

Burn Injury and Hands:
What is Missing in the State of Science
in Rehabilitation of These Injuries?

State of the Science in Burn Research

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R. Scott Ward, PT, PhD

Professor and Chair

Division of Physical Therapy

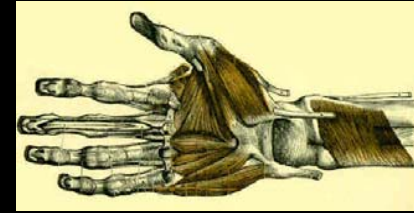
University of Utah

Salt Lake City, Utah

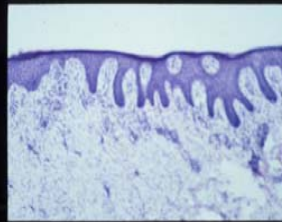
What Science? What Matters?

- Anatomical
- Physiological/Biological
- Functional/Biomechanical
- Translational

Anatomy



- The anatomy of the hand is well understood – even anatomical responses to burn injury seem to be clear, but wait ...
 - does the possible loss of normal anatomy, such as epidermal/dermal ridging mean something?



- other thoughts? ...

Physiology/Biology

- The physiology of the healing or healed burn wounds, scarring and the effects of these responses on adjacent uninjured tissue is not understood ...
 - fibrosis of tissue – what does this mean?
 - adhesion of tissues – why does this happen? What can be done?



- nerve regrowth and function – is the residual protective?
- vascular regrowth – is it functional or are we missing something?
- does the loss of skin appendages affect adjacent or deeper tissues?
- scarring, scarring, scarring! So many questions ...
- does the injury change expected biological responses such as inflammation, immunity, etc.?
- other thoughts? ...

Functional/Biomechanical

- The functional and biomechanical questions related to burn injury are expansive and this is just a sampling ...
 - is there a dose response to stretch? (or for that matter, are there dose responses for other interventions)
 - does the type of stretch matter – static/dynamic?
 - do sufficient and useful outcomes measures exist?
 - do outcomes measures relates to measurable biomechanical variables or changes?
 - does strength improve function acutely/chronically?
 - what is important to our patients?
 - are there optimal ways to manage scar tissue for both contour and function?
 - more to come ...

Functional/Biomechanical

- The functional and biomechanical questions related to burn injury are expansive and the sampling continues...
 - what are the real restrictions limiting functional performance?
 - does early intervention – splinting, ROM, etc. – influence recovery of hand function?
 - do limits in hand function create associated impairments of the upper extremity or conversely can the opposite be the case?
 - does hand dominance really play a role in outcome or expectation?
 - any predictors for contracture potential?
 - what does patient satisfaction mean? Are we asking the right questions?
 - are there good measures of patient compliance to rehabilitation plans?
 - other thoughts? ...

Translational

Play the matching game if we can ...

Anatomy \rightarrow Physiology \rightarrow Function
or

Physiology \rightarrow Biomechanics \rightarrow Function
or

Function \rightarrow Biology \rightarrow Anatomy
or

Physiology \rightarrow Function \rightarrow Biomechanics
or

... other thoughts?

