



move
well.
move
often



Name:



FUNCTIONAL MOVEMENT SCREEN

Level 2

CORRECTIVE STRATEGIES

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Why do we perform the movement screen?

As a movement screening professional you understand that the Functional Movement Screen sets a baseline for fundamental movement competency. The primary goal of movement screening is to quickly identify pain or limitations that need to be addressed. This was the focus of the FMS level 1 course; learning the FMS screen (7 movement patterns and 3 clearance tests).

Now we are going to shift focus to how you address issues found in the screen either through referral for pain or by using "corrective exercise". However, please remember that if your screen is wrong or scored incorrectly then your corrective strategies will be wrong.

While we all sit in the same room with varying backgrounds there are things we can agree upon based on the goal of training for movement quality. The basis of improving movement that transfers to specific performance goals is the reason we value different aspects of training movement. The ability to express higher levels of neuromuscular control while improving our physical condition is the goal of functional exercise. Using the screen we can identify the "weak link" and use "corrective exercise" as a gauge for proficiency and deficiency for specific movement tasks within a movement pattern. By using the corrective exercise to expose areas for improvement we apply strategies until the movement pattern has consistently shown proficiency. This is the application of "corrective" vs. "functional". And everyone in this room may have different strategies from our areas of expertise, but the goal is the same.

The FMS is best applied by having a deep familiarity with the Purpose, Description and Tips for Testing from your Level 1 manual or Movement. Then the Verbal Instructions are used to ensure proper set up for every rep of the screen. After the set up is perfect and the movement pattern is being assessed, then apply the Scoring Criteria. At that point, the scores have meaning and can be applied correctly.

Remember the Purpose, Description and Tips for Testing are for you the movement screening professional. The Verbal Instructions are for the individual being screened for ease of understanding, proper set-up and execution. Then you the movement screening professional use the Scoring Criteria to properly "score" the movement.

Running your “Best” FMS Screen

1. As stated above, be sure you have a deep understanding of the Purpose, Description and Tips for Testing. Use the Verbal Instructions and then apply the Scoring Criteria.
2. The first and last questions are the most important - "Do you have pain with this movement? and Do you understand these instructions?"
3. The person being screened needs as much information as they need to understand the movement they are being asked to perform. For most the verbal instructions will suffice, some will need pictures and some will need some form of demonstration (video even) but everyone screened needs to understand what is being asked of them.
4. Every rep needs to start from the proper set up position. For example, if the feet "turn out" during the first rep of the DS then it is up to you to repeat the instructions and make sure the feet are straight ahead for the second and third reps.
5. Step back and watch the entire movement. Do not restrict your vision to one area and don't try to scan from "part to part" or criteria to criteria. Artists use a technique called "negative space" or looking for what "isn't" there - give it a try.
6. Every rep gets a "number" or score. If the person performs three deep squats with their heels on the board then every rep gets either a 1 or a 2 in your mind with the best of the three attempts being the final score for that movement.
7. Why they receive a score doesn't matter only the score matters. Do not worry with trying to figure out "why" the person being screened scores a 1 or 2 or 3 only put that movement into the right "box" according to the scoring criteria.
8. Do not "blame" based on the score. A 1 left /3 right SM does not mean the left shoulder is the "problem". It means you need to look at the SM Pattern by working through the corrective strategies for that pattern.
9. Proper feedback and communication - the person being screened does not need to know the score or why the score is the score. Set the expectation early by letting the person know that you will not be giving a lot of feedback until the end of the screen when you will discuss the results with them. Communicate with them like they are the client not the people you learned the screen with at the workshop.
10. Keep it Fun! That's right - fun!

A good corrective strategy begins with a good movement screen- the quality of the screen determines the effectiveness of the strategy.

The Movement Principles

Functional Movement Systems is based on ten principles originally appearing in the book [Movement](#) by Gray Cook. These are detailed, multifaceted action points to guide movement observation, screening, assessment and treatment. That philosophy can now be distilled into three movement principles. They are simple, yet contain every aspect of physical development to better our understanding and guide our efforts:

Principle 1 states that we should first move well, then move often.

- Principle 1 is our "**Natural Principle**".
- Seek a qualitative minimum before worrying about quantities. If moving well is the standard, moving often is the foreseeable outcome.
- FMS firmly believes this is the life lesson that nature teaches us; we see it in animals and those people who are the physically and mentally healthiest.
- We must protect this 1st principle because, despite what many current fitness philosophies say, the principle does not work in reverse. It is not natural to build capacity on incompetence . . . at least, in nature, it usually doesn't have a good outcome.
- You may have noticed that we have incorporated the first principle into the FMS logo. The lack of punctuation after move often is not an oversight, but an insight. The period following move well means that we need a biomarker before progressing to developing capacity. The lack of a closing period symbolizes sustainability.
- Moving well enables us to adapt. Here's how: It gives us opportunities to develop. Moving often keeps us in contact with our environment and provides us with the ability to explore and expose ourselves to movement opportunities.
- *We should move well enough to respond and often enough to adapt. Moving well allows us to respond appropriately to environmental signals.* It sets up the feedback that is vital for progressive movement learning. Moving often adds volume across time which allows our patterns and tissues to adapt.

Principle 2 directs us to protect, correct, and develop the movement of those in our care.

- Principle 2 is the "**Ethical Principle**".
- Guided by the Hippocratic Oath, first do no harm, and then progress in direction of independence and sustainability.
- Protect! If someone lacks fundamental movement, the current path to fitness and health does not usually begin with foundational and supplementary exercise. That is the paradigm that puts quantity before quality—it attempts to build fitness on dysfunction—it focuses on body parts. The first principle has somehow been reversed—people move often and hope that moving well will just happen. It won't. And movement problems will only get worse when compounded by load and frequency. As functional movement professionals, we stop and protect by temporarily removing exposure to quantity and focus on exercises and strategies that ensure a movement baseline.
- **Protect** could mean referring to a healthcare professional to address pain or avoiding patterns and exercises where pain or dysfunction are present. This allows us to reduce exposure to the exercises, activities and drills that may be reinforcing or exacerbating the dysfunction. In some cases, this may be enough to improve the movement pattern without even adding any corrective exercises or strategies.
- Risk? It is not as scary as it sounds if we invoke our second principle: **protection always precedes correction, which in turn, precedes development.** Protect our clients from themselves and us by removing negatives that are reinforcing poor movement quality. Then, using objective feedback of the screen and corrective strategies, improve the movement baseline. Now, the movement patterns will support the exposure and adaptations that develop capacity, fitness and performance.

Principle 3 tells us to create systems that enforce our philosophy.

- Also, called the "**Practical Principle**".
- Implementation of standard operating procedures, practice intelligent selection, always matching the risk to challenge ratio to the growth and development desired.
- Standard operating procedures and intelligent selection protect those who entrust their health and fitness to us.
- But where should a system start? It should recognize that we cannot know anything without perspective—that we cannot progress without baselines. We consider movement as a vital sign of life, and along with blood pressure and body temperature and many others, it absolutely is. If we can have a system that looks at fundamental movement patterns, we can create a baseline. With that baseline, we can identify and demonstrate the fundamental movements that are missing, deficient or dysfunctional.
- If movement is below a vital sign or ability where it falls below an acceptable fundamental movement standard—that's dysfunction. If someone is unable to execute responses to their environment such as load, energy system response, frequency and volume- that person falls below a physical capacity standard—that's deficiency. We can communicate these states to colleagues and medical professionals in a common language that, in itself, will enforce responsibility and accountability.

If you believe in Principle 1, you honor it with Principle 2. To take action on Principle 2, implement Principle 3.

Corrective Exercise Concepts

SOP - STANDARD OPERATING PROCEDURE

How do you get started with a client? Paperwork? Of course, but beyond that you should have a standard intake procedure. An SOP will consistently ensure you do not miss something in the process of getting a client started. Paperwork, detailed history of exercise, medical conditions, and injury etc..., maybe ACSM guidelines, blood pressure and of course an FMS screen to set the movement baseline.

An SOP does not remove your creativity and experience but rather protects you from any assumptions or missed steps. Please read *The Checklist Manifesto* by Atul Gawande for an excellent book on the concept of the checklist and SOP.

IDENTIFY THE CORRECT PATTERN

There are two aspects of identifying the correct pattern for "correction". First you need to perform a correct FMS screen (see the intro and "running" your best FMS screen). Second you need to apply the algorithm correctly (see above).

PAIN IS THE DIVIDING LINE

Zero's need referral to the appropriate medical professional. As Gray Cook has stated: "pain changes everything." An individual no matter how "tough" will compensate around a painful pattern or area. Hence the need to have pain checked by the appropriate medical professional. This does not mean the expectation is that your client needs to be "pain free" to begin exercising but you do need to have a diagnosis and documented clearance to train them.

There are many horror stories that should convince you not to mess with pain, but speak with your instructor for more information if you have questions or concerns regarding this. Pain means an SFMA evaluation is the most appropriate course of action. This again brings up the importance of developing your professional network. Do not "train the pain". Read Mike Boyle's "Does It Hurt" article on Strengthcoach.com

NEUROLOGICAL

When an FMS screen is performed you are "capturing" the individual's "movement behavior" and competency at that moment in time. This is a reflection of what is currently happening with that person. During your corrective work you will be trying to change their movement behavior, this means you will need to get the best response from their neurological system.

The beauty of this is that if you follow the FMS corrective algorithm and are working towards correcting the correct pattern, and you are providing them with a sensory rich environment on the edge of their ability, the neurological system will do the rest. Read *Movement* by Gray Cook and look for the work of Nick Winkleman on cueing and motor learning

DON'T FORGET THE MECHANICAL IN BIOMECHANICAL

While the neurological system is "in control" there are realities to working with the physical structure of the body. The mechanical in biomechanical should remind us that there is an underlying joint system and anatomy that can have a powerful influence on movement. An ankle with a bone spur (or someone with a history of a congenital issue like clubfoot) will not respond to "correction" and can even lead to problems. Someone with a "unique" hip structure (anteversion or retroversion or FAI) will likely not improve their hip internal rotation and problems can result from "banging" away on a restriction that is structural in nature. When something does not respond to good corrective work, first you need to make sure you have performed your best FMS. Then you need to make sure you are correcting the appropriate pattern. At that point, if the corrective work is not effective you should consider the individuals' structure and keep in mind how this may be influencing your corrective strategy.

