

1. The lumbar spine is a transmitter of forces and a reactor to forces
2. FMR (Functional Manual Reaction) techniques mimic what happens in the lumbar spine during function
3. Pure FMR techniques look at the what is happening, why it is happening, and the sequencing of the biomechanical events
4. Following our FMR techniques, we reintegrate the desired **Chain Reaction™** with our exercise programs
5. Facilitating normalized motion is the gift that just keeps on giving
6. We want function to dictate to us our preferred techniques
7. The analysis blends right into the treatment with FMR techniques
8. Training and conditioning the lumbar spine the way the lumbar spine was supposed to be trained and conditioned
9. Transforming everything we do into Functional Fun
10. "If you be messing with one plane of motion, you be messing with the other two"



FUNCTIONAL DESIGN SYSTEMS

Transforming Knowledge Into Function

866.230.8300 | www.functionaldesign.com

v4.7 FUNCTIONAL MANUAL REACTION (FMR)

The Lumbar Spine
By: Gary Gray, PT



TAPE CONTENTS	PAGE
Contents / Objectives	1
Functional Strategies	2
Functional Understanding	4
Functional Analysis	6
Functional Rehabilitation	8
Functional Training	10
Functional Transformation	12
Functional Fun	14
Key Messages / Information	16

OBJECTIVES FOR FMR OF THE LUMBAR SPINE FUNCTIONAL GUIDE

To assimilate up-to-date information and knowledge about FMR of the Lumbar Spine.

To learn how to apply effective functional techniques when testing, training, and rehabilitating using a FMR of the Lumbar Spine approach.

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

Belly flop lumbar mobilization . . . face flop as well

STRATEGY 1

Strategically appreciating the biomechanical forces the lumbar spine has to deal with

STRATEGY 2

Strategically sensing the 3D Coupling of the lumbar spine with all functional activities

STRATEGY 3

Strategically taking advantage of our assessment techniques to effectively initiate rehabilitative techniques

STRATEGY 4

Strategically understanding PITOT's . . . Position In Time Of Transformation

STRATEGY 5

Strategically assess Type I and Type II of the lumbar spine



STRATEGY 6

Strategically facilitating the desired **Chain Reaction™** throughout the entire body and through the lumbar spine

STRATEGY 7

Strategically training and conditioning the lumbar spine with bottom up and top down 3D drivers

STRATEGY 8

Strategically developing transformational exercises specific to the functional biomechanics of the desired activity

STRATEGY 9

Strategically leveraging our understanding of research into improved assessment, research, and training and conditioning techniques



What and why the lumbar spine does what it does, and can we take advantage of the why of what it does, to help it do what it really needs to do?

The lumbar spine is a miraculous part of the body when it is working correctly

The lumbar spine is a continuation of the **Chain Reaction™** of the body

The lumbar spine says "I have to do everything and react to everything that the rest of the body does"

The lumbar spine is a transmitter of forces and a reactor to forces

What drives the lumbar spine to do what it does?

- The drivers of gravity and ground reaction force
- The drivers of mass and momentum of the body
- The drivers of other muscle forces
- The drivers of the hands and the feet

Dealing with the static driving of sitting and lying down

The lumbar spine says "I take a lot of hits"

Understanding the orientation of the facets of the vertebrae of the lumbar spine and of the sacrum

Developing a functional cheat sheet with our hands to appreciate the relative motions between the inferior vertebrae (or sacrum) and the superior vertebrae of the lumbar spine

- Inferior rotation to the opposite side creates a relative transverse plane gapping
- Superior rotation to the same side creates a relative transverse plane gapping
- Inferior rotation to the same side creates a relative transverse plane compression
- Superior rotation to the opposite side creates a relative transverse plane compression

Proper terminology is referenced by what the superior vertebrae did on the inferior vertebrae . . . relative motion

Example: Right rotation between L5 and L4

- L5 rotating left on a fixed L4
- L4 rotating right on a fixed L5
- L5 rotating left faster than L4 rotating left
- L4 rotating right faster than L5 rotating right
- L5 rotating left with L4 rotating right



Understanding all three planes of motion concurrently in the lumbar spine

FMR (Functional Manual Reaction) techniques mimic what happens in the lumbar spine during function

Understanding Three Dimensional Coupling with 3D motion and 3D force

Looking at the **Chain Reaction™** of the entire body and its influence on hyper and/or hypo-mobility of the lumbar spine in each plane of motion

“Why did it do that? . . . What drove it to do that? . . . What didn't drive it to do that? . . . ” in all three planes

Pure FMR techniques look at the what is happening, why it is happening, and the sequencing of the biomechanical events

FMR techniques take advantage of:

- the forces that are already out there
- the positions of function
- the environments of external stabilization
- the drivers of the hand and the feet and other body parts
- the subconscious nature of the lumbar spine integrated within the reactive nature of the other parts of the body
- the ability to authentically reproduce the desired 3D motion
- utilizing our hands as a complement to authentic motion
- creating the desired **Chain Reaction™** directly to the lumbar spine or through other parts of the **Chain Reaction™**

