COACHES COACHING COACHES

teaching, training, learning

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Editor's Message

Every year, newly graduated college students enter the coaching profession. In most cases, these newly minted coaches have completed at least one coaching course with some earning a coaching minor. But, as every experienced coach knows, no amount of book learning or required college courses can truly prepare one to be an effective coach. There is truly no better way of learning than through experience.

An adage I learned many years ago truly explains how one learns and how one helps the next generation learn.

I do, you watch, and we talk.

I do, you help, and we talk.

You do, I help, and we talk.

You do, I watch, and we talk.

And then we each go help the next person

Coaches Coaching Coaches (CCC) is a supplement to Dakota Coach. The purpose of CCC is to provide an outlet for coaches to share coaching knowledge that helps other coaches become better coaches. CCC is interested in all topics related to coaching, for example, skill techniques, game tactics, coaching strategies, practice planning, team and individual psychology, nutrition, culture, first aid, training and conditioning, motivation, parent relationships, practice planning, mental health, leadership, mentoring, and relationships.

To submit an article to Coaches Coaching Coaches, send your article in word format to bradford.strand@ndsu.edu

Brad Strand

The Four Degrees of Defense Theory

Brad Strand, NDSU

Many basketball coaches like to say that defense wins championships. Although this is difficult to quantify, it's hard to argue against the idea. With today's style of playing basketball, especially at the collegiate and professional levels, it seems that defense has become a secondary principle situated far behind shooting threes. Even with that, many coaches lament the fact that their players cannot defend.

Building a high school basketball program takes time, patience, and consistency. In most learning environments, be it teaching or coaching, the teacher or coach designs their program based on scope and sequence (what to teach and when to teach it) and then puts it into action via scaffolding of skills and knowledge.

The article presents the four degrees of man-to-man defense and provides a scope and sequence for attaining the identified defensive skills.

First Degree Defense

First-degree defense is simply defending a (1) assigned player. First-degree applies to those game situations which find one defensive player assigned to one offensive player (commonly referred to as the "one-on-one" situation) who must be defended when he or she is stationary or moving, with or without the ball. Some offensive maneuvers that are problems for the first-degree, defensive player are:

- Defending against the fake during and after passing the ball.

- Defending against the fake during and after the dribble.
- Defending movements before, and including receiving the ball.
- Defending faking that occurs before shooting.
- Defending the offensive moves after the shot (blocking the offensive follow-up).
- Defending the field goal attempt (the mid-air block).
- Defending the pivot man (a player who is in a position to receive the ball with his back to the basket).

It is a fact that first-degree defense (and less) characterizes the limit of most players' abilities. To some extent, a demonstration of any degree of defense is influenced by the ability of the offensive player; however, the proper defensive position, and the proper application of sound counter mechanics in the situation represent the factors that are used to judge the defender in his relationship to the first-degree goal. Can the player play the person assigned man-to-man (nose-to-nose) in the above situations? If so, he or she can play first-degree defense.

Second Degree Defense

Second-degree defense is defending an (1) assigned player plus (2) the ball. The ability of a defensive player to keep the optimum defensive advantage each time the ball moves requires second-degree defensive skill. To be able to play the person assigned in relation to the ever-changing ball position is required defensive play for this degree. The relative

position of the defender in relation to the position of his or her offensive player and in relation to the goal being defended is a fine adjustment natural to few. For most, it requires many tedious hours of practice. Examples of second-degree situations are:

- Adopting the proper position defensively when the ball is passed from one player (position) to another player (position). The essential skill is that of watching the player assigned and the ball and being able to play the ball and the player at all times, maintaining optimum position on each in relation to the scoring area.
- Out-of-bounds plays. The difficult assignment of playing the person and the ball in situations where the ball is behind the defender is a real second-degree defensive problem.
- Jump ball situation. Each jump ball circle requires the defense to assume a different position on the person and the ball. Each circle requires a defensive involving playing the person and the ball.
- Defending the pivot player – individual defensive play versus a stationary or moving pivot person must of the second-degree level of the offense will take over completely. Here is an example of an area of the game where it is impossible to defend a player (pivot man) when you have no idea where the ball is. It is also impossible to play the ball only and still keep a defensible position on the assigned player. Second-degree defense is a must here.
- Defense against the passer who passes into the pivot player is inadequate defense if both player and ball are not played simultaneously.
- Defensive rebounding is best achieved when the defender plays the player first, then the ball. Some may try the

reverse, but they fail because the player does not play both at the same time. Position play on the backboards is dependent on the second-degree defensive ability.

Players who can manage a second-degree performance are not easily found. Coaching the awareness of and the skills necessary to rise to this level of defense is a worthy challenge for the coach and the players.

Third Degree Defense

Third-degree defense is defending an (1) assigned player, (2) plus the ball, (3) plus the offensive situation. That degree of defensive play in which the player recognizes and anticipates the offensive maneuver or technique being used, and by skill, ability, and 'game sense' eliminates the disadvantage to which he is being subjected. A third-degree defensive player must have these abilities:

- Ability to slide through, slide under, or over the top of his teammates and their respective assigned players.
- Ability to recognize or anticipate when and when not to slide
- Ability to switch.
- The anticipatory knowledge of when to switch or when not to switch.
- The cooperative technique involved in switching.
- The ability to 'beat the switch'.
- The individual and cooperative ability is needed to defeat the 'blind' screen, the stationary screen inside and outside, and the moving screen inside and outside.
- The technique of beating the post-play (when the pivot player is used as a stationary screen).

