

1. The abdominal muscles are the most under utilized muscle group in function.
2. The abdominals consist of four layers functionally positioned in all three planes of motion.
3. The abdominals control motion of the pelvis and motion of the rib cage in all three planes of motion.
4. We must identify the causes of the compensations that lead to the dysfunction and limitations which do not allow the abdominals to function properly
5. Stability is created by proper motion in all three planes . . . **3D Mostability**
6. We have to have an active lifestyle in order to turn on and tune up the abdominals.
7. Pooh Bear has the ability to quickly determine whether or not our programs have goposis.
8. Understanding how the abdominals are important to the rest of the body is a key component of Pump & Praise.
9. The key is to find out where the shoulders and pelvis can effectively decelerate the various loads in all three planes of motion and build upon that.
10. The most under utilized power source with the golf swing and with most function are the abdominals.
11. Functional stretching requires a strategy for functional strengthening to fully enhance function.
12. We need to understand transformation through mobility creating stability and stability then creating mobility.
13. Functional research reinforces our understanding of the **Chain Reaction** and the biomechanics of function.
14. Tri-plane exercises are the key to training and conditioning for your abdominals.



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v2.2 ABDOMINALS

Power Potential

By: Gary Gray, PT



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OBJECTIVES FOR THE ABDOMINALS *FUNCTIONAL GUIDE*

To assimilate up-to-date information and knowledge of the Abdominals.

To learn how to apply effective functional techniques when testing, training and rehabilitating the Abdominals.

To understand and appreciate the tri-plane **Chain Reaction** principles as they apply to the Abdominals.

HOW TO USE THIS *FUNCTIONAL GUIDE*

This *functional guide* can be used as a convenient summary of the program's contents to take with you after viewing. You can also use this guide as a notebook; space has been provided so that you can make notes on relevant tracts as you watch them.



FUNCTIONAL

Video Digest Series

View of single station Pump & Praise at the “abdominal corner”. Music “One of These Days” by Cliff Washburn

Pump & Praise is a wonderful opportunity to uplift others and be uplifted

STRATEGY 1

Strategically appreciating the giftedness and the miracle of the abdominals as an amazing power source for all forms of function.

STRATEGY 2

Strategically understanding that the abdominals, as with all muscle groups, get turned on proprioceptively and are a sensory driven subconscious part of our total being.

STRATEGY 3

Strategically exploding the myths of the abdominal musculature to create artificial pelvic and back and trunk stability.

STRATEGY 4

Strategically realizing that it is reactive motion, that creates the load, that creates the explode, that leads to the load on the other side.

STRATEGY 5

Strategically analyzing each individual to fully assess the effectiveness of the various components of the body to stimulate and take advantage of the abdominals.



STRATEGY 6

Strategically testing the motion of the pelvis as driven from below and from above as well as the motion of the rib cage as driven from above and below and their relationships to each other to facilitate abdominal reaction.

STRATEGY 7

Strategically comprehending the three dimensionality of motion combined with stability producing effective and ongoing tri-plane function.

STRATEGY 8

Strategically building upon successes and developing effective rehabilitation, prevention, training and conditioning programs with their foundation on the successful functional thresholds.

STRATEGY 9

Strategically transforming the cause of the compensation and dysfunction into the cure through a biomechanical understanding of function and the functional activity itself.

STRATEGY 10

Strategically utilizing the function of the abdominals as a guide to create appropriate flexibility and strengthening programs for any type of activity or sport.

STRATEGY 11

Strategically taking advantage of valid functional research articles for the benefit of our clinical practices.



The abdominal muscles are the most under utilized muscle group in function.

The abdominals are a huge group of muscles consisting of four layers functionally positioned in all three planes of motion.

One of the first groups of muscles that “get turned off” when there is something wrong with the rest of the body.

How do the abdominals proprioceptively get turned on?