Following our FMR techniques, we reintegrate the desired **Chain Reaction™** with our exercise programs

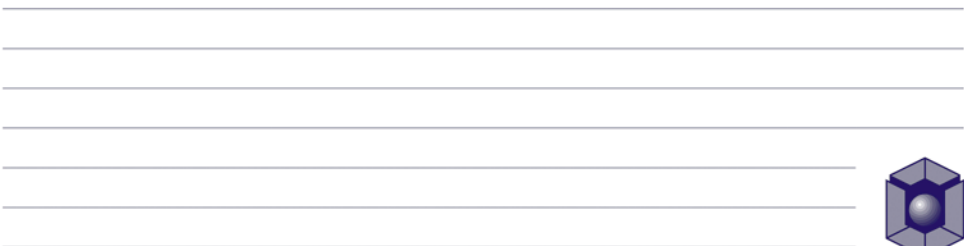
The sequencing of “functionally clearing” (creating success in the rest of the body) through the hips, feet, knees, thoracic spine and shoulders

The strategy of our assessment techniques

A concurrent strategic approach to the lumbar spine

“The gift of life is motion . . . at the right joints, in the right planes, at the right time, for the right reason, for the right functional purpose”

Facilitating normalized motion is the gift that just keeps on giving



Debrief with Bob Wiersma, Executive Director, Functional Rehabilitation Network

"The main thing is to keep the main thing, the main thing" Yogi Berra

The lumbar spine is a three dimensional vital part of the NeuroMusculoSkeletal Movement System

Facilitating a healthy spine

The critical element of timing and sequencing

"Is this the best I can give this person?"

We want function to dictate to us our preferred techniques

"What do the proprioceptors demand from us?"

The limitation of the "one bone in one plane, just in the back" approach

Understanding functional feeding

The lumbar spine will rarely say "I did this to myself"

Discussing differences between FMR of the spine as compared to the extremities

The strategies of treating hypo-mobility and hyper-mobility of the lumbar spine

Compression forces of the sagittal, frontal, and the transverse planes

Discussion of "unloading" techniques . . . "physiological unloading" and "artificial unloading"

FMR utilizing the forces that the patient will go home with . . . perfect transition into homeworkable exercises

PITOT's . . . Position In Time Of Transformation

A special thanks to Bob Wiersma



Gary and Dr. David Tiberio with Keith Bozyk

Understanding relative rotation and Type I and Type II spinal mechanics

“When you treat the lumbar spine you usually don’t do much treating of the lumbar spine”

It is crucial that we take advantage of our knowledge of functional biomechanics specifically of the lumbar spine within the entire **Chain Reaction™**

Functional hyper-mobility and functional hypo-mobility

The specificity of the FMR approach

Facilitating functionally consistent motions in the lumbar spine and the sagittal plane, frontal plane and transverse plane

“Look, Feel and Facilitate”

TrueStretch™, right stride stance, left hand anterior/right lateral reach at shoulder height, with right hand left lateral overhead reach
- 3D loading of left L5/S1

TrueStretch™, right stride stance, with right foot at knee height, left hand anterior/right lateral reach at hip height, with right hand right lateral overhead reach
- 3D unloading of right L5/S1

FMR of the lumbar spine in the transverse plane, sagittal plane and frontal plane

From an upright stable four point functional position the FMR techniques are subtle

Tri-plane loading and unloading with analysis

Going after Type II motion . . . side bend and rotation in the same direction



TrueStretch™, left stride stance, right hand left lateral overhead reach, with left hand posterior/left lateral reach at hip height, with right foot driving to left lateral with return

- FMR in transverse plane with facilitation of trunk rotation to the left and pelvic rotation to the right

Discussion of distraction techniques in the **TrueStretch™**

Same position as above with right hand driving

TrueStretch™, left stride stance with left foot at knee height, right hand anterior/left lateral overhead reach with left hand posterior/left lateral at hip height reach

We are after a “proportional synergy”

The analysis blends right into the treatment with FMR techniques

Fully engaged positions of lumbar flexion and lumbar extension create the spinal demand for Type II motion (lateral flexion and rotation same)

In between the fully engaged positions of the lumbar spine flexion and extension, the spine can reveal Type I (lateral flexion, rotation opposite) or Type II (lateral flexion, rotation same)



TrueStretch™, right stride stance, right hand left lateral overhead reach, left hand anterior/right lateral at shoulder height reach, with right foot driving to left lateral with return

- FMR facilitating superior segment right rotation and inferior segment left rotation

Discussion of FMR progressions with same position as above, with left hand driving in the transverse plane, with FMR facilitating lateral flexion to the left and rotation to the right.