DON'T FORGET THE BIO IN BIOMECHANICAL

The other part of the biomechanical equation is the bio (biology). This includes everything from the neurological system, digestive system (internal organs), hormones, enzymes and many other aspects of our human biology.

Our nutrition, stress (sympathetic/parasympathetic systems), emotional state, visual/vestibular and proprioceptive systems all play a part in how our biomechanical system works. Gut irritation from poor nutrition or simple dehydration from inadequate water intake can influence how a person moves. It "all" matters.

LANGUAGE

Our words are powerful. Clients can be especially influenced by the language we use during screening, corrective work and training. When you learned the FMS you were working with other movement screening professionals. Words like failure for pain, dysfunctional, and "at risk" were used between those being screened and those running the screen. NEVER use these words with a client. They are not a movement screening professional and you should never tell a client they failed or that they are "dysfunctional" etc... Our words are powerful.

Keep everything in the positive and supportive language. Keep the language appropriate for the individual. A client should never leave you feeling "broken" but in the case of medical referral or needing to stop a favorite activity for a short time you may have to provide the answer they need, not the answer they want. And in those cases you need to have the personality and communication skills to transmit the message in a positive manner and help them understand the great opportunity you just uncovered.

SHORT TERM RESPONSE FOR LONG TERM ADAPTATION

You need to have a clear vision of what expectation each corrective drill you apply will have and how each individual is expected to respond to this. There must be a positive short-term response to each corrective drill - you need to know that each corrective drill translates to an improvement on the pattern you have chosen to target. DO NOT GUESS - Retest and make the appropriate changes until you get the desired outcome in a timely manner. Know that the corrective drills change the pattern so that the short-term responses can add up to long-term adaptation. This is when you will actually change the pattern in an efficient manner. Remember, every corrective drill presents an opportunity to change the targeted pattern - you will either improve the pattern or make the pattern worse. Retesting is vital in order for you to continue on the correct path.

ART AND A SCIENCE

"No plan survives contact with the enemy." A classic military saying and one that is appropriate to corrective exercise as well. The individual in front of you will determine the actual process, your designed "blueprint" for them should not. Most people will stay fairly close to the blueprint you lay out, but the art of exercise and corrective exercise is applying the science to the individual in front of you. You cannot have your "top 5" ASLR corrective exercises that you apply to everyone. You simply have options to address the targeted pattern and you will retest after each exercise to find the exercise (or exercises) that create the positive change you expect in that pattern. The right exercise for the right person at the right time. Apply an exercise and then retest the pattern so what you do is always tailored to the individual. The thing to keep in mind is that the most important aspect of corrective exercise and program design are achieve the desired and expected results. The exercise you choose are the ends to a mean - If an exercise does not result in the outcome you expect, it is time utilize a different exercise. Favorite exercises will change over time - don't be so hung up on using your favorite exercises that you forget that the results are more important than the chosen exercise.

"SYMMETRY"

A frequent criticism of the FMS is the concept of symmetry. There are those that feel it necessary to "remind" everyone that we are all "asymmetrical". Therefore "symmetry" is not possible or desirable. Please remember that the "symmetry" sought in the FMS is a symmetry of score not of precise measurement. A person with an 8 inch hand can have a 4 inch variance between their right and left shoulder mobility reach (between 8 and 12 inches) and still score a pair of 2's on the FMS. Symmetry of score (FMS Score - 3, 2, or 1) not symmetry of measurement (meaning precise left to right movement in inches etc...). Individual variation is "built in" to the FMS.

"THE GOLDILOCKS PRINCIPLE" - TOO HOT - TOO COLD - JUST RIGHT

While not all cultures have the story of the 3 little bears and Goldilocks, the concept of "too hot - too cold - just right" can be a powerful one for corrective exercise and movement. As exercise professionals and clinicians the "fear" of going to the extremes of movement or of not performing an exercise in "neutral" can lead us to expect perfect from the first moment. Expecting perfect from the beginning can frustrate the client and prevent movement exploration that feeds motor learning.

Enter "The Goldilocks Principle" - safely visit the extremes or where you "don't" want the client to be so they can find the middle or "neutral".

The Cat/Camel drill is a great example: Full spine flexion (too hot) followed by full spine extension (too cold) so the person can find the middle neutral spine position (just right).

Clients often have reduced proprioception so it is our job to improve that proprioception and allow them to safely explore their movement from the extremes to the middle. The key is to do so safely! Unloaded and slow movement through the available range allows a client to feel where you "don't" want them to be so that where you want them to be has meaning.

Not every drill for every person

"That drill didn't work. What now?" Try another drill (not to be short or smart).

Not every drill will work for every person so you cannot develop such a "devotion" to a drill. What works for you or what worked for the last 10 clients might not work for the eleventh client and might even send them backwards.

There are a myriad of ways to "correct" movement. Be open to what works for the individual in front of you. Remember it is about exposing areas for improvement, not forcing them to "follow the protocol". We are suggesting options for you to explore to have a positive impact on the movement pattern.

SEQUENCE

The suggested FMS training "cycle" is a sequence or a "path" built on natural movement logic. Follow the sequence. Don't skip mobility competency because you are sure that it is a static motor control issue. Don't get lost in improving the mobility and forget to work on the static motor control so the client can control their new mobility. Follow the sequence.

CORRECTIVE OR CONDITIONING

If you are performing an exercise to improve movement or reduce movement related risk then it is a corrective exercise. If you are performing an exercise to improve performance or physical capacity it is a conditioning exercise. Know WHY you are performing an exercise.

CORRECTIVE EX VS. CORRECT EX

Feet straight ahead in the DS on the FMS does not mean we train the squat with the feet straight ahead. The "rules" for movement screening are not necessarily the same as the "rules" for corrective exercise or the correct execution of an exercise. By movement screening and applying corrective exercise first (in our SOP) we are trying to be as sure as we can be that a "mistake" that we see in the execution of an exercise is a technique or strength issue not a movement quality (restriction, mobility, stability, motor control, patterning) issue. By taking the movement quality "issues" off the table, the focus can shift to applying great coaching and proven program design to accomplish the goals of the clients.

CORRECT AND MOVE ON...

Movement screening and corrective exercise should not be a long detour in the training process. When the algorithm is applied along with corrective exercise you should see very efficient change in the movement quality (as identified on the FMS) and have programming clues that help you work towards the client's goals.

A client that has been seated behind a desk without exercise for 20+ years, other sedentary individuals or post injury situations may require much more time in order to achieve the desired movement correction. The longer it takes for a problem to develop, or the longer a client has a movement problem, in general, the longer it will take to achieve permanent results. In this situation, you should be making noticeable and measurable progress towards the ultimate goal of the client. As a general rule, the goal is to move from "correcting" something to training for the client's goals and having fun training or competing.

Introduction to FMS Corrective Essentials

Moving well requires setting a minimum movement competency where an individual can adapt positively at all levels of performance. A movement system, like FMS, must establish an efficient and supportive baseline described as an individual's ability to perform movements with proper joint alignment, muscle coordination, and postural control. This requires changes in muscular length, kinesthetic awareness, stability, strength as well as active and static postures sustained throughout activities of daily living, work, and sport. From our perspective as functional movement professionals, this means our training applications and strategies must provide opportunities to improve mobility, motor control/stability, and functional loading.

Having said that, our first critical objective is do no harm. Our corrective strategies are based on not only improving the pattern but also making sure our interventions do not make them worse or diminish function. This means having an objective feedback tool to use while applying our corrective experience, such as the movement screen.


REGIONAL INTERDEPENDENCE: THE JOINT-BY-JOINT APPROACH

"The body works in an alternating pattern of stable segments connected by mobile joints. If this pattern is altered - dysfunction and compensation will occur." - Gray Cook

Mobility is the amount of motion available at a joint, or series of joints, and the ease with which the joint(s) can actively move through the range of motion (ROM). Mobility allows the body to get into the positions needed to move in all three planes of motion and perform any given motion- without sacrificing stability!

Stability is the ability of any system to remain unchanged or aligned in the presence of change or outside forces. Stability combines the qualities of timing, balance, strength and muscular endurance to prevent any unwanted movement - *without robbing from mobility!*

For our purposes of discussing this movement philosophy:

 A mobile segment is designed to execute movement in six degrees of freedom to achieve more positions within and around a joint. Such as a ball and socket joint like the hip or multi-articular joints like the ankle.


