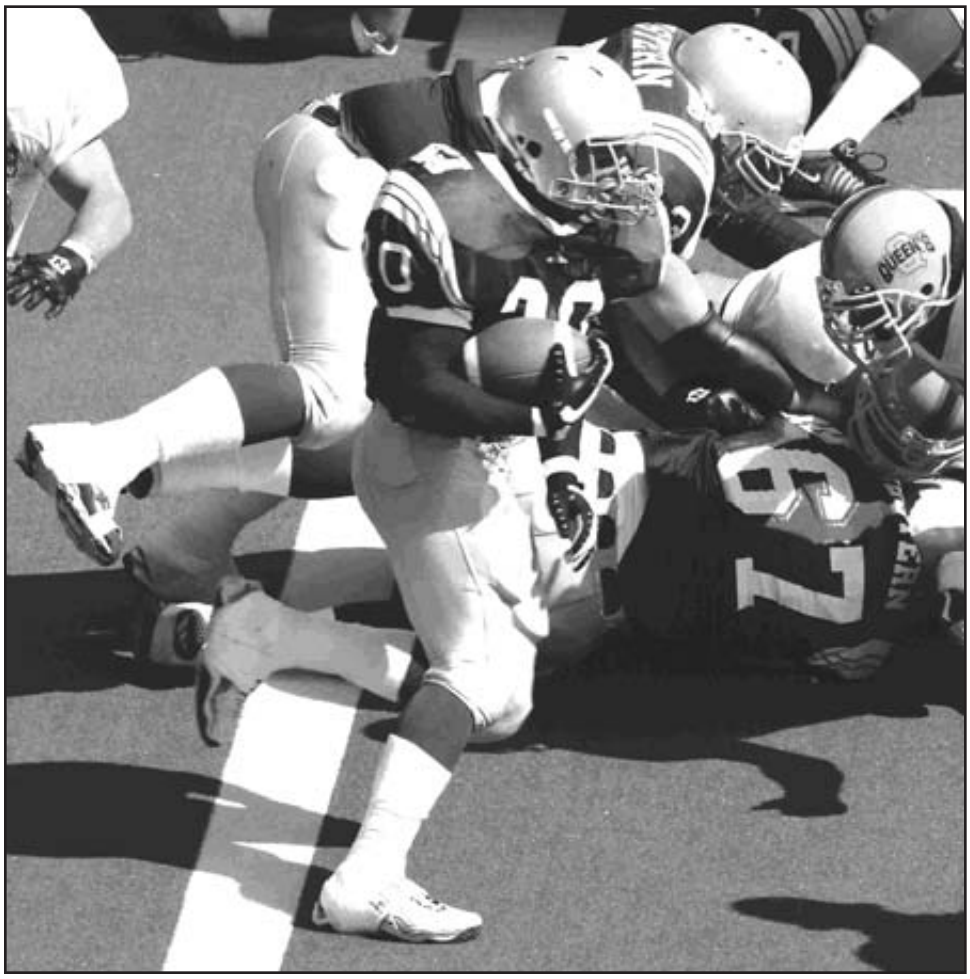
You learned to relax your mind and body with progressive muscular relaxation and had a restful sleep last night before the 'big game'. You visualized the plays and your great performance in your head last night, and feel confident that you can perform at your best. You had a good meal the night before the game, making sure that you have gas in the tank to play all out for the entire 60 minutes.

Just before the game, you had your small pre-game meal and feel energized for the big game. In the dressing room, you took a few moments to focus your thoughts, then energized yourself with some deep breaths and centering your mind to fill your body with energy.

This is it. This is what its all about. You are ready. You are ready to fly. There's the whistle. Here comes the kick.

Its mine, all mine.

Appendix



Appendix A

Appendix A

List of Exercises

Appendix B

Exercise Techniques Check Lists

Appendix A: List of Exercises

Listed alphabetically under upper body, midsection and lower body sections.

