

1. In order to design an appropriate program of functional flexibility we must first of all understand the authentic function of muscles, joints, and nerves.
2. Our goal is to provide our patients, clients and athletes their MOST ABILITY . . . MOSTABILITY.
3. Functional flexibility demands a tri-plane approach . . . understanding the three dimensional function of all muscles and all muscle groups.
4. Functional flexibility allows us to focus on the causes, compensations and symptoms, all at the same time, without getting lost in the minutia.
5. With functional flexibility we must constantly be aware of proprioceptive input and feedback.
6. Discussion of three dimensional stride stance positions with arm drivers in all three planes.
7. Range of motion must be properly identified relative to position, amount of stability, or planes of motion.
8. Understanding turning on the proprioceptors and mimicking the force reduction and force production in a functional flexibility program.
9. Strengthening that which you just stretched functionally.
10. Creating the flexibility needed to enhance the transformation points of our golf swing.
11. Strengthen that which we just stretched for the game of golf.
12. Concept of three dimensional lengthening with submaximal lengthening in one plane of motion with maximal lengthening in the other two.
13. Functional flexibility can be static in all three planes, static in two planes and dynamic in one, static in one plane and dynamic in two, or dynamic in all three planes.



## FUNCTIONAL DESIGN SYSTEMS

Transforming Knowledge Into Function

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# v2.11 FUNCTIONAL FLEXIBILITY

Enhancing Life

By: Gary Gray, PT



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## OBJECTIVES FOR FUNCTIONAL FLEXIBILITY FUNCTIONAL GUIDE

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To assimilate up-to-date information and knowledge about functional flexibility. To learn how to apply effective functional techniques when testing and training for functional flexibility.

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

## HOW TO USE THIS FUNCTIONAL GUIDE

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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

Lucy and Gary stretching before engaging in a fun time of jogging.

Lucy, even though she has significant flexibility, intuitively prepares for the functional task at hand by going through her own functional flexibility program.

## STRATEGY 1

Strategically appreciating the difference between traditional flexibility and functional flexibility.

## STRATEGY 2

Strategically realizing the three dimensional systems approach to functional flexibility.

## STRATEGY 3

Strategically utilizing our biomechanical understanding of function.

## STRATEGY 4

Strategically integrating motion with stability to produce mostability.

## STRATEGY 5

Strategically explaining thresholds of function through transformational functional flexibility.



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STRATEGY 6

Strategically analyzing each individual to determine their unique functional flexibility needs.

STRATEGY 7

Strategically rehabilitating utilizing controlled instability within our functional flexibility program.

STRATEGY 8

Strategically training with an integrated stretch and strengthen program.

STRATEGY 9

Strategically designing functional flexibility programs based on the biomechanical analysis of specific forms of function.

STRATEGY 10

Strategically understanding Chain Reaction™ integrated isolation functional flexibility.

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Functional Flexibility requires a biomechanical understanding of function

Functional flexibility, strangely enough, allows us to function better.

In order to design an appropriate program of functional flexibility we must first of all understand the authentic function of muscles, joints, and nerves.

Functional flexibility requires us to take advantage of the strategy of mostability . . . the combination of mobility and stability, providing the motion and the strength to enhance function.

Our goal is to provide our patients, clients and athletes their MOST ABILITY . . . MOSTABILITY.

Functional flexibility prepares us for the three dimensions of life; work, play, and rest.

Flexibility is the base of the fitness triangle . . . the three dimensions of fitness include strength fitness, cardiovascular fitness, and flexibility fitness.

Flexibility is the base of the base of the triangle and functional flexibility allows us to gain better strength and cardiovascular fitness.

Functional flexibility demands a tri-plane approach . . . understanding the three dimensional function of all muscles and all muscle groups.

The “non-publicized” function of muscles, the “other two planes” may in fact be the most powerful planes of motion for that muscle.

Example of the hamstrings which have notoriety in the sagittal plane but have power and dramatic effectiveness in function in the frontal and transverse planes.

The “most bang for the buck” planes of motion many times are the planes that have subtle motion available to them.

A three dimensional systems approach is essential to understanding functional flexibility.

Three dimensional mobilization of the neurological system, the skeletal joint



system, and the muscular system must be fully understood and taken advantage of.

