IOU Coaching Certification

Level 3: Professional Coaching

Section 2: Physical Training

Training Program Design

- Having a plan is vital for training
- Designing a program should involve a dialog between the athlete, their coach, and even their family.

Setting Goals

- Objective: The goal is measurable. Be able to lift 200lbs or run a sprint in 30 seconds, not look better or be more athletic.
- Challenging: The goal forces the athlete to challenge themself.
- Realistic:
- Oarball-specific: The goal is relevant to oarball. Chest strength is more relevant than 50m butterfly swim time. 40m Sprint time is more relevant than 26 mile time.

Neurological Load

- Every exercise wears out an athlete over time. This effect applies to every muscle group, not just the ones being used in a particular exercise. This means even if an athlete did nothing but leg exercises in a session, their arms will still not be at maximum power. This effect is called **neurological load**.
- The amount of neurological load varies from exercise to exercise
    - Exercises requiring balance have a much higher load
    - Exercises which activate stabilizing muscles have a higher load
    - Exercises that activate large muscles have a higher load than those which only activate small muscles
    - Compound exercises have a higher load than isolation exercises
- Exercise programs need to be designed with neurological load in mind
    - Higher load exercises first, lower load exercises after
    - Make sure total load is not more than is comfortable or safe for an athlete

Season Phases

- Program changes over the course of the year
- Off-season: intensive training to meet goals for strength, mobility, endurance, or physique
- Pre-season: preparation for upcoming season, used to round out training
    - If off-season was focused on strenght and power, use pre-season to make sure endurance and mobility are good
    - If off-season was focused on endurance, make sure to build up some fat stores for sustainment through the season
- Early season: all-around training with intermediate intensity, with a focus on slow growth and injury prevention
- Late season: light training and an intense focus on injury prevention, with goal of maintenance and performance
- Post season: focus entirely on current performance, with little to no effort on growth; this is what all of the training is for

Working Around Injuries

- Exercise, especially weight lifting and running, can aggravate and even worsen existing injuries
- Certain injuries can be worked around just be reducing stress on those body parts
    - Reducing impact by running only on soft surfaces (sand, grass) can help lower leg joints

- Certain injuries can be worked around by strengthening a different muscle group
    - Working the abdominals can reduce lower back pain
    - Working the shoulders can reduce neck pain
- Some injuries require machine isolation exercises instead of freeweights or calisthenics
    - For a knee injury, a machine can prevent the twisting that re-aggravates injuries
    - For an elbow injury, triceps machines may be preferable to a bench press, dips, or dumbbell tricep work

Sustainability

- Optimization is not optimal. If an athlete burns out, they achieve nothing
- Small changes over time are better than rapid changes all at once
- Moderation is good. An occasional treat does not ruin a diet, an occasional day off does not ruin a training plan.
- Even for top-level athletes, having a single controlled and moderated “vice” can help a player have enough mental energy to keep discipline. (i.e. sweets, soda, beer)

Weight, Build, and Nutrition

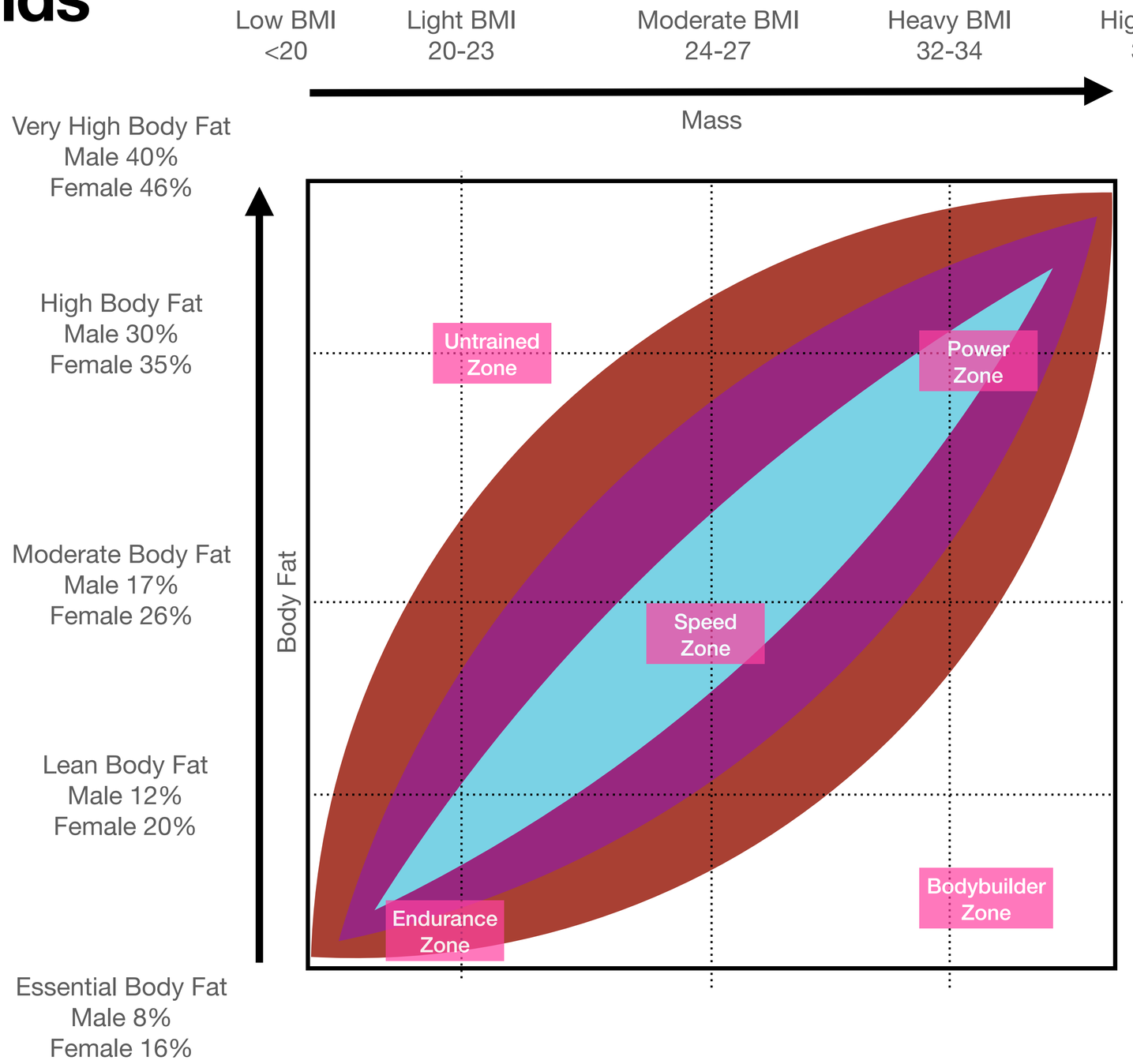
- A wide variety of bodies are needed to form a perfect oarball team
- There is no one “oarball body” and it’s important to remember that high performance, health, and “beach body” do not necessarily overlap.
    - **Performance** involves speed, strength, and skill on the field. Performance may sacrifice health in some ways, such as stressing the joints, or carry more body fat or less muscle than a layperson would expect, but performance is about just that: performing on the field.
    - **Health** involves good breathing, cardiovascular health, comfortable joints, and longevity. A healthy person may not be the strongest or be on the cover or any magazines, but they will be happy and comfortable for a long time.
    - “**Beach body**” is what people see on TV and in movies, and is often a fake, unachievable physique requiring unsustainable eating habits, use of dangerous performance enhancing drugs, dehydration, and mental anguish. While big muscles and lean bodies look athletic and healthy, and sometimes they can be, there is no correlation between appearance and anything else.
- Athletes should focus on health and performance. People in their post-playing careers need to focus on health. Beach body should never be of concern.