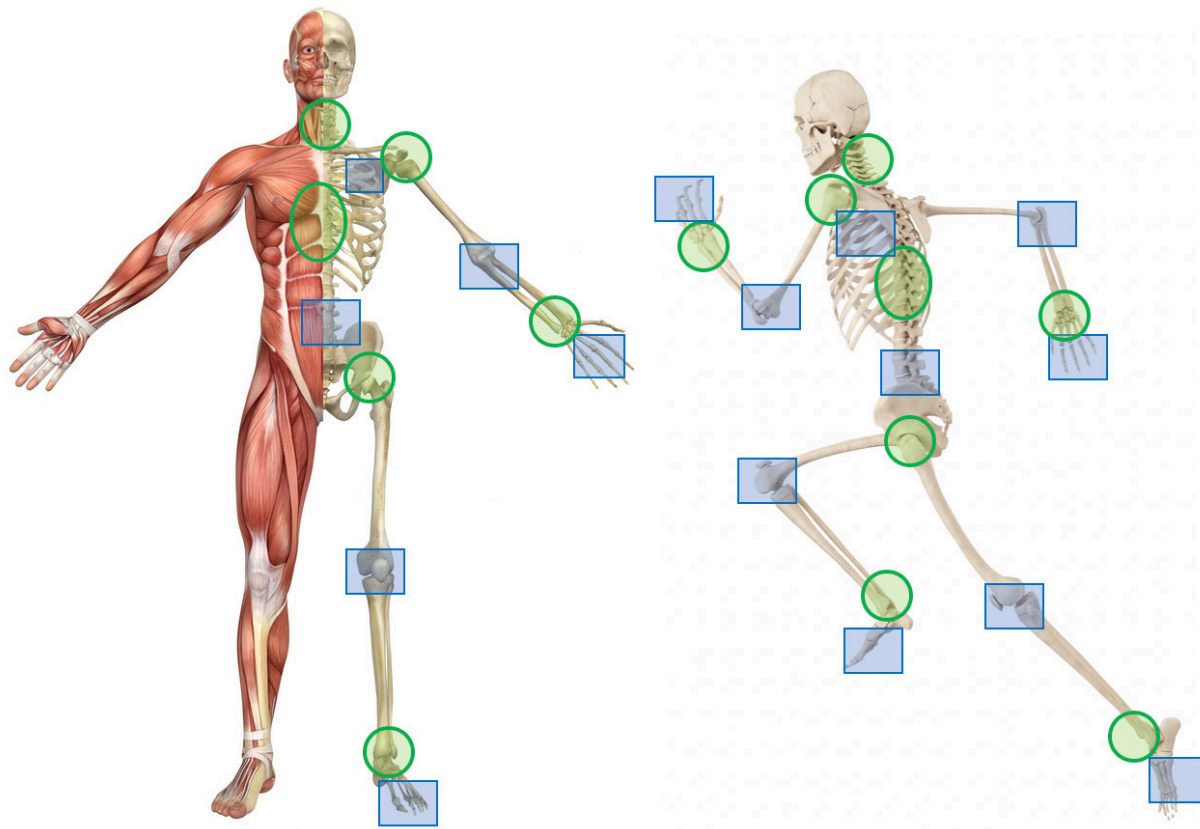
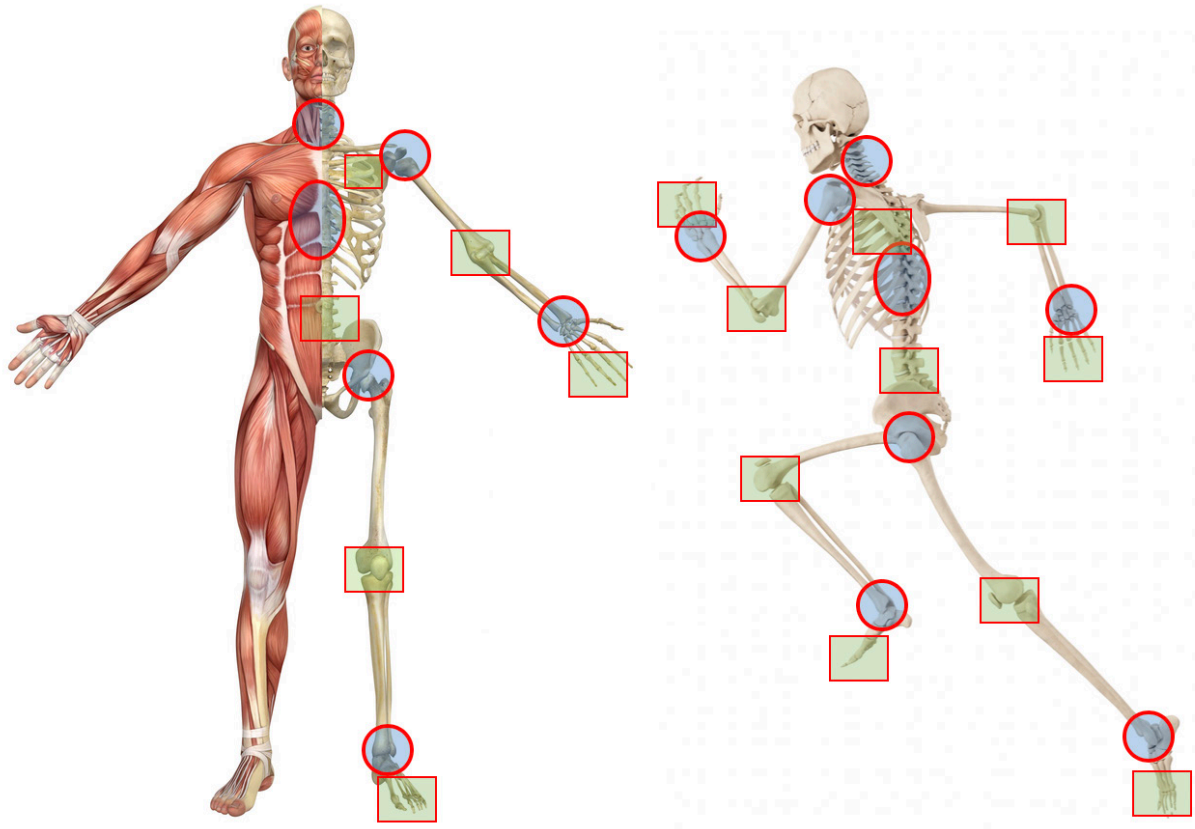
 We define a stable segment as a segment that primarily moves in one plane. For example, the knee is a primary flexor and extender. Therefore, we define it as a stable segment. Now we all know the knee moves in three planes of motion and all three planes are critically important. But for our simple philosophy, the knee would be considered stable compared to the ankle or hip.

DIAGRAM OF HEALTHY, FUNCTIONAL JOINT-BY-JOINT RELATIONSHIP:



Stabile Segments	Mobile Segments
Foot	Ankle
Knee	Hip
Lumbar Spine	Thoracic Spine
Scapula	Cervical Spine
Elbow	Shoulder
Hand	Wrist

WHEN THINGS GO WRONG IN THE JOINT-BY-JOINT RELATIONSHIP:



What alters a healthy, joint-by-joint relationship (from TPI Level 1 Certification):

- **Traumas** - Accidents, Posture, Repetitive Injuries.
- **Thoughts** - Stress, Anxiety, Mental Collapse.
- **Toxins** - What You Eat, What You Breathe, What You Drink.
- **Technique** - Poor Learned Skills, Muscle Patterns, Bad Habits.

Corrective Essential: Mobility

WHY MOBILITY FIRST AND THE FMS PERSPECTIVE

Improving Mobility creates opportunities for:

- Better input and proprioceptive feedback (perception)
- Full advantage of active ROM
- Cascade of neural input through changing joint positions

The FMS prioritizes mobility of the hip, thorax and ankle as demonstrated by the ASLR, SM and Ankle Mobility prioritization in the Corrective Algorithm. The focus on these mobility-biased patterns can lead to some misinterpretations since proximal stability for distal mobility is a common perspective in movement education circles.

The interpretation of the proximal stability for distal mobility can lead to a reductionist conclusion that stability should be first and sometimes only. The interpretation of the FMS Corrective Hierarchy can lead to a reductionist conclusion that mobility should be first or isolated. However, the concept of proximal stability for distal mobility does not imply isolated stability or stability first. And the FMS Corrective Algorithm prioritizes the mobility-biased patterns (ASLR and SM) but does not say mobility only or mean to imply it's in the absence of stability. FMS is looking at patterns of movement that include both mobility and stability within the whole pattern. In fact, we have specific examples of applying a stability directed strategy in order to gain mobility within a mobility-biased pattern.

FMS Online Article: Proximal stability for Distal Mobility by Brett Jones

These mobility patterns are prioritized since quality stability is dependent on quality proprioception and quality proprioception is reduced or inaccurate when mobility is limited. Therefore, motor control/stability work should not be attempted until active range of motion is restored or at least improved. If proprioception and stability training are attempted without a good mobility base, then compensations will be learned and motor programs will be altered.

Journal Article: Reactive Neuromuscular Training for the Anterior Cruciate Ligament-Deficient Knee: A Case Report. Gray Cook, MSPT, OCS, CSCS; Lee Burton, MS, ATC, CSCS; Keith Fields, MS, CSCS; Journal of Athletic Training 1999;34(2):194-201

MOBILITY VS. FLEXIBILITY

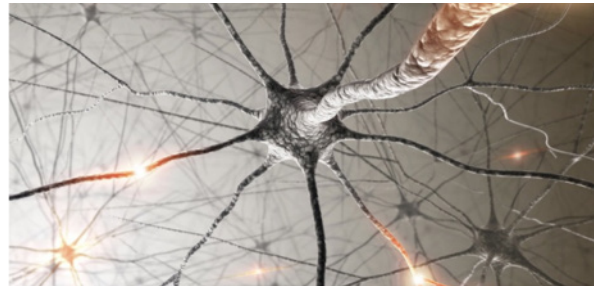
Simply stated, mobility is the amount of motion available at a joint, or series of joints, and the ease with which the joint(s) can actively move through the range of motion (ROM). It should be noted that mobility differs from flexibility. Flexibility refers to the range of motion at a specific joint or series of joints, is typically assessed in non-weight bearing situations and may limit mobility. Flexibility describes the tissue extensibility and tissue quality affecting the ROM around a joint or series of joints. Mobility refers to the client's ability to achieve a position with joint integrity during a given task, activity or skill and must be present for quality motor control and stability.

MOBILITY LIMITATIONS

Dr. Greg Rose, co-founder of Functional Movement Systems shared several possible causes for limitations in mobility in a video hosted by FMS. Both fitness and healthcare professionals can benefit from a better understanding of what could limit mobility. FMS relies on our Certified FMS Professionals to correctly identify what lies within their scope of practice to pursue as possible solutions. Below are some reasons why mobility could be limited:

Neurological Interference within the muscle can cause mobility limitations. Examples:

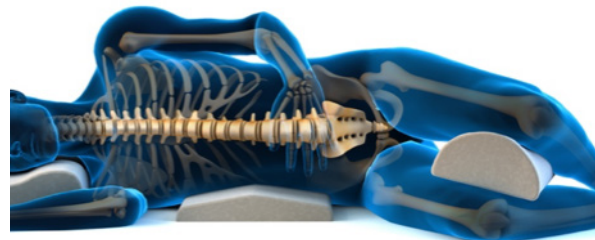
- Stretch reflex can change the perception of length-tension relationships and influence the input that is used for both mobility and motor control.
- Guarding is the reduction of range of motion due to a pain or previous pain experiences.



Overload describes how experiencing dysfunction or previous pain shifts dependence to another side or area of the body.

Ischemia is a reduction in blood flow and oxygenation that can lead to reduced range of motion, muscle activity and hasten muscle fatigue.

