

1. The thoracic spine often is the compensation to a cause somewhere else in the chain and ultimately produces symptoms somewhere else in the chain.
2. Concurrent treatment and analysis leads to the revealing of obvious biomechanical suspects.
3. The hands and feet are **Chain Reaction™** drivers of the thoracic spine.
4. FMR - allows us to concurrently treat the cause, the compensation, and ultimately the symptoms.
5. The test is the exercise and the exercise properly tweaked is the test.
6. First of all analyze the hip, the foot and the knee . . . then look and feel how the thoracic spine moves.
7. In upright function our upright table is the TrueStretch™.
8. The goal is to enhance function and restore normalized motion.
9. The FMR is the exercise and the exercise is the FMR.
10. We need to evaluate the thoracic spine the way it functions, treat it the way it functions, rehab it the way it functions, and train and condition it the way it functions.
11. The thoracic spine is a neat place to go to enhance function.
12. The right amount of a good 3D thing is a real good thing.
13. Understanding the loading pattern to the point of transformation is the name of every game . . . in every form of function.
14. Facilitating good and normalized movement with our FMR approach, to let God do the ultimate healing.



FUNCTIONAL DESIGN SYSTEMS

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v3.10 FUNCTIONAL MANUAL REACTION (FMR)

Thoracic Spine
By: Gary Gray, PT



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OBJECTIVES FOR FUNCTIONAL MANUAL REACTION OF THE THORACIC SPINE **FUNCTIONAL GUIDE**

To assimilate up-to-date information and knowledge about FMR of the thoracic spine. To learn how to apply effective functional techniques when testing, training, and rehabilitating using FMR of the thoracic spine.

To understand and appreciate the tri-plane **Chain Reaction™** principles as they apply to FMR of the thoracic spine.

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

A special thanks to Larry Russell . . . G2's boxing partner

STRATEGY 1

Strategically understanding the functional forces that influence the thoracic spine.

STRATEGY 2

Strategically realizing the consistency between functional drivers and the drivers of Functional Manual Reaction.

STRATEGY 3

Strategically appreciating that our Functional Manual Reaction approach is proprioceptively directed.

STRATEGY 4

Strategically proving the effectiveness of our Functional Manual Reaction approach with objectively quantifiable functional testing.



STRATEGY 5

Strategically accessing the thoracic spine utilizing a biomechanically consistent movement analysis.

STRATEGY 6

Strategically seeking the causes of dysfunction through effective Functional Manual Reaction treatment.

STRATEGY 7

Strategically training thoracic spine movement with pole drivers.

STRATEGY 8

Strategically creating a loading **Chain Reaction™** at the point of transformation.



In one of our earlier issues of the Functional Video Digest we described the thoracic spine as a three dimensional cage.

If we are going to design an effective functional manual reaction environment, we are going to have to know as much as possible about the function of the thoracic spine.

What forces influence the thoracic spine? The thoracic spine often is the compensation to a cause somewhere else in the chain, and ultimately produces symptoms somewhere else in the chain.

T-Spine - Relative Symmetrical Frontal Plane Motion
Progressively more transverse plane motion superiorly
Progressively more sagittal plane motion inferiorly

Understanding 3D Coupling . . . tri-plane real and relative motions

Joint motions in the thoracic spine described in reference to the superior segment

With walking, the thoracic spine simultaneously goes through lateral flexion to the right and the left, extension and flexion, and right rotation and left rotation

The miracle of the thoracic spine is complex

Concurrent treatment and analysis leads to the revealing of obvious biomechanical suspects

Type III Mechanics - Too much motion used up in one plane of motion inhibits motion in the other two planes, which will in turn force motion somewhere else . . . "somewhere else hypermobility"

Type III Mechanics - Reflective of our tri-plane rule

Type II Mechanics - Rotation and lateral flexion same

Type I Mechanics - Rotation and lateral flexion opposite

The inferior cervical spine is primarily Type I Mechanics

The thoracic spine reveals Type I, II, and III Mechanics



What influences the thoracic spine and what does it do with it?

Gravity and ground reaction force are powerful drivers of the thoracic spine -- a kyphotic spine creates Type III Mechanics

The hands and feet are **Chain Reaction™** drivers of the thoracic spine

The calf eccentrically controls and concentrically moves the thoracic spine in all three planes

Momentum and other muscle forces are drivers of the thoracic spine

The beauty of functional manual reaction is the utilization of the same drivers of function are the drivers for the FMR techniques

As we seek out functional ways to treat the thoracic spine, we will find potential culprits, potential causes

FMR - allows us to concurrently treat the cause, the compensation, and ultimately the symptoms

Understanding the spinous process and transverse process anatomy

Macro FMR approach to a micro FMR approach . . . utilizing our hands as a progressive compliment