Upper Body

Arms

Biceps curls

Dumbbell biceps curls

French curls

Preacher curls

Towel chin-ups

Triceps pulldowns

Chest

Bench press

Dumbbell bench press

Hammer grip dumbbell incline

Incline bench press

Incline dumbbell press

Lying pullovers

Narrow grip bench

Back – Upper

Bent-over-rows

Incline bench pulls

One arm dumbbell rows

Lat pulldowns (lats) (WBN — wide behind neck)

Seated rows

Shrugs

T-bar rows

Shoulders

Overhead neck press

Dumbbell shoulder press

Front deltoid raises (hammer grip)

Hammer grip front deltoid work with footwork

Lateral deltoid raises

Reverse flies (rear deltoid raises)

Midsection

Abdominals

Bench leg tucks

Chinnies (bicycle abs)

Curl ups (abs)

Front static hold

Side supports

V-sits

Lower Back

Back extensions

Back extensions with twist

Goodmornings

Lower Body

Legs

Calf raises

Deadlifts

Drive ups

Drive ups with leg exchange

Drop jumps

Hamstring curls (Hams)

Lateral squats

Leg press

Seated calf raises

Squats

Split Squats

Standing calf raises

Squat jumps

Stiff legged deadlift

Olympic-Type Lifts

Clean pulls

Hang cleans

Hang pulls

Power cleans

Push press

Rotator Cuff

External rotation work

Appendix B: Exercise Technique Check Lists

Listed alphabetically under: upper body/ midsection/ lower body

Upper Body

Bench Press

The strongest of the presses, this exercise is used as a reference to determine weight for the other presses. Both the pectorals and triceps muscle are recruited depending on the width of the hand placement or grip.

Narrow grip

- uses more tricep than pec
- easier on shoulders, more stressful on elbows
- large ROM
- because it focuses on a smaller muscle group (triceps) it is a weaker lift

Wide grip

- uses more pec than triceps
- more shoulder stress, less elbow stress
- smaller ROM
- because it focuses on a larger muscle group (pecs) it is a stronger lift

To Start

Evenly load the bar and use safety collars

Lie on bench with eyes positioned directly under the bar

Set the shoulders:

- pull shoulder blades together
- stick out chest and pull shoulders down towards the butt
- there should be a slight arch in the lower back

Assume a proud squat type position and then hold it as you lay down:

- feet should be flat and firmly braced on the floor
- head should be resting on the bench
- butt always stays in contact with the bench grip width choice ultimately determines which *style* of bench is done

Set the grip:

- width dependent on what muscles you want to work
- overhand (pronated) grip, with the thumbs securely around the bar
- false grip: the thumbs are under the bar and it is very dangerous as the bar could easily slip off and land on the chest
- wrists locked straight

Round House Style:

- employed if using a middle to narrow grip
- bar does not move in a straight up and down path, but rather a curved path because elbows are tucked in at sides
- most common mistake with this method is not driving the bar back over the eyes into a strong lock out position

Straight Line Style

- employed if using a middle to wide grip
- bar travels straight up and down
- elbows are out wide to the sides forming a 90 degree angle

The Descent

- lift the bar off the rack and lock it out
- inhale and hold breath as you lower the bar
- bar is lowered slowly and in a controlled fashion to the breast line
- chest is gently touched, do not bounce the bar off the sternum
- anticipate the change of direction; think up before the bar is all the way down
- body is held tight throughout
- no movement
- feet remain firmly braced
- butt stays down on bench

The Ascent

- want to explode out of the bottom position, no hesitation
- ease bar into lock out, do not wham the bar up, you may hyper extend elbow joint
- once bar is out of bottom position and on the way back up, begin to slowly exhale
- if you hit a **sticking point**, BREATHE
  - holding your breath will not help and can be dangerous most of the time,
  - a slight exhalation at the sticking point will get you through it,
  - employ the BIG BAD WOLF TECHNIQUE: huff and puff the bar up,
  - once arms are fully extended and set completed, place bar back into rack

Spotting

- spotter's job is to assist the lifter
- bar should never stop moving
- take only as much weight as is needed to keep the bar moving
- stay alert and be in the ready position

One Spotter

- assume a shoulder width stance with feet slightly staggered
- bend the knees
- keep back tight
- use both hands
- grip should be alternated (one hand over, pronated; one hand under, supinated)
- keep the bar moving

Two Spotters

- one either end of the bar
- positioning same as the single spotter, except feet are not staggered

Three Spotters

- one takes the centre of the bar; other two take either end

Shoulder Press

This exercise can be done with the bar in front of the body (anterior) or with the bar behind the neck (posterior). It is recommended to start off behind neck for posture reasons and to help strengthen the posterior side of the shoulder that is often neglected. This can be done in a seated or standing position. It is recommended to start in a seated position with your back supported for safety. Be careful not to strain the shoulders with a behind-neck press. If you have shoulder problems it is better to do the shoulder press with dumbells instead of a bar.