Scale of Builds

Peak Performance

Sustainable Performance

Good Performance



Untrained Zone

This is where most people begin their athletic journey. A blank canvas which can be turned into the desired form. There is no shame in being in the untrained zone- it’s not a failure of willpower or morality. It’s not even necessarily unhealthy- you may find that your untrained body has a healthy heart rate, blood pressure, and that you feel good exercising. That is not always the case though, and so many people will need to train their bodies to feel healthy. Specifically in oarball, it’s also not the most efficient body shape for performance, which is why serious players train themselves into more specialized shapes. For the casual player, there is no reason they can’t play with an untrained body- oarball is for everyone.

Power Zone

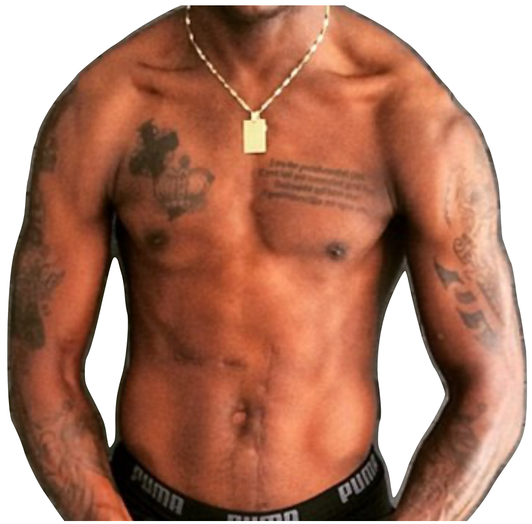
By cultivating a body with a high amount of muscle and a moderate amount of fat, an athlete finds an optimal form which is resistant to injuries and has a large amount of **functional strength**. Players with this sort of build are tough for opponents to move and can exert lots of force on both their opponents and the ball, which are useful in the crease, in the center square, and in a post-up.

Speed Zone

When engineers make a race car, they strip down as much weight as possible- this makes the car more efficient. They also put as big of an engine as possible into the car to make it go fast. This applies directly to athletes as well. By reducing body fat and increasing muscle mass, a good balance can be found where the athlete is a finely tuned, high speed machine. Players built like this are especially good at closing down on defense, on making quick and incisive counterattacks in loose play, and at running routes on set plays.

Endurance Zone

By reducing the body's fat and muscle levels down to the minimum needed for sustainable exercise, the player has less weight to carry around, making it much less tiring to move around the field. It's important to note that this body type still requires *some* muscle and *some* fat- simply starving oneself will not achieve maximal endurance- the body needs fat stores to burn when exercising and it needs muscles to move effectively. Players built like this can take long shifts and play big minutes, which is especially important for shot-stopping backs.



Bodybuilder Zone

While one might think that having the most muscle and the least fat would be the best physique for an athlete, these builds are not actually optimal for sport. Actual bodybuilders can maintain these physiques for only a short period of time. Even if the build could be maintained, it is associated with reduced endurance and a high chance of soft tissue injury. Luckily, it’s easy to not fall into this range- only extremely deliberate training and nutrition can shape a body this way. Instead, athletes who want to maximize power can accept some body fat on their person, athletes who want to maximize endurance can skip much of the intensive and grinding strength training, and athletes who want to maximize speed can do similar work but with much less intensity

Caloric Consumption

- The number of calories consumed by an athlete is the most directly relevant factor when developing a desired physique
- When trying to gain muscle, it's easier to gain fat and muscle together, then "cut" the fat after desired size has been reached. This is called **bulking** and **cutting**.
- Bulking and cutting are done in cycles. In the first phase of the offseason, an athlete bulks to maximize power. Then as the season approaches, they cut to reach playing shape. During the season, a steadier approach is used, with either a maintenance focus or a slow building focus
- Caloric consumption should be thought of over the course of a week, not a day

Surplus and Bulking

- First, the athlete needs to calculate their **maintenance calories**. This is how much food they must eat to maintain their weight. It varies depending on:
  - Current weight
  - Age
  - Metabolism
  - Exercise levels
- In a given week, 3500 calories surplus is equivalent to one pound of mass gained
- Bulking is the process of putting on mass, both muscle and fat at the same time.