- Sleeping is one of the leading causes of ischemia.
- Poor posture and poor ergonomics are also common causes of ischemia.



Inflammation can reduce mobility in muscle and joints. Possible causes:

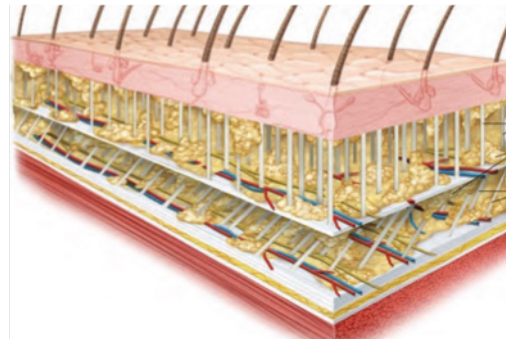
- Diet supports flexibility of the soft tissues, can reduce inflammation, and can support recovery and healing of the neuromuscular system. Hydration is vital for tissue health and function. Therefore, poor diet and lack of hydration can limit mobility.
- Environmental Factors can cause an inflammatory response.
- Delayed Onset Muscle Soreness (DOMS) can result in inflammation and pain during the healing and recovery process that can limit mobility.

Health Problems or disease such as arthritis can cause inflammation in and around the joint.

- Inflammaging as described by Dr. Greg Rose is common inflammation as a result of aging and aging factors.
- Joint Restrictions can be present due to capsular integrity of contractile and non-contractile tissue, as well as changes in articular surfaces. These biomechanical factors can inhibit joint position and ROM.

Fascial Restrictions can limit mobility within our movement system.

- Fascial tissue exists in, around and in between all tissues of the body. It is the glue that holds all other tissues together. Fascia is made of adjacent layers of wavelike collagen fibers, intertwined with elastic fibers and layered with adipose tissue. This composition of collagen and elastic fibers makes it resistant yet adaptable to stretching.
- Biotensegrity is a way to describe how the human body functions and supports movement. It is based on the idea that our bodies rely on the integrity of tensile forces through fascia tissues and that our bones don't pass load directly to each other. As such, forces primarily flow through our fascial structures and muscles instead of depending on the bony structures for this load-bearing support. So, if there are facial restrictions that limit flexibility and or extensibility of soft tissue, then it can limit the mobility and motor control/stability.



Other Connective Tissue such as tendons and ligaments have a direct relationship to joint positioning and tracking to support functional movement. There are multiple reasons that they limit mobility, for example: responding to dysfunctional movement from the joints they are linked to in the kinetic chain, trauma during injury, or tension changes due to overload or postural stress.

Trigger points are described as being the tip of the iceberg. (or the biosberg as Dr. Greg Rose puts it). Trigger points are often described as muscle knots or as a neurological sensation in an area of the muscle. Although there is much discussion on how to identify and define a trigger point, FMS recognizes that this hypertonic and sensitive nature of the tissue can limit ROM. It can be located by sensitive and even painful tissue at the surface area of a muscle yet possibly caused by underlying factors that must be addressed to reduce the occurrence or reoccurrence of the trigger points that limit mobility.

Muscle bulk simply blocks joint movement in some cases. Although having lean muscle mass can be very positive, in excess there can be a tradeoff of ROM around some joints that restricts movement. This changes movement patterns that can limit adaptability and durability to training. This does not need to be an either-or relationship that we accept between muscle mass and mobility. In most cases, sustaining the level of training needed to maintain muscle bulk will benefit from improving mobility and maintaining acceptable movement patterns.

Neurological conditions – Stroke, Parkinson's, Multiple Sclerosis, concussion, Cerebral Palsy, Scleroderma and other medical conditions affect the neural communication with muscle and soft tissue that can inhibit or disrupt mobility. Over time these conditions can create altered structural integrity that limits mobility.

Growth spurts are a very natural and real part of life. Around the age of 12 for females and 14 for males we tend to see dramatic growth and changes in the body. Mobility is limited as the soft tissues are adjusting to changes during growth.

EXAMPLES OF “TOOLS FOR TIGHTNESS”

- Joint distraction – breathing, brachiation (hanging), inversion, band applications, etc.
- Stretching – develops stretch tolerance and can use different modalities such as PNF stretching, static stretching, dynamic stretching, isometric techniques, etc.
- Myofascial release and considerations – fascial manipulation to achieve a release using a number of tools and methods.
- Increasing blood supply – cardio, breathing, sauna, infra-red, dynamic warm-up
- Posture control – By achieving and maintaining optimal posture, the body’s position will encourage ROM and functional opposition around joints to support joint integrity.
- Reducing inflammation – managing inflammation can improve joint mobility as well as reduce stress on soft tissue. Inflammation is part of the healing process to repair damage. While chronic inflammation can impose physical limitations that make intervention with nutrition and possibly a medical referral necessary for improvement.
- Monitoring Growth – strategies scheduling regular measurements for height are simple, quick and can easily help identify growth spurts in youth clients so that programming can be adjusted appropriately.

Foam Rolling or Similar Applications

It is not self-myofascial release but can be good self tissue work. Provides a lot of proprioceptive input and can be entry level bodyweight strength work.

Foam rolling could be good for:

- Trigger points – but in this context only tender spots (the tool is too blunt to be precise)
- Inflammation – can help with reducing inflammation
- Joint distraction
- Active release

Foam rolling may not be good for:

- Fascial restrictions
- Ischemia
- Stretch reflex
- Guarding
- Overload
- Neurological conditions

KEY AREAS TO ADDRESS MOBILITY

Functional Breathing Concepts:

Breathing is the entry point to creating change in all the patterns. Recent research has exposed that breathing dysfunction is multi-dimensional in nature and includes 3 primary categories of dysfunction: biochemical (CO₂, pH), biomechanical (patterns, ribcage movement, respiratory muscles), and the psychophysiological dimension. (FMS Online Course- Screening and Assessing Breathing: A Multidimensional Approach)



Biomechanical: Involves the action of the diaphragm and thorax as well as the interrelationship to posture and motor control.

- Reduced ability to dynamically & accurately regulate intra-abdominal pressure
 - o Poor motor control
 - o Poor spinal support
 - o Poor stabilization
- Muscle Imbalance - (neck, shoulder, girdle, abdominals, spine and pelvis)
 - o Neck pain
 - o Back pain
 - o Pelvic pain
 - o Incontinence

Biochemical: O₂/CO₂ balance and the action of respiration in maintaining blood gas ratios and removal of CO₂ and bringing O₂ to the tissues of the body. The biochemical dimension refers to disturbances in oxygen, carbon dioxide and pH. Hyperventilation is the most common disturbance in the biochemical dimension. Hyperventilation means breathing in excess of metabolic requirements with subsequent depletion of CO₂.

- Possible Effects of Hyperventilation:
 - o Muscle Hypertonicity
 - o Muscle Fatigue
 - o Lower Anabolic Threshold
 - o Pain

Psychophysiological: Sympathetic/parasympathetic balance and emotional state.

FMS Online Article: How Your Breathing Relates to Movement

Example Breathing Corrective Exercises:

- Breathing Observation/Screen
- Crocodile Breathing
- Hook Lying Breathing
- Key Coaching Points
 - o 360-degree Expansion
 - o Pauses
 - o Other postures

Hip Mobility Corrective Strategies:

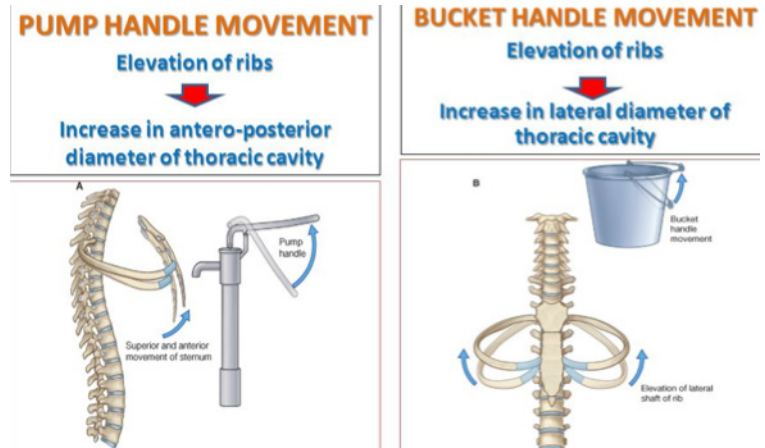
- Twenty-one muscles cross the hip to provide both triplanar movement and stability between the femur and acetabulum. This mobility biased segment uses muscle actions to create both femoral-on-pelvic and pelvic-on-femoral movement. Functional movement at the hips requires the coactivation of trunk muscles. We must pay attention to the biomechanical variables that alter the effectiveness, force, range of motion and torque of muscles used to produce movement patterns involving the hip.
- A mobile hip with good lumbo-pelvic control and rhythm is key to stabilizing the pelvis and lumbar spine and transferring forces below and above the hips.
- The relationship between hip mobility and lumbo-pelvic stability allows us to access functional movement patterns such as the hip hinge. Appropriate weight shifts, positioning, and force production are dependent on such patterns.

Example Hip Mobility Corrective Exercises:

- Related Screens and Movement Patterns – ASLR, RS, TS, IL, HS, DS
- Posterior Chain Strategies
 - o Straight Leg Stretch
 - o Leg Lowering Progression
 - o Leg Raise Core Engagement with FMT
- Anterior Chain Strategies
 - o Hip Flexor Stretch with Core Activation
 - o Straight Leg Bridge
 - o Leg Lock Bridge
 - o Bridge with Extended Leg – Yoga Block
 - o Bridge with Ankle Pump
- Key Coaching Points
 - o Core sequencing
 - o Posterior vs. Anterior emphasis

Thoracic Mobility Corrective Strategies:

The rib cage and all of its attaching musculature are critical to many human movements. The design of the thorax allows for rotation, compression, and extension made possible by the cartilage attachments of the ribs to the sternum as well as the costovertebral and costotransverse attachments of the ribs to the thoracic spine. This creates pump handle movement of the ribs which increases antero-posterior diameter of the thoracic cavity and bucket handle movement of the ribs which increases lateral diameter of the thoracic cavity. These movements are critical to breathing/respiration. So, do not think of the rib cage as a rigid cage but rather as a spring.