All good teams use various strategies involving two or more players to give the

offense a temporary advantage. Since there is already the advantage of prior knowledge on the offense's side, the problem of defeating the maneuver is almost insurmountable unless the defender is equipped with third-degree defensive ability. If a player is continually caught in the offensive "traps", he or she is not in third-degree defense. A player knows as well as the coach where he or she fits in this category.

Fourth Degree Defense

Fourth-degree defense is defending (1) an assigned player, plus (2) the ball, plus (3) the situation, and (4) helping a teammate with his or her assignment. The fourth-degree defensive player is quite rare. This player represents the ultimate in defensive ability, and given rebounding power along with this degree of skill, is invaluable. The fourth-degree player not only covers the numerous assignments listed in the three previous degrees, but also assists teammates with their assignments, and does so in such a way that nothing is sacrificed in terms of carrying out their defensive responsibilities.

The fourth-degree player is the "double-team" player, the person who helps "sandwich" the pivot player, the slough-off defender on the away-from-the-ball side of the court. The fourth-degree defender helps in defensive traps around the court and worries the person with the ball or the person about to receive a pass every time he or she is near. This player is the loose-ball recoverer, the jump-ball stealer, the "ball-hawk". This defender can do his or her job well and help others do theirs. This is the type of player who makes a fast-break offense move faster and more frequently. This is the player who makes the defensive play a very important part of the offensive plan.

Objective measurement of defensive ability may not be completely feasible using the foregoing "degree" concept, yet it is certainly possible to categorize personnel with reasonable accuracy after applying this formula.

Fifth and sixth-grade players should be able to play first-degree defense by the end of the season. Seventh-grade players should be able to play second-degree defense by the end of the year. Eighth-grade players should be able to play third-degree defense by the end of the year. Freshman and junior varsity players should be able to play fourth-degree defense.

Age-Appropriate Skills and Progressions

Fifth and Sixth Grade Athletes

Individual defensive skill	Team Defense
Stance	Man to man
Hands	
Eyes	

Seventh Grade Athletes

Individual defensive skill	Team Defense
Stance	Man to man
Hands	M-M press
Eyes	Jump ball
Rebounding	Out of bounds
Triangles	
Help and Recover	
Influence	
Sliding post	

Eighth Grade Athletes

Individual defensive skill	Team Defense
Stance	Man to man
Hands	M-M press
Eyes	Jump ball
Rebounding	Out of bounds
Triangles	
Help and Recover	

Influence
Sliding post
Denying pass
Denying cutter

Influence
Sliding post
Denying pass
Denying cutter
Covering outlet pass

Freshman/JV Athletes

Individual defensive skill	Team Defense
Stance	Man to man
Hands	M-M press
Eyes	Jump ball
Rebounding	Out of bounds
Triangles	Zone principles
Help and Recover	Zone press

About the Author

Brad Strand is a professor in the Department of Health, Nutrition, and Exercise Sciences at NDSU. His research and scholarly endeavors focus on sports and coaching; especially in the area of youth sports.

Nutrition for Peak Performance

Joan Knoll, Licensed Registered Dietitian
Bismarck Public Schools

Proper nutrition and hydration are essential for optimal sports performance. All coaches know this but many do not understand the complexities of nutrition. Not understanding the nuances leaves many coaches ignoring nutrition education with their athletes. Athletes are then left to their own understanding about fueling and refueling before, during, and after training/practice sessions and competitions.

This article seeks to educate coaches on the many and varied aspects of nutrition about physical activity and recovery. The article begins with a brief description of energy sources (carbohydrates, protein, and fat) follows by nutrition and hydration suggests for practice, competition, and beyond, and concludes with information about hydration and supplements. It is hoped that coaches use this information as they prepare a nutrition and hydration handout to be shared with their athletes.

Benefits of Balanced Nutrition for Athletic Performance

- Reduced recovery time between training sessions
- Reduced risk of injury and illness
- Increased energy and improved performance
- Prevention of Hypoglycemia (low blood sugar) and symptoms (lightheadedness, fatigue)
- Peace of mind knowing the body is adequately fueled.
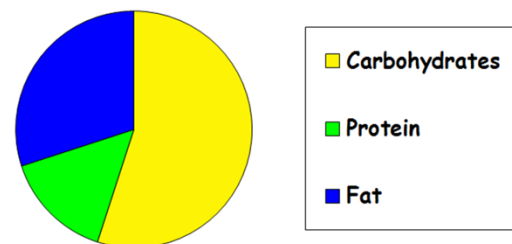
Choose MyPlate

- Your guide to a balanced diet and good health

- Provides the nutrients your body needs to grow, learn and stay healthy
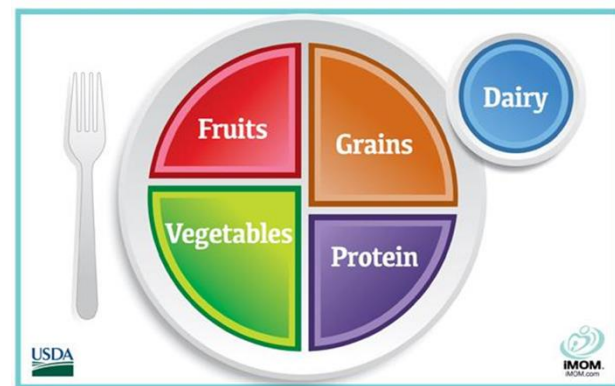
Sources of Nutrition

What is the Best Nutrient Balance for Athletes?