Seated

- use high back chair so back is fully supported
- both shoulders and butt should stay against the back of the chair at all times
- there will be an arch in the lower back as want to be in a proud strong position
- feet should be flat and firmly braced on the floor

Standing

- feet shoulder width apart
- knees slightly bent and remain bent throughout lift
- if you extend the legs, you are using legs to help with the lift and cheating
- if you straighten, you are more prone to hyper extending the back possibly causing injury
- chest out, shoulders back; proud position

Strength of the lift is variable

- *posterior position is weaker*, working predominately posterior deltoids and triceps; there is also some latissimus dorsi involvement
- *anterior position is stronger*, working predominately anterior deltoids and triceps; there is also some latissimus dorsi involvement breathing pattern is the same as bench press: suck weight to you, blow weight away spotting same as bench press

Military Press

- hands are slightly wider than the shoulders; a narrow grip
- use an overhand (pronated) grip with thumb securely around the bar
- bar is lowered slowly in a controlled fashion to the anterior deltoids (front)
- bar follows a curved path down from lock out over shoulders, around head, and into the anterior deltoids
- to lower the bar elbows are flexed and move forward to be tucked in to the sides
- depending upon the individual, the weight should be 60-80% of bench press

Behind the Neck Press [BNP]

- use a medium width grip
- elbows should form a right angle
- use an overhand (pronated) grip with thumb securely around the bar
- bar is lowered in a controlled fashion straight down behind the head to just below C7 (top of shoulders)
- depending upon the individual, the weight should be 50- 70% of bench press

Upper Back

- part of the CORE exercise grouping
- any exercise that pulls the shoulder blades together
- the exact opposite exercise movement of the presses
- important to maintain agonist-antagonist balance
- easiest way to maintain body balance is work in opposites or push-pull
- not only need to work this area to balance the presses but also to strengthen the area that supports all the squats
- if the back is not strong enough to hold sufficient weight to work the legs when squatting, you will not see any improvements (the back is usually the limiting factor in the squats)
- the primary muscles worked when doing upper back exercises are the latissimus dorsi, trapezius and rhomboids

Seated (Cable) Rows

- done on a universal machine
- a very simple and effective exercise

To Start

- assume a seated position with knees bent, chest out and shoulders back (proud)
- keep back (trunk) vertical throughout lift except when initially getting weight and when returning weight once the set is finished
- use an overhand, pronated grip with thumbs securely around handles or bar

To Lift

- initiate the movement by retracting (squeezing together) the shoulder blades, then pull elbows out and tuck into the sides (shrug & pull)
- inhale as weight is moving towards you, exhale as the weight is moving away from you (suck weight to you, blow weight away)
- speed of pull towards body is faster than movement of bar away from the body
- allow arms to fully extend as weight moves away, then re-initiate the shrug and pull
- keep torso vertical and tight throughout lift

Lat Pull Downs

This exercise is also done on a universal machine and can be done seated or kneeling.

Seated:

- allows for a greater ROM
- more difficult to get into and out of position
- be sure to always keep good posture; chest out, shoulders back, sit tall
- cheating if you bend forward and use abs
- stay straight & tall

Kneeling:

- ROM may be decreased for a very tall person
- easier to get into and out of position
- can kneel on both knees, or have one knee down and the other leg out in front as in a split squat type of position
- be sure to always keep good posture; chest out, shoulders back, sit tall
- cheating: bending forward and using abs
- cheating: drop hips down and using legs
- stay straight & tall
    - can be done with a wide or narrow grip
    - can be done bringing bar to the front (anterior) or to the back (posterior)
    - while you can have any combination of grip and front/back the most common are:

wide grip pull down (WF) :

- use an overhand (pronated) grip
- grip should be as wide as possible
- want to pull weight bar down to the clavicle
- keep hips forward and lean back slightly

narrow grip front pull down:

- use an underhand (supinated) grip
- grip is typically shoulder width, but can be narrower
- want to pull weight bar down so elbows tuck completely into the sides

- regardless of whether wide behind neck or narrow in front, the pull should always be initiated with the elbows not the hands (if pull with hands will use too much biceps)
- inhale as weight is moving towards you, exhale as the weight is moving away from you; suck weight to you, blow weight away
- speed of pull towards body should always be faster than movement of bar away from the body