These movements are critical to breathing/respiration. So, do not think of the rib cage as a rigid cage but rather as a spring.

Online Article: Thoracic Spine an Immovable Cage or a Mobile Spring? by Gray Cook

The human spine is comprised of vertebrae that are developed with a purpose driven architecture. Notice the difference in the spinous processes and the vertebral bodies when looking at the cervical spine, the thoracic spine and the lumbar spine. The design of these



structures are evident of their purpose and function when it comes to more mobility biased or more stability biased. The cervical spine and thoracic spine are designed to be more mobile. While the lumbar spine limits ranges of motion and is designed to offer structural support.

Example Thoracic Mobility Corrective Exercises:

Related Screens and Movement Patterns – SM, RS, TS, IL, HS, DS

- T-Spine Rotation with Rib Grab
- T-Spine Rotation with Reach
- Brettzel Variations
- Quadruped Rotation Lumbar Locked
- Tall Kneeling Turns- active and loaded
 - o Rotation Sequence: Eyes, Head, Shoulders
 - o Rotation + Lat Flex
- Key Coaching Points
 - o Using breath assisted movement
 - o Set-up postures

Ankle Mobility Screen and Corrective Strategies:

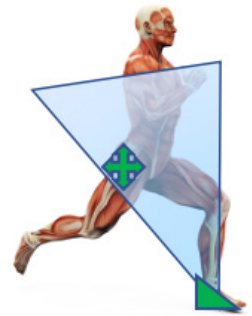
The FMS is designed to move and load the ankle in several different movement patterns. We understand that if the ankle is not able to move well enough to send at least the bare minimum amount of sensory information up the chain, then it is going to drive bad movement behavior.

It is a great example of how important it is to change perception if we are going to change behavior. Here the perception is communicated through the proprioceptive feedback. Think about the popular topic of using exercises to increase glute activation. Most people jump to prescribing exercises such as bridges, hip thrusts and deadlifts in the hopes of growing glute muscles and changing hip extension behavior. But if the ankle is restricted, then it will never send the signal up (perception) the chain that we need full hip extension. Therefore, in movement patterns used in activities and sport, the body is going to listen to this lack of sensory information and reinforce behavior that shows up as limited hip extension. Ankle perception drives glute behavior.

Ankle flexibility (ROM symmetry) is listed as a risk factor for injury.

The FMS Ankle Clearing Screen is designed to check that the client has adequate ankle dorsiflexion. This will allow a more robust, sensory-rich environment that will create the need for full movement capabilities of other segments within many movement patterns that support development and performance.

Online Article: Importance of Considering How the Ankle Influences Movement



Example Ankle Corrective Exercises

Related Screens and Movement Patterns: RS, TSPU, IL, HS, DS

- Ankle Clearing Screen
- Corrective Exercises
 - o Half Kneeling Dorsiflexion Stretch
 - o Open Half Kneeling Pulses with KB
 - o Open Half Kneeling Pulses with Indian Clubs
- Key Coaching Points
 - o Pay attention to anterior ankle discomfort as this may indicate closed joint dysfunction that may benefit from a medical referral.
 - o Setup and direction of knee drive (middle to lateral aspect) are important to avoid using pronation for ROM gains.

Motor Control and Stability

Why Motor Control?

Once mobility in a pattern has been improved (even a small amount) it is our obligation to provide better control over that new range of motion. We can think of this control as stability. A coordination and timing that creates integrity around a joint. Another way to express this is Stability is instantaneous integrity in the presence of full range of motion, as stated by Gray Cook. Training stability is distinctly different from training strength since Most of the stability that makes you do what you do, aligns your joints, creates dynamic posture and produces the axis of rotation so your prime movers can fire; occurs at about 20% of the maximal voluntary contraction. (Gray Cook from The Future of Exercise Program Design). Stability can be broken down into two aspects; static and dynamic stability. Static stability occurs when a muscle adjusts itself to reduce motion in the presence of motion somewhere else. Dynamic stability occurs when one group of muscles changes the angle of the joint while another group of muscles maintains a joint position in a different plane. (Gray Cook from Is Stability the same as Motor Control article on FMS site)

We use the term Motor Control in relation to stability for two reasons:

- To shift away from the perception that stability is a lack of movement or stiffness. Stability is about reflex or reactive timing needed to create integrity around a joint. This does not mean stiff or restricted, but it indicates the motor programs and timing needed to control motion.
- A movement pattern emerges as a function of the ever-changing constraints placed on the learner.
- Movement is a function of the system self-organizing the available degrees of freedom into a single functional unit that is designed to carry out a specific task. (Motor Learning. Mills, DA)
 - o Schmidt's General Motor Program is proposed to account for adaptive and flexibility of coordinated movement behavior. We know that no two movements are exactly the same and there is variation between reps. The neurological system and motor control are alive and adaptive. Recognizing a General Motor Program allows us to better design strategies to take advantage of the motor learning theory.
 - o We refer to schema and incorporate these theories with our corrective mantra: *Create a proprioceptively rich environment at the edge of your abilities, but not beyond, where you are successful but challenged. And the mistakes or asymmetries are magnified so they are brought to the level of awareness of the person performing them.*

It is important to note, these movement learning opportunities are set up with minimal cuing and no mention of muscles. Instead provide external cues and control or constrain the outcomes so learning in the pattern and areas desired can be experienced and achieved. To put it into schema terms, we set the initial conditions to limit the options with set parameters for the execution of the drill. This allows the person to perform the movement and experience the sensory consequence (feedback) and achieve the end result.

Core?

Core stability and postural control is integrated throughout FMS corrective strategies through the application of both static and dynamic motor control drills and corrective strategies. Core stabilizers below are never working in isolation yet each has an important role.

- Local (deep) stabilizers
 - o Sensory feedback for position and posture
 - o Compression of the spine, pelvis and hips to prevent excessive translation contributes to preparatory stiffness
- Global (superficial) stabilizers
 - o Direction-related control of motion, especially in the transverse plane.
 - o Dominant in postural control and alignment.
 - o Most effective at decelerating motion, especially rotational motion (the brakes and steering) in low- and high-load situations
 - o Larger multisegmental muscles that envelop the trunk in a series of interconnected slings and resist trunk motion under load, speed and limb motion.
- Global movers
 - o Direction specific motion
 - o Most effective muscles for generating and accelerating joint motion
 - o Trunk stabilization in high-load sagittal plane circumstances

What Affects Motor Control?

- Pain
- Breathing
- Mobility
- Patterning

Static Motor Control Strategies

Between improving mobility and using a pattern with a functional load, the first step should be to establish static motor control. Instead of jumping to the end goal of a specific movement pattern, we should make sure the individual can control unwanted motion in a static position in order to efficiently maintain postures and positions. Motion control of the joints requires the timely activation of various muscle groups such that the coactivation pattern occurs at minimal cost (minimal compression or tension loading and the least amount of effort) to the musculoskeletal system. Optimal stability is achieved when the balance between performance (the level of stability) and effort is optimized to economize the use of energy. (Vleeming et al, Joint Stability)

To achieve this for both symmetrical and asymmetrical patterns we use transitional postures from the developmental sequence, such as tall and half kneeling positions, to perform drills. Then a dynamic movement on the upper body, such as chops and lifts, is added to the position to challenge the static control of the lower body. Conversely, we can use the movement of the lower body to challenge the upper body static motor control, such as the Trunk Stability Rotation with Knees Flexed, to focus on static motor control of the scapula.

Tall and Half Kneeling Postures:

The tall and half kneeling postures are developmental steps on the ladder of function. These two lower body postures are familiar to rehabilitation providers who practice neuro-developmental strategies during treatment of patients whose central nervous system function is compromised. Earliest or lowest developmental postures include bridging, quadruped, planking, and rolling. The highest level developmental posture is standing (floor based upright postures) or other functional postures which offer challenges to multiple systems (neuromuscular, proprioceptive/ coordination, vestibular, etc.) with little external input. The authors of this article prefer the term 'transitional postures' to describe the two kneeling postures. These transitional postures will be emphasized due to their ability to stress or recruit the smaller stabilizing muscles of the core. (Voight, M. L., Hoogenboom, B. J., & Cook, G. (2008). The chop and lift reconsidered: integrating neuromuscular principles into orthopedic and sports rehabilitation. *N Am J Sports Phys Ther*, 3, 151-159.)

These movements capitalize on the principles of proximal to distal and distal to proximal overflow (also known in the PNF literature as irradiation). According to Knott and Voss, distal to proximal sequencing is essential to improve motor abilities. Reinforcement of the movements by addition of resistance may strengthen the response in a weaker portion of the pattern. Coordinated movements of multiple muscles acting in a kinetic sequence helps to provide sequential, fine-tuned muscular actions. (Moreside, J. M., & McGill, S. M. (2012). Hip joint range of motion improvements using three different interventions. *The Journal of Strength & Conditioning Research*, 26(5), 1265-1273.)

Example Motor Control Corrective Exercises- Static Motor Control:

- Trunk Stability Rotation
- Quadruped Rock with Core Activation
- Transitional Postures
 - o Tall Kneeling
 - Tall Kneeling Set-up
 - Tall Kneeling Chop/Lift/Halo
 - Tall Kneeling Turns
 - o Half Kneeling
 - Half Kneeling Setup
 - Half Kneeling Chop/Lift/Halo
 - Half Kneeling Turns
- Key Coaching Points
 - o Set-up positions
 - o Core sequencing
 - o Leveling the pelvis
 - o Avoid biasing prime-movers
 - o Efficiency in lumbo-pelvic positioning

Dynamic Motor Control Strategies

Rolling patterns are introduced in our dynamic motor control strategies. As part of the developmental sequence rolling sets the foundation for contralateral movement, disassociation between the upper and lower body, and eventually gait and locomotion.

As Gray et al explains in their article:

As the infant matures, head control is achieved by four months of age leading to the ability to transition from one posture to the other, also known as rolling. Rolling is defined as moving from supine to prone or from prone to supine position and involves some aspect of axial rotation. Rotational movements are described as a form of a righting reaction because, as the head rotates, the remainder of the body twists or rotates to become realigned with the head. Rolling can be initiated either by the upper extremity or the lower extremity, each pattern producing the same functional outcome: movement from prone to supine or supine to prone.

