

1. Jumping is truly a **Chain Reaction**, what occurs at the foot and ankle will have a dramatic effect on the trunk and visa versa.
2. Understanding the strategy of treating various symptoms and compensations associated with jumping.
3. Improper jump training involves driving things that are already being driven.
4. Gravity is the number one competitor with respect to jumping . . . however gravity is really the best friend of loading, therefore the best friend of jumping.
5. Jumping is loading the entire body in three planes of motion
6. Enhancing three plane mobility with integrated three plane balance and strength exercises.
7. We want to coil to load all 70 joints, all 400 muscles, in all three planes of motion.
8. Following any training and conditioning program we need to ask ourselves; Does it enhance the function that we desire?
9. Jumping is loading off of one or two legs and landing on two legs.
10. The good news about research jumping is that it normally involves actual jumping.
11. The key to a great jumping workout is diversity with tweakology.



## FUNCTIONAL DESIGN SYSTEMS

Transforming Knowledge Into Function

866.230.8300 | [www.functionaldesign.com](http://www.functionaldesign.com)

# v2.4 JUMPING

## Unleashing the Load

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 JUMPING ***FUNCTIONAL GUIDE***

---

To assimilate up-to-date information and knowledge of jumping. To learn how to apply effective functional techniques when testing and training jumping.

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

### 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

## STRATEGY 1

Strategically understanding that jumping is loading followed by exploding.

## STRATEGY 2

Strategically taking advantage of all three planes of motion to effectively load for jumping.

## STRATEGY 3

Strategically realizing that jumping is truly a **Chain Reaction**; what occurs at the foot and ankle will have a dramatic effect on the trunk and visa versa.

## STRATEGY 4

Strategically appreciating how to test not only vertical jumping but the combination of vertical and horizontal jumping.

## STRATEGY 5

Strategically comprehending the need for a target testing and training device such as the Functional 3-D Testing System <sup>TM</sup>\*

\*For additional information call 800-273-6588 or e-mail us at [info@functionaldesign.com](mailto:info@functionaldesign.com)



---

---

---

---

---

---

---

---

STRATEGY 6

Strategically understanding what the point of transformation is relative to muscle length, muscle strength, energy within the tendons, motions within the joints and activation of the proprioceptors.

STRATEGY 7

Strategically designing proper training and conditioning programs for jumping.

STRATEGY 8

Strategically transforming the knowledge of enhancing the golf swing into enhancing other functional activities.

STRATEGY 9

Strategically evaluating the paths of loading in order to understand the ability to unload.

---

---

---

---

---

---

---

---



Jumping is everything coming together in order to be a successful jumper.

Jumping is a tri-plane phenomenon.

Jumping is loading the entire body in three planes of motion.

We normally jump for a purpose . . . it is target driven.

Jumping is subconscious.

Successful jumping involves the intuitive ability to load.

The load in jumping is in the direct opposite direction in all three planes of motion that the exploding to the jump involves.

Jumping is you vs. you.

The name of the game is; "How can I improve?"

There are many forms of jumping including vertical jumping, horizontal jumping, jumping over objects, jumping toward an object.

Jumping without loading is impossible.

The part that we have to evaluate is the load . . . "are the paths clear to load?"

Understanding the sagittal, frontal and transverse planes of loading throughout the body.

Improper jump training involves driving things that are already being driven.

To enhance jumping we need to establish new pathways of loading and to



---

---

---

---

---

---

---

---

deepen the ones already established.

Understanding the strategy of treating various symptoms and compensations associated with jumping.

Understanding getting the foot loaded first.

Discussion of a foot that can't load or a foot that is already loaded.

Describing the tri-plane knee load.

Facilitating the load of all of the powerful hip muscles.

Lack of hip motion turns the hip muscles off and inhibits the trunk.

Understanding the core muscles and the scapular muscles as components of loading for jumping.

Using enhanced jumping to enhance other forms of function.

Gravity is the number one competitor with respect to jumping . . . however gravity is really the best friend of loading, therefore the best friend of jumping.

The hint from gravity . . . you have been blessed with tri-plane muscles, tri-plane joints, proprioceptors that react subconsciously . . . take advantage of all of those.

---

---

---

---

---

---

---

---

---

---



## CASE PRESENTATION -

Thanking Doug Gray for his valuable assistance in analysis, training and conditioning in reference to jumping.