Midsection

- is the total core trunk (torso) area
- includes both abdominal and back extensor (lower back) work
- for strength limited working range; maximum 20 reps, minimum 10 reps
- if you do more than 20 reps there is no strength benefit as this is endurance work
- if you do less than 10 reps the intensity of the work is such that the injury risk may out weigh any potential benefits
- it is critical to sport performance that this area is developed
- the midsection is the connector unit between the lower and upper body
- if it is weak the forces you are generating cannot be transferred or are absorbed depending upon the nature of the activity
- the midsection is the main stabilizer that allows heavy squat or pressing work to be done
- a weak midsection may limit your ability to develop stronger legs and arms
- because of the injury potential and severity of any injury in this area, all movements should be done in a slow and controlled fashion

Back Extension Exercises

- this exercise should be called back extensions not hyper extensions as the back should never be hyper extended, due to the risk of injury
- **safety** always has to be the overriding consideration in training
- you train to get better, not to get injured
- if have an option between an exercise that does the same thing with less injury risk, always choose the safer exercise
- the slightest imperfection of movement with these lifts can lead to severe back injury

To Start

- use a proper extension bench
- lie down, hooking both feet securely under ankle support
- slide forward so are able to completely bend forward at the waist
- if using a weight for added resistance hold it on the chest, not behind the head as it puts unnecessary strain on the neck

To Lift

- raise shoulders up so that the back and shoulders form a straight line
- shoulders should not raise above butt level
- inhale, sucking self up
- slow controlled raise
- can hold at top level position for varying times to make work harder

To Lower

- exhale
- lower slowly under control

Abdominal Exercises

- only limited by your imagination
- use own body weight, or an added resistance (weight or medicine ball)
- can mix contraction types, either used in isolation or in combination
- isometric: holding contraction for a given time period
- eccentric: very slow lowering (i.e. 8 second count to lower)

Note: see back stabilization exercises

Three Rules for Abdominal Work:

1. **NEVER HOOK FEET**: hooking the feet promotes the use of the hip flexors which pull the lower back into hyper extension
2. **KNEES MUST BE BENT**: if you do work straight legged, lower back stress is significantly increased
3. **ORDER OF WORK**: working from hard to isolate to easy to isolate
   - lower abs must be worked first
   - obliques worked second,
   - middle-upper abs worked last

Lower Abdominals

- is the toughest area to work without lower back stress, as hip flexors are used
- any movement where the knees are moving toward the chest works lower abs
- inhale, sucking knees to chest, exhale as knees move away from chest
- recommend you work from a hanging position as it puts less stress on the lower back
- must be worked first as it is the weakest area and requires the obliques and middle-upper abs to act as stabilizers which they can not do if already fatigued

Obliques

- any movement with a twist, or side to side action will work the obliques
- with all twisting actions the hips should be locked so that the movement occurs only in the trunk area
- inhale on the lengthening (eccentric) phase of the exercise, exhale on the shorting (concentric) phase of the exercise

Middle-Upper Abdominals

- any action where chest is moving towards the knees will work this area
- exhale on the up (concentric) phase, inhale on the lower (eccentric) phase
- do not clasp hands behind neck or pull on the head

Lower Body

Clean Pulls

- this explosive lift is a modified version of the power clean
- the weight is lifted from the floor to shoulder height but not racked on the deltoids and lowered back to the floor.

Before Beginning

- designated area assigned to exercise
- a wood platform with rubber area for weights is the best
- no loose plates in area; area is clean and neat
- Olympic straight bar with revolving sleeves
- evenly loaded bar with collars

To Start

Stance

- shoulder width or slightly narrower
- feet flat
- toes slightly pointed outward
- shins touching bar
- knees inside arms
- back arched and rigid; chest out, shoulder blades pulled back
- head up, looking straight ahead
- shoulders over bar or slightly ahead of the bar
- butt down

Grip

- overhand, slightly wider than shoulder width, with thumb around bar
- arms straight, elbows pointed to side

Breathing

- inhale slowly so lungs are fully inflated at start of first pull

First Pull

- smooth, slow, pull off floor; ease the bar off the floor
- DO NOT JERK BAR AWAY FROM THE FLOOR
- push into floor with legs, knees extending
- shoulders and hips raise at the same speed
- angle of the back remains constant
- do not pull with back
- keep shoulders over bar
- keep back tight
- bar drags up the shins
- bar path is a perfectly straight line
- bar does not move around the knees
- if extension of knees correct, knees are moving backwards, so bar will clear the knees

- if bar hits knees it is a sign of pulling too soon with the back
- arms should be perfectly straight
- breath is held