- They don't have brains and don't react to brain power.
- They react to three dimensional motion.
- They react to gravity
- They react to ground reaction forces
- They react to momentum and other muscle forces


For us to facilitate success in our patients/clients and athletes we have to know how the abdominals authentically get turned on.

The power of the abdominals is realized in three planes of motion, through motion in all three planes of motion, in order to turn the abdominals on.

In gait the abdominals get turned on by reacting to motion in all three planes between the pelvis and the rib cage.

As our upper body maintains an upright posture and our arms swing in the opposite direction as the pelvis, the abdominals get turned on in all three planes.

With the right foot entering into the ground the pelvis anteriorly rotates in the sagittal plane, drops on the left side in the frontal plane, and rotates forward on the right (left rotation in the transverse plane).



Explosion or concentric reaction of the abdominals occurs following tri-plane loading and during swing phase which feeds to the load for the next step.

What can I do to have fun today? . . . *"if the butt ain't movin' - the abdominals ain't groovin'"* (in all three planes).

You might be wasting your time if you;

- Lay down and stabilize the pelvis while exercising
- Lay down and stabilize the pelvis while consciously trying to turn the abdominals on.
- Stabilize the pelvis with external stabilizers while moving the trunk.

The abdominals control motion of the pelvis and motion of the rib cage in all three planes of motion. . . sometimes in the same direction and sometimes in opposite directions.

Discussion of how the abdominals protect the rest of the body

The abdominals are just begging to be turned on . . . they get turned off by gravity, limitation of the hips, thoracic spine and other major joints of the body.

Limitation of foot function and shoulder function.

Stability is created by proper motion in all three planes . . . 3D Mostability

We must identify the causes of the compensations that lead to the dysfunction and limitations which do not allow the abdominals to function properly.

The key to training and conditioning the abdominals is strategically understanding what the abdominals do and how to tap into this secret power source.



CASE PRESENTATION -

Thanking Shallon Bowden for her valuable assistance in the analysis, rehabilitation, training and conditioning in reference to the abdominal musculature.

We used to think that the abdominal muscles were those muscles that helped us do a sit-up over and over.

Now that we know that they do not do "sit-ups" in real function, the complexity of understanding abdominal function forces us to re-evaluate our strategies.

With analyzing the Chain Reaction of the total body, the problem is that the abdominals do a lot and therefore we must analyze a lot.

Looking for sagittal plane explosion

- Anterior lunging

Looking for anterior rotation of the pelvis

- Gait evaluation, foot analysis, posterior lunging

Looking for frontal plane rotation of the pelvis

- Lateral lunging

Looking for transverse plane rotation of the pelvis

- Rotational lunging. . . posterior lateral rotational and anterior medial rotational

Looking for sagittal plane pelvis and rib cage motion

- Posterior lunging with bilateral upper extremity overhead posterior reaching

Looking for frontal plane pelvis and rib cage motion

- Lateral lunging with bilateral upper extremity overhead lateral reaching

Looking for transverse plane pelvis and rib cage motion

- Posterior lateral rotational lunging with bilateral upper extremity rotational reach to the same side and to the opposite side at shoulder height



Discussion of "losing tone and strength" of the abdominals during function

Looking at the motion and the ability to control the motion between the pelvis and the rib cage

- Left leg balance, trunk extension, posterior trunk reach
- Left leg balance, trunk rotation, rotational trunk reach each way
- Left leg balance, trunk lateral flexion, medial and lateral trunk reach

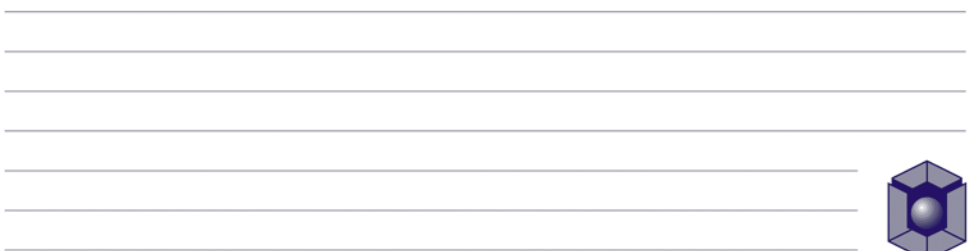
Looking at preloading the pelvis with rib cage movement
(Utilizing step down and return balance reach test)