FMR is proprioceptively directed . . . our treatment facilitates the movement to turn on the proprioceptors to restore normal life motion in the thoracic spine, where the causes are, and where the symptoms are

Utilizing the power of tweakology to find and to treat the cause, compensations, and symptoms

The effectiveness of our FMR approach needs to be proven and objectively quantifiable through functional testing

The test is the exercise and the exercise properly tweaked is the test



A special thanks to Dr. David Tiberio

First of all analyze the hip, foot and the knee . . . then look and feel how the thoracic spine moves

Understanding the why behind looking at the thoracic spine relative to the lumbar and cervical spines

Initiating our evaluation with gait and then tweaking the gait

Analysis of the hip with opposite foot drivers in all three planes

Analysis of the hip with bilateral arm drivers in all three planes

We need to know what the foot, knee and hip are doing

A traditional look at the thoracic spine in all three planes

Analysis of the cervical spine with a head driver

Utilizing the arm unilaterally and bilaterally as drivers of the thoracic spine

Starting with the shoulder to overhead 3D Matrix

- Alternate shoulder to overhead anterior
- Alternate shoulder to overhead posterior
- Alternate shoulder to overhead same side lateral
- Alternate shoulder to overhead opposite side lateral
- Alternate shoulder to overhead opposite side rotational
- Alternate shoulder to overhead same side rotational

- Alternate shoulder to knee anterior
- Alternate shoulder to knee posterior
- Alternate shoulder to knee same side lateral
- Alternate shoulder to knee opposite side lateral
- Alternate shoulder to knee opposite side rotational
- Alternate shoulder to knee same side rotational

- Bilateral knee anterior to overhead posterior
- Bilateral overhead right lateral to overhead left lateral
- Bilateral shoulder right rotational to shoulder left rotational



Analysis with tweaking the positions of the feet

Left stride stance with

- Right hand shoulder, left rotational reach with left hand knee, same side lateral reach
- Right hand shoulder, left rotational reach with left hand overhead, opposite side lateral reach

Analyzing at the point of transformation

Left stride stance with

- Right hand knee, left rotational reach
- Right hand knee, left rotational reach with left hand overhead, opposite side lateral reach
- Right hand overhead, left rotational reach with left hand knee, same side lateral reach

Emphasis on the sequencing of the reach

Analysis with pre-position, with left stride stance, with left hand rotational reach to the right to get the pelvis and trunk going in the same direction

Left stride stance

- Left hand shoulder, right rotational reach
- Left hand shoulder, right rotational reach with right hand knee, same side lateral reach
- Left hand shoulder, right rotational reach with right hand overhead, opposite side lateral reach
- Left hand knee, right rotational reach
- Left hand knee, right rotational reach with right hand knee, same side lateral reach
- Left hand knee, right rotational reach with right hand overhead, opposite side lateral reach

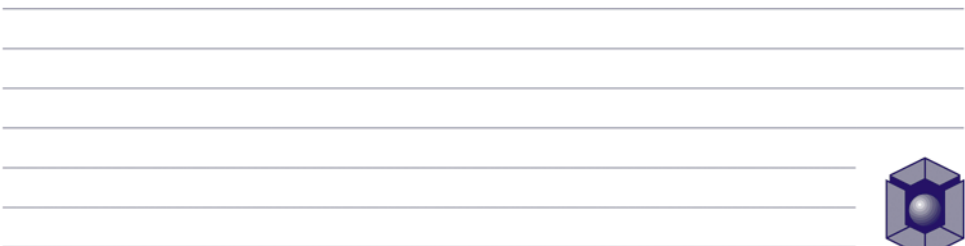
Measuring either one of the reaches relative to the lower extremity that is doing most of the work with Functional 3D Testing System™

A real quick review by pre-positioning the hands and moving the feet into three dimensional lunges

Example of a left lateral flexion and a left rotational pre-positional reach, with a dynamic left rotational motion of the pelvis, with a posterior lunge

Analysis with the exaggeration of the sagittal plane motions and positions of the pelvis and thoracic spine

In our upright table . . . the TrueStretch™, we create flexion of the pelvis and flexion of the thoracic spine, and then use the hands as a driver for the trunk rotation and the trunk lateral flexion, either in the same direction or in opposite directions



In the TrueStretch™ flexion of the pelvis and flexion of the trunk - driving in the frontal plane and/or driving in the transverse plane with the arms

FMR with the thoracic spine and FMR with the scapula

While doing specific segmental mobilizations, the FMR approach also emphasizes the use of gravity; one leg as a driver, the other leg as a driver, one arm as a transverse plane driver, and the other arm as a frontal plane driver

Muscle energy emphasizes taking up the barrier and then initiating contract / relax response