Second Pull

- begins once bar has cleared the knees
- knees re-bend and move back under the bar
- should feel the bar on the quads
- shoulders stay over the bar as long as possible
- hips also move forward under the bar
- need to get hips under so can execute the jump
- JUMP: once hips under; rapidly extend both knees and HIPS
- jump straight up
- do not break vertical plane backwards with shoulders
- want complete body extension
- body = straight line
- want to get off the ground
- arms straight until bar at top of thighs and jump is initiated
- once jump initiated; SHRUG shoulders into ears (Don't Know), then **PULL**
- **pull**: elbows move rapidly straight up & out
- do not drop elbows or pull back with elbows = cutting pull
- keep elbows over wrists
- cutting pull will result in a reverse curl
- pull should come chest-line high
- breath is held

Lowering

- lower bar exactly the opposite way it was raised
- bar from shoulders to top of thighs
- as bar slides down thighs to knees, slide your shoulders back over bar
- once bar is at knees, sit and lower bar to floor with legs
- incorrect lowering of bar accounts for 95% of all power clean injuries

Hang Pulls

- in this version of the **clean pull** the weight is not lowered to the floor after each rep but comes to rest on the thighs just above the knees.
- on the first rep the athlete may lift the weight from the floor to the "hang" position using the technique described under **first pull** or the weight already be positioned at knee height supported on two boxes.
- the weight is only lowered to the floor after the final rep
- see the following sections under **clean pulls**
  - before beginning
  - to start
  - first pull
  - second pull
  - lowering

Power Cleans

Considered by many to be the primary power/strength exercise … the other olympic type lifts described here are all versions of the power clean and the following are the instructions in their entirety:

Before Beginning

- designated area assigned to exercise
- a wood platform with rubber area for weights is the best
- no loose plates in area; area is clean and neat
- Olympic straight bar with *revolving sleeves*
- evenly loaded bar with *collars*

To Start

Stance

- shoulder width or slightly narrower
- feet flat
- toes slightly pointed outward
- shins touching bar
- knees inside arms
- back arched and rigid; chest out, shoulder blades pulled back
- head up, looking straight ahead
- shoulders over bar or slightly ahead of the bar
- butt down

Grip

- overhand, slightly wider than shoulder width, with thumb around bar
- arms straight, elbows pointed to side

Breathing

- inhale slowly so lungs are fully inflated at start of first pull

First Pull

- smooth, slow, pull off floor; ease the bar off the floor
- DO NOT JERK BAR AWAY FROM THE FLOOR
- push into floor with legs, knees extending
- shoulders and hips raise at the same speed
- angle of the back remains constant
- do not pull with back
- keep shoulders over bar
- keep back tight
- bar drags up the shins
- bar path is a perfectly straight line
- bar does not move around the knees
- if extension of knees correct, knees are moving backwards, so bar will clear the knees
- if bar hits knees it is a sign of pulling too soon with the back

- arms should be perfectly straight
- breath is held

Second Pull

- begins once bar has cleared the knees
- knees re-bend and move back under the bar
- should feel the bar on the quads
- shoulders stay over the bar as long as possible
- hips also move forward under the bar
- need to get hips under so can execute the jump
- JUMP: once hips under; rapidly extend both knees and HIPS
- jump straight up
- do not break vertical plane backwards with shoulders
- want complete body extension
- body = straight line
- want to get off the ground
- arms straight until bar at top of thighs and jump is initiated
- once jump initiated; SHRUG shoulders into ears (Don't Know), then **PULL**
- **pull**: elbows move rapidly straight up & out
- do not drop elbows or pull back with elbows = cutting pull
- keep elbows over wrists
- cutting pull will result in a reverse curl
- pull should come chest-line high
- breath is held

Rack & Recovery

- once off the ground, keep body straight and everything as high as possible
- quickly shift feet laterally so they are shoulder width apart
- quickly rotate elbows forward and up, under the bar, so upper arms are parallel with the floor
- land flat footed, absorbing the impact; knees bent; elbows up; bar on anterior deltoids
- do not place bar on deltoids
- bar line should fall through the middle of the quads
- keeping back tight, stand up straight
- slowly exhale
- relax only when back in a fully extended position

Lowering

- re-inflate; breath in and hold; back tight
- lower bar exactly the opposite way it was raised
- bar from shoulders to top of thighs
- as bar slides down thighs to knees, slide your shoulders back over bar
- once bar is at knees, sit and lower bar to floor with legs
- incorrect lowering of bar accounts for 95% of all power clean injuries

