

The Past, Present and Future of Podiatric Biomechanics

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What is Podiatric biomechanics?

- importance of "Podiatric" biomechanics to the profession
- as a "brand" name
- traditionally Podiatric biomechanics is based on two key concepts:
 - i) the concept of the neutral position of the subtalar joint
 - ii) the concept of the locked position of the midtarsal joint

Early theoretical contributions:

- 1845 - Durlacher
- 1874 - Thomas
- 1888 - Whitman
- 1916 - Roberts
- 1920 - Schuster
- 1940 - Morton
- 1948 - Schreiber & Weinerman
- 1950 - Levy

What Root et al contributed:

- foot as a dynamic rather than static structure
- a protocol for measurement (does this make it scientific?)
- derived the defined position of the subtalar joint
- derived the concept of the locked position of the midtarsal joint
- used these concepts to reinterpret published research and clinical observations

Root et al gave us a protocol for clinical management based on:

- deviations from the defined normal that can be measured
- variations from normal alignment causing abnormal foot function, resulting in a particular set of signs and symptoms depending on the nature of the variation
- the variation is measured
- a cast of the foot is made to capture these deviations in alignment
- a functional foot orthosis is constructed with posts to restore normal function

Problems with traditional theory

- use and understanding of terminology
- criteria for the definition of normal
- validation of subtalar joint neutral
- position of STJ at midstance
- reliability / reproducibility of placing foot in neutral
- reliability / reproducibility of measurements
- reliability / reproducibility of casting

Problems cont....

- static measurements
- hinge joints
- the two axes midtarsal joint model
- aetiology and diagnosis of forefoot varus
- knee pathomechanics
- clinical trials
- abuse of orthoses

What has happened since:

- Widespread adoption into clinical practice
- Developments and modification of the theory
- Scientific testing comparing the fit between the theory and reality
- Clinical success
- Confusion over what is theory, fact and science

Emerging alternatives:

- interpreting alternatives through the wrong “lens”
- they are attempting to explain the same set of facts and clinical observations
- they can not yet explain everything we see and have a lot of development to go before widespread adoption
- they are informing clinical practice

Future directions:

- No major change - traditional theory is modified/changed to account for the problems
- the sagittal plane facilitation of motion of model
- centre of pressure and the position of the subtalar joint axis
- neurophysiological explanations
- the tissue stress model
- Bottom block theory; Neoteric biomechanics; preferred pathway model
- another, as yet, unknown alternative

? What and how ?
are we now
? supposed to ?
teach students ?
? ? ?

The course manual:

- starts with the controversy
- goes through traditional theory
- reviews the “uncertainty” in the knowledge
- goes through some of the alternatives

If, at the end of the
year you are
confused then your
lecturers have done
their jobs

It is being able to resolve the
confusion in your own minds which
will allow you to make 'contextually
appropriate decisions' and become
the kind of critical thinkers that
make good clinicians. We hope
that this course gives you the tools
to do this