Adults use a form of rolling that is segmental; but has also been described as deliberate. Adult rolling described by Richter and colleagues found that normal adults use a variety of movement patterns to roll, most likely related to the flexibility and strength (or lack thereof) in the individual performing the movement. Several of the movement patterns described by Richter et al, were similar to the original patterns of rolling movement described by Voss et al in their original text on Proprioceptive Neuromuscular Facilitation (PNF). The variability of movement patterns used by adults to roll gives therapists multiple options to use when training or retraining adults in the task of rolling.

Four variations of rolling can be used to accomplish movement from prone to supine and supine to prone. Movement from the start position (either supine or prone) can be accomplished by using one upper extremity or one lower extremity to initiate movement in a direction. We use the four variations as a rolling screen to observe symmetry, control, quality, and the ability to complete the roll.

We can then use rolling as a corrective strategy, the upper extremity patterns make use of the fact that movements of the neck facilitate trunk motions or stated more simply, where the eyes, head, and neck go, the trunk will follow. By applying the PNF principle of irradiation, neck flexion facilitates trunk flexion, neck extension facilitates trunk extension, and full neck rotation facilitates lateral flexion of the trunk. Neck patterns can even be used to achieve irradiation into distal parts of the body, for example, neck extension can facilitate extension and abduction of the hip.

Journal Article: Using Rolling to Develop Neuromuscular Control and Coordination of the Core and Extremities of Athletes. Hoogenboom, B., PT, Voight, M., Cook, G., Gill, L. North American Journal of Sports Physical Therapy | Volume 4, Number 2 | May 2009 | Page 70

Example Motor Control Essential Exercises – Dynamic Motor Control:

- Rolling Observation – 8 quadrants
 - o Rolling Corrective Exercises
 - Easy Roll
 - Hard Roll
 - Elbow to knee
 - Hand to ankle
 - Log Roll
 - Rolling Assisted
- Key Coaching Points
 - o Positioning
 - o Roll Sequence – Developmental Sequence
 - o Breathing

Importance of the Toe Touch

The Toe Touch Screen also gives us a unique look into the window of dynamic motor control and offers additional insight to someone's fundamental movement ability. It's common to hear professionals talk about how athletes and clients haven't touched their toes in years and immediately assume it's due to poor tissue quality or muscle length. (usually blaming the short hamstrings) It's a classic example of focusing on parts instead of patterns, hardware instead of software. The reason many people can't touch their toes has nothing to do with the flexibility of their hamstring and everything to do with the sequence of their movement toward the ground.

Much of the posterior chain tension people feel if they can't touch their toes is literally their body putting on the brakes as a protection mechanism. This is due to a number of reasons.

- The rhythm of the lumbar spine and pelvis could be out of sync—the hips and pelvis should be the first part of flexion, and the spine should be the second part of flexion.
- They may not feel comfortable with the posterior weight shift required as the hips go back, and the trunk comes forward.
- They may not be comfortable bending the lumbar spine along with the hips in a rhythmical fashion.

Online Article: "What's in a Toe Touch?" by Gray Cook

The toe touch progression can improve a toe touch in less than a minute. This quickly allows people to see that in a majority of cases it is not about changing muscle length or core stability. It is about simply giving the brain permission to subconsciously adopt a more efficient pattern. The goal is to reintroduce the pattern, increase exposure in the environment, and then be able to subconsciously call upon this regained dynamic motor control in the future.

Motor Control Exercises – Dynamic Motor Control:

- Toe Touch Screen
 - o Standing
 - o Seated
- Toe Touch Progression
- Key Coaching
 - o Breathing pattern
 - o Finishing the pattern
 - o Alternating foot positions

Corrective Essential: Functional Loading

Why Functional Loading?

All of the corrective strategies bring us to functional loading. As Gray would say to hit save on the document. Hip Hinge/ Deadlift, Get-up, Carries and Goblet Squat along with Reactive Neuromuscular Training (RNT) allow us to transition and progress corrections applied within the pattern to goal activities and strength training work. This builds confidence that the movement pattern can return to loaded positions with reduced risk of failure and with a better baseline in which to build performance and physical capacity.

Hip Hinge / Deadlift Variations

Proper hip hinging and deadlifting is a goal of many of the corrective strategies. The basic hip hinge called the deadlift in weight training circles is the most unused and misunderstood exercise in training and rehabilitation. Deadlifting promotes static shoulder girdle motor control, functional core stability, and dynamic hip motor control. It should be a precursor to lunging, squatting and single leg stance activity. Done correctly, deadlifting can foster reflex stabilization. It is great for sagittal plane stability if performed with both arms on a two-leg stance, and great for transverse plane stability if performed with one arm on a single-leg stance.

Example Motor Control Essential Exercises - Functional Loading

- Hip Hinge Pattern
 - o Double to Single Leg
 - Deadlift Touch the Wall
 - With Dowel - RNT
 - o Deadlift Variations

Reactive Neuromuscular Training

The theory behind RNT is to emphasize activities designed to minimize the need for verbal and visual instruction. This type of training asks only that the [individual] respond to a stimulus created by an outside force (eg, being pulled by elastic tubing). The initial emphasis is not altering strength but rather on dynamic stability and proprioception, which can be defined as awareness of posture, movement and changes in equilibrium as well as the knowledge of position, weight and resistance of objects in relation to the body, respectively. This type of training focuses on appropriate body positioning and posture to promote proper dynamic muscular stabilization during functional activities, thus allowing for the control of abnormal joint translation during functional activities. These activities are designed to emphasize quality of movement before quantity of movement.

Reactive Neuromuscular Training for the Anterior Cruciate Ligament-Deficient Knee: A Case Report Gray Cook, MSPT, OCS, CSCS; Lee Burton, MS, ATC, CSCS;

Keith Fields, MS, CSCS; Journal of Athletic Training 1999;34(2):194-201

This can best be summarized by saying feed the mistake. Instead of coaching or cuing someone out of a mistake (valgus collapse for example) we will place an FMT band around that knee and actually pull them into the valgus, safely and with appropriate tension. The appropriate tension is enough tension to bring the mistake to the level of awareness of the person performing the drill and correcting the pattern is triggered. They are not cued to activate a muscle but rather to not let the band win. As control and proper patterning is established the tension is reduced so the proper pattern is maintained without the outside trigger.

RNT can be performed in countless ways and as long as you are appropriately feeding the mistake in a safe manner that triggers the right pattern, then it can be applied to almost any movement. Symmetrical stance, double to single leg stance, split stance and core activation techniques can all benefit from the application of RNT.

Example Motor Control Essential Exercises - Functional Loading

- Reactive Neuromuscular Training (RNT) with FMT
 - o Valgus Collapse
 - o Rotation
 - o Leg Extension
 - o Anterior Shift
 - o Lateral Shift
 - o Push-up RNT
- Get-up
 - o Shoulder Packing Partner Assist
 - o Get-up Arm Bar
 - o Half Getup
- Carries
 - o Farmer's Walk
 - o Overhead Walk
- Goblet Squat
- Key Coaching Points
 - o Movement sequence of hips
 - o Connection to Ground
 - o Maintaining spine position
 - o Feeding the Mistake and positional awareness - RNT

Corrective Strategy Algorithm

An algorithm, as defined by Cormen, Leiserson, Reivest and Stein in Introduction to Algorithms, is "any well-defined procedure describing how to carry out a particular task." Within the FMS there is an algorithm or procedure for addressing the "weak link" found using the screen.

Remember that you don't have to fix "everything" but rather the algorithm should point you towards the "one" thing you need to address as your priority.

While this may seem like a long process it takes less than a second or two to look at a score sheet and apply the algorithm.

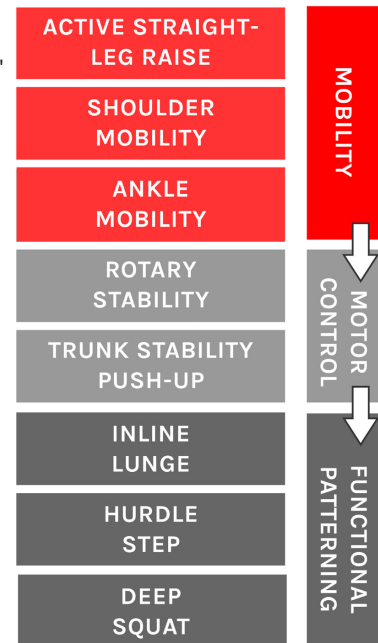
For example, if the raw scores on a score sheet are as follows:

DS - 1
HS - 2/2
ILL - 1/2
SM - 2/2
ASLR - 1/1
TSPU - 1
RS - 2/2

Following the order of the algorithm, look for scores of 1 or an asymmetry in order to identify the "weak link". (Remember the order of the score sheet is designed for efficiently administering the screen. The order of the algorithm is different based on the priorities for the corrective process.) So for this example, your eyes should immediately go to the ASLR and stop there because you have found your "weak link" in the order designated by the algorithm and don't need to look any further. Ignore all other scores and address the ASLR.

General Scoring Rules

1. A score of Zero must be referred to the appropriate medical professional.
 - a. It is extremely important to establish a referral network of professionals - Physician, physical therapist, chiropractor, massage therapist, sports psychologist, etc. One thing to actively seek out in your immediate area is an individual trained in the SFMA where you can send those patients that score a 0 to be further evaluated based on a movement-based diagnostic system sharing the functional movement system philosophy.
2. Mobility patterns are addressed first because Stability/Motor Control cannot be present with reduced mobility. (Mobility must be restored before addressing stability or motor control. Appropriate levels of mobility ensure that adequate sensory input is being used to develop the appropriate stabilization strategies and the appropriate levels of motor control. Without quality levels of mobility, stability and motor control cannot and will not be maximized.)
3. A score of 21 is not the goal. The goal is to set a baseline and to work towards achieving at least 2's on each movement screen.