Clearing the slate of preconceived ideas . . . a comprehensive biomechanical analysis requires starting with a clean slate.

“How well does Doug jump today?”

Taking advantage of the gifts and determining if we can treat some of the limitations.

Jumping is loading off of one or two legs and landing on two legs.

Hopping is loading off of one leg and landing on that same leg.

A jump profile consists of analysis in all three planes.

Describing target jumping.

Providing a tri-plane warm-up prior to submaximal jumps before maximal jumps in three planes.

Getting a right legged and then left legged jump profile in all three planes.

- Right leg, anterior vertical jump, left hand reach
- Right leg, posterior vertical jump, left hand reach
- Right leg, medial vertical jump, left hand reach
- Right leg, lateral vertical jump, right hand reach
- Right leg, right rotational vertical jump, left hand reach
- Right leg, left rotational vertical jump, right hand reach

Document the anterior/posterior dimension, the medial/lateral dimension, and the degrees of rotation in addition to the documentation of the vertical height.

Measuring the jump while at the same time analyzing the ability to load in all three planes.



---

---

---

---

---

---

---

---

Analyze the objective measurements relative to the loading mechanism in all three planes.

Compare right to left and day to day.

Providing multiple opportunities for improvement.

“How do we unveil the potential?”

Discussing changing the horizontal displacement with the test. Can we make the vertical height a given with the variable being the horizontal displacement along the sagittal and frontal planes, and the degrees of rotation in the transverse plane?

If jumping is loading first . . . “How well does Doug load?”

Looking at ankle dorsiflexion, knee flexion and hip flexion in the sagittal plane.

Biomechanical exam of the foot.

Discussion of the environment of the orthotics.

Evaluating transverse plane thoracic loading.

Evaluation of the hip in the sagittal plane, transverse plane and frontal planes.

Discussion of three dimensional hamstring function in jumping.

Demonstration of functional three dimensional stretching in the True Stretch™

Self mobilization of the subtalar joint with Biomechanical Ankle Platform System.

Enhancing three plane mobility with integrated three plane balance and strength exercises.

Jumping is hard work.

---

---

---

---

---

---

---

---



## ANALYSIS AND REHABILITATION DEBRIEF WITH BOB WIERSMA, EXECUTIVE DIRECTOR, ACCELERATED FUNCTIONAL REHABILITATION NETWORK.

- Target testing with a three dimensional target for three dimensional testing.
- Understanding the function of jumping relative to providing a target.
- Being able to quickly and simply move the target in all three planes of motion.
- Target jumping is functional . . . athletes “get it”.
- Worry and plan for the fatigue issue in jump testing and training . . . fatigue is a huge information piece.
- Jump testing is XYZ . . . we must train and test ABC and the “rest of the alphabet” before we engage in jump testing and training.


---

---

---

---

---



---

---

---

- Understanding what is before and after jumping in the functional spectrum.
- The discussion of "gaposis".
- Emphasis of safety.
- The logic of a three dimensional warm-up progression.
- Jump testing and training for seniors.
- At what point should we stop the progress of function . . . never.
- "Expanding your functional performance envelope"*. - Bob Wiersma
- Providing an environment to expand our functional performance envelope in our physical function, our intellectual function and our spiritual function.

---

---

---

---

---

---

---

---



## JUMPING WORKOUT

### TAKING ADVANTAGE OF “WHERE YOU ARE ALREADY AT”

#### 3-D WALK JOG WARM-UP

#### 3-D TWO FOOTED JUMP MATRIX

- Sagittal plane
- Frontal plane
- Transverse plane
- Tweak to more of a vertical load

#### 3-D HOP MATRIX

- Sagittal plane
- Frontal plane
- Transverse plane

#### 3-D TWO FOOTED JUMPS

- Sagittal plane
- Frontal plane
- Transverse plane

#### 3-D TWO FOOTED JUMPS

- Mirror Reaction

#### 3-D TWO FOOTED JUMPS WITH OVERHEAD 3-D DUMBBELL MATRIX

- Sagittal plane
- Frontal plane
- Transverse plane

#### 3-D LUNGE JUMP MATRIX

- Sagittal plane
- Frontal plane
- Transverse plane


---

---

---

---

---



---

---

---

---

### 3-D LUNGE JUMP MATRIX WITH DUMBBELL LOAD

- Sagittal plane with load at knees
- Frontal plane with load at knees
- Transverse plane with load at knees