Deficit and Cutting

- In order to reduce body weight, an athlete must consume fewer calories than they exert. This is called a caloric deficit, and using a deficit to reduce weight to a particular goal is called **cutting**.
- The intensity of a surplus determines the speed of weight loss, but faster cut cycles eat away at more muscle than slower cycles. A fast cut cycle would be a 3500 cal/wk deficit, while a slower cut would be a 1400 cal/wk. Attempts to cut weight too rapidly can lead to severe health complications.
- Intensive cardio and weight lifting do not have a significant impact on calories burned. For athletes looking to cut weight, long-distance walking is most efficient

Eating Disorders

- When developing physique, it can be easy to fall into an eating disorder
    - This comes from an unhealthy fixation on developing a desired physique
    - It can come in the form of binging, purging, starving, or hyper-fixation on diet quality. These disorders can range from mild anxiety to life threatening compulsions
- Anyone can be victim to an eating disorder. Avoiding eating disorder requires a combination of factors:
    - Support system. Athletes must be around people who support them and want them to be healthy and happy.
    - Moderation. Too much of a good thing can be bad. A little bit of a bad thing is not the end of the world. A lifestyle that thrives on moderation is more sustainable and less stressful
- It’s important to remember that weight fluctuates throughout the day, week, and even month depending on water levels, meals, hormones, and even tidal forces. It’s best not to fixate on any one weight measurement, no matter how desirable or undesirable that weight is
- If you suspect an athlete of having an eating disorder, you must:
    - Speak with their family
    - Encourage body positivity
    - Reduce emphasis on training, potentially even stopping training

Nutrients

- Athletes can’t just eat anything- the body has particular ingredients it needs to operate at peak performance
- Every nutrient needed for maximum performance is found naturally in multiple foods. There is no one food that a person needs to eat and most people do not require supplements of any kind
- **Macro Nutrients** are the materials that make up a particular food’s caloric value. These are the components that give energy
- **Micro Nutrients** serve specific purposes in the body

Macro nutrients

- Sugars: Give energy to the brain, organs, and muscles
  - Carbohydrates: store the energy for later
  - Sugars: immediate energy
- Fats: Provide key nutrients and provide energy, balance cholesterol levels
  - Eating fats does not give the body fat. Stored body fat is a product of excess caloric consumption that the body stores as energy for later, not fat consumption
  - Trans fat is known to negatively impact health. Small amounts of rtans fat in the diet are acceptable, but its consumption should be minimized
- Proteins: Used to build bodily structures
  - Proteins are made of amino acids. Different sources of protein are made of different combinations of amino acids, and the body requires a variety of amino acids, so athletes should eat a variety of protein sources (like beans, whole grains, fish, meat) to make sure the body gets all of the different amino acids it needs
  - Generally more protein is needed during a bulk cycle to help build muscles faster

Vitamins

- Organic compounds needed for bodily function
- A (retinol), B1 (thiamin), B2 (riboflavin), B3 (niacin), B5 (pantothenic acid), B6 (pyrodoxine), B7 (biotin), B9 (folate), B12 (cobalamin), C (ascorbic acid), D (cholecalciferol), E (tocopherol), K (menaquinone or phylloquinone)
- Necessary for maintaining bodily functions like immune system, hair growth, and skin regeneration
- Found in various fruits and vegetables. Instead of worrying about exactly which are needed, it is best to just eat a variety of foods
- Athletes who cannot consume a healthy enough diet may want to consume vitamin supplements, but need to not take more than recommended because vitamin overdose is a serious health risk
- Not consuming enough vitamins can lead to malnutrition and reduced overall health

Fiber

- Helps regulate gastrointestinal tract
- Fixes BOTH problems with poop
  - Hardens stool which is too soft
  - Softens stool which is too hard
- Found in vegetables, whole grains, and beans
- Can also be found in popcorn and in supplements for players who need a short-term boost

Minerals

- Inorganinc compounds needed for bodily function
- Macrominerals: Calcium, Magnesium, Potassium, Sodium, Chloride, Phosphorus, and Sulfur are needed in large quantities
- Trace Minerals: Iron, Fluoride, Zinc, Cobalt, Iodide, Copper, Manganese, Molybdenum, Chromium, Selenium are not needed in very large quantities
- Eating a wide variety of foods can ensure adequate mineral consumption
- Calcium in particular is important for athletes because it is an important structural material in bone repair

Water

- Adequate hydration is vital for athletic performance
- Water is absorbed through the stomach lining and into the blood
  - Well-hydrated blood is easy for the heart to pump
  - Poorly-hydrated blood is thicker and harder for the heart to pump
- Water helps regulate body temperature
- Well-hydrated muscles are less prone to injury
- It is possible to drink too much water and get water poisoning- this is easily prevented. Athletes should just never drink more water than is comfortable for them.

Muscle Development

- Muscles are developed when they suffer minor damage. The body repairs the muscles bigger and stronger when they
- Soreness is common when developing muscles, but it’s not a requirement
- Muscle development may not always be visible- sometimes growth occurs at the **belly** (bulge that people can see) and sometimes growth happens at the **attachment point** (where the muscle meets the bone)
- Muscle development takes time. Patience and consistency are vital. There are no tricks to overnight development.

Muscle Group	Movement	Stick Striking	Foot Striking	Stick Handling	Contact	Shin Kicking	Injury Prevention
Calves	✅✅						✅
Quadriceps	✅		✅✅		✅✅	✅	✅
Hamstrings	✅		✅				✅
Gluteous	✅	✅✅	✅		✅✅		✅
Hip Flexors	✅		✅✅			✅✅	✅
Abdominals		✅	✅		✅✅	✅	✅✅
Obliques		✅✅	✅				✅
Lower Back		✅		✅	✅	✅	✅
Lateralis						✅	✅
Trapezius		✅			✅		✅✅
Pectorals		✅✅			✅✅	✅	✅
Deltoids		✅✅		✅			✅✅
Biceps		✅				✅	✅
Triceps		✅		✅	✅	✅	✅
Forearms		✅		✅✅			✅
Grip				✅		✅✅	✅
Neck					✅		✅✅

Resistance Training

- Free weights (dumb bells, kettle bells, bar bells) work stability
- Machines (cables, fixed-motion, plate-loaded) isolate the desired muscles
- Resistance training is completed in **sets**
  - Each **set** has a number of **repetitions**
  - After each set, the athlete must rest or do a different exercise
  - Depending on the exercise program, muscle, and movement, the number of sets generally range from 2 to 6. The number of repetitions per set generally range from 3 to 20

Traditional Sets

- Standard movement pattern, should make up the majority of an athlete's resistance training program
- Sets in the 8-12 repetition range promote a good combination of hypertrophy and movement specialty with an efficient amount of neurological load

Drop Sets

- Instead of resting between sets, this technique sees several sets completed in a short time
- Instead of resting, lower weight slightly and continue doing the exercise
- Continue doing exercise until strength of a particular muscle group is totally exhausted
- Using drop sets can build anaerobic endurance and can rapidly stimulate muscle growth at the expense of a heavy neurological load- it is not sustainable to build an entire workout of drop sets. Instead, only one or two exercises a day should be drop sets.

