Hand exercising - Why strengthen the muscles that open the hand and spread the fingers, as well as grip strength?

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Keywords: (carpal tunnel syndrome, lateral epicondylitis, tennis elbow, DeQuervain's Syndrome, repetitive stress injuries, reciprocal muscle groups, reciprocal inhibition, finger/thumb extensor and abductor muscles, finger/thumb flexor and adductor muscles)

(**NOTE** For the clarity of readers who are not health care professionals, there will be many references to **finger/ thumb extension and abduction**, which simply means opening (extension) and spreading (abduction) the digits of the hand, as in action of stretching out the hand. There will also be many references to **finger/thumb flexion and adduction**, which means the action of closing (flexion) and squeezing (adduction) the digits of the hand, as in gripping or making a fist.)

Historically, athletes, musicians and workers have ignored the importance of strengthening the muscles that open the hand (finger/thumb extensor and abductor muscles) concurrently with strengthening grip. Everything we know and apply to the rest of the body relating to muscle balance and exercise is mysteriously laid to waste when it comes to the hand muscles. This oversight not only limits performance, it can cause problems. Lets examine why it is so important to strengthen these finger/thumb extensor & abductor muscles.

1. Performance Enhancement

a. Extension- Direct Benefit

Many athletic activities directly demand finger and thumb extension and abduction. Some examples are the act of opening a baseball or hockey goalie glove, the loading action in shooting a basketball, opening the hand to catch a football and setting a volleyball. If an athlete can improve the action (speed and strength) of opening the hand even minutely, there is an immediate improvement in performance potential. If we don't train finger/thumb extension and abduction, we directly limit that potential. It makes no sense to omit these exercises from the training routine of any athlete, musician or worker; yet, most often, we do.

b. All Actions- Indirect Benefit (reciprocal inhibition)

When muscles in the body contract, there occurs a simultaneous cooperation or relaxation of the opposing muscle group(s), where present. The most common example is the triceps muscle relaxing when the biceps muscle is contracted. This neuromuscular process is called "reciprocal inhibition". In our sports environments, and in society in general, the finger/thumb flexor and adductor muscles (gripping muscles) are repetitively contracted, causing the opposing finger/thumb extensor and abductor muscles to repetitively relax. We are constantly grasping with our hands, yet rarely opening them. The extensor and

abductor muscle groups are, in essence, continuously being trained by the brain (via reciprocal inhibition) to be submissive and weak.

Unfortunately, reciprocating muscle groups need to be strengthened equally in order for reciprocal inhibition to work most efficiently. If domineering finger/thumb flexor and adductor muscles are present (which is almost always the case), all hand actions are handicapped. The hard fact is that if you are not strengthening finger/thumb extensor and abductor muscles, you are creating imbalance and limiting performance potential for all actions of the hand, wrist and forearm.

Equalizing this imbalance by strengthening extensor and abductor muscles, does not, incidentally, reduce grip strength, hand speed and/or wrist flexion strength. Instead, it creates better reciprocal muscle cooperation. To have strength and balance in all hand muscles improves the athlete's ability to perform all actions faster, stronger and through wider ranges of motion.

2. Injury Prevention

Carpal Tunnel Syndrome (CTS), lateral epicondylitis (tennis elbow) and DeQuervain's Syndrome are three of many repetitive stress injuries (RSI's) that are rampant in sports, music and in the workplace today. The potential for their presence is in direct proportion to the presence of shortened finger/thumb flexor and adductor muscles dominating over the opposing extensor and abductor muscles.

It is commonplace to see gripping activities in sports (golf, tennis, baseball, motor sports, rock-climbing, bowling, hockey, etc.), music (guitar, piano, wind instruments, etc.) and in the workplace (computers, cashiers, production line workers, trades people, etc.). Repetitive flexion and adduction leads to imbalance. The more we participate in these activities, the greater the imbalance becomes.

It is important for the athlete to offset this imbalance by equally strengthening finger/thumb flexion and adduction AND finger/thumb extension and abduction when exercising the hand. Athletes may even choose to FAVOR the extension and abduction component in an attempt to rectify the imbalance. If we begin to strengthen finger/thumb extensor and abductor muscles in athletes, musicians and workers, we can, over time, eliminate this commonly overlooked imbalance. As we eliminate this imbalance, we will see a direct reduction in carpal tunnel syndrome (CTS), tennis elbow, DeQuervain's Syndrome and other RSI cases.

3. Injury Rehabilitation (The Final Stage of the Treatment Protocol)

The first stage in addressing any hand, wrist and forearm problem is to consult an appropriate health care professional (physician, physiotherapist, chiropractor, hand

therapist, occupational therapist, athletic trainer, naturopath or massage therapist). They will be able to diagnose the given condition and begin treatment, or recommend an appropriate course of action.

The first stages of treatment protocol will involve reducing symptomatology, re-establishing joint and tissue function and breaking adhesions, if present. The final stage of treatment protocol must involve re-establishing normal balance and blood flow to the injured area. Strengthening finger/thumb extensor and abductor muscles is an important part of this final stage.

a. Balance, Balance, Balance

For optimal rehabilitation, the athlete or patient must strengthen the muscles that open the hand and spread the fingers. The finger/thumb extensor and abductor muscles have attachments at the elbow, forearm, wrist, hand, fingers and thumb, as do the gripping muscles. Their actions, and therefore their balance, affect the mechanics of all of these areas. If we ignore reciprocal muscle group principles in the hand during rehabilitation efforts, recovery from hand, wrist and forearm injury will be incomplete and re-injury will be more likely. We are asking for trouble.

b. Form Follows Function (Stimulating Blood Flow)

The body establishes optimum nerve and blood supply to areas that are “being used regularly” (“use it or lose it”). We must ensure that rehabilitative hand exercises are through full flexion, adduction, extension and abduction in order to stimulate optimum blood flow to the injured area. Optimum blood flow means optimum oxygen and nutrients supply to injured tissues. If we are incomplete in our choice of rehabilitation exercises, we do not stimulate optimum blood flow and risk greatly the chronic formation of adhesions and scar tissue. Rehabilitate through full, balanced ranges of motion and ensure an optimum healing response from the body.

Whether enhancing performance, preventing or treating injury, the therapist, trainer, athlete, musician and worker must respect reciprocal muscle group principles the same in the hand as in any other area in the body.