Squats

The best basic CORE exercise to develop leg strength and power

- must always do single leg work before double leg work
- use of a weight belt helps to stabilize midsection, but will not prevent injury

Key Don'ts

- never wrap knees
- will help to lift more weight, but causes destabilization of knee and promotes chondromalacia
- never wrap the bar with a towel
- need to feel where the bar is
- the bar could slip with a towel
- never lower to a bench or chair
- need to feel positions and react accordingly
- every time the glutes "touch" the chair, vertebral discs are being compressed
- the touching promotes leaning forward (hard to keep midsection tight) so stress on back is increased
- never allow your hips to shift backwards
- hips should always be moving forwards and upwards
- if hips are allowed to shift backwards it increases forward lean and stress on back

Must Do's

- must always lower to at least parallel
- parallel = bottom of thigh parallel to floor
- hamstrings are only effectively worked when at least parallel
- the greater the range of motion (ROM) the greater the power potential
- only when joint worked through full ROM is its strength and stability increased
- speed of descent is never faster than speed of ascent
- you want a smooth transition out of the bottom position
- no bouncing
- think up before all the way down
- before starting must have developed a strong midsection
- before starting must have good full body flexibility (especially in the shoulders, hips and ankles)
- always use a power rack and have a spotter
- must always use safety collars
- collars prevent the weights from sliding, thus reducing risk of injury

Back Squat

- is the strongest of the squat lifts
- used as the reference for selecting weights for the other squat lifts
- works primarily the glutes, quads and hams
- almost every muscle is used in the lift as a stabilizers

Before Beginning

- load bar evenly and put safety collars on
- bar approximately at breast line height

To Start

- place hands evenly, in an overhand grip with the thumb around the bar
- hands should be slightly wider than shoulder width
- step under the bar with both feet so hips are directly under the shoulders
- stick the chest out and pull the shoulders back
- creates a natural groove across the posterior deltoids and trapezius
- inhale and tighten torso
- torso must be tight before taking bar off the rack
- keep the head up and eyes focused straight ahead
- lift the bar off the rack with a straightening of the legs, take one step back
- place feet approximately shoulder width apart, toes ever so slightly flared outwards
- with proper lifting boots or great ankle flexibility feet should be flat on the floor
- if you don't have the flexibility, you need to work and develop it
- elevate just the very backs of the heels on a board
- if flexibility really bad, may have to double elevate
- heels should not lift off floor/board during lift
- feet should not be moving during the lift

The Descent

- should be inflated and holding breath throughout descent
- start descent by pushing knees forward and sitting hips down

- do not push knees out passed the toes; just over the toes
- chest out, shoulders back (proud position), lower back tight position held at all times
- weight stays over the heels
- do not allow weight to shift forward over the toes
- drive elbows in under bar to help keep proud position
- controlled slow lower until thighs parallel with floor
- so that transition out of the bottom position is smooth, need to anticipate the change of direction, think about coming up before all the way down

The Ascent

- once parallel position is reached, you want to explode up out of bottom position
- no hesitation in the change of direction phase
- get out of the bottom as fast as possible
- hips are driving under the bar (moving up and forward at all times) while shoulders are driving back
- this combination of movements keeps tight posture and protects the back
- counters the tendency to lean forward
- the drive of hips and shoulders never goes past the vertical plane
- feel the push down into the floor, feel the push through the heels not the toes
- speed of ascent must always be faster than speed of descent
- power out of the bottom position then ease into lock out
- do not want to hyper extend the knees
- breath is held until about a 3/4 squat position, then slowly exhale
- being inflated (inhaling and holding breath) helps to keep midsection tight
- if you exhale too quickly you will loose the midsection tightness

Racking the Bar

- once fully extended at the end of your set, step forward with both feet and set the weight down into the rack
- Important to:
  - walk the weight in
  - not lean in with the back
  - stay tight until weight is on rack

Spotting

Single Spotter

- take the anterior deltoids to prevent lifter from leaning forward
- never pull back, just do not allow the lifter to lean forward
- assist in keeping the lifter's hips in and under

Double Spotter

- take either side of the bar; take weight if lifter starts to lose it forward

Triple Spotter

- one person takes the body, the other two take the bar
- communication is the key to good spotting