Carbohydrates

- Body's main energy source; provides fuel quickly and efficiently
- The preferred fuel source for muscle – carbohydrate is less competitive with

working muscles' need for fuel/oxygen than fat and protein

- Stored as glycogen in the muscle and needs continual replenishing
  - o **Two Types**
    - Simple Sugars – sucrose, lactose, fructose
    - Complex Carbohydrates – starches, fruits, veggies, beans

Food Sources

- Complex Carbohydrates
  - o Grains
  - o Legumes (beans)
  - o Fruits
  - o Vegetables
- Simple Sugars
  - o Pastries, cookies, brownies, cake
  - o Pop & other sugary beverages
  - o Candy

What happens if Carbs are too low?

- Decreased Athletic Performance
- Depleted Glycogen Stores
  - o Loss of Muscle (protein is used for energy)
    - o Fatigue (athletes "hit the wall")
    - o Loss of Focus (the brain needs carbohydrates to concentrate)
    - o Lightheadedness (dizziness)

Proteins
Functions in the body

- Provides Energy and amino acids
- Transports oxygen and nutrient
- Help to build, maintain and repair body tissues

Food Sources

- Meat, Fish, Poultry
- Dairy products, Eggs
- Legumes
- Nuts and Seeds

Protein Needs

Protein Intake for Athletes = 1.2 - 2.0 grams per kg of body weight/day

- To convert bodyweight (lbs) to kilograms (kg) take bodyweight/2.2

Example: 160 lb athlete - take $160/2.2 = 73$ kg
73 kg x 1.2 – 2.0 grams of protein = 88 – 146 grams of protein/day

Protein (grams) in Common Foods

Egg (1 Large)	6
Cheddar Cheese (1 oz)	7
Milk (8 oz)	8
Yogurt (1 cup)	11
Cottage Cheese ($\frac{1}{2}$ cup)	15
Chicken Breast (4 oz)	35
Tuna (6 oz)	40
Beef, Pork (4 oz)	30
Beef Jerky (1 oz)	9
String Cheese (1 stick)	8
Beans/Legumes ($\frac{1}{2}$ cup)	6 - 7
Edamame ($\frac{1}{2}$ cup shelled)	11
Peanut Butter (1 tbsp)	$4\frac{1}{2}$
Hummus ($\frac{1}{2}$ cup)	6
Nuts ($\frac{1}{2}$ cup)	11

Fat

- The most concentrated form of food energy (calories)
- Food Sources
  - o Butter and Oils
    - o Salad Dressings
    - o Nuts and Seeds
    - o Whole Dairy Products
    - o Fatty Meats
    - o Fried Foods
    - o Pastries, Cakes, and Baked Goods

Stick with lean meats and low-fat dairy products, nuts/seeds.

Limit fatty meats, whole dairy products, fried and fast foods, and baked goods.

Practice and Competition Needs

Pre-training/Competition Meals

- Eaten 3 – 4 hours before the event/training session
- High in complex carbohydrates like grains, veggies, fruit, and beans
- Minimal in simple sugars like pop or other sugary beverages, candy, and baked goods
- Low to moderate in protein – preferably lean meats and low-fat dairy products as opposed to fatty meats and whole dairy products
- Low in Fat
- Adequate in fluids

Morning Events

- Eat a carbohydrate-rich dinner and drink extra water the day before
  - Spaghetti with meat sauce, vegetables, fruit
  - Pasta/rice with chicken, vegetables, fruit
  - Burrito with meat/beans, rice, vegetables, fruit
- In the morning, have a 200-400 calorie meal at least $1\frac{1}{2}$ – 2 hours before the event
- Eat familiar foods
  - Cereal, Toast, Bagels, English Muffins, Oatmeal, Yogurt, Milk, Fruit Smoothie, Energy Bars

****If the training session/competition is longer, may need to add an egg, peanut butter, and cheese and eat 3 hours before the event.

Afternoon Events

- Eat a carbohydrate-rich breakfast such as pancakes, eggs, French toast, peanut butter toast, fruit, milk
- A light lunch, depending on the time of the event. The lunch should be low in fat, moderate in protein, and higher in carbohydrate
  - Sandwich with lean meat and cheese
  - Bagel/bread with peanut butter
  - Hummus with crackers/veggies
  - Cereal with milk/fruit
  - Yogurt Parfait with fruit/granola

****A heavier brunch may be sufficient with a light snack before the event (if the event is mid-afternoon

- Light snacks – energy bar, fruit, pretzels, trail mix, yogurt, fruit juice, cereal, toast, cottage cheese, string cheese

Evening Events

- Eat a healthful, balanced breakfast and lunch
- A light dinner – late afternoon or early evening depending on the time of the event
  - **High in carbohydrates, low in fat, moderate in protein**
    - Pasta, Rice, Potatoes, Bread,
    - Protein-rich foods like chicken, fish, lean meat, vegetables/fruits, milk

