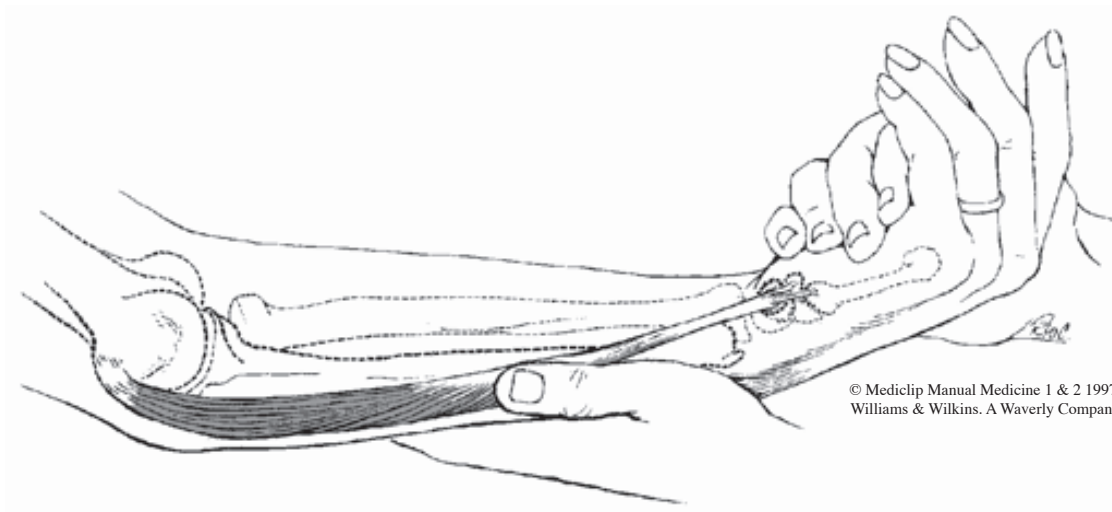


NeuroMuscular Therapy American Version™

Forewarned is Forearmed

Understanding and Treatment of
Forearm and Hand Pain and Dysfunction

Donald Kelley, LMT, Presenter



Published by:

NMT Training Center
900 14th Avenue North
St. Petersburg, FL 33705
(727) 821-7167
fax: (727) 822-0643
nmtcenter@aol.com
www.nmtcenter.com

Special Editors

Donald Kelley, LMT
Judith DeLany, LMT

Copyright © 2008 NMT Center

All rights reserved. This booklet is protected by copyright. No part of this book may be reproduced in any form or by any means, including photocopying, or utilized by any information storage and retrieval system without written permission from the copyright owner.

NMT's Foundational Platform

BE INFORMED ON STATE LAWS WHERE
THERAPY IS CONDUCTED. PRACTICE WITHIN
THE SCOPE OF YOUR LICENSE AND TRAINING.

The Big Picture

Homeostasis is the state of equilibrium in the body with respect to its various functions, regarding everything from postural adjustments to the chemical compositions of the body's fluids. It is through this goal of equilibrium in the normal process of day to day life that our body deals with the many stresses and expectations placed upon it. It accomplishes this through adaptation and compensation. If stresses are excessive, the adverse effects of decompensation, where frank disease and degeneration occur, may emerge as well.

Adaptation - The dynamic process wherein the thoughts, feelings, behavior, and biophysiological mechanisms of the individual continually change to adjust to a constantly changing environment.

Compensation - A process in which a tendency for a change in a given direction is counteracted by another change so that the original change is not evident.

Decompensation - Where patterns of adaptive changes are seen to be dysfunctional and to produce symptoms, evidencing a failure of homeostatic adaptation.