Split Squat

- is considered a single leg lift
- must be done first prior to any other leg work for safety reasons
- single leg strength is highly correlated to speed, this is the most specific of the squats to sprinting
- initially, until get the feel for the balance of the lift, will be lifting around 50% of a back squat;
- for average athlete, 70-80% of the back squat for the same reps
- if speed is critical to sport, the split squat should be 80-90% of the back squat
- Works predominately gluts and quads
- supplemental ham work must be done
- because back is kept vertical throughout the lift there is minimal back stress associated with this lift

Before Beginning

- as per back squat

To Start

- everything up to the one step back from the rack is exactly the same as the back squat
- feet should be flat on the floor
- no elevation is required
- set the feet into a shoulder width stance
- split the legs stepping forwards and backwards
- the weak leg steps forward first
- the strong leg steps backwards first
- be sure when split, feet retain the shoulder width lateral positioning
- the foot of the front leg should be flat on the floor
- the heel of the back leg will be up off the floor
- split length will be individually determined
- split length determined by:
  - front knee is kept at a 90 degree angle when decent made
  - front knee should never be pushed out over the toes

The Descent

- should be inflated and holding breath throughout descent
- to initiate the descent bend (flex) the back leg knee and push down towards the floor
- chest out, shoulders back (proud position); lower back in a tight position at all times
- keep hips pushed forward so that they always stay directly under the shoulders
- do not stick the butt out
- shoulders and hips should form a perfectly vertical line

- controlled slow lower until back knee within an inch of the floor
- front thigh should be at parallel or below
- front knee should be at a 90 degree angle
- never let the back knee hit the floor
- the weight should be centred between the two legs
- both legs are used in the lift, with the front leg doing more of the work
- drive elbows in under bar to help keep "proud" position
- for a smooth transition, anticipate the change of direction, think up, before descending fully down

The Ascent

- speed of ascent must always be faster than speed of descent
- power out of the bottom position, extending both knees
- ease both knees into lock out as you do not want to hyper extend the knees
- breath is held until about a 3/4 squat position, then slowly exhale

Front Squat

Starting Position

- Keep back straight
- Eyes forward
- Feet parallel, toes pointing forward or slightly to the side
- Grasp bar with palms facing upward
- With the help of a squat bar and/or spotters balance the bar as it is placed in front of the neck, resting on the upper chest, collar bones and shoulders
- Rotate the elbows forward

Movement:

- Slowly bend at the knees and hips until the upper thighs are parallel to the floor
- Keep back flat, elbows high, and chest up and out
- Return to starting position

Switching Legs

- once both legs are fully extended, step forward with the back leg, reassuming a double leg support, from there step forward and backwards positioning the legs to complete the set
- always step forward to initiate the switch

Racking the Bar

- once fully extended at the end of a set, step forward with both feet and set the weight down into the rack
- important to:
  - Walk the weight in
  - Do not lean in with the back
  - Stay tight until weight is racked

Spotting

Single Spotter

- straddle the back leg and take the anterior deltoids to prevent lifter from leaning forward
- if spotter can not get under to take anterior deltoids, take the bar
- never pull back, just do not allow the lifter to lean forward
- assist in keeping the lifters hips in and under

Double Spotter

- take either side of the bar; take weight if lifter starts to lose it forward

Triple Spotter

- one person takes the body, the other two take the bar

Step-Ups

- very similar to the split squat for muscles worked and weight that can be handled
- not as efficient as a split squat
- it is easy to cheat — push off
- safety is a concern
- it is very unstable
- it is very difficult to spot

Before Beginning

- must find appropriate elevation; box height will vary according to individual
- box height should be such that starting with thigh of leg with foot on the box is parallel to the ground
- never start from a below parallel position
- box should be strong, solid and very stable, with a non-slip surface

To Start

- position squat bar so you can walk out
- take bar off rack exactly as you would to do a back squat
- take one step forward and place weak leg foot fully and solidly on the box
- support leg should be perfectly straight, with foot flat on ground
- shoulders and hips should form a perfectly vertical line

The Ascent

- do not push off; keep support leg straight and toe up
- shift forward, pushing down into the box, and extending the box leg knee
- box leg should do all the work
- there should be NO assistance from the support leg
- once the box leg knee is fully extended, place the other foot down to create a double leg support on top of the box
- inhale as you begin movement and hold breath until you assume double leg support
- do not lean forward; keep trunk as vertical as possible

The Descent

- can either switch legs alternating with each rep, or do all reps on one leg then all reps on the other leg
- slowly lower self under control
- do not drop down jarring self
- slowly exhale during lowering

Racking the Bar

- same as the back squat, except extra precaution must be taken as you are stepping backwards

Spotting

- difficult because of movement
- use three people, one to take the lifters hips, two take the bar

Step Up Variations

Drive-Ups

- Drive-Ups are a variation from Step-Ups but at a faster pace.