All-Day Events: What should Athletes pack for food, beverages

- Whole grain bagels
- Peanut butter and jelly sandwich
- Peanut butter crackers
- Granola/Energy bars
- Trail mix (pretzels, cereals, nuts, seeds, dried fruit)
- String cheese
- Yogurt
- Dry Cereals
- Fruit/Dried Fruit
- Pretzels/Baked chips/crackers
- Sport Drinks
- Veggies/Hummus
- Juice boxes
- Water

Good Choices on the Road
- Sandwich Shops
  - Light deli sandwiches, baked chips
- Burger Places
  - Single burgers, chicken sandwiches, baked potatoes, salads, yogurt parfaits
- Mexican Fast Food
  - Small bean burrito, beef/chicken taco, rice/meat veggie bowls
- Convenience Stores
  - Sandwich, fruit, yogurt, string cheese
- Breakfast Places
  - Eggs, toast, cereal, short stack pancakes, oatmeal

Post Training/Competition Meals
- In the first 10-30 minutes
  - Replace fluids and electrolytes
  - Eat high-carbohydrate foods to replenish glycogen stores
    - Examples: Yogurt, Banana/Orange, Granola Bar, Chocolate Milk, Juice, Smoothie

****If the food contains a little protein, even better
- Within 45 minutes to 2 hours
  - Drink 2 cups of water for every pound lost
  - Eat a high-carbohydrate meal with some protein

****Timing of post-training competition meals is key to enhanced muscle recovery for the next workout!

Hydration

Fluid replacement is critical for Athletes
- Drink fluid before, after, and during training and competition – small sips if possible (keep water bottles handy)
- Drink about 4 oz ($\frac{1}{2}$ cup) fluid every 15-20 minutes if possible

- Drink 2 cups water for every 1 pound weight loss after activity
- With high-intensity training sessions or activity over 60 minutes, use diluted sports drinks or juice to replenish electrolyte and glycogen stores
- Avoid caffeine immediately after training

****Dehydration can severely limit performance

How much water should you have per day?
- 8 glasses = 64 oz

Or

Caffeine and its Effects on Health

Will caffeine stunt growth?
- No, not technically
- Phosphoric acid in pop can leach calcium from bone
- If a child is drinking too much pop, they may be drinking less milk which can reduce calcium in the diet

Why does caffeine make me jittery?

- Caffeine is a stimulant that speeds up the Central Nervous System (adrenaline)
- Increases blood pressure and heart rate – may feel nervous, anxious and jumpy

Is caffeine a drug?
- Yes – it is a stimulant and can be addictive
- Can affect the brain leading to withdrawal and bad headaches
- May cause insomnia, irritability, sleepiness, lethargy, muscle cramping and pain, and lack of concentration

Limit Caffeine

No Energy Drinks

Beverage	Sugar (tsp)	Calories	Caffeine (mg)
Refresher SB (16 oz)	5-8	60-120	40-60
Bang Energy (16 oz)	0	0	300
Mocha Frap (16 oz)	14.5	390	110
Monster (16 oz)	13	220	160
Mountain Dew (20 oz)	18	290	90
Peace Tea (23 oz)	9	150	60

Rockstar (16 oz)	15	160	151
5-Hour Energy (2 oz)	0	4	200-230
Hot Chocolate (small)	6	250	25
Iced Mocha (medium)	10	340	167
Coke (12 oz)	9.5	140	35

Supplements

Iron Requirements
- **Iron is essential for oxygen transport to muscle**
  - **Inadequate iron levels lead to: tiredness, fatigue and muscle weakness**
    - Female Teens – 15 mg/day
    - Male Teens – 11 mg/day

- Athletes **at risk** of developing iron-deficiency anemia
  - Female athletes who lose iron through menses
  - Vegetarians who do not eat red meat or iron-enriched cereals
  - Endurance athletes who may lose iron through heavy sweat losses – distance runners
  - Teenage athletes, particularly girls, who are growing quickly and may consume inadequate iron to meet expanded requirements

Iron (mg) in Common Foods

Beef (4 oz)	3
Turkey Breast (4 oz)	2
Chicken (4 oz)	1-2
Tuna (3 oz)	1
Egg (1)	1
Raisins ($\frac{1}{3}$ cup)	1

Refried Beans ($\frac{1}{2}$ cup)	2
Spinach ($\frac{1}{2}$ cup cooked)	3
Tofu ($\frac{1}{2}$ cup)	2
Raisin Bran (1 cup)	4.5
Pasta (1 cup)	2
Bread (1 slice)	1
Peas ($\frac{1}{2}$ cup)	1
Baked Potato (medium)	2
Kidney, Garbanzo ($\frac{1}{2}$ cup)	2

Maximizing Iron Absorption
- Iron is absorbed best from animal sources
- Less iron absorption from plant sources

Vitamin C-rich foods enhance iron absorption
- Have berries/orange/grapefruit at breakfast with cereal
- Drink fruit juice like orange, pineapple, grapefruit, tomato
- Add a baked potato with steak, chicken, fish, or shrimp
- Have peas, tomato, broccoli, peppers, cabbage, cauliflower, spinach, or brussel sprouts with your protein at lunch and dinner

****Avoid having tea/coffee with breakfast or other meals; have them 1 hour before or after eating

Calcium Requirements
Calcium Needs: 1,300 mg/day female teens
1,000 mg/day male teens