- Right posterior step down with bilateral upper extremity overhead posterior reach
- Right medial step down with bilateral upper extremity overhead medial reach
- Right medial step down with bilateral upper extremity overhead lateral reach
- Right medial rotational step down with bilateral upper extremity left rotational reach at shoulder height
- Right medial rotational step down with bilateral upper extremity right rotational reach at shoulder height
- Right anterior lateral rotational step down with bilateral upper extremity left rotational reach at shoulder height
- Right anterior lateral rotational step down with bilateral upper extremity right rotational reach at shoulder height

Looking at specific functional hip range of motion with tri-plane hip specific excursion test

- The strategy is to take advantage of abdominal successes so we can turn on the abdominals even more to be even more effective.

"Dancing that special dance" - G. Gray



ANALYSIS AND REHABILITATION DEBRIEF WITH BOB WIERSMA, P.T.

The abdominal muscles are so powerful, have so much potential and do so much that they are willing to let "someone else" take the hit.

With many of the problems that we analyze and rehabilitate, one of goals is to go to the abdominals and ask them "so how do you want to help me today?"

We have to have an active lifestyle in order to turn on and tune up the abdominals.

With functional training and conditioning, functional rehabilitation, functional prevention the activity that the person wants to be involved in must be a part of the care, the treatment and the training and conditioning if our program is on target.

We call this causative cures . . . taking a look at global cause and transforming that into the cure utilizing the abdominal musculature.

Pooh Bear has the ability to quickly determine whether or not our programs have gapolis.

Pooh Bear, watching someone train and condition while lying on their back, yet stating that they are preparing to play golf will state the following:

- Proprioceptors don't work that way
- The pelvis doesn't work that way
- The shoulders don't work that way
- The abdominals do not get loaded that way
- Transformation of the abdominals does not occur like that
- I don't think you are there yet

And Pooh Bear would be correct

Discussion of evaluating a patient that is considered obese . . . we need to transform the abdominals through their current successes to allow them to enhance their function in order to move more effectively and therefore burn calories.

Analysis utilizing body weight and gravity and then tweaking with various loads and in various planes of motion.

Rehabilitation and prevention programs are essentially effectively tweaked training and conditioning programs, constantly looking for causes and potential causes as well as compensations.



Sensory driven proprioceptively . . . what drives you? Understanding the drivers of proprioceptive stimulation allows us to determine when and where motion should occur to get an appropriate response of the abdominals

The pelvic tilt and the transverse abdominous squeeze have gone by the wayside just as the attempt to consciously stimulate the vasus medialis obliquus was to control the patella

If something is not being turned on it is our responsibility to find out what is not being turned on and why it is not being turned on and how we need to drive it proprioceptively to turn

it on to get the abdominals to the point of transformation in order to create mostability.

Trying to get the look and trying to get the function many times require different strategies and will definitely have different results especially in the functional realm.

Brad Gray, Director of PEAK PE

PEAK PE - Promoting Encouragement and Athleticism in Kids of all ages

Pump and Praise is an exciting functional workout.

Pump and Praise is a major component of PEAK PE.

Pump and Praise is a functional circuit training workout driven by music and structured by three dimensional functional exercise opportunities


Pump & Praise provides a multitude of opportunities to experience function.

Understanding how the abdominals are important to the rest of the body is a key component of Pump & Praise.

Pump & Praise utilizes functional equipment to teach the body subconsciously how to take advantage of the abdominals

Pump & Praise takes what the body naturally does and helps it to do better by utilizing activities that the body will naturally know how to do.