Making sense of the picture

As will become clear in these courses, fundamental influences on health (musculoskeletal stress, postural influences, emotions, breathing pattern disorders) constantly mix and merge together to create the picture of health of the patient. In trying to make sense of a patient's complaints and to get to the root of the causes of resultant symptoms, it is frequently clinically valuable to differentiate these interacting etiological factors. One model which allows a focus to be brought to factors which may be amenable to change is to associate negative influences into three categories:

- *biomechanical* (overuse, misuse, trauma, disuse, congenital, etc.)
- *biochemical* (nutritional deficiency, ischemia, inflammation, toxicity, endocrine imbalance, etc.)
- *psychosocial* (unresolved emotional states, somatization, anxiety, depression, etc.).

The influences of a *biomechanical, biochemical and psychosocial* nature do not produce single changes. Their interaction with each other is profound and intervention in one category can affect the others remarkably. While it is necessary to address the influences which can be identified in order to remove or modify as many etiological and perpetuating factors as possible, it is important to do so without creating further distress or a requirement for excessive adaptation. For each therapeutic intervention, adaptation may also be required, so it is important that we do not overload the adaptive mechanisms in the healing process.

Note Chaitow & DeLany (2002), "*In truth, the overlap between these causative categories is so great that in many cases interventions applied to one will also greatly influence the others. Synergistic and rapid improvements are often noted if modifications are made in more than one area as long as too much is not being demanded of the individual's adaptive capacity. Adaptations and modifications (lifestyle, diet, habits and patterns of use, etc.) are commonly called for as part of a therapeutic intervention and usually require the patient's time, money, thought and effort. The physical, and sometimes psychological, changes which result may at times represent too much of a 'good thing', demanding an overwhelming degree of the individual's potential to adapt. Application of therapy should therefore attempt to include an awareness of the potential to create overload, and should be carefully balanced to achieve the best results possible without creating therapeutic saturation and exhausting the body's self-regulating mechanisms.*"

Local and global causes and perpetuating factors

Within these three categories are to be found most major influences on health, with a number of these features being commonly involved in causing or intensifying pain (Chaitow 1996). These include, among others, locally dysfunctional states such as:

- hypertonia
- trigger points
- ischemia
- inflammation
- habits of use
- local trauma
- neural compression or entrapment
- local adaptation

as well as the following global factors which systemically affect the whole body:

- genetic predispositions (e.g. connective tissue factors leading to hypermobility) and inborn anomalies (e.g. short leg)
- nutritional deficiencies and imbalances
- toxicity (exogenous and endogenous)
- infections (chronic or acute)
- endocrine imbalances and deficiencies (hormonal, including thyroid)
- stress (physical or psychological)
- trauma
- posture (including patterns of misuse)
- hyperventilation tendencies.

NMT American version™ attempts to address (or at least take account of) six ‘subdivisions’ from this list, although the entire list should be kept in mind. NMT practitioners particularly address ischemia, trigger points, neural entrapments/compressions, postural imbalance, nutritional imbalances/deficiencies and emotional factors. When assessing the individual, any of these (or others from the above list) which lie outside the scope of practice and license of the practitioner should be considered for referral. The practitioner's role may be to alleviate the stress burden as far as possible, or to lighten the load, or to work toward more efficient handling of the adaptive load. It also includes teaching and encouraging the individual to alter daily habits.

The ‘Six Factors’ of NMT

When working with a person in chronic pain, six factors, in particular, should be addressed systematically to assess for and, hopefully, reduce underlying causes and/or to decrease the intensity of the discomfort. If one or more of the factors are not addressed, the person may plateau in his or her recovery or regress to a previous state of discomfort and dysfunction. The following six factors are considered with all patients and are either addressed by the practitioner or the patient is referred for assessment by another practitioner skilled in the field. If progress is not seen within a few treatments or if pain, fatigue, or other primary symptoms return, other factors, such as hormonal, organ or bone health, toxicity, etc., should be considered as possibly being primary.