Starting Position:

- Place a sturdy knee – high step or bench in front of you
- Assume a hip-width stance
- Hold dumbbells to the side

Movement:

- Step forward with one leg onto the step
- Drive body upward
- Bring opposite leg to the top of the step and stand
- Stand back with the opposite leg to the floor
- Repeat movement
- Keep head up and back straight throughout movement



Lateral Step Ups

- done exactly as a normal step up except step up laterally on to the bench
- works exactly the same muscles as a normal step up, but puts extra stress on the abductors
- this exercise is a tremendous hip joint stabilizer
- it is particularly appropriate for sports with lateral movement like football
- it is a weaker lift, because of the abductor focus
- this lift should be treated as a sport specific, range of motion (ROM) lift, where weight handled is not as important as the ROM

Cross-Over Step Ups

- same as the lateral step up except you bring outside leg up and across the leg nearest the bench using it to take the weight up
- this is a ROM lift; weight must be kept light
- particularly specific to inside linebackers

Bent-Over Rowing

Starting Position:

- Start from a partial squat
- Grip the bar with the hands slightly wider than shoulder width
- Palms facing the body
- Stand up using the legs not the back
- Barbell should touch thighs
- Bend over at the waist until your torso is almost parallel to the floor
- The bar should be handing straight down from the shoulders and off the ground
- Back should be straight from the hips to the shoulders
- Head, looking slightly up
- Knees slightly bent
- Feet about shoulder width apart

Movement:

- Pull bar upward until it touches your lower abs
- Elbows should be above the back and shoulders at the end of the pull
- Then slowly lower the bar back to starting position
- You should have full arm extension
- Do not use the back and legs to start moving the bar moving upward
- The back should remain straight from the hips to the shoulders during the entire exercise

Stiff-Legged Dead Lift

Starting Position:

- From an erect standing position, feet should be shoulder-width apart
- Eyes straight ahead
- Bend over and grip bar with an overhand grip
- Hands should be slightly wider than shoulders width
- Keep back straight and flex knees

Movement:

- Lift the bar to waist level while extending lower back
- Back is straight and rigid through the exercise
- Barbell should be mid thigh level while standing erect
- Slowly return to starting position



Good Mornings

Starting Position:

- Form an erect standing position, feet should be shoulder-width apart
- The bar placed on the back in a high bar position near the base of the neck
- Flex knees with head straight up

Movement:

- Slowly bend at the waist until torso horizontal to the floor
- Then slowly return to the starting position
- Keep back straight from the hips to the shoulders throughout the exercise

Single Arm Dumbbell

Starting Position:

- Hold dumbbell with one hand across the front of the thigh
- Feet shoulder width apart
- Flex knees
- Use an overhand grip

Movement:

- Raise dumbbell out to the side until elbow and upper arm are parallel to the floor
- Pause at the top of the motion then slowly lower dumbbell back down to starting position
- Repeat and eventually alternate arms

Front Lunge

Starting Position:

- From an erect position, feet shoulder width apart

Movement:

- Slowly take a large step forward with left leg and flex left knee where it comes over the left foot
- Keep left foot flat on the floor
- Keep back leg straight
- The back foot should be pointed in the same direction
- Lower the body as far as possible until the knee of the back leg touches the floor
- Return to starting position by pushing off of the floor with the lead leg
- Use two or three short steps backward with lead leg to return to the original starting position
- Repeat exercise using the same movement but with the opposite leg

Hammer

Starting Position:

- Grasp two dumbbells
- Feet should be approximately shoulder-width apart
- Flex knees
- Position dumbbells alongside thighs
- Arms fully extended

Movement:

- Slowly raise one fully extended arm to shoulder level
- Do not jerk the body or swing the dumbbell upward
- Slowly return to the beginning position
- Repeat the upward and downward movement with the other arm by alternating

Exercise – Ball Dumbbell Pullover

Starting Position:

- Grasp two dumbbells
- Lie with your upper back on an exercise ball
- Plant feet firmly on the floor
- Hold dumbbells over the chest
- Arms extended
- Drop hips slightly towards the floor

Movement:

- Bring arms back behind head as far as possible
- Keep a slight bend in elbows
- Return to starting point by pulling the weight back up over the chest