Negative Sets

- In a traditional exercise, the weight is lowered (an **eccentric** movement) and raised (a **concentric** movement). Most of the time, the lowering is first, then the raise, but not always.
- In a **negative** exercise, the weight is put into position, then the entire repetition is just the **eccentric** movement. The athlete's muscles start extended and flexed, and they lower the weight slowly and under control
- In conjunction with traditional movements, negative sets can increase the rate of muscle growth
- Best to do this type of movement with something where it is easy to set up
  - Tricep Dips and Preacher Curls are very efficient for this sort of set
  - Some weight machines have a safety squeeze mechanism, allowing the equipment to be moved with no weight
  - Having a spotter can make this sort of exercise much easier

Super Sets

- Instead of resting, the athlete works out the opposite muscle
- Activating the opposite muscle stimulates growth in its counterpart and prevents overdevelopment, which can cause issues with posture, range of motion, and soft tissue injury

Heavy Lifts

- Typical repetition ranges for muscle hypertrophy (growth) are in the 8-12 range
- With **heavy** loads, closer to the athlete's one-repetition maximum, typically 3-5, the focus is instead shifted to **muscle activation** rather than **hypertrophy**
    - This means that by working in this range, the athlete is getting better at a particular movement. For key movements, like extending the legs, this can be a valuable way to increase **functional strength**
    - This movement range still causes come hypertrophy, but it should not be the focus of an entire workout program
    - These lifts are exhausting and potentially very dangerous. It is important to rest, to use all relevant safety equipment, and to never perform such exercises alone (even if a spotter is not considered necessary, someone should be in the gym with the athlete)

Time-under-tension exercises

- Exact opposite of lifting heavy- shifts focus away from activation and into hypertrophy
- The athlete uses lighter weights with one of three strategies
  - Very high repetition sets (15-100)
  - Pause and hold movements
  - Isometric static exercises

Protein Consumption

- There is significant cultural pressure to increase protein consumption to maximize muscle development
- While this is technically true, the need to increase protein consumption varies by program intensity
  - Athletes working on a beginner program or a less intense program do not need to worry about increasing protein consumption over their body's natural cravings
  - Athletes with a moderately intense program should try to consume 6 to 9 grams of protein per kilogram of body mass in a given week (ie, a 100kg player should try to eat between 600g and 900g of protein in that week)
  - Athletes in extremely intense programs or those who are working moderately intense programs and physically demanding jobs should try to consume 8 to 11 grams of protein per kilogram of body mass in a given week.
- In general, a varied diet that meets an athlete's caloric goals will provide more than adequate protein for muscle development

Rest

- Muscles must be given adequate time to rest between exercises
- Muscles must be given multiple days to recover after a day of exercise
  - For beginners, this means lifting weights, then taking a day or multiple days off to recover
  - For advanced athletes, this means splitting exercises into “days” such as taking a **leg day** where only leg exercises are done, then doing different “days” (2 to 3) of other exercises before doing more leg exercises
- Muscles are only growing and gaining power when they rest

Bone Stimulation

- By stressing bones, the body can be tricked into developing stronger bones
  - Weight lifting stretches and compresses the large bones of the body
  - Repeated impact: Punching sand, running, etc. can strengthen hand and foot bones
- A balance must be struck: too intensive and an athlete will just break their bones. Not intense enough, and no bone stimulation will occur

Functional Strength

- Functional strength consists of three parts: muscle power, technique, and body mass.
- Muscle Power. How big and strong an athlete's muscles are
- Technique. How good an athlete is at making a particular movement, in particular how good they are at activating every relevant muscle for that movement. In a game environment, an understanding of legal techniques, stick skills, and balance influence the power of a movement too.
- Body mass. Having a larger, heavier body is harder for opponents to move and puts more force into collisions with opponents and the ball
- A 150lb athlete who can exert 200lbs of force is "stronger" than a 200lb athlete who can exert 180lbs, but the bigger athlete will be harder to move (380 > 350), being functionally stronger because of that. This is why crease players in particular want to cultivate mass.

Safety Concerns

- Weight crush
- Over-stress injuries
- Chronic soft tissue damage
- Acute soft tissue damage

Weight Crush

- Lifters should always have an exit plan for their lift if it fails
  - A spotter can help the athlete put the weight back if their strength fails
  - For some exercises, a catch mechanism prevents a weight crush
  - With certain types of weights and movements, simply dropping the weight on the floor is often a good exit plan. If this is chosen, make sure that the area where a weight drops is not a risk to anyone else in the gym
- Safety pins and collars are vital to keep plates from falling off of bar bells and injuring someone
- Hands should be kept away from moving weight stacks on machines, moving parts, and re-racking weights to prevent finger crush injuries

Over-Stress Injuries

- Extreme loads can be too much for the body’s structures to handle
- Broken bones, popped blood vessels, and ruptured ligaments can occur from overly intensive weight lifting
- Rhabdomyolosis occurs when muscles break down due to over-exercise. It is life threatening
- Any over-stress injury is a medical emergency and such injuries need to be treated at a hospital

Chronic Soft Tissue Damage

- Wear and tear over time can tear muscles, ligaments, cartilage, and tendons
- The only solution to these sorts of injuries is rest

Acute Soft Tissue Damage

- Over-extension of a joint can tear muscles, ligaments, tendons, and cartilage
- This type of injury requires medical examination to determine severity and treatment plan, but is not an emergency