Review of the three dimensional drivers in the flexed position

In the TrueStretch™ in an extended pelvis and extended trunk position

- Utilize arm drivers to drive the frontal plane and transverse plane . . . same or opposite

Example in the TrueStretch™

- Left hip extended, right foot everted, right hip internally rotated, pelvis anteriorly rotated, pelvis rotated to the left, trunk laterally flexed right, left arm driving right rotation . . . can drive with the hand, humerus, scapula, pelvis, and peltrunkula

The goal is to enhance function and restore normalized motion

With effective functional FMR treatment the causes will explode right out in front of us

As long as we know what questions we want to ask, our patients will show us the answers

What exercise should I do to reinforce the FMR? . . . The test is the exercise and the exercise is the test . . . the FMR is the exercise and the exercise is the FMR

The use of a free weight to create the transverse plane and the frontal plane driving loads

The use of a bungee cord to load the transverse plane, while utilizing the opposite arm as a frontal plane driver



The use of multiple strategies to position and/or drive movement with the legs and arms to create the desired **Chain Reaction™** in the thoracic spine and throughout the entire body

This is not a theory . . . this is how the thoracic spine functions

Therefore, we need to evaluate the thoracic spine the way it functions, treat it the way it functions, rehab it the way it functions, and train and condition it the way it functions

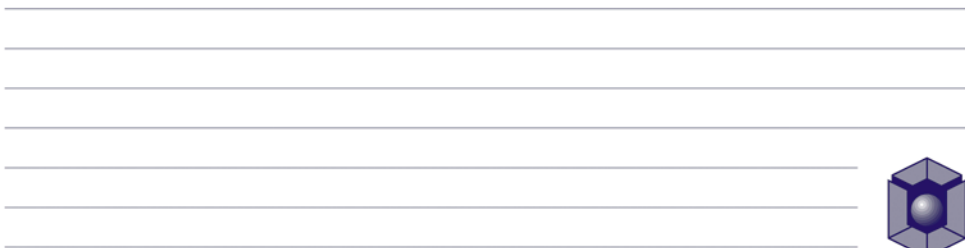
Chain Reaction™ therapy, functional therapy is always a beautiful continuum

G2's quick review reveals thousands of ways to evaluate and treat the thoracic spine . . . it needs to be this way because function reveals itself in thousands of ways

Debrief with Bob Wiersma, Executive Director, Functional Rehabilitation Network

- How excited Dave and G2 got with this information
- Scarier if Dave had to wear the tight lycra top
- "Caught in the middle with few places to go and no place to hide" - The Knee
- "Caught in the middle with a lot of places to go and a lot of places to hide" - TheThoracic Spine
- Why the cervical spine and lumbar spine get most of the press
- The direct link of the "front butt" through the ribs to the thoracic spine
- If gravity is beating the thoracic spine up, we need to use gravity to restore the thoracic spine
- The integration of a specific localized mobilization technique with our FMR approach
- In our functional plinth, the TrueStretch™, we can slow things down, stabilize, isolate planes, isolate joints, and control the reaction and the entire **Chain Reaction™** . . . facilitating integrated isolation
- The thoracic spine is a neat place to go to enhance function

Special thanks to Bob Wiersma



A visit to Dr. Derek Steveson's clinic . . . utilizing a stick as a driver and a tweak

Understanding what drives the thoracic spine

Lunges with pole drivers and lunges with pole stability

Utilizing the pole to drive our three dimensional thoracic cage . . . in order that the thoracic spine will say I have done everything I was created to do

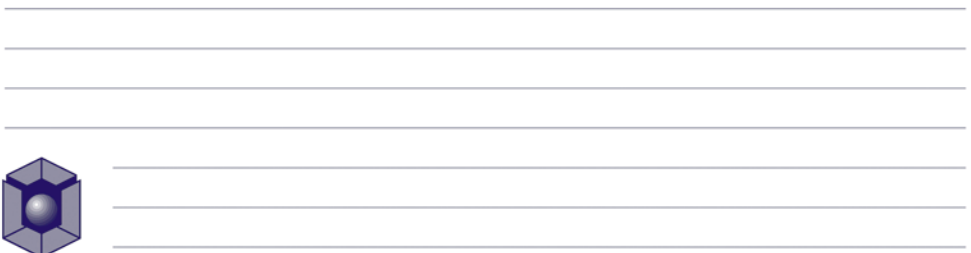
3D pelvis motion with 3D Lunge Matrix

Getting both arms to drive at the same time and in the same plane

- Bilateral pole drivers in the transverse plane
- Bilateral pole drivers in the frontal plane
- Bilateral pole drivers in the sagittal plane
- Bilateral pole drivers overhead in the frontal plane
- Bilateral pole drivers overhead in the transverse plane