Tri-plane rule of function . . . the loss of motion in one plane will begin to inhibit motion in the other two planes.

Inhibition of motion in one plane will also create abnormal motion, too much motion or not enough motion, and abnormal force somewhere else in the **Chain Reaction™** of body function.

Functional flexibility allows us to focus on the causes, compensations and symptoms, all at the same time, without getting lost in the minutia.

We lose functional flexibility because of a number of factors . . the greatest factor being our ability to deal with gravity.

Understanding gravity as the culprit as well as the friend of the body reveals the body's schizophrenic relationship with gravity.

Functional flexibility is as simple as asking ourselves; Is what we are doing for flexibility looking a lot like what we want to be doing?

The positions we assume and the motions that we generate with our functional flexibility program should be consistent with the positions and motions required by the ultimate desired function.

One of the most revealing questions with functional flexibility is "Is the functional flexibility transformational?"

Does the functional flexibility program get us into the points of transformation for the functional activities we want to engage in?

With functional flexibility we must constantly be aware of proprioceptive input and feedback.

Functional flexibility is functional and fun . . . we design the programs to enhance function and life itself.

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## CASE PRESENTATION -

Expressing the privilege it is to have Cindi be a part of the Functional Video Digest

Our need to stay tough and functional, mobile and stable.

Understanding what is best for each individual.

Discussion of individualized mobility needs.

Main question . . . "how does Cindi move?"

The description of a flexibility screen.

Going from screening to measuring utilizing the Functional 3D Testing System™

Balance examination with opposite leg drivers

- Left leg balance, alternate anterior and posterior right leg reaches
- Left leg balance, alternate anterior and posterior left leg reaches
- Right leg balance, left leg medial reach
- Left leg balance, right leg medial reach
- Right leg balance, alternate left rotation and right rotation, left leg reaches
- Left leg balance, alternate left rotation and right rotation, right leg reaches
- Right leg balance, left leg right rotational reaches
- Left leg balance, right leg left rotational reaches

Discussion of balance reach screen with opposite leg drive in all three planes.

Now utilizing balance assessment with driving from the top down with the use of the upper extremities

- Right leg balance, alternate anterior and overhead posterior bilateral arm reach
- Left leg balance, alternate anterior and overhead posterior bilateral arm reach
- Right leg balance, alternate overhead medial and lateral bilateral arm reach
- Left leg balance, alternate overhead medial and lateral bilateral arm reach
- Right leg balance with toe touch left, alternate overhead medial and lateral bilateral arm reach
- Left leg balance with toe touch right, alternate overhead medial and lateral bilateral arm reach
- Left leg balance, alternate right rotational and left rotational bilateral arm reach at shoulder height
- Right leg balance, alternate right rotational and left rotational bilateral arm reach at shoulder height



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Discussion of observations and suspicions.

- Review of 3D Lunge Matrix
- Anterior lunge with bilateral arm anterior reach at shoulder height.
- Anterior lunge with bilateral arm overhead posterior reach
- Right lateral lunge with bilateral arm overhead posterior reach
- Left lateral lunge with bilateral arm overhead posterior reach
- Right posterior lateral rotational lunge with bilateral arm overhead posterior reach
- Left posterior lateral rotational lunge with bilateral arm overhead posterior reach

Discussion of observations and suspicions.

Discussion of three dimensional stride stance positions with arm drivers in all three planes.

- Right leg balance, right arm right rotational reach at shoulder height
- Right leg balance, right arm left rotational reach at shoulder height
- Left leg balance, left arm right rotational reach at shoulder height
- Left leg balance, left arm left rotational reach at shoulder height

Discussion of the "glitches".

- Right leg balance, left arm right rotational and left rotational reaches at shoulder height
- Left leg balance, right arm right rotational and left rotational reaches at shoulder height

Discussion of the ongoing strategies of functional flexibility screening.

Structured and stabilized functional flexibility screening in the True Stretch™

- Hamstrings, thoracic spine, hip flexors
- Rectus stretch with right hip extension
  - Right hip extension with left hip flexion
  - Right hip extension with bilateral arm overhead posterior reach
  - Right hip extension with bilateral arm left rotational reach
  - Right hip extension with bilateral arm right rotational reach
  - Right hip extension with right arm overhead left lateral reach
  - Right hip extension with left arm overhead right lateral reach

Discussion of finding and strategies.

