

THE FOOT BEGINS THE CONVERSATION

How the foot prepares the body for what comes next

The foot is often described as the body's foundation. A foundation sounds fixed. The human foot is anything but fixed. It must adapt to the surface, accept force, create sensory information, and then become stable enough to help propel the body forward.

Its motion influences the tibia, knee, hip, pelvis, and trunk. Those regions also drive motion back toward the foot. Function emerges from this continuing two-way exchange.



THE FOOT AS A FUNCTIONAL SYSTEM



SENSE

Pressure, position, direction, and speed create information.



ADAPT

Pronation helps the foot meet the ground and accept load.



TRANSFORM

Mobility shifts toward stability as the task progresses.



CONNECT

Foot motion and whole-body motion influence one another.

A THREE-DIMENSIONAL EXCHANGE

Calcaneal eversion and abduction, ankle and midfoot dorsiflexion, tibial rotation, and forward progression occur as coordinated relationships. The useful question is not whether one motion exists. It is whether the available range, rate, timing, and control fit the task.

COACHING PEARL™

The foot does more than support the body. It receives the environment, creates information, and helps organize the entire Chain Reaction®.

FROM FLEXIBLE ADAPTER TO STABLE PROPELLER

A successful step requires mobility and stability to emerge at the right time



1 RECEIVE AND ADAPT

During loading, calcaneal eversion and abduction contribute to subtalar pronation. Ankle and midfoot dorsiflexion help the foot accommodate the surface and accept force.

2 CONTROL AND TRANSFORM

As the body progresses over the foot, muscles and connective tissues manage motion and redistribute energy. Mobility and stability coexist during the transition.

3 RETURN AND PROPEL

Subtalar inversion and adduction help the midfoot become more stable. Heel rise, first-ray motion, and great-toe extension support propulsion.

DORSIFLEXION: HOW MUCH, WHERE, AND WHEN?

Dorsiflexion may occur at the tibiotalar joint, the midtarsal joint, or through both. It also occurs with the subtalar joint moving toward either eversion or inversion. Assessment must identify where the motion appears and whether the person can control and use it during the intended task.

PRONATION NEEDS CONTEXT

Pronation supports adaptation and loading. Concern arises when its amount, rate, timing, control, or ability to reverse does not match the person's task.

Ask what the motion permits the system to accomplish.

COACHING PEARL™

Do not coach the foot toward a permanent position. Help it access, control, and transform the motions required by the task.

ASSESS THE PERSON, NOT JUST THE FOOT

The symptom identifies the tissue experiencing stress. It may not identify every contributor to that stress.



WHAT TO OBSERVE



CALCANEAL MOTION

Excursion, direction, rate, and timing during loading and return.



TIBIAL PROGRESSION

Forward motion and rotation relative to the foot and femur.



MIDFOOT RESPONSE

Adaptability during loading and stability as propulsion approaches.



HEEL RISE AND HALLUX

Timing of heel rise, first-ray contribution, and great-toe extension.



WHOLE-CHAIN RESPONSE

Knee, hip, pelvis, trunk, and opposite-limb contributions.



TASK AND ENVIRONMENT

Surface, footwear, direction, speed, load, fatigue, and intention.

PRINCIPLES → STRATEGIES → TECHNIQUES

Principle: Function is integrated and three-dimensional.
 Strategy: Identify what the person must receive, control, and return.
 Technique: Select the position, driver, direction, range, rate, and load that create the intended response.

WHAT THIS MEANS FOR COACHES



OBSERVE BEFORE CORRECTING

Describe what changes across the task before naming a fault.



USE BOTH DIRECTIONS

Explore bottom-up and top-down drivers. The foot influences the hip, and the hip influences the foot.



TWEAK ONE VARIABLE

Change one environmental or movement variable and use the response as information.



FIND THE THRESHOLD

Begin where motion and control remain successful. Progress only while the intended response remains available.

CLINICAL PEARL™

A painful foot may need local care. It also deserves an assessment of the motions and forces arriving from the rest of the body.

THE SCIENCE BEHIND THE INSIGHT

Established biomechanics supports a variable, task-dependent view of foot and ankle function

RESEARCH INSIGHT

IN VIVO KINEMATICS

The ankle and subtalar joints move in all three planes. Their relative contributions vary among people and across phases of gait.

MUSCLE-TENDON ELASTICITY

Tendons and other elastic tissues can store and return energy while muscles regulate force, timing, and stiffness.

HIP-FOOT RELATIONSHIPS

Hip capacity and trunk control can alter lower-extremity mechanics. Association identifies probable contributors, not universal causes.

SCIENTIFIC BOUNDARIES



VARIABILITY IS EXPECTED

Structure, task, speed, surface, and individual strategy change the observed motion.



ASSOCIATION IS NOT CAUSATION

A relationship in a study supports assessment. It does not prove a single cause.



ORTHOSES MODIFY THE INTERFACE

They may reduce pain, but effects and mechanisms vary. Reassess the whole person.



INJURY TYPE CHANGES STRATEGY

A lateral sprain and a syndesmotic injury require different early loading decisions.

COACHING TAKEAWAY

The goal is not to make every foot look the same.

The goal is to understand what motion is available, how it is controlled, how it changes through the task, and whether it supports the person's intended function.

REFERENCES

1. Roach KE, et al. J Biomech Eng. 2016;138:091006.
2. Alexander RM. Comp Biochem Physiol A. 2002;133:1001–1011.
3. Lee SP, Powers CM. Gait Posture. 2014;39:933–938.
4. Kulig K, et al. Phys Ther. 2009;89:26–37.
5. Bramah C, et al. Am J Sports Med. 2018;46:3023–3031.
6. Clanton TO, et al. Foot Ankle Int. 2017;38:66–75.

ABOUT BOB FANELLI

Bob Fanelli, M.S., FAFS
Applied Biomechanist • Exercise Physiologist • Movement Educator

For more than 35 years, Bob has integrated exercise physiology, kinesiology, applied biomechanics, and movement education to help people understand and develop human capability.

PROFESSIONAL ATTRIBUTION

Chain Reaction®, 3DMAPS®, Applied Functional Science®, and related teaching concepts are the intellectual property of Gary Gray and the Gray Institute®. The Prism Framework™ applies these principles within Bob Fanelli's independent educational and coaching architecture.

COACHING PEARL™

The foot's appearance offers one frame of information. Its value becomes clear when we observe how it receives, transforms, and returns force within the whole task.

UNDERSTAND
THE HUMAN SYSTEM

DEVELOP
HUMAN POTENTIAL

EXPAND
HUMAN POSSIBILITY

SERVE
A GREATER PURPOSE