The 3D Pole Reach Matrix

- Lateral flexion and rotation same
- Lateral flexion and rotation opposite
- Lateral flexion and rotation same with lateral lunge same
- Lateral flexion and rotation same with lateral lunge opposite
- Lateral flexion and rotation same with anterior lunge same
- Lateral flexion and rotation same with anterior lunge opposite
- Lateral flexion and rotation same with rotational lunge same
- Lateral flexion and rotation same with rotational lunge opposite
- Lateral flexion and rotation opposite with lateral lunge right and left
- Lateral flexion and rotation opposite with right anterior lunge and left anterior lunge
- Lateral flexion and rotation opposite with right rotational lunge and left rotational lunge



The right amount of a good 3D thing is a real good thing

Using the pole to drive sagittal plane and transverse plane

Discussion of the cervical spine 3D Matrix

Example . . . pole driven right hand opposite side lateral, pole driven left hand same side rotational, with right anterior lunge with left cervical rotation

The key question . . . "Have you expanded my functional threshold?"

The goal of the thoracic spine is to make everyone happy . . . it's goal is to become a great friend, one that is mobile and stable, one that can be termed a mostability friend



Golf takes advantage of Type I Mechanics of the spine . . . rotation and lateral flexion opposites

Understanding the loading pattern to the point of transformation is the name of every game . . . in every form of function

Golf demands Type I Mechanics with relative sagittal plane neutral, with pelvis and trunk rotating in sync

A three dimensional strategy with leg and arm drivers with free weights

3D Dumbbell Thoracic Matrix for Golf

- Arm reaches in the frontal plane and in the transverse plane opposite . . . to the point of backswing transformation and to the point of follow through transformation
- Both arm reaches in the frontal plane and both arm reaches in the transverse plane
- 3D Lunge Matrix with arm reaches in the frontal and transverse plane opposite to the point of back swing and follow through transformation, with the pelvis and trunk in sync in the transverse plane

The mirror images are the reactive exercises for the follow through for the golf swing



3D Lunge Matrix with bilateral reaches in the frontal plane and bilateral reaches in the transverse plane, with pelvis and trunk rotating in sync

It is a big, big muscle trunk workout and a big, big muscle butt workout

Stimulating the thoracic spine for appropriate transformational mobility and stability in the backswing and the follow through

Adding a speed tweak with golf clubs as the free weights


I need mostability grooved with proprioceptive reactiveness

A Michigan range during the winter . . . looks a lot like a basketball court

Dual club swing to hit two balls simultaneously

It is tougher than golf . . . but does it make me better at golf?

Bottom line . . . I want to become more child-like and I want to have more fun



RESEARCH ROUNDTABLE WITH DR. DAVID TIBERIO

Browder D.A., Erhard R.E., Piva S.R. Intermittent cervical traction and thoracic manipulation for management of mild cervical compressive myelopathy from cervical herniated disc: a case series. J Orthop Sports Phys Ther. 2004 34 (11):701-712.

Pho C, Godges J. Management of whiplash-associated disorder addressing thoracic and cervical spine impairments: A case report. J Orthop Sports Phys Ther, 2004 34 (9): 511-519.

Menck J.Y., Requejo S.M., Kulig K. Thoracic spine dysfunction in upper extremity complex regional pain syndrome type I. J Orthop Sports Phys Ther. 2000, 30(7):401-409.

- Cervical spine symptoms with treatment of the thoracic spine research articles
- A case study with cervical disc problems, with treatment combining cervical traction and manipulation of the thoracic spine
- Treatment of the thoracic spine directly influences and benefits the cervical spine
- Understanding the biomechanics of a bottom up **Chain Reaction™**, relative to the cervical spine through the thoracic spine
- The eyes are drivers for the cervical spine, emphasizing thoracic spine movement
- Description of the 3D Cervical Spine Matrix
- Head and trunk relative motion is truly a three dimensional matrix
- Acute whiplash injury with treatment of manipulation and soft tissue treatment to the thoracic spine



- Understanding that the body is a **Chain Reaction™** and the wisdom of treating the next door neighbor in all three planes
- Looking to create a reaction and let the head go where it wants to . . . let the wisdom of the body tell us what is going on
- Initially seeing the head and shoulder moving in sync in all three planes, the body lets you know when it is ready for the next tweak
- Case study with traumatic injury to the hand, with treatment directly to the thoracic spine
- Disuse dysfunction of the thoracic spine
- **Chain Reaction™** strategy going as close as possible to dysfunction, yet where the patient is successful in all three planes
- Starting with success and ending with success, as a rehabilitative strategy
- FMR of the thoracic spine with a strategy of letting the wisdom of the body direct us, relative to the motion of the lower extremities, to facilitate thoracic motion
- Getting to the left hand, through the right scapula
- Facilitating good and normalized movement with our FMR approach, to let God do the ultimate healing

A special thanks to Dr. Dave Tiberio