Aerobic Endurance Development

- Aerobic endurance refers to the body's ability to convert oxygen into repeated movement
- There is no "silver bullet" to aerobic training, only patience and consistent effort

Acclimation

- Before starting any cardiovascular training, acclimation to the local/seasonal temperature is vital
- Multi-phase process
  - Starts with just existing outside in the weather conditions and in appropriate attire
  - Then low-intensity movement (walking, gardening)
  - Then moderate intensity (short jogging, jog and walk, hiking)
  - Then high intensity (long jogging, sprint and walk)

Building Aerobic Capacity

- After acclimation, aerobic capacity can be built up over time
- Start small, and look to make marginal improvements (in speed or distance) every time doing aerobic exercises
- Building aerobic capacity is exhausting, but should not be painful. Stop if you experience any pain.
- Before any aerobic movements, athletes should stretch to prevent injuries.

Maintaining Aerobic Capacity

- Aerobic fitness drops off quickly, as little as two weeks off can re-set aerobic capacity back to baseline levels
- Luckily, after having built up maximum capacity, performance can be brought back up to 100% within a month
- Maintaining capacity is easier than losing it and getting it back
- Just one maximum-capacity cardio session per week can keep current fitness levels the same

Safety concerns

- Cardiovascular health
    - Make sure that heart has healthy rhythm before training aerobic health
    - Any severe heart conditions (structural damage, congestive failure) make aerobic training impossible. Follow your doctor’s orders in this case.
- Chronic joint damage
    - Running in particular can do serious damage to ankles and knees
    - Make sure to wear appropriate footwear for your activity and surface, stretch, hydrate, and stop immediately if anything hurts
- Danger from surroundings (cars, wild animals, falls)
    - In urban environments, cars pose a life threatening danger to exercisers.
        - You cannot assume the driver of any vehicle sees you unless you make eye contact and they signal you
        - Make sure you are able to hear your surroundings- music is good, but noise cancelling can make you unaware of your surroundings
        - In rural areas, make sure to stick to designated trails to avoid dangerous falls
        - Make sure you know what kinds of wildlife life in your area and what to do if you encounter any of them

Speed development

- Being able to outmaneuver opponents on the field puts players in better position to make plays
- Speed isn’t just one thing. Being fast in just one sense can be enough to make plays, and players should focus on maximising their strengths

Straight line speed

- Traditional conception of “fast”
- Players need to train for a variety of speeds across the game

Short Sprint

- 9 meters
- Most frequent sprint used in a game
- Target times vary by role:
  - Loose Forward: 1.6 Seconds
  - Crease Forward: 1.8 Seconds
  - Loose Back: 1.7 Seconds
  - Crease Back: 1.9 Seconds

Long Sprint

- 60m
- Allows players to win end-to-end foot races
- Target times vary by role:
  - Loose Forward: 7.2 Seconds
  - Crease Forward: 7.6 Seconds
  - Loose Back: 7.4 Seconds
  - Crease Back: 8.0 Seconds

Short Jog

- 2 kilometer
- Allows players to have a higher “base speed” when not sprinting
- Target times vary by role:
  - Loose Forward: 9:36 Minutes
  - Crease Forward: 10:48 Minutes
  - Loose Back: 8:24 Minutes
  - Crease Back: 12:00 minutes

Long Jog

- 5 kilometer
- Allows players to extend their “base speed” for longer periods without slowing to a walk
- Target times vary by role:
  - Loose Forward: 23 Minutes
  - Crease Forward: 26 Minutes
  - Loose Back: 20 Minutes
  - Crease Back: 30 Minutes

Speed-developing exercises

- In addition to just practicing the distances desired for maximal speed, additional training can be done to work on speed-related skills and functionality
  - Working the muscles used in running to increase sprint speed
  - Improving foot speed
  - Improving technical aspects of running

Downhill runs

- Running on a decline can improve foot speed and body control at top speeds
- Being used to moving faster and being able to physically move the body at those speeds

Agility Ladders

- Increasing foot speed can improve balance, change of direction, and top speed
- Having precise foot movements also improves route running on set plays and reduces the chance of handling errors like two touches or two line passes
- Almost any agility movement is good for what oarball players need, so don’t worry too much about choosing the “right” one

Uphill runs

- Running uphill builds power and makes players more comfortable running in a forward lean, which is essential for starting sprints quickly
- Long distance uphill running can also serve as anaerobic development

Resistance Running

- By running while pushing or pulling a weighted sled or pulling a parachute, the muscles used in running can be specifically targeted and the exact movement can be trained
- Very high resistances and slower speeds can help with the first three steps and with pushing opponents in the crease
- Lower resistances and closer to natural speeds can gradually improve speed across the distance

Pool Running

- Running while in standing-depth water adds resistance and reduces impact
- The deeper the water, the more difficult. Ankle deep water is easier than knee-high, which is easier than waist-high, which is easier than chest high.
- Athletes should work their way up to more challenging pool runs, not jump immediately to running a 2k in chest high water at the beach
- Never run in water alone. Having a spotter who is comfortable pulling the athlete out of the water is vital in case of danger

Starts

- Starting in an oarball stance specifically (either a two-point stance with just the feet on the ground, a three-point stance with the stick planted, or a four-point stance with both feet and both hands planted)
- Work on explosiveness and technique from the first three steps
- Goal is to have no wasted movements
  - No false steps
  - Forward movements only