Best Calcium Sources: Milk, Yogurt, Cheese
Good Calcium Sources: Leafy greens like broccoli, kale, cabbage, dried fruits, nuts, seeds, peas, lentils, soybeans

Examples of Calcium Content:
- 1 cup of milk or 6 ounces of yogurt = 300 mg
- $\frac{1}{2}$ cup of cooked broccoli = 31 mg
- 1 ounce cheese = 224 mg
- $\frac{1}{2}$ cup cottage cheese = 70 mg
- $\frac{1}{2}$ cup frozen yogurt = 100 mg

What about a multivitamin?
- Vitamins/minerals should be ~ 100% of DV (daily value)
- Don't buy supplements with excessive doses of nutrients
- Buy and use the supplement before its expiration date
- Look for USP on the label (inspected by US Pharmacopeia)
- For optimum absorption, have it with or after a meal

****Ask Pediatrician if a multivitamin is recommended!

About the Author

Joan Knoll is a Licensed Registered Dietitian working in the Bismarck Public Schools.

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Friendly Competition

Dan Glasser, Dickinson High School

Beating the number-one team in the state is always a good feeling. You have come up with a game plan that puts you on top when the final buzzer sounds. What some might not expect, is to be sharing the excitement of that win with a phone call from the coach of the team you just beat. While he may have been disappointed in the loss, we still talked like we always do after any other game. Over an hour later, we said goodbye and wished each other luck in the upcoming games. The win was nice but having another coach to talk to is one of the great things I love about coaching.

I love coaching and we all know that coaching can be very tough between all the hours, dealing with parents, the players, and making difficult decisions daily. What I have noticed is a large percentage of new basketball coaches in my area not lasting a very long time in the coaching profession. It is not hard for me to see why some young coaches would find it easier to walk away than to try and grind out the long months of January and February and deal with all these issues. But I believe all it takes for new coaches to get over these tough issues that they have to deal with and enjoy what they love to do is right in front of them…..the guy sitting on the other bench that they are competing against. I believe this is one of the biggest misconceptions for young coaches just getting started. The misconception of thinking that they cannot talk to other coaches they compete against. I don't mean small talk on a game night. I mean deep conversations about life issues, our families, our health, and how to deal with important day-to-day problems.

I was blessed to grow up in a family of coaches. My Grandpa was a multi-sport coach and my father, who I still look up to this day, coached everything from golf to football, and track and field. But his main love was always basketball. Basketball was always the topic of conversation in our house and growing up I was the kid that was able to go to the practices and ride the bus to the games. It was a great childhood. When I was finally in high school, I had the privilege of having my father as my coach. So, when I was in college and decided to become a teacher and coach, my parents weren't surprised at all. Luckily for me, when I started coaching, I had my father to talk to and help me in the beginning. He was only a call away and he was there to share his experiences with me and inform me about what things worked for him and what didn't. I was lucky, he was that guy I could go to for advice and conversation. I was grateful to have my dad as a sounding board and one regret is not reaching out more to the other coaches in my region. I thought that by having conversations with the other coaches, they would use that as a way to beat me. Experience has taught me otherwise and now I know that some of the best conversations I have after a game are with the guys I'm competing against.

If you are a coach just getting started, do not be afraid to reach out to other coaches that you compete against. Use this huge pool of amazing people and get to know them. You will be amazed by how much you have in common with these other coaches and how open they will be to talk to you and help you out. We all want to be successful and help create great young men and women but that doesn't mean that you can't become close friends with other coaches. There are many great, veteran coaches all around that can be a resource, but you must get over the

misconception that competition is greater than human kindness.

Growing up with a father as a coach I noticed that most of his best friends were also coaches. I often wondered how that worked but as a coach for 15 years, I completely understand. I'm happy to say that some of the coaches I coach against every year and compete our tails off against are some of my closest friends. They understand the tough issues I go through, and we can share things that we can't tell other people in the community. These friendships would have never happened if I thought I couldn't open up to them just because we compete against each other

Five Tips for Beginning Coaches

1. Never forget why you are a coach - raising young boys/girls to become successful citizens in the community
2. Be a good leader/mentor - Show your athletes how to be a good person
3. Make sure your athletes know what is important to you (Family, Faith, Job)
4. Find people that you can open up to and talk about important issues
5. Remember that it IS ok to put yourself first sometimes - You need to take care of yourself so you can take care of your program

Developing Talent

Jace Duffield, Fargo North High School

"As many as possible, as long as possible, in the best environment possible" – Johan Fallby

I want to preface this discussion with a story from my coaching career. I started coaching high school soccer eight years ago at Fargo North High School. In my first year with the program, I was a JV co-head coach, and entering tryouts, I knew only a handful of players from my experience coaching for a local soccer club. At tryouts there was a particular player; we can call him Michael. Michael had spent his first two years with the JV program splitting time in the net with another goalkeeper and playing field occasionally when between the posts. During his freshman year, the coaching staff had identified him as a JV2 player, someone they hadn't been able to get extra games added into their JV schedule would be facing the cut list. Michael made the varsity roster his junior year but didn't earn the starting goalie position. Another keeper in his same class earned the nod, which put Michael in his third year in the program and facing a scenario where he might not see the field all year. Nevertheless, Michael preceded to put his head down and get back to work, he helped push the other keeper, whom we shall call Nick, in practice and never once made the situation about himself.