1) **Ischemia** - A state in which the current oxygen supply is inadequate for the current physiological needs of tissue. Causes of ischemia can be pathological (narrowed artery or thrombus), biochemical (vasoconstriction by the body to reduce flow to a particular area), anatomical (tendon obstruction of blood flow) or as a result of overuse or facilitation. Ischemia reduces the level of oxygen, nutrients, and waste removal and the tension produced by the resultant muscle shortening can alter joint mechanics and/or entrap neural structures. Ischemia also leads to the production of trigger points.

2) **Trigger Points (TrPs)** - localized areas within muscle bellies (central TrPs) or at myotendinous or periosteal attachments (attachment TrPs) which, when sufficiently provoked, produce a referral pattern to a target zone. The referral pattern may include pain, tingling, numbness, itching or other sensations. In addition to its location (central or attachment), a TrP can be classified as to its state of activity (active or latent) as well as whether it is primary, key or satellite. (see ‘Trigger point formation theories’)

3) **Neural interferences** - compression (by osseous structures) or entrapment (by myofascial tissues) of neural structures may result in muscle contraction disturbances, vasomotion, pain impulses, reflex mechanisms and disturbances in sympathetic activity

4) **Postural and biomechanical dysfunctions** - repeated postural and biomechanical insults over a period of time, combined with the somatic effects of emotional and psychological origin, will often present altered patterns of tense, shortened, bunched, fatigued and, ultimately, fibrotic tissues with resultant alterations from healthy postural positioning

5) **Nutritional factors** - nutritional deficiencies/imbalances, sensitivities, allergies and stimulants all play roles in myofascial health as well as hormonal, emotional and mental health

6) **Emotional wellbeing** - the degree and type of the emotional and stress loads the individual is carrying can influence various systems of the body. Ultimately, if excessive or prolonged, these factors can result in distress and disease.

Anterior Forearm - "The Flexors"

References

Clinical Application of Neuromuscular Techniques V1 Myofascial Pain & Dysfunction, V1
Innervation: Radial, ulnar, and median nerves (C5-T1)



Brachioradialis: proximal 2/3 of lateral supracondylar ridge of the humerus and intermuscular septum to the styloid process of the radius; **Supinator:** supinator crest of the ulna, lateral epicondyle of the humerus and ligaments and joint capsule of the elbow to the lateral surface of the proximal third of the radius; **Pronator teres:** medial epicondyle of humerus, medial intermuscular septum and coronoid process of the ulna to the pronator tuberosity of the radius; **Pronator quadratus:** anterior surface of the ulna to anterior surface of the radius;

Precautions: Treat these muscles in carpal tunnel syndrome, however, be cautious of the radial artery and median nerve at the wrist.

Preparation: The patient is supine or sits in a chair. The non-lubricated arm is semi-supinated and supported on the table. The practitioner stands or is seated.

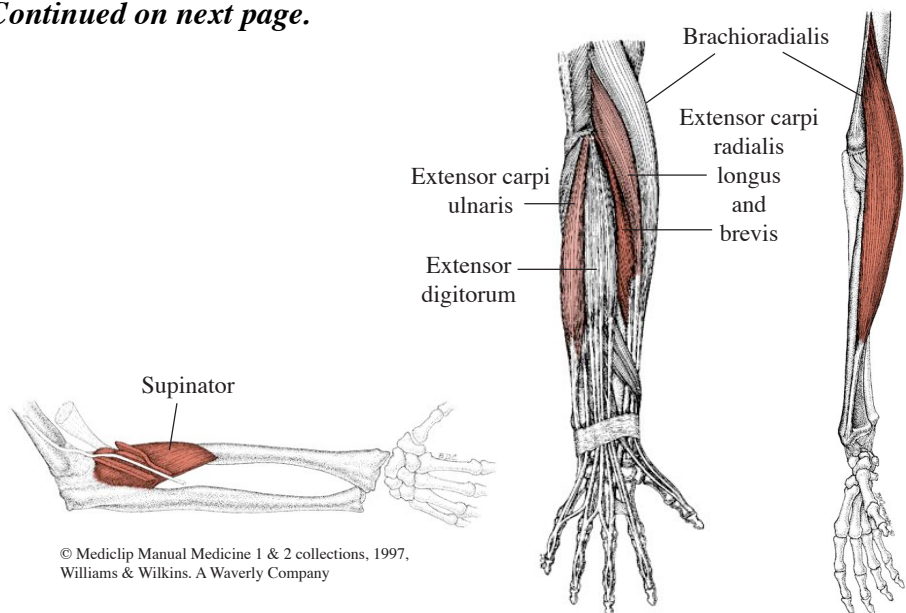
Step 1: With the patient's forearm in a semi-supinated position, grasp the **brachioradialis** and apply compression at thumb width intervals from the humeral attachment to as far distally as it can be grasped. Repeat several times if tender. A deeper grasp will also treat the **extensor carpi radialis longus** and **brevis**, and (possibly) **supinator**.