Filmed Running

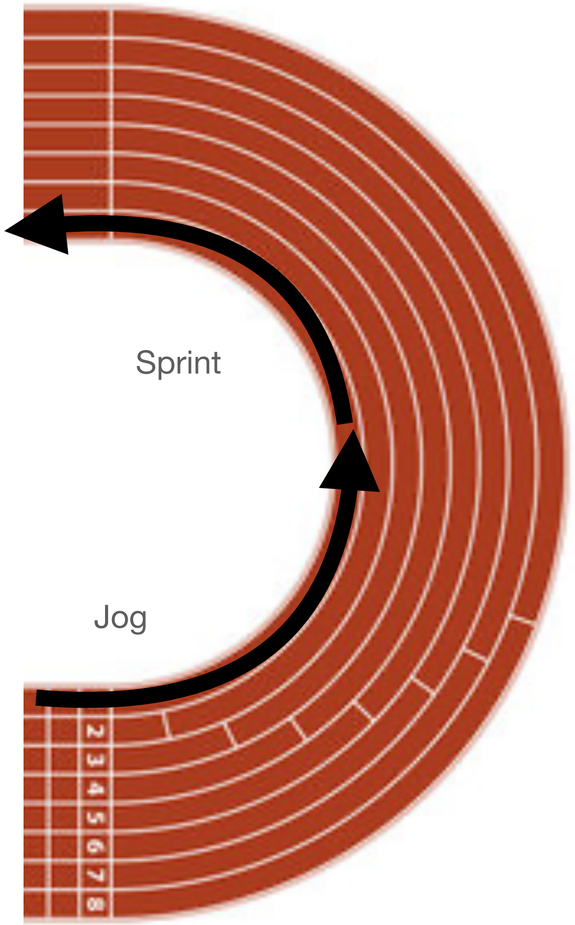
- Have a player jog a moderate distance- not so far as to exhaust them, but far enough that they are using their standard gait
- Film the player running from different angles
- Review film with the player, looking for inefficiencies that can be corrected
  - A common inefficiency is in how the arms are used. Movements should either work with the running movement (forwards) or be minimized entirely to conserve energy. Lateral movements are no good
  - Another common inefficiency is not extending the legs far enough, running with choppy strides. Long strides are both faster and more efficient

Nonlinear Speed

- Speed when moving in a curved direction or when switching the direction faced
- More frequently used in the game than straight line speed

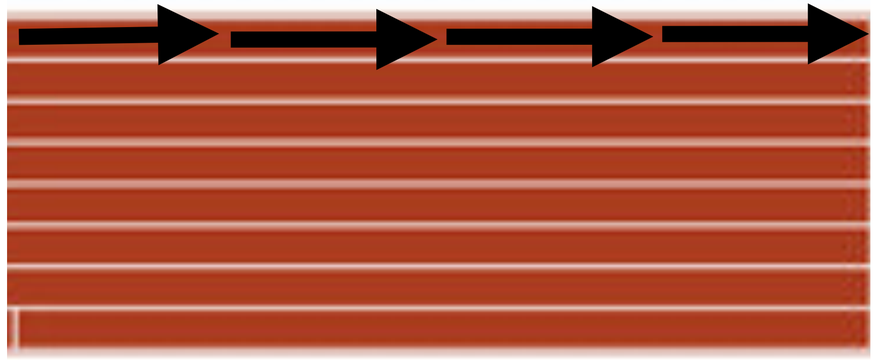
60m Bend Sprints

- At running track or made from cones
- Jog first half of the curve
- Pick up to sprinting speed for second half of curve
- Make sure players practice running both turning left and turning right equally



Shuffle to Sprint

- At running track or made from cones
- 25m shuffling leftwards (simple or crossover)
- 25m sprinting forwards
- 25m shuffling rightwards (simple or crossover) 25m sprinting forwards



Change of Direction

- Most relevant to actually getting separation from opponents
- Very important to only train this when in top condition
  - Without stretching, hard plants can damage soft tissues
  - Without proper footwear for a surface, a slip can lead to an immediate injury
  - If exhausted, an athlete may use sloppy form that leads to injury

One-Cut Drill

- Start at one cone, then sprint to the next cone
- Work way “around the clock” changing the angle of the cut each time
- For short cuts (4:00-8:00) plant before reaching the cone, just behind it
- For leftward cuts (9:00-11:00), run around the right side of the cone and plant with the right foot
- For rightward cuts (1:00-3:00), run around the left side of the cone and plant with the left foot
- For the 6:00 cut, run that twice, practicing planting with both the left foot and right foot

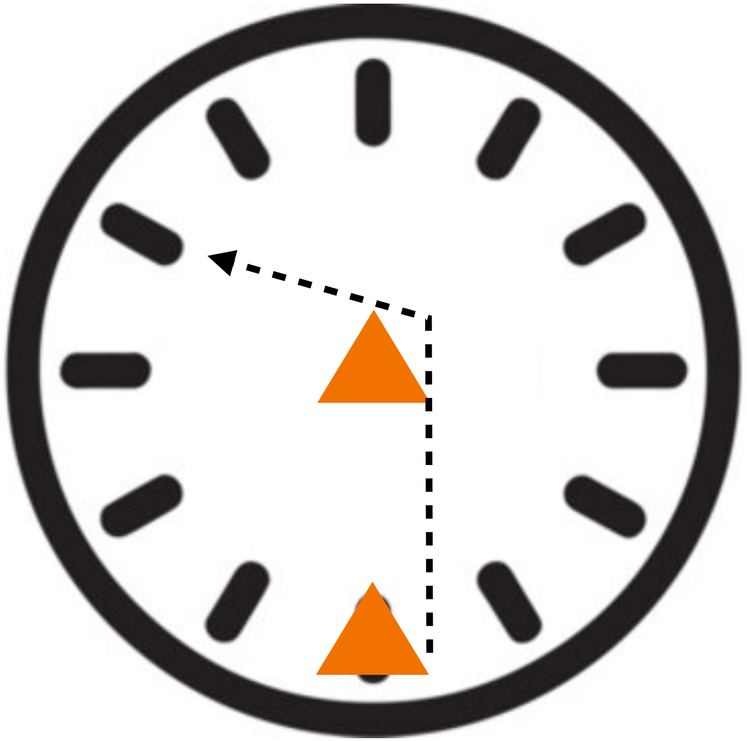
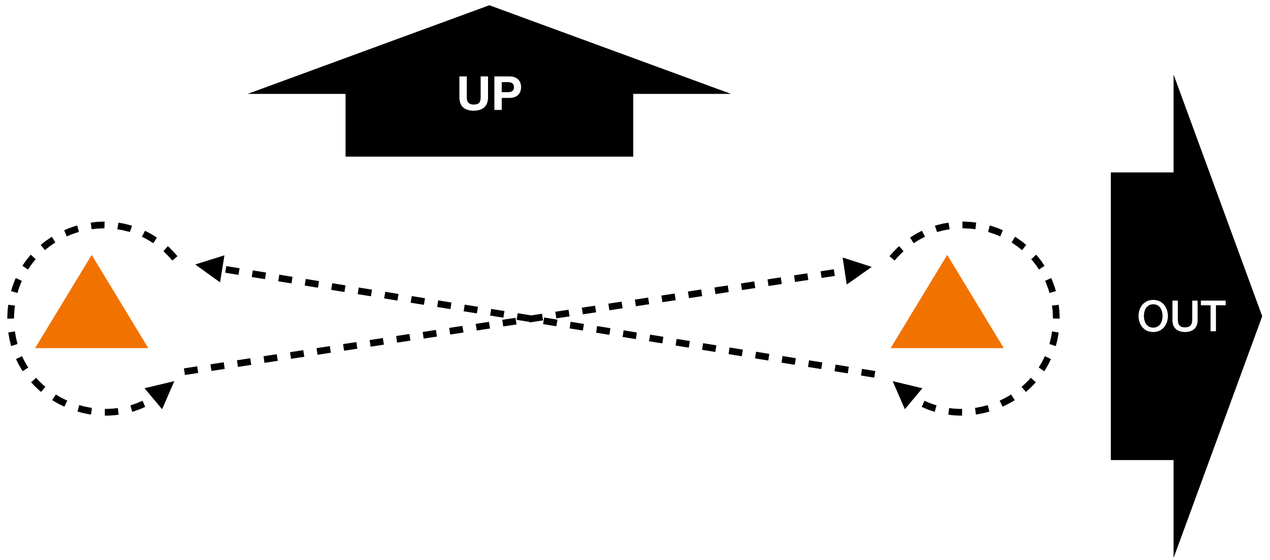