In the second game of the season, Nick hurt his back diving for a ball and was unable to continue in the match, so Michael's number was called. From that moment Michael never looked back; he turned in many impressive games and never gave up the starting position again for the remainder of his career. His senior year Michael was voted to first-team all-state and to this day six years later, in my personal biased opinion, Michael is the best boy's keeper I have seen play in North Dakota over my eight-year career.

Michael was a late bloomer in terms of coordination and maturity. He came into the program as a freshman awkward and not fully in control of his limbs, but he was willing to work harder than the next guy, learn, and compete at everything he did. Nick, on the other hand, was over six feet as a freshman, he had decent coordination, and experience in the net. What the coaching staff failed to recognize is that given the right environment, with the right mentors, teammates, and some hard work, Michael was going to grow into a very competent keeper. Now that isn't to say the coaches were bad at recognizing talent or taking anything away from Nick as a keeper. It is just so easy to recognize maturity at the moment.

This story epitomizes the quote, "As many as possible, as long as possible, in the best environment possible." The book *Every Moment Matters* by John Sullivan, states that at best we as coaches can assume we are average at recognizing talent, especially the younger the athlete is. We tend to recognize ability through maturity instead, leaving the late bloomers behind.

I was a late bloomer as well having a June birthday with a July cut-off for our age group. It wasn't until my junior year of high school that I topped 5'3". During that time, I had to learn to be creative on the ball. I was forced to develop my touches, passing technique, and mental side of the game. I had to be one step ahead of the competition because I sure wasn't going to be at an advantage when it came to a foot race. Once I grew (a whopping 4 inches to 5'7") and put some muscle on, I closed the gap on my teammates. I was now able to outrun

players to the ball, physically maintain possession, and challenge ariel balls. Pair that with how I had to learn how to play when I was smaller than the opposition, it made for a fun summer of soccer after my junior year.

In my time at Fargo North, I could pick out a dozen more examples like my own personal experience. Players, who when they came in freshman year, were not on our radar. They were the players that only once the season was in full swing and we could see their character traits and their love for the game did we start to see the brilliance they possessed. At Fargo North, we have adopted a no-cut philosophy as a program in the hopes of providing more opportunities for talent development. In his book, Sullivan talks about the relative age effect and how early maturity is often confused with ability. When Sullivan looked at a study conducted in 2006 on 55 Serbian U-14 soccer players in professional youth teams, the biological breakdown was as follows:

- 43.8 percent early maturity
- 35.4 percent neutral maturity
- 20.8 percent late maturity

This breakdown indicates a problem with talent identification. Does this mean most talented players are born in the first third of the age group range? Or does it indicate something else? When these players were tracked through their careers, the breakdown of who made it to the top level is as follows:

- 11.8 percent of early maturing players
- 38.1 percent of neutral maturing players
- 60.1 percent of late-maturing players

As Sullivan states, "In other words, you have a greater likelihood of becoming an elite level performer if you are a late maturing child." I have given this some thought and objectively, could it be only the best of the best remain once a large majority of the late blooms are pushed out at an early age due to lack of athletic ability? So of course, the percentage of players who make it is going to be high. Or could it be some other reason? Sullivan proposed that late-maturing athletes are forced to gain footholds in the system and develop resilience and other character traits needed to stick with it until the physical differences start to disappear. He could be spot on with this analysis, and where I jump back in is, why not assume the latter? Assume we are pushing out these potentially elite-level performers through maturity identification, and instead give them a chance to develop as long as possible, as many as possible, and in the best possible environment. Then let's see what happens.

Foremost, I hope my coaching staff and I can instill in our players within our program a love for what they do. If our players love the sport and enjoy their time training and competing, they are going to be motivated to learn. Second, high-character players, earn their respect, communicate with their teammates, positively impact those around them, and commit to a process. Lastly, successful players are resilient. They recognize they are problem solvers and that the process of improving is a slow, stressful, and sometimes sticky one but are willing to take on the challenges. If every athlete in our program is given this best possible environment for as long as possible, they are going to perform at elite levels and find a plethora of success.

For more stories like my own and the many players that have come through the Fargo North Soccer Program, we need to ensure equal access to coaching and resources are provided. We need to stop pushing kids out at early ages because they are late developers. We need to provide character education as part of our coaching, so players understand how to develop and become process orientated and delay all-star teams and tryouts and cuts as long as possible. The smaller you cut your talent pool of players, the more potential elite-level performers you are leaving off your list.

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Training the Developmental Athlete in the Sprints, Hurdles, and Jumps for Long Term Success

Aaron Fuller, Simpson College

Prioritizing general training for developing athletes allows them to become fully developed athletes leading to long-term success while decreasing the chance of injury and burnout. The recent trend has become to hyper-focus on event-specific training, fast-tracking non-event-specific training, or cutting it out completely. This is sold as a way to let each athlete reach their fullest potential. This often does not work and hinders their long-term athletic progression and ability to stay healthy. It also takes away the chance for developing athletes to explore new events, potentially taking away the chance for success in new areas.

Prioritizing general training does not mean that every athlete on the team does the same training. However, it does mean that athletes are given exposure to different types of training during each cycle to varying degrees. This article is going to look at the five bio-motor abilities and how they can be used for developing athletes in sprint, hurdle, and jumping events.