The body loves what it is doing because that is what the body was designed to do.



LOOKING FOR THE ABDOMINALS FUNCTIONAL THRESHOLDS

STRATEGICALLY BUILDING UPON DEMONSTRATED FUNCTIONAL SUCCESSES

Abdominal Matrix

- 5 lb dumbbell matrix, shoulder to overhead (behind head)
- 5 lb dumbbell matrix, waist to shoulder (behind shoulder)
- Left leg balance, 5 lb dumbbell matrix, shoulder to overhead (behind head)
- Right leg balance, mirror above exercise
- Left leg balance, 5 lb dumbbell matrix, waist to shoulder (behind shoulder)
- Right leg balance, mirror above exercise
- Anterior lunge with 5 lb dumbbell overhead posterior reach
- Posterior lunge with 5 lb dumbbell overhead posterior reach
- Lateral lunge with 5 lb dumbbell overhead posterior reach
- Posterior lateral rotational lunge with 5 lb dumbbell overhead posterior reach

Discussion of overhead frontal plane load with all three lunges

Discussion of overhead transverse plane load with all three lunges

Discussion of transverse plane load at shoulder height with all three lunges

- Left leg balance with right posterior reach with 5 lb dumbbell overhead posterior reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg medial reach with 5 lb dumbbell overhead medial reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg posterior medial rotational reach 5 lb dumbbell overhead left rotational reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg anterior lateral rotational reach with 5 lb dumbbell overhead right rotational reach
- Right leg balance, mirror above exercise



- Left leg balance with right leg posterior medial rotational reach with 5 lb dumbbell overhead right rotational reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg anterior lateral rotational reach with 5 lb dumbbell overhead left rotational reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg posterior bungee pull with 5 lb dumbbell overhead posterior reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg lateral bungee pull with overhead lateral reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg medial bungee pull with overhead medial reach
- Right leg balance, mirror above exercise
- Left leg balance with right leg posterior medial rotational bungee pull with overhead left rotational reach
- Right leg balance, mirror above exercise
- Left leg balance, right leg anterior lateral rotational bungee pull with overhead right rotational reach
- Right leg balance, mirror above exercise
- (Perform above four exercises with overhead rotational reach in opposite direction)

- Medicine ball anterior lunge with overhead sagittal plane throw
- Medicine ball posterior lunge with overhead sagittal plane throw
- Medicine ball lateral lunge with underhand frontal plane throw
- Medicine ball rotational lunge with rotational throw

The key is to find out where the shoulders and pelvis can effectively decelerate the various loads in all three planes of motion and build upon that

Thanking Shallon Bowden for an amazing workout.



Gary discussing how to turn on the abdominals in preparation for an effective golf swing while Dave progresses through the Golf Gazebo™

We swing with our trunk and perhaps the most important part of our trunk are our abdominals. However the most under utilized power source with the golf swing and with most function are the abdominals.

There are 6 stations in the Golf Gazebo™ each having four stretches that will prepare all of the golfers muscles and joints for a complete golf swing.

The stretches of Station 1 prepare the feet, ankles and lower legs to enhance balance and stability of the golf swing. Station 1 also mobilizes the total body to provide a proper warm-up for each of the stretches of the Gazebo. Overhead rotational stretches are done to facilitate the coil and load and explode through the abdominal musculature.

Station 2 continues to benefit the feet and ankles and lower legs while creating elasticity to the powerful golf muscles of the thighs and hips - specifically the hip flexors, hip rotators, and the glutes.

Significant mobility must be facilitated through all tri-plane hip muscles in order to facilitate effective pelvic motion to turn the abdominals on in all three planes.

Station 3 builds upon Stations 1 & 2 while providing a golf specific synergistic stretch for the posterior leg and back muscles, joint and nerves in order to create improved balance with more coil and power. Mobilizing the tri-plane hamstrings allows additional coil for the pelvis and therefore proprioceptive stimulation and power for the abdominals.