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## Functional manual reaction strategy

### Becoming the manual therapy driver

- Hip extension with arms neutral with sagittal plane femoral drive
- Hip extension with arms rotated left with sagittal and transverse plane femoral drive
- Hip extension with arms rotated right with sagittal and transverse plane femoral drive
- Hip extension with arms lateral flexion right with sagittal and transverse plane femoral drive
- Hip extension with arms lateral flexion left with sagittal and transverse plane femoral drive

### Going from stretching to strengthening

- Progressive posterior lunging
- Progressive posterior lunges with bilateral arm overhead posterior reaches
- Progressive posterior lunges with bilateral arm same side rotational reaches
- Progressive posterior lunges with bilateral arm opposite side rotational reaches

### Discussion of posterior lunges with overhead frontal plane arm drive

### Strategy of gaining mobility and stability concurrently

- Left leg balance, right leg posterior reach with bilateral arm overhead posterior reach
- Right leg balance, left leg posterior reach with bilateral arm overhead posterior reach
- Left leg balance with opposite leg rotational drive
- Right leg balance with opposite leg rotational drive
- Unilateral balance with opposite leg three dimensional drivers with shoulder to overhead three dimensional lift matrix.
- Home workable anterior hip three dimensional stretches with tweaking of foot position and tweaking of arm drivers in all three planes.



Discussion of follow up home exercise program.

Discussion of overall functional flexibility strategy.

Combining mobility with stability to enhance your functionability.

Debrief with Bob Wiersma, Executive Director, Accelerated Functional Rehabilitation Network

- Cindi . . . a beautiful and gracious lady
- Discussion of passive range of motion and active range of motion
- Range of motion must be properly identified relative to position, amount of stability, or planes of motion.
- Non-functional versus functional flexibility
- Stretching should be done for a reason
- Balance reaction flexibility screen
- Creating functional stability
- Stability with the True Stretch™
- Off weight bearing unloaded mobility
- Just enough instability to show functional mobility
- Dynamic flexibility correlated to proprioceptors
- Understanding turning on the proprioceptors and mimicking the force reduction and force production in a functional flexibility program
- Eccentric elongation in three planes of motion to the points of transformation is the name of the game
- The body works through the back door
- Treatment goes from stability to instability with assessment going from instability to stability
- Multiple points of transformation through the **Chain Reaction**™
- Not living at end range
- Dosage of functional flexibility "depends"
- Evaluating the response
- Bob's questions always have a better answer within the question than the answer I give



## GARY'S OPPORTUNITY TO TRAIN AND CONDITION WITH BRAD & CINDI

Stretch and strengthen Pump & Praise™  
Strengthening that which you just stretched functionally

- Trunk stretching with flexion
- Trunk stretching with rotation
  
- Trunk strengthening with extension
- Trunk strengthening with rotation
  
- Trunk stretching with extension
- Trunk stretching with rotation
  
- Trunk strengthening with flexion
- Trunk strengthening with rotation
  
- Hamstring stretch with flexion
- Hamstring stretch with rotation
  
- Hamstring strengthening with extension
- Hamstring strengthening with rotation
  
- Hip flexor stretching with extension
- Hip flexor stretching with rotation
  
- Hip flexor strengthening with flexion
- Hip flexor strengthening with rotation
  
- Anterior chest stretching with extension
- Anterior chest stretching with rotation
  
- Anterior chest strengthening with flexion
- Anterior chest strengthening with rotation
  
- Upper back stretching with flexion
- Upper back stretching with rotation
  
- Upper back strengthening with extension
- Upper back strengthening with rotation



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- Hip rotator stretching with flexion
- Hip rotator stretching with rotation
  
- Hip rotator strengthening with extension
- Hip rotator strengthening with rotation
  
- Groin stretching with extension
- Groin stretching with rotation
  
- Groin strengthening with flexion
- Groin strengthening with rotation
  
- Low back stretching with extension
- Low back stretching with rotation
  
- Low back strengthening with flexion
- Low back strengthening with rotation
  
- Low back stretching with flexion
- Low back stretching with rotation
  
- Low back strengthening with extension
- Low back strengthening with rotation

20 Minute Stretch and Strengthen Workout

“I need motion plus stability . . . I need mostability.”