USA Track & Field education courses define bio-motor abilities as strength, speed, endurance, flexibility, and coordination. These abilities can also be broken down into more specific areas.

Many benefits come from prioritizing bio-motor abilities during training. Athletic performance is increased and easily seen. Another benefit is developing athletes with the ability to remain healthy. When balancing these abilities, you add variety to training. Overuse injuries as a result of repetitive movement are the most common injuries in track and field. The addition of new movements and stimulus lowers the chances of these repetitive movement injuries allowing athletes to remain healthy longer. This also leads to increased performance in both the short and long term as athletes miss less practice time.

Another benefit is allowing athletes to explore new events. At the developmental level, many times the athletes who are the most successful can compete in multiple events. Focusing on building up the bio-motor abilities and letting athletes explore different events is a way to find where athletes can be successful. Many times, athletes who are successful in the sprints or hurdles can also be successful in the jumps, or vice versa.

When looking at the bio-motor abilities it is important to understand that when using them, they do not all have to be prioritized or programmed equally all the time. A coach can use periodization to prioritize certain areas to differing amounts during certain times of the year. The coach can also progress through different forms of the same bio-motor category. As an example, when looking at strength, strength not only refers to the highest amount of force one can produce, maximal strength but other areas as well. All these abilities work together to help improve athleticism. Let's look at how bio-motor abilities can be broken down into more specific abilities.

Strength

General strength uses bodyweight exercises with full ranges of motion and is the most basic form of strength. Differing set/rep schemes can be implemented based on the athlete's abilities and the desired physiological response. Much of the time used as a circuit, it can also have a positive effect on endurance, coordination, and flexibility. It is prioritized early in the athlete's development. As an athlete's strength and fitness levels grow, as well as training age, it is often used as a form of recovery.

Maximal strength can begin development after the athlete has developed proficient general strength. While maximal strength is defined as the highest amount of force one can produce at one time, it is developed using less than maximal weights, 80-95% 1RM, for low to moderate amounts of volume. When testing maximal strength, it is common to express it through one rep max (1RM) testing, a test to see how much weight the athlete can lift at one time. A predicted 1RM test is often used for developmental athletes. During this test, the athlete completes the lift for multiple reps, generally 3-5, and uses a calculation to predict the 1RM. Coaches can have athletes use full or partial ranges of motion during training and testing.

On the force-velocity curve, power falls in the middle, between strength and speed. Just as maximal strength is developed using one method and tested by another, so is power. Power is developed by using low to moderate weights, 30-55% 1RM, for low volume at high intensities. When testing power, it is common to express it through jumping or throwing movements such as standing long or triple jump, vertical jump, or medicine ball throws for distance.

The force equation, Force = mass * acceleration, shows us how maximal strength and power work together to produce the highest amount of force. If we wish to produce the highest amount of force, we cannot have either a high amount of weight at a slow speed or a low amount of weight at a high speed. To achieve the highest level of force we need to move high amounts of weight at high speed. Therefore, these two types of strength training are both important parts of an athlete's development.

Reactive strength measures how the muscle absorbs force and redistributes it through the stretch-shortening cycle. In the lower body, it is most commonly trained by using different variations of unloaded and loaded jumping exercises. While it is the most specific type of strength for sprinting and jumping, it can be easily overprescribed causing injury. It should be progressed slowly starting with small jumps until the athlete has developed the strength qualities mentioned earlier.

Speed

Speed, much like strength, refers to different areas including acceleration, maximal speed, and speed endurance. While these hold commonalities, they are also unique with differing challenges. Executing a proper acceleration pattern requires a high amount of power to be expressed to be able to maintain proper posture. Coordination abilities are a limiting factor in speed and speed endurance, although slightly different. During maximal speed the ability to coordinate limbs at a high frequency while maintaining posture and stability is essential. During speed endurance, the ability to continuously coordinate limbs for an extended duration is the limiting factor. Deceleration occurs when coordination breaks down causing a loss of force production into the ground.

Breaking these down, acceleration is the distance covered in which the body is continuing to gain velocity. For most developmental athletes this occurs between 25-40m. The ability to continue acceleration

farther is affected highly by strength and power levels. More powerful athletes will accelerate more rapidly, increasing velocity at a faster rate, and making it easier for the body to maintain correct posture. Maintaining correct posture throughout acceleration is a limiting factor. If the athlete is unable to maintain correct posture, they risk putting the body in a position of deceleration, more simply put as the foot contacting the ground in front of the center of mass.

Speed, also referred to as max velocity, is the fastest that the athlete's body can move. Where it happens on the track is dependent on the athlete's acceleration abilities and mechanics. Max velocity occurs where acceleration ends and is held for a short period. Developmental athletes will hold max velocity for 15-25m depending on how well the athlete accelerated, the velocity that they are traveling at, and their coordination abilities.

Speed endurance is to resist deceleration and begins when the athlete starts to lose velocity following the max velocity zone. Because the body is limited in its ability to maintain max velocity for more than a few seconds, speed endurance becomes very important, even in short sprint events. Speed endurance should not be thought of as aerobic training, but rather as conditioning of coordination abilities. Speed endurance workouts should fit the event that the athlete participates in as it covers a wide range of distances. For developmental athletes speed endurance runs can cover distances between 60-300m.