Moving from Station 3 to Station 4 progresses the golfer from golf specific leg, hip and trunk mobility to golf specific hip, trunk, neck and arm mobility. Station 4 continues to develop proper hip and trunk rotation while facilitating tri-plane



loading of the abdominal musculature as well as all anterior and posterior trunk musculature, all within the golf swing plane in order to create a more powerful and accurate golf swing.

The stretches of Station 5 facilitate the powerful 9 o'clock and 3 o'clock motions. Additional abdominal stimulation is enhanced as the full take away arch and the full post impact positions are achieved. Every muscle, joint, and nerve from the feet, through the chain of the body to the hands come into play.

Station 6 integrates all of the stations of the first 5 stations of the Golf Gazebo™ and clears the path for the complete back swing all the way through the complete and balanced follow through, guaranteeing full mobility through the abdominals, entire trunk and the entire chain of the body. Station 6 facilitates the required positions and motions of a powerful golf swing, guaranteeing that the body is now fully prepared and warmed up.

Effective neurological stretching for golf, and for any activity, takes the body through all three planes of motion and through all joints, muscles and nerves a little beyond what is needed for the extremes of the functional activity.

Functional stretching requires a strategy for functional strengthening to fully enhance function.

With all activities, a simple approach is to simply ask the abdominals; What can I do for you to first of all turn you on and make you more effective for this particular activity and/or sport?

Being thankful for a friend like Dave.



RESEARCH ROUNDTABLE WITH DR. DAVID TIBERIO

- The greatest challenge when looking at research regarding the abdominals is to transform the knowledge into function and practical applications we can use as professionals interested in enhancing function.
- In the good old days we weren't functional but we thought we were . . . now it is okay not to be functional, but it is not okay not to be functional but think we are.
- Nonfunctional research, properly interpreted, can provide us with functional strategies.
- We do not want to lock in the pelvis or begin to artificially limit its motion . . . we need to understand the dynamic balance of mobile stability.
- We need to understand transformation through mobility creating stability and stability then creating mobility.

Discussion of research article

C.M. Zannotti, R. W. Bohannon, D. Tiberio, M.J. Dewberry, R. Murray, Kinematics of the double-leg-lowering test for abdominal muscle strength. J Ortho. Sports. Phys. Ther. 32 (2002): 432-436.

M.J. Dewberry, R.W. Bohannon, D. Tiberio, R. Murray, C.M. Zannotti. Pelvic and femoral contributions to bilateral hip flexion by subjects suspended from a bar. Clinical Biomechanics 18 (2003): 494-499.

R. Murray, R.W. Bohannon, D. Tiberio, M.J. Dewberry, C.M. Zannotti. Pelvifemoral rhythm during unilateral hip flexion in standing. Clinical Biomechanics 17 (2002): 147-151.



The research articles deal with three findings:

1. While stabilizing the upper extremities, lifting the leg out in front reveals both pelvic and femoral motion.

Understanding that a load occurs for the unload as when lifting one leg up forward.

2. While supine with the pelvis stabilized, lowering the legs reveals movement of the pelvis.

We are not a linkage system and rarely if ever does motion occur in one segment without motion in the other segments.

Challenging previous conceptions of this test as an assessment tool for the function of the abdominals

3. While hanging, lifting the legs with the knees flexed and the knees extended

Biomechanically understanding the reaction of the hamstrings in the sagittal plane but also in the frontal and transverse planes.

•Discussion of the hip flexors in the same light.

Understanding that the abdominals are "little tattletales". They will not only put everyone else at risk, they will actually "spill their guts" and give evidence as to who the cause and compensations are.

Understanding "little loads" of the abdominals and in all other parts of the body and in all three planes of motion.

The abdominals can help in all forms of function over and over again with the proper subtle tri-plane eccentric loads.

Taking advantage of wonderful research studies and thanking Dave for his ongoing exceptional efforts in bringing pertinent research articles to the table.