Step 2: Apply lubricated gliding strokes to **brachioradialis**. Deeper pressure addresses **extensor carpi radialis longus** and **brevis**, and **supinator**.

Step 3: Displace the brachioradialis and extensor carpi muscles laterally and glide the thumb directly on **supinator**. Repeat on the medial side.

Step 4: Supinate the forearm and apply gliding strokes from the lateral wrist (scaphoid bone) to the elbow crease 6-8 times to treat portions of **brachioradialis**, **pronator quadratus**, **flexor digitorum superficialis**, **flexor pollicis longus**, and **pronator teres**.

Continued on next page.



© Medclip Manual Medicine 1 & 2 collections, 1997, Williams & Wilkins. A Waverly Company

© Medclip Manual Medicine 1 & 2 collections, 1997, Williams & Wilkins. A Waverly Company

Anterior Forearm - "The Flexors"

References

Clinical Application of
Neuromuscular Techniques V1
Myofascial Pain &
Dysfunction, V1
Innervation: Radial, ulnar,
median (C5-T1)

Palmaris longus: medial epicondyle to palmar fascia and transverse carpal ligament; **Flexor carpi radialis:** medial epicondyle of humerus, antebrachial fascia and intermuscular septa to the base of 2nd and 3rd metacarpals; **Flexor carpi ulnaris:** medial epicondyle of humerus and olecranon to the pisiform, hamate and 5th metacarpal; **Flexor digitorum superficialis:** medial epicondyle of humerus, coronoid process of elbow and oblique line of radius through the carpal canal to end in four tendons each attaching to a middle phalanx; **Flexor digitorum profundus:** ulna, interosseous membrane and coronoid process of the elbow to become four tendons, each attaching to a distal phalanx



Continued from previous page.

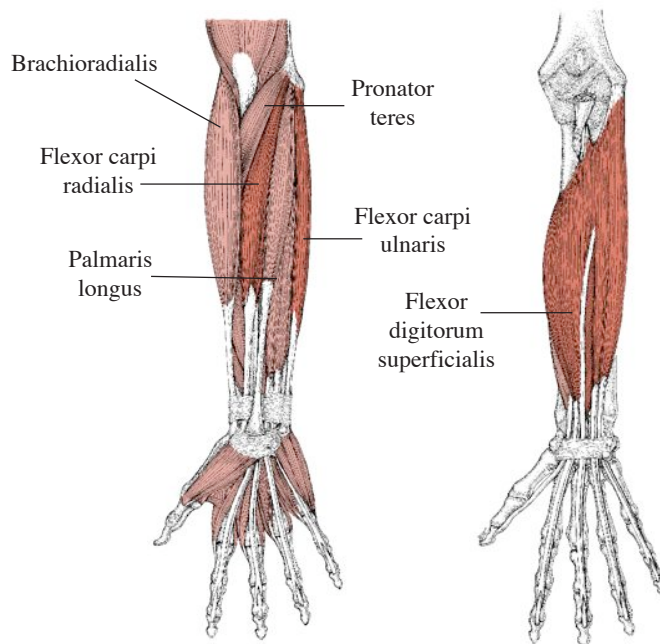
Step 5: Move the thumbs medially and continue the gliding strokes on the next strip of the anterior forearm from the wrist to the elbow crease to treat **flexor carpi radialis**, **palmaris longus**, **flexor digitorum superficialis** and **pronator teres**. Deeper pressure will treat **pronator quadratus** and **flexor digitorum profundus**. Do not press deeply at the wrist as the radial artery and median nerve lie deep to the tendons. Continue gliding in strips until the entire anterior forearm has been treated.