Getting Type I and Type II motion with trunk and pelvis in-sync . . . going in the same direction . . . creating the proper relative motion

TrueStretch™, right stride, narrow stance with right hand left lateral overhead reach with left hand anterior/right lateral at shoulder height reach, with right hand driving mid-range sagittal plane

- Neutral is not a position . . . it is a huge range where the lumbar spine is neither fully engaged into flexion or extension

Utilization of other body drivers to facilitate the FMR techniques

Simplifying the complexity of the **Chain Reaction™** and resultant lumbar 3D Coupling

Special thanks to Dr. David Tiberio and Keith Bozyk



Training and conditioning the lumbar spine the way the lumbar spine was supposed to be trained and conditioned

The sagittal plane engagement of the lumbar spine into flexion and into extension

The desire of the lumbar spine for Type II motion when engaged in the sagittal plane

Between fully engaged flexion and extension the lumbar spine 3D Coupling can demonstrate Type II (lateral flexion and rotation same) or Type I (lateral flexion and rotation opposite) motion

Creating a **Chain Reaction™** from the bottom up and a **Chain Reaction™** from the top down to guarantee biomechanically consistent 3D Coupling in the lumbar spine

Concurrently creating bottom up and top down 3D Coupling to facilitate fully flexed Type II motion, fully extended Type II motion, and in between (disengaged in the sagittal plane) Type I motion

Feeding the lumbar spine through the feet and the hands

Fully Flexed Type II Motion

Exercise: Right anterior lunge to 12" step, right hand with 10 lb. dumbbell, with left hand with 5 lb. dumbbell anterior/right lateral reach at ankle height

Exercise: Mirror of the above



Fully Extended Type II Motion

Exercise: Right anterior lunge from 6" step, left hand with 10 lb. dumbbell, with right hand with 5 lb. dumbbell overhead left rotational reach

Exercise: Mirror of the above

Type I Motion

Exercise: Right anterior lunge to 12" step, right hand with 10 lb. dumbbell, with left hand with 5 lb. dumbbell overhead left rotational reach

Exercise: Mirror of the above

Exercise: Right anterior lunge from 6" step, left hand with 10 lb. dumbbell, with right hand with 5 lb. dumbbell knee height right rotational reach

Exercise: Mirror of the above

Providing the lumbar spine the proper environment to react to the **Chain Reaction™** of the body with biomechanically consistent 3D Coupling



The lumbar spine and the golf swing . . . the vicious cycle

The PITOT (Position In Time Of Transformation) of the back swing of a right handed golfer

The 3D Coupling of the lumbar spine . . . right rotation, right lateral flexion, with extension

The PITOT (Position In Time Of Transformation) of the follow through of a right handed golfer

The 3D Coupling of the lumbar spine . . . left rotation, left lateral flexion, with extension

Backswing PITOT Exercise

- Create bottom up right lateral flexion
- Create bottom up right rotation
- Create top down right rotation greater than bottom up
- Create bottom up and top down extension

Exercise:

Right leg balance on step, bilateral hands on bungee handle at right shoulder, bungee attached posterior lateral shoulder height, left foot anterior/left lateral step down and return



Follow through PITOT Exercise

- Create bottom up left lateral flexion
- Create bottom up left rotation
- Create top down left rotation greater than bottom up
- Create bottom up and top down extension

Exercise:

Left leg balance on step, bilateral hands on bungee handle at left shoulder, bungee attached right lateral at shoulder height, right foot anterior/right lateral step down and return

Emphasize the pull of the bungee creating rotation with extension, not top down lateral flexion

The step creates the bottom up lateral flexion with a frontal plane pelvis drive

With rotation and lateral flexion at the same side with extension we are creating Type II motion

Transforming everything we do into Functional Fun



RESEARCH ROUNDTABLE WITH DR. DAVID TIBERIO

Okawa A, Shinomiya K, Komori H, Muneta T, Arai Y, Nakai O. Dynamic motion study of the whole lumbar spine by videofluoroscopy. Spine (1998) 23(16): 1743-1749.

Functional versus structural hypo and hyper-mobility


Dynamic versus static determination of hypo and hyper-mobility

Discussion of the sequencing of the movement of the lumbar vertebrae

Top down sequencing with forward flexion and bottom up sequencing with extension . . . from a transformational dynamic understanding the sequencing is predictable

The spondylolisthesis, the sequence with extension is more top down

Discussion of the potential causes of spondylolisthesis instabilities



“If you be messing with one plane of motion, you be messing with the other two”

The strategies of beginning at end range of the sagittal plane to facilitate mobility and stability of the transverse and frontal planes throughout the entire **Chain Reaction™**

Giving the gift of transverse plane motion through the thoracic spine and through the hips with Dave's strategy

Dave is “brilliant”

Putting isolated, single plane, contrived, artificial, findings into an integrated, tri-plane, non-contrived, functional system to take advantage of current research

Thanking Bob Wiersma and Dave Tiberio for “cleaning it up”