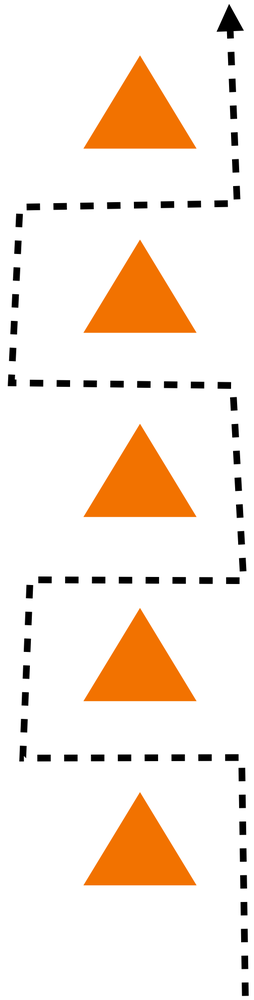
Figure-Eight Drill

- Run around the cones, turning around them and then running across
- Practice running the drill in three ways:
  - Facing “Up” perpendicular to the cones through the whole drill
  - Facing “Out” parallel to the cones through the whole drill
  - Facing “Forward” in the direction of movement for the whole drill



Shimmy Drill

- Run to end of cones, cutting between them laterally
- Use different types of cuts
  - Plant cut
  - Jump cut
- Doing the drill on different inclines builds different skills
  - uphill builds power through contact
  - downhill increases foot speed
  - across a hill builds lateral explosiveness
  - flat ground is most translatable to the movement in a game



What is Anaerobic Endurance?

- Muscle endurance when the lungs can’t supply enough oxygen
- Uses up glycogen stores, creating lactic acid and burning sensation
- Anaerobic endurance is a combination of factors
  - Muscle conditioning to extended stresses
  - Improvement of high-intensity oxygen supply
  - Psychological conditioning to personal limits

Calisthenic Training

- Body movements to train muscles (squats, lunges, push-ups, sit-ups)
- Continuous muscle usage (hiking, long-distance lunges, jumping rope)
- Can be either **plyometric** (exercises that move) or **isometric** (exercises that do not move)

Plyometrics

- Bodyweight exercises
- Push-ups, chin-ups, inverted rows, dips
- Crunches, captain’s chair, leg raises, supine bicycle, Russian twist,
- Squats, lunges, lateral lunges, calf raises, jumping rope

Isometrics

- Plyometrics which are held for extended periods rather than being a movement
- Tend to be a test of mental rather than physical power. How long an athlete can face the “burn” of the exercise
- Held push-up position, held pull-up position, held chin-up
- Planks, supermans, held leg raises
- Invisible Chair/Wall Sit, sumo squat

Endurance Lifts

- Low weight high repetition
- Carries- hold weight and walk short distances
  - Farmer carry- take weights and hold them in hands, using grip strength to hold them up
  - Fireman carry- take soft weights like sand bags or heavy backpacks and sling them onto shoulder, using balance and shoulder to hold them up
- Heavy backpack hiking

High Intensity Movements

- Uphill running
- Swimming
- Intense bicycle riding (up hill medium gear, high gear sprints)
- Cross country skiing
- Running stairs
- Wrestling

Safety Concerns

- Rhabdomyolysis
- Pinched Nerves
- Falls
- Drowning

Rhabdomyolysis

- Potentially life threatening injury
- Result of over-exercise, especially with poor hydration, in poor heat, or when jumping into exercises too challenging for the current fitness level.
- The body begins breaking down its own muscle tissues
- Can be prevented by exercising in healthy regimented ways, hydrating properly, building up to intense training slowly, and listening when the body tells you to stop
- Characterized by muscle pain, weakness, and swelling of muscles. May also see dark brown or reddish urine, disrupted heart rhythm, nausea, or loss of consciousness

Pinched Nerves

- Result of holding stressful positions or repetitive movements, especially under weight pressure
- Reduces movement and causes discomfort
- Can usually be alleviated through stretching and rest, but in severe cases may require medical intervention and physical, occupational, or even speech therapy
- Usually prevented by taking adequate breaks, varying the exercises used week to week