Step 6: Transverse snapping palpation can be applied to the **pronator teres**, which courses diagonally just distal to the crease of the elbow.

Step 7: If appropriate, apply friction to the attachment of the **common flexor tendon** on the medial epicondyle of the humerus where 5 muscles originate (**pronator teres**, **palmaris longus**, **flexor carpi ulnaris**, **flexor carpi radialis** and **flexor digitorum superficialis**).

Note: The supinator can entrap the deep branch of radial nerve.



© Mediclip Manual Medicine 1 & 2 collections, 1997,
Williams & Wilkins. A Waverly Company

Palmar and Dorsal Hand

References

Clinical Application of
Neuromuscular Techniques V1
Myofascial Pain &
Dysfunction, V1
Innervation: Radial, ulnar,
and median nerves
(C5-T1)

For the lengthy list of muscles associated with fine finger and thumb control, see *Clinical Application of Neuromuscular Techniques, Vol. 1, The Upper Body* or any other detailed anatomy text.



Precautions:

- Do not treat when inflamed arthritis is present.
- Avoid pressure directly over wrist.
- Do not treat the tendons when swelling over the tendons is present.

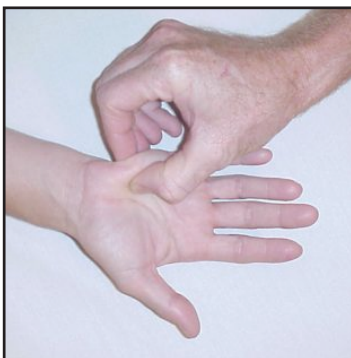
Preparation: Practitioner and patient are positioned as in the previous two pages and with the patient's hand supinated. The beveled pressure bar is needed.

Step 1: Compress the thenar eminence to treat the **abductor pollicis brevis**, **flexor pollicis brevis** and **opponens pollicis**.

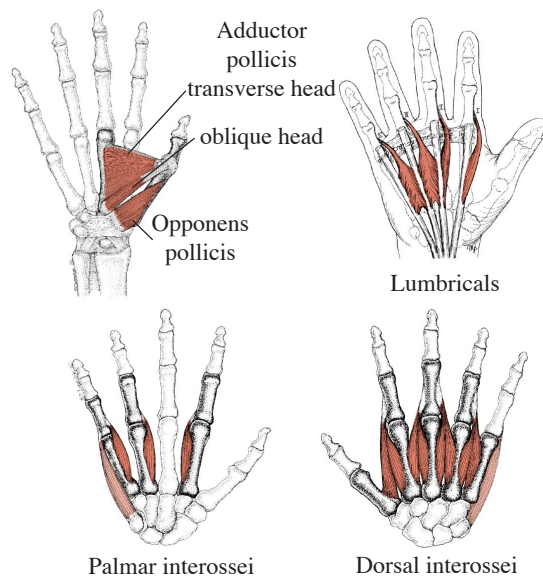


Step 2: Compress the “web” between the thumb and index finger to treat the **adductor pollicis**.

Step 3: Compress hypothenar eminence to treat the **abductor minimi**, **flexor digiti minimi brevis** and **opponens digiti minimi** muscles.



Step 4: Apply myofascial spreading to the **palmar fascia**.



© Mediclip Manual Medicine 1 & 2 collections, 1997,
Williams & Wilkins. A Waverly Company