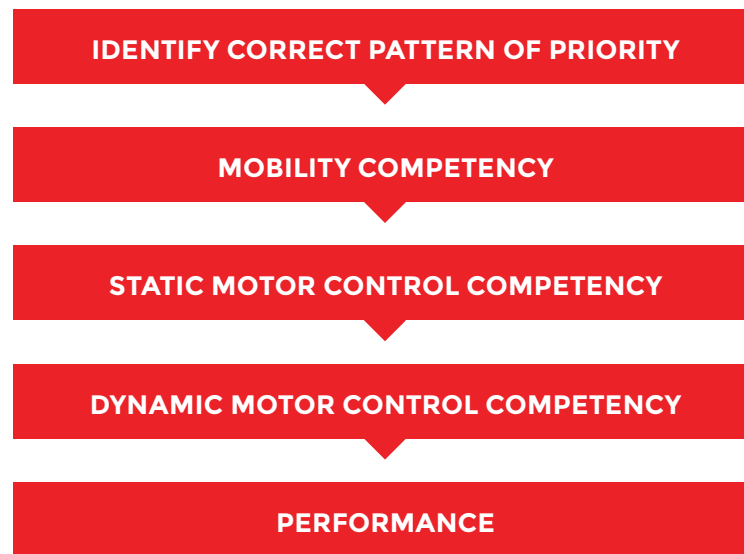


Corrective Exercise Sequence

WHAT IS THE CORRECTIVE EXERCISE SEQUENCE?

It is the application of the FMS training cycle. A "cycle" can be a single session or a training plan over multiple sessions. The flow from IDing the correct pattern > Mobility Competency > Static Stability Competency > Dynamic Motor Control Competency > Strength/Performance is applied to the individual and you move as far down that flow as you can every session as long as the pattern is improving.

FMS TRAINING CYCLE



Key Points:

Remember that corrective exercise is best performed in a sensory rich environment at the edge of your clients abilities. Not beyond where they are successful but where they are challenged.

This sensory rich environment you provide for the corrective drill should magnify the restriction or asymmetry you are work on correcting.

Move as far down the "Corrective path" as you can every session as long as the pattern you are trying to correct is improving.

Improving the pattern is only an indication that the pattern can change. It does not mean you can skip the rest of the Corrective Exercise Sequence. If mobility changes then move on to static stability work and so on.

For example an ASLR corrective strategy might look like:

ID correct pattern = ASLR

Mobility competency = foam roller + core engagement leg raise

Static Stability competency = 1/2 kneeling chops

Dynamic Motor Control competency = SLDL patterning

Strength = Not ready yet

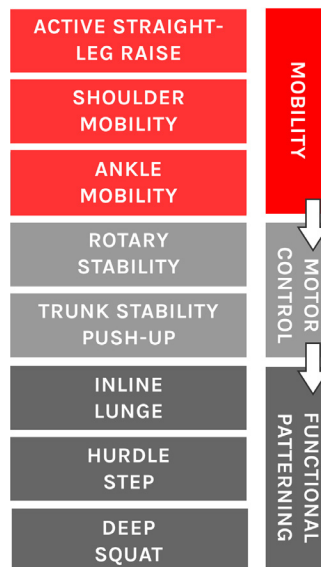
Stoplights, Movement Screening and Exercise

**BRETT JONES, ATC, CSCS, CHIEF SFG
FMS ADVISORY BOARD**

"Stoplights, movement screening and exercise" is all about how FMS professionals approach the results of your FMS screen and make exercise recommendations based on those results. This is the implementation of Principle #2 – Protect, Correct, and Develop. Protect before you correct is a powerful tool. Sometimes what we remove is as or more important than what we add. Removing the exercises that challenge a pattern with a score of zero, one, or asymmetry can be an essential step in the corrective process.

Stoplights help us to safely navigate our roads with a simple color-coded series of signals. Red means stop. Yellow means slow down then prepare to stop or proceed with caution. Green means go. The results of your FMS screen will direct us toward your weak links and asymmetries and can be "color-coded" for ease of understanding the implications of each screen. Exercise recommendations can be color-coded using this stoplight analogy.

If you are an FMS practitioner, you should be familiar with the Corrective Strategy Algorithm used in evaluating the results of an FMS screen.



By reading Movement (make this a link to the book) by Gray Cook and understanding the corrective algorithm, you will be able to easily explain to your client why you are prioritizing a pattern like the ASLR over the DS. Put simply, it means the priority is on mobility first since adequate mobility is the foundation for stability, and the five more primitive patterns of the screen (ASLR, SM, AM, RS, TSPU) form the building blocks for the three "functional" patterns (ILL, HS, DS) as seen in the algorithm order above.

Now we come to the "interesting" part of the stoplight approach: how the FMS screen is used to provide exercise programming recommendations using the Red/Yellow/ Green format. The basis of exercise recommendations using the FMS screen is rooted in two of the central FMS corrective concepts:

1. Do not add fitness to dysfunction.
2. Remove the negative

(Remember that dysfunctional in FMS terms means inability to access the pattern and could negatively impact your progress or success. And we do not call our clients "dysfunctional".)

"Do not add fitness to dysfunction" simply means do not exercise a dysfunctional movement pattern. So, scores of 1 or 0 should not be part of your exercise programming (you will see how this is implemented in the actual Red/Yellow/Green list for exercise recommendations based on the weakest link). "Remove the negative" means two things: First, it means addressing asymmetry and dysfunction found in the screen using the algorithm. Second, it means removing those exercises from the routine that will challenge the dysfunctional pattern. This is also known as the "Protect, then Correct, then Develop" rule from Movement Principle #2.

A key point here – the Red Lights are temporary!

I am not asking you to stop performing an exercise "forever." The conversation is based on what I need to ask you to not do for now – not forever. As the pattern improves red lighted exercises become green again. An analogy we use is not trying to fix the car while driving it. You are better off taking it to the mechanic for a couple of days and then you are back on the road. Removing the negative or offending activity may be enough to improve the movement pattern and FMS score. And then corrective exercise will make sure they can own and hold on to those improvements in the movement pattern.

Also keep in mind the Lifestyle "red lights" of sleep, nutrition, hydration, stress and programming. There is a chance you don't really have a "movement issue" but rather a lifestyle issue is causing a movement issue. Sleep, nutrition, hydration and stress can be major factors in how your body adapts to your exercise routine. Programming is also a huge component especially when it does not cycle or vary the intensity, volume and frequency.

How do we implement the stoplights?

Suggestions are based on the weakest link—if multiple weak links are found, follow the Red Lights for each one. For example, overhead work might be cleared for an ASLR weak link only if the SM is a pass. Simply put, if a particular movement pattern is a 1 or 0, you can look at the Red/Yellow/Green list to see which exercise patterns are in the warning zone



Red Light

These exercises will directly challenge a movement pattern already established to be dysfunctional or asymmetrical. These should therefore be avoided until the movement pattern is symmetrical 2's or 3's—these results prove the individual cannot access that movement pattern and loading or challenging that pattern will only cement the dysfunction.



Yellow Light

Yellow indicates exercise patterns that do not directly challenge the dysfunctional movement pattern, however, these patterns should be used with caution, since they may or may not have a positive impact. Re-screening the dysfunctional pattern will tell you if the Yellow Light exercise is having a positive or negative impact.






Green Light




Green Lighted exercise patterns do not challenge the dysfunctional movement pattern. They might even be helpful in correcting the movement pattern and can be used in training.

EXERCISE RECOMMENDATIONS BASED ON RESULTS OF FMS SCREEN:




Active Straight-Leg Raise

-  Red Light - hip hinging (deadlift—all variations), KB swing and ballistic drills, jumping, running
-  Yellow Light - step-up, lunges, split stance, squatting
-  Green Light - upper body training, core work (excluding sit-ups), tall and half kneeling chop/lift




Shoulder Mobility

-  Red Light - overhead pressing, pulling, carries and some Indian Club work, and handstand position/work, low/high bar barbell position, versa-climber
-  Yellow Light - horizontal pressing and rowing, partial get-ups, rack walk/carries
-  Green Light - deadlift, swings, lower body work, core work (excluding roll outs), farmer's walk/carries




Ankle Mobility

-  Red Light - Lunges, full get-up, split stance exercises, running, jump rope, jumping, prowler/sled push, Squats
-  Yellow Light - deadlift, kettlebell swing, single leg deadlift, elliptical
-  Green Light - half get-up, half kneeling chop/lift and exercises, upper body training




Rotary Stability

-  Red Light - asymmetrical loaded exercises (dumbbell snatch, kettlebell swing)
-  Yellow Light - partial get-up, tall kneeling pressing/chop/lift exercises, half kneeling pressing/chop/lift, deadlifting and symmetrically loaded squatting exercises
-  Green Light - floor press, symmetrical positioned and loaded upper body training

Trunk Stability Push-Up

-  Red Light - pressing (overhead, standing chest press), kettlebell swing and ballistic drills, running, prowler/sled push, overhead carries
-  Yellow Light - deadlift, squatting, core work, push-up progressions, lunges, rack and farmer's walk/carries
-  Green Light - step-ups, split stance exercises, single leg deadlift, half get-up

Inline Lunge and Ankle Clearing Pain

-  Red Light - Lunges, full get-up, split stance exercises, running, jump rope, jumping, prowler/sled push
-  Yellow Light - deadlift, squats (red light if ankle mobility fail), kettlebell swing, single leg deadlift, elliptical
-  Green Light - half get-up, half kneeling chop/lift and exercises, upper body training

Hurdle Step



Red Light - single leg exercises, full get-up, running, prowler/sled push, carries



Yellow Light - symmetrically loaded deadlift and squat variations



Green Light - half get-up, half kneeling chop/lift and exercises, suitcase deadlift, upper body training, core work

Deep Squat



Red Light - squat and variations, jumping



Yellow Light - single leg squatting, split stance and lunge exercises, rowing machine, running



Green Light - get-up, deadlift, single leg deadlift, half kneeling chop/lift and exercises, tall kneeling chop/lift and exercises, upper body training

This list of exercise recommendations is NOT exhaustive or "complete" but should provide adequate direction in which exercises to Red Light, which exercises to proceed with caution (Yellow Light) and which exercises receive a Green Light for exercises based on the weakest link of the FMS screen.