Falls

- Many anaerobic exercises put stress on the joints and muscles in a way that risks falling
- Always have a way to “bail out” of a movement that reduces the risk of injury from a fall (dropping or throwing weights, jumping into bushes instead of falling onto concrete, etc.)
- Make sure path is clear of obstacles before beginning exercises

Drowning

- Only relevant when swimming or pool running
- Important not to go into water when at risk of cramping (immediately after eating, when already experiencing cramps, or when dehydrated)
- Never swim under anything: no boats, caves, or anything which could hit the swimmer’s head.
- Never jump into water which is too shallow for jumping or in a manner which risks injury
- Never go into hazardous waters: no waterfalls, nowhere with boats crossing, no crocodiles, hippos, or sharks, no quarries, no freezing or frozen waters, rip tides, severe weather, “red” tides or bacteria-infested waters, rapids, or shoals
- Never swim alone. Always have someone nearby who is there who can rescue you. That person can swim too if they are capable of rescuing from the water, otherwise they should stay out and have rescue devices (floats, hooks, etc) available.

Athletic Skills

- In addition to being bigger, faster, stronger, athletes must also build their athletic skills
- **Flexibility** prevents injuries and extends reach
- **Balance** lets players make more aggressive plays and

Building Flexibility

- Flexibility comes from trained muscles. Having one flexible muscle doesn’t guarantee other muscles are flexible too
- Just like strength training, flexibility training should be done in sets. Instead of sets based on number of repetitions, use sets based on
- A good mix of static, dynamic, and ballistic stretching is best
    - **Static** stretches involve reaching and holding a position
    - **Dynamic** stretches involve stretching in a continuous movement, often while walking
    - **Ballistic** stretches involve repeated movements back and forth to extend a muscle as far as possible
- Consistent stretching is the only way to build flexibility
    - Before running
    - After weight lifting
    - On off days
- Flexibility-focused cross training can make significant improvements
    - Yoga
    - Ballet
    - Goalkeeping in certain sports (handball, ice hockey) or first base in baseball/softball

Building Balance

- Balance comes from hand-eye coordination, foot control, leg strength, and core strength
- Special equipment exists to help build balance
  - Balance beam and slack rope: walking while balancing, jumping and landing
  - Balance board: extended balancing, catching while balancing, stickhandling while balancing
  - Bosu ball: leg exercises while balancing, being shoved while balancing
  - Exercise ball: extended balancing from knees
- Incorporating single-leg freeweight training can help build balance as well
- Balance-focused cross training can help too
  - Bicycling
  - Skateboarding
  - Ice or roller skating
  - Wrestling
  - Rugby

Example Training Programs

- As a beginner, the focus is on learning movements and adequate rest. Even low-intensity resistance training will see large gains
- As an intermediate player, the player's training can specialize depending on their role on the field. In general, crease players will look for bulk and focus on muscles used in contact, while loose players will focus more on injury prevention
- As an advanced player in early 20s, players can maximize their training load to reach peak physical performance.
- Senior players in their 30s and 40s need to alter their training to focus more on muscle activation, injury prevention, and rest as gains are unlikely and the body wears down over time
- Players who begin serious exercising as an adult focus on a simple, sustainable program

Beginner, 16 years old

- Monday: Jogging, 15 sets full-body plyometrics, stick handling and kicking practice
- Tuesday: Off
- Wednesday: Speed training, 18 sets leg and core weight lifting, 15 minutes stationary bike
- Thursday: Off
- Friday: Jogging, 18 sets upper body and core weight lifting, 15 minutes rowing ergometer
- Saturday: Off
- Sunday: Stick handling and kicking practice

Intermediate Crease Player, 20 years old

- Monday: Speed training, 15 sets arm and chest weight lifting (Heavy Bench Press)
- Tuesday: Speed training, 15 sets shoulder and trapezius weight lifting (Heavy Barbell Shrug)
- Wednesday: 15 sets leg weight training, kicking practice
- Thursday: 15 sets core weight training, stick handling practice
- Friday: Jogging, stick handling practice
- Saturday: Off
- Sunday: Off

Intermediate Loose Player, 20 years old

- Monday: 18 sets upper body weight lifting, kicking practice
- Tuesday: Speed training, 15 sets core weight training
- Wednesday: Speed training, 15 sets leg weight training (Heavy Calf Raise)
- Thursday: Jogging, kicking practice
- Friday: Jogging, stick handling practice
- Saturday: Off
- Sunday: Off

Advanced Crease Player, 24 years old

- Monday: 21 sets upper body weight training
- Tuesday: 21 sets core weight training
- Wednesday: 21 sets leg weight training
- Thursday: Speed training, 15 sets upper body weight training, stick handling practice
- Friday: Speed training, 15 sets core weight training, stick handling practice
- Saturday: Jogging, 15 sets leg weight training, kicking practice
- Sunday: Off

Advanced Loose Player, 24 years old

- Monday: Jogging, 15 sets upper body weight training, kicking practice
- Tuesday: Speed training, 15 sets core weight training, stick handling practice
- Wednesday: Jogging, 15 sets leg weight training, kicking practice
- Thursday: Speed training, 15 sets upper body weight training, stick handling practice
- Friday: Jogging, 15 sets core weight training, kicking practice
- Saturday: Speed training, 15 sets leg weight training, stick handling practice
- Sunday: Off

Advanced Crease Player, 32 years old

- Monday: off
- Tuesday: 18 sets upper body weight training, Speed training, stick handling practice
- Wednesday: Off
- Thursday: 18 sets leg weight training, Speed training, stick handling practice
- Friday: Off
- Saturday: Jogging, 12 sets core weight training, stick handling practice
- Sunday: Off

Advanced Loose Player, 32 years old

- Monday: Jogging, 12 sets upper body weight training
- Tuesday: Off
- Wednesday: Jogging, 12 sets core weight training
- Thursday: Off
- Friday: Speed training, 12 sets leg weight training
- Saturday: Off
- Sunday: Jogging, kicking training

Beginner Player, 32 years old

- Monday: Jogging, stick handling practice
- Tuesday: Off
- Wednesday: Off
- Thursday: 21 sets full body weight lifting
- Friday: Off
- Saturday: Off
- Sunday: Stick handling and kicking practice