### 3-D LUNGE JUMP MATRIX WITH DUMBBELL LOAD

- Sagittal plane with load at knees, explosion overhead
- Frontal plane with load at knees, explosion overhead
- Transverse plane with load at knees, explosion overhead

### TARGET JUMPING

- Sagittal hops to sagittal jumps - anterior and posterior
- Frontal hops to frontal jumps - medial and lateral
- Transverse hops to transverse jumps - right rotational and left rotational

### TARGET JUMPING WITH SMARTVEST™ LOADING

- Sagittal jumps anterior and posterior, right reach and left reach
- Frontal jumps left lateral and right lateral, right reach and left reach
- Transverse jumps right rotational, left rotational, right reach and left reach

Discussion of three dimensional vertical line jumps and three dimensional hurdle jumps.

The key to a great jumping workout is diversity with tweakology.

Discussion of the Doug Gray three dimensional lay-up drills.

To order call 800-273-6588 or order online at [functionaldesign.com](http://functionaldesign.com), Quest videos, Doug Gray Lay-Up Drills

A special thanks to Doug Gray for his excellent efforts and the opportunity to workout with him.

---

---

---

---

---

---

---

---



Discussion of how jumping can help the golf swing and other functional activities.

Hopping drills versus jumping drills

Let jumping add power to our swing

We want to coil to load all 70 joints, all 400 muscles, in all three planes of motion.

Will the jumping drill help us gain more power and accuracy?

- Frontal plane jumping load . . . frontal plane jump and explode into the ball.

With a right handed golfer, exploding the center of gravity from right to left through the ball.

- Sagittal plane jumping load . . . sagittal plane jump and explode into the ball.

With a right handed golfer, exploding the center of gravity from posterior to anterior through the ball.

- Transverse plane jumping load . . . transverse plane jump and explode into the ball.

With a right handed golfer, exploding the center of gravity from right rotation to left rotation through the ball.

---

---

---

---



---

---

---

*"Put the camera on you and you are agakin". - G.Gray*

Proof of the pudding:

Following the drill; Can you strike the ball better?

Functional proof of the pudding:

Following any training and conditioning program; Does it enhance the function that you desire?

---

---

---

---

---

---

---

---

---

---



## RESEARCH ROUNDTABLE WITH DR. DAVID TIBERIO

The good news about research jumping is that it normally involves actual jumping.

Discussion of research article

M.F. Bobbert, K.G. Gerritsen, M.C. Litjens, A.J. Van Soest. Why is counter-movement jump height greater than squat jump height? *Med Sci Sports Exerc.* 1996 Nov; 28 (11):1402-12.

M.F. Bobbert, A.J. Van Soest. Effects of muscle strengthening on vertical jump height: a simulation study. *Med Sci Sports Exerc.* 1994 Aug;26(8):1012-20.

M.F. Bobbert. Dependence of human squat jump performance on the series elastic compliance of the triceps surae: a simulation study. *The Journal of Experimental Biology* 2001 Jan;15 104, 533-542.

Discussion of the study of countermovement jumps versus squat jumping.

- Looking at what occurs at the point of transformation.
- The peak of power is the point of transformation.
- Looking at activation patterns of muscle groups in the lower extremity and manipulating those through computer analysis.
- Points to the functional fact that everything has to come together in its own time to enhance function.
- If you strengthen in isolation there is a big responsibility to put that isolated strength back into function and back into sync. Integrated isolation versus artificial isolation.
- Create the sync while creating the strength.



---

---

---

---

---

---

---

---

Discussion of distal mobility with proximal quick loading in all three planes of motion.

- Storing energy in long tendons.
- With discomfort and dysfunction our bodies lock down.
- Putting the appropriate message into the tendon with tri-plane stretching.
- Length and mobility requires that we provide strength at the point of transformation in three planes of motion throughout the entire **Chain Reaction**.
- Functionally when a muscle is at it's greatest length it is usually demonstrating it's greatest strength and power in all three planes of motion.
- Transforming stretching from a passive, turned off muscle into a biased and activated muscle.

Discussion of range tweaking.

A special thanks to Dave for his ongoing exceptional efforts in bringing pertinent research articles to the table.

---

---

---

---

---

---

---

---