Endurance

Endurance can be thought of in more ways than just how long or far an athlete can run. Many times, for speed-power athletes, endurance work shows up in the form of work capacity, or the ability to tolerate a high workload while maintaining the ability to recover efficiently after its completion. Work

capacity training is often used as a way to enhance the athlete's ability to recover from the current workload before the next training session.

When training work capacity, the duration of each rep will not be to exhaustion. The endurance training effect does not come from the single rep but is the result of the sum of the reps. These workouts often use a circuit or interval format alternating between short rest periods and longer rest periods. Using work capacity during the early training cycles will allow for higher volume, while also maintaining the desired intensities, in the later training cycles. As the athlete improves throughout the season, the training can move towards longer runs while maintaining the desired intensity.

An example for a long sprinter wishing to cover 300m per rep is to break each 300m rep down into 100m reps. If the goal is to run 3x300m for 900m total, the early season capacity workout could be 3 sets of 3x100m, also for 900m total. The athlete will accumulate the same amount of total volume but will have an easier time maintaining the desired velocity through each rep and the workout as a whole. As the athlete progresses during the season, they can move more towards the 3x300m goal session.

For a horizontal jumper to be able to execute 6 long jumps and 6 triple jumps at the championship season meets, it will be different. They will look at the goal as having the ability to execute 12 jumps in competition, plus the warm-ups. The distances covered per rep of the workout will be more reflective of the distance they will cover during their approach. For a developmental jumper, this may be 25m. An early season work capacity workout for them may be 3 sets of 4x25m. This is reflective of what will be asked of them during the championship meets.

Flexibility

Flexibility, which also includes mobility, measures the muscle's ability to stretch and the range of motion available at the joint while static or in dynamic motion. Flexibility can be addressed in multiple ways within training including static and dynamic stretching, yoga, hurdle mobility, and sprint drills. It is used during the warm-up and cool-down portions of practice.

Coordination

Coordination is a broad term that during track most often describes abilities related to balance, spatial orientation, sense of rhythm, and synchronization of movements in time. These abilities work together to make the athlete more technically proficient, allowing for greater performance with a decrease in the chance of injury. Often coordination is addressed during sprint drills and event technique practice.

Working together

These five bio-motor abilities work together to create the athleticism used in track and field events. Because these abilities work together, they are also trained together and often a single task can work to develop more than one of the bio-motor abilities. Let's look at some examples.

Body weight strength circuits will check the boxes of strength, endurance, flexibility, and coordination. While easy to understand how these challenge strength and endurance, it can be harder to see the effects on flexibility and coordination. Flexibility is addressed because of the large ranges of motion used. Coordination is challenged by the controlled tempo of each movement. The muscle will also fatigue, resulting in the additional challenge of added stabilization of the surrounding joints.

Hurdle mobility works on flexibility and coordination. It is easy to see how a range of motion can be challenged while doing these walk-over drills, but also challenged is balance and spatial orientation, or the ability to control one's body in space.

Event technique work can also be used to work on bio-motor abilities. A long jumper doing approach runs works on speed and coordination as they sprint and steer themselves to the board. A hurdler working on a block starts through the first 2 hurdles and also works on speed, coordination, and flexibility. This is how athletes can work on the same bio-motor abilities on a certain day, while not doing the same workout.

As mentioned earlier, an acceleration workout with the correct set and rep scheme can work on speed, as well as work capacity. The same can be done in the weight room. Pairing lifts together to shorten rest times allows athletes to work on strength, while also improving work capacity. When doing this, pairing a lower body movement with an upper body movement will allow less muscle fatigue during the final reps while continuing to gain work capacity as the athlete completes multiple lifts with a short rest break. This is also a great way to shorten the time needed in the weight room.

The bio-motor abilities also work together to progress the athlete through the season using periodization. This means the program prioritizes certain areas of the bio-motor abilities to differing degrees at different points of the season, to help them prepare for the championship meet season.

In the early season general strength, acceleration, and work capacity are of high importance as they set up the foundation for the bio-motor abilities that follow, as well as the ability to recover between workouts. Progressing forward maximal strength and acceleration work together and lead to power and speed development. The late season, for ready athletes, moves to reactive strength and speed endurance.

Event-specific work capacity, flexibility, and coordination are present throughout the entire season. During the early and mid-season, these are often addressed during the drill and technical practice sessions. During the later season, they are addressed by the increased demands of competition and from the recovery sessions that follow.

Conclusion

Prioritizing the development of the bio-motor abilities not only helps the athlete individually but the team as a whole. When looking at training this way you can see that there are more commonalities between the training needed for sprints, hurdles, and jumps than differences. It allows the coach to set up a workout schedule where athletes can work out together, creating a positive team culture where athletes can compete and challenge each other during practices.

It is also easier to allow the athlete to try new events because it disrupts the training for their main event less. Allowing developing athletes to try new things and find success is something that should be prioritized.

When bio-motor development is prioritized with developmental athletes it will minimize the chance of burnout and give the athlete a better chance to succeed while having long-term development.

About the Author

Aaron Fuller is the Head Track & Field Coach at Simpson College (Indianola, IA). In 8 years of coaching at the collegiate level, Fuller has coached 1 National Championship team, 1 individual National Runner-Up in the Women's Heptathlon, and 10 All-Americans in the sprint, hurdle, and jumping events.