Remember that movement patterns that received a Green Light for the FMS results (scores of 2/2 or 3/3) are cleared to exercise, and you should see that there are many options for exercise recommendations even within movement patterns that received a Red Light. Also keep in mind that the expectation is that the Red Lighted patterns will efficiently become Green Lights with the application of the corrective strategies so no pattern (outside of certain medical or injury related situations) will be Red Lighted "forever" or for long.

Stoplights, movement screening and exercise: a simple way to use the Red, Yellow and Green Light concepts for understanding exercise recommendations based on those scores. Please visit us on the FMS forum if you have questions or comments.

LIGHT SYSTEM CHART OF POPULAR EXERCISES

This chart provides examples of popular exercises and is simply giving you examples of how you may identify programming needs using the stop light colors with each movement pattern. Many of these examples can be included or excluded based on the intensity, volume or technique you are using. In other words, an exercise such as the Get-up may be exercise when loaded for strength and intensity and it may also be a corrective exercise when removing or reducing the load to work on improving key movement qualities. So please bare that in mind with these examples.

Categories:

- COMBO (Multiple Patterns Involved)
- HIP HINGE
- PULL
- PUSH
- SPLIT STANCE
- SQUAT

Movement	Exercise	ASLR	SM	Ankle	RS	TSPU	IL	HS	DS
Combo	Barbell Snatch	Red	Red	Green	Green	Red	Green	Green	Red
Combo	Battling Ropes	Green	Yellow	Green	Yellow	Yellow	Green	Green	Green
Combo	Biking (Stationary)	Yellow	Yellow	Yellow	Green	Green	Yellow	Green	Green
Combo	Cycling	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Green	Green
Combo	Double Kettlebell Clean	Red	Green	Green	Green	Red	Green	Green	Green
Combo	Double Kettlebell Snatch	Red	Red	Green	Green	Red	Green	Green	Green
Combo	Farmers Carry Two-Arm	Green	Green	Green	Green	Yellow	Green	Yellow	Green
Combo	Get Up - Loaded Full	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Green	Green
Combo	Jerk	Yellow	Red	Red	Yellow	Red	Red	Green	Red
Combo	Jerk Barbell	Yellow	Red	Red	Green	Red	Red	Green	Yellow
Combo	Jerk Single Arm	Yellow	Red	Green	Yellow	Yellow	Green	Green	Yellow
Combo	Jump Rope Double Unders	Yellow	Green	Yellow	Green	Yellow	Green	Green	Yellow
Combo	Jump Rope Single Leg	Green	Green	Yellow	Yellow	Green	Green	Red	Green
Combo	Kettlebell Clean	Red	Red	Green	Yellow	Red	Green	Green	Green
Combo	Kettlebell Snatch	Red	Red	Green	Yellow	Red	Green	Green	Green
Combo	Lateral Speed/Agility Work	Green	Green	Red	Yellow	Yellow	Red	Red	Yellow
Combo	Partial/Half Get Up	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Green
Combo	Pendlay Row	Yellow	Yellow	Green	Green	Yellow	Green	Green	Green
Combo	Pistol Squat	Red	Green	Red	Yellow	Yellow	Red	Red	Red
Combo	Power Snatch	Red	Red	Green	Green	Red	Green	Green	Green
Combo	Push Press Barbell	Yellow	Red	Red	Yellow	Yellow	Green	Green	Green
Combo	Rower	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Combo	Running (Medium Pace)	Red	Yellow	Red	Yellow	Yellow	Red	Red	Green
Combo	Running (Slow Paced)	Red	Yellow	Red	Yellow	Yellow	Red	Red	Green
Combo	Sit Ups	Yellow	Yellow	Yellow	Red	Red	Green	Green	Green
Combo	Sprinting	Yellow	Green	Red	Yellow	Red	Red	Red	Green
Combo	Barbell Clean	Red	Yellow	Green	Yellow	Red	Green	Green	Red
Combo	Dumbbell Snatch Single Arm	Red	Red	Green	Yellow	Red	Green	Green	Yellow
Combo	Farmers Carry Single Arm	Green	Green	Green	Green	Yellow	Green	Yellow	Green
Combo	Get Up—BW Full	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Green	Green
Combo	Hang Power Clean	Red	Red	Yellow	Green	Red	Green	Green	Red
Combo	Hang Power Snatch	Yellow	Red	Yellow	Green	Red	Green	Green	Yellow
Combo	Hang Snatch	Yellow	Red	Red	Green	Red	Green	Green	Red
Combo	Jump Rope Double Leg	Green	Green	Red	Green	Green	Green	Green	Green
Combo	Muscle Up	Yellow	Red	Green	Yellow	Yellow	Green	Green	Green
Combo	Power Clean	Red	Yellow	Green	Green	Red	Green	Green	Red
Combo	Prowler Push	Yellow	Green	Yellow	Green	Red	Yellow	Yellow	Green
Combo	Push Press Double Arm	Yellow	Red	Red	Green	Yellow	Green	Green	Green
Combo	Push Press Single Arm	Yellow	Red	Red	Yellow	Yellow	Green	Green	Green
Combo	Renegade Row	Green	Green	Green	Yellow	Red	Green	Green	Green
Combo	Toes to Bar	Red	Red	Green	Yellow	Yellow	Green	Green	Yellow
Combo	Wall Ball	Green	Red	Red	Green	Yellow	Green	Green	Red
Hip Hinge	Conventional Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Green

Movement	Exercise	ASLR	SM	Ankle	RS	TSPU	IL	HS	DS
Hip Hinge	Double KB Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Double KB Suitcase Deadlift	Red	Green	Green	Yellow	Yellow	Green	Green	Green
Hip Hinge	Double KB Swing	Red	Green	Green	Green	Red	Green	Green	Green
Hip Hinge	Good Morning	Red	Red	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Hip Hinge BW	Yellow	Green	Green	Green	Green	Green	Green	Green
Hip Hinge	Kettlebell Deadlift	Red	Green	Green	Green	Green	Green	Green	Green
Hip Hinge	Kettlebell Deadlift-Elevated	Yellow	Green	Green	Green	Green	Green	Green	Green
Hip Hinge	Romanian Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Single Arm KB Deadlift	Red	Green	Green	Yellow	Yellow	Green	Green	Green
Hip Hinge	Single Arm KB Suitcase Deadlift	Red	Green	Green	Yellow	Yellow	Green	Green	Green
Hip Hinge	Single Arm KB Swing	Red	Green	Green	Yellow	Red	Green	Green	Green
Hip Hinge	Single Leg Deadlift	Red	Green	Green	Yellow	Green	Green	Yellow	Green
Hip Hinge	Single Leg Deadlift - Elevated	Yellow	Green	Green	Yellow	Green	Green	Green	Green
Hip Hinge	Snatch Grip Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Yellow
Hip Hinge	Sumo Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Trap Bar Deadlift	Red	Green	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Two Arm KB Swing	Red	Green	Green	Green	Red	Green	Green	Green
Hip Hinge	GHD Back Extension	Red	Yellow	Green	Green	Yellow	Green	Green	Green
Hip Hinge	Glute/Ham Raise	Red	Green	Yellow	Green	Green	Yellow	Green	Green
Pull	Bent Over Row	Green	Yellow	Green	Green	Red	Green	Green	Green
Pull	Double Arm Row	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Pull	Hanging	Green	Red	Green	Green	Green	Green	Green	Green
Pull	Inverted Row	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Pull	Jumping Pull-up	Green	Red	Green	Green	Green	Green	Green	Yellow
Pull	Kipping Pull-up	Yellow	Red	Green	Green	Yellow	Green	Green	Green
Pull	Pull-up Assisted	Green	Red	Green	Green	Green	Green	Green	Green
Pull	Pull-up	Green	Red	Green	Green	Green	Green	Green	Green
Pull	Single Arm Row	Green	Yellow	Green	Yellow	Green	Green	Green	Green
Pull	TRX Row or Suspended Ring Row	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Push	Bench Press	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Push	Handstand Hold	Green	Red	Green	Green	Green	Green	Green	Green
Push	Handstand Push Up	Green	Red	Green	Green	Red	Green	Green	Green
Push	Incline Press	Green	Red	Green	Green	Yellow	Green	Green	Green
Push	OH Press Barbell	Yellow	Red	Green	Green	Red	Green	Green	Green
Push	OH Press Double Arm	Yellow	Red	Green	Green	Red	Green	Green	Green
Push	OH Press Single Arm	Green	Red	Green	Yellow	Red	Green	Green	Green
Push	OH Walks Double Arm	Green	Red	Green	Green	Red	Green	Yellow	Green
Push	OH Walks Single Arm	Green	Red	Green	Yellow	Red	Green	Yellow	Green
Push	Push-up	Green	Yellow	Green	Green	Red	Green	Green	Green
Push	Push-up Plank	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Push	Push-up: Elevated or Assisted	Green	Yellow	Green	Green	Yellow	Green	Green	Green
Push	Single Arm Bench Press Dumbbell	Green	Yellow	Green	Yellow	Yellow	Green	Green	Green
Push	Single Arm Push-up	Green	Red	Green	Red	Red	Green	Green	Green
Split Stance	Forward Lunge	Yellow	Green	Red	Yellow	Yellow	Red	Green	Green
Split Stance	Reverse Lunge	Yellow	Green	Red	Green	Green	Red	Green	Green
Split Stance	Split Squat	Yellow	Green	Red	Yellow	Yellow	Red	Green	Green
Split Stance	Step Up	Yellow	Green	Red	Yellow	Green	Red	Yellow	Green
Squat	Barbell Back Squat	Yellow	Red	Red	Green	Yellow	Red	Green	Red
Squat	Double KB Front Squat	Yellow	Green	Red	Green	Yellow	Red	Green	Red
Squat	Front/Zercher Barbell Squat	Yellow	Green	Red	Green	Yellow	Red	Green	Red
Squat	Goblet Squat	Yellow	Green	Yellow	Green	Green	Yellow	Green	Yellow
Squat	KB Front Squat	Yellow	Red	Red	Yellow	Green	Red	Green	Red
Squat	Overhead Squat	Yellow	Red	Red	Green	Red	Red	Green	Red
Squat	Bodyweight & Assisted Squats	Green	Green	Yellow	Green	Green	Yellow	Green	Yellow