Being proud of both Cindi and Brad

With a special thanks to Cindi and Brad

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Functional flexibility in golf . . . the fun and function of golf.

Understanding the concepts and the strategies and transforming that knowledge into any form of function.

Functional flexibility in golf . . . the requirements of the golf swing are significant.

Creating the flexibility needed to enhance the transformation points of our golf swing.

Working and stretching from the ground up

- Subtalar joint eversion, with ankle joint dorsiflexion, with opposite leg driver, with trunk stretching.
- Sagittal plane, frontal plane and transverse plane spinal distraction.
- Three dimensional hamstring lengthening, with arm rotational drivers.
- Reinforcement of calf stretch with initial hip flexor stretch, while performing hamstring stretching.
- Three dimensional hamstring stretching with trunk extension
- Hip flexor, groin and abdominal three dimensional stretches in the sagittal plane, frontal plane and transverse plane with golf specific arm and trunk drivers.
- Mobilization of hips, thoracic spine and cervical spine as well as shoulder girdles with right arm, right rotation driver and left arm, left rotation driver . . . left arm, right rotation driver and right arm, left rotation driver.
- Facilitate the arc take-away and follow-through with left arm right lateral reach stretch, right arm left lateral reach stretch, bilateral arm right lateral reach stretch, bilateral arm left lateral reach stretch.
- Full backswing stretch to full follow through stretch
- Final follow through stretch with pivot and left hip internal rotational stretch with full bilateral arm follow through.



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Strengthen that which we just stretched for the game of golf

- Bungee right arm backswing transformation
- Bungee left arm backswing transformation
- Bungee bilateral arm backswing transformation  
(the above bungee sequence with right leg balance and left leg balance)
- Bungee left arm follow through transformation
- Bungee right arm follow through transformation
- Bungee bilateral arm follow through transformation  
(the above bungee sequence with right leg balance and left leg balance)

Stretching and strengthening, developing functional flexibility to expand our envelope of function . . . for the game of golf . . . for any form of function . . . requires a biomechanical understanding of that function and of functional flexibility.

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## RESEARCH ROUNDTABLE WITH DR. DAVID TIBERIO

Studies referred to:

McHugh MP, Connolly DA, Eston RG, Kremenich IJ, Nicholas SJ, Gleim GW. The role of passive muscle stiffness in symptoms of exercise-induced muscle damage. *Am J Sports Med.* 1999; 27(5): 594-599.

Witvrouw E, Danneels L, Asselman P, D'Have T, Cambier D. Muscle flexibility as a risk factor for developing muscle injuries in male professional soccer players. *Am J Sports Med.* 2003; 31(1): 41-41-46.

Worrell TW, Smith TL, Winegardner J. Effect of hamstring stretching on hamstring muscle performance. *J Orthop Sports Phys Ther.* 1994; 20(3): 154-159.

Magnusson SP. Passive properties of human skeletal muscle during stretch maneuvers. 1998; 8:65-77.

- Flexibility . . . so much promise yet so much failure.
- Traditional model single plane with single joint action.
- We need to start from what is functional and then go from there.
- Getting nuggets, pearls, and default buttons from studies.
- Can we transform . . . do we have transformational strength?
- The game is proprioceptive flexibility.
- Concept of three dimensional lengthening with submaximal lengthening in one plane of motion with maximal lengthening in the other two.



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- Example of the iliopsoas, loading more in the frontal and transverse plane with minimal loading in the sagittal plane.
- Stretch tolerance is an important part of stretching . . . the proprioceptors allow the tolerance.
- The functional test . . . followed by the appropriate three dimensional functional flexibility program . . . followed by the appropriate functional strengthening program . . . leads to an enhanced functional test.
- Functional flexibility can be static in all three planes, static in two planes and dynamic in one, static in one plane and dynamic in two, or dynamic in all three planes.
- Not needing to be at end range . . . the point of transformation, with multiple points of transformation in all three planes, is not at end range.
- Manual reaction is a part of a functional flexibility program . . . the use of subtle influences creating functional loads to obtain the desired reaction and the ultimate desired effect.
- Functional manual reaction creates the subtle relative rotations . . . we therefore need to know the real and relative rotations at all joints and in all three planes.

A special thanks to Dr. David Tiberio for sharing such relevant research articles.

