

My life as a pianist temporarily came to an end in July 2004 when increasingly severe spasms in my right hand became too much. By 2005 I couldn't even play a scale because the curling of my thumb would contort the whole hand.

After pursuing every avenue I was finally told by a neurologist in early 2006 that I suffer from focal dystonia, a conclusion already reached by myself.

Powerful flexion occurred in the right thumb, pulling it into the palm by the powerful flexor pollicis longus. This would occur most severely when moving the hand down the keys (from right to left). In the end I only had to move the hand down (without even touching anything) for the thumb to curl. The full extent of the damage was only revealed by freeze-frame analysis of digital film. At the instant of the thumb curling right under the palm, the wrist would plummet, the index finger would point upwards, while the little finger curled under the hand to touch the thumb. I soon discovered that these additional movements are attempts to compensate for flexion, but end up sustaining it in a dreadful cycle of co-contraction that makes playing impossible.

When researching CIMT (Constraint Induced Movement Therapy, now called SMT Sensory Motor Retuning) I read the experiences of a poster (AURELIO) on the 'Musicians with Dystonia Forum' who underwent professionally guided therapy. The account is very detailed. Much of it, however, sounds like a medieval torture chamber. A sample is given below.

"Well, the non splinted fingers had to do the movements in an exaggerated manner, that is, when one finger is pushing a key the other ones must be maintained raised. "

"I had to pull trying to bend it (which was impossible because of the splint), that is, I had to make a muscular contraction of the flexor of the index finger."

"With 4 and 5 fingers I had to push the splints trying to unbend and raise the fingers making a muscular contraction of the extensor muscles of 4 and 5 fingers."

To my mind all this struggle seemed wrong. Co-contraction is a recipe for disaster and, hardly surprisingly, the poster admitted that after therapy there was no improvement.

If I let the arms fully relax by my side so that the palms face backwards and then bring the hand up to the keys, pronating slightly with the elbow in the same plane as the white keys, then the little finger is aligned with the ulna, the fingers are curved (but not curled) and the thumb is straight, making key contact with the front edge and not the distal phalanx. Using my other hand I can push the thumb under the palm and, when I release, it automatically springs back into place. Likewise I can use the other hand to tap each finger into the key whereupon it automatically reassumes its position of rest on the rebound. Finger tapping the thumb above the DIP joint causes movement from the CMC. This sensation of movement followed by immediate recovery into a relaxed neutral or natural hand position forms the basis of my interpretation of CIMT - and was also the start of my complete recovery from focal dystonia.

In a sense nothing is actually constrained because splints are not (at least in my case) necessary. What is important is that only several digits are involved in therapy at any one time, the others rest motionless on the keys, and that all compensatory movements are excluded. (Digital film will reveal what these partners in crime actually are.) My index finger was the main compensator (compensation is invariably supplied by an adjacent digit). Care was taken to avoid dorsiflexion of the hand, another compensatory movement. After an hour or so of tapping other digits using the other hand my right index would remain undisturbed, resting gently over its key.

I placed the digits over the whole-tone scale with the thumb on E, avoiding deviation of the wrist. Use the smallest movement possible with the therapy so that you distinctly feel the key bump before reaching the keybed. This is the point at which (no matter how hard you press) there can be no difference to the sound. Maintain skin contact with the key at all times - absolutely no raising of any digit above the key.

Alter the way finger movement is registered in the brain by shifting patterns of articulation. Taking oscillation between two keys as an example, divide a very slow beat incrementally from crotchets to demisemiquavers, increasing the tuplet division after, say, every twelve beats. I found this method greatly fine-tunes both sensory and motor functions, providing you continue to feel the key movement and allow each digit to immediately return to its position of rest on the key. It also requires concentration to maintain perfect balance and evenness. Every combination of digit was used sequentially in the therapy except the index. After finger-tapping the two methods of moving keys were:

1. Multi-leverage system using MCP and PIP joints in tandem by lengthening the finger into the key while moving the thumb from the CMC joint and not the MCP. (There is nothing wrong in finger movement from the MCP, but I just enjoyed the sensation of multi-leverage. Thumb movement from the CMC was essential in my case to avoid the claw-shape and reactivate this stiffened joint).

2. Rotating the radius around the ulna without any feeling that the fingers are actually doing anything other than keeping key contact. Here you are effectively transferring movement to the arm. If you maintain key contact the rotation will be very small, but you will be more aware of the sensation that the radius does not articulate with the humerus, and that the wrist cannot rotate by itself (the radius rotates around the ulna - not the other way round).

Taking great care to avoid compensatory dorsiflexion, I extended the CIMT described above to a more mobile therapy playing, for example, 1-3-1-3 etc up and down the keyboard using a very slight volarflexion when passing the thumb.

In my case, persisting with this therapy for several hours a day over a period of three months, sorted out the mess of flexion and extension - effectively reorganising digital representation. There is little point, however, in applying therapy if it is interspersed with bouts of dystonia-inducing playing. This is akin to the injured footballer taking time out from his therapy to play matches. Also, it will only work as a long-term solution if one consistently applies the new sensations to post-therapy playing. Begin with what you can play easily and progress very slowly from there. (I found the sonatas of A. Soler and D. Scarlatti particularly useful. They are light-textured and range from easy to advanced. They facilitate playing without force.)

Once determined on a specific course of action it took me only about a year after therapy to fully recover from dystonia, so I've obviously done something very right. The rather shallow

tone I was left with has been surmounted in recent years by using speed instead of force, and there is nothing that I could play before the onset of dystonia that I can't play now. In fact I play with greater fluidity and range of motion. Here are some general recommendations:

- * Don't try and fix an unnatural position - such as curling or straightening the fingers or tensing something - in the hope that it will offset dystonia; it won't work. Attempting to force or fix a position means you are unnecessarily tensing muscles and compounds the misery by fusing it in the brain as compensation for flexion. Unlike many isometric exercises, the CIMT therapy I used eliminates unnecessary muscular activity and reinforces surround inhibition so that clean signals are sent.
- * Don't focus on the dystonic digit. I initially focussed on the little finger and ulna and expanded body awareness from there. Making the errant digit the focal point of your attention tenses it.
- * Focus not on muscles but on movement only. If you focus on movement by hard structure such as bones then you will only be using the muscles required for that movement. If you focus on muscles then they will tense. Be aware of that in your daily activity also.
- * Don't use any digit as an axis of balance or stability. This point was particularly relevant in my case as I imagined the thumb to be a stable pivot over which the hand turns, consequently fixing it. The saddle-shaped CMC joint, however, can't rotate. The CMC aligns with the carpal bones, articulating in turn with the radius rotating around a stable ulna. Being aware of that anatomical fact helps release muscles operating on the thumb. In point of fact don't use any part of your anatomy as a fixed point except where gravity keeps you upright on the floor.
- * Use the minimal force necessary to produce the required sound. With the piano, four or five ounces, really doesn't require much strength or effort. I've rediscovered the effortlessness of playing again. My hand, once claw-shaped, is now normal in appearance and I suffer no forearm tension however much I choose to play.
- * Sit so that the elbow is level with the white keys. This is sometimes difficult as seating - especially in churches and small town halls - is atrocious. Use hymn books, town hall minutes or anything else to elevate yourself to best ergonomic advantage. Sitting too low encouraged me to use the distal phalanx of the thumb. To remedy this I would raise (tense) my shoulders. The solution, of course, is to sit at the correct height.
- * Learn to play the piano without producing any sound, 'listening' instead to the movements of bones and joints from the sternoclavicular (where the arm joins the rib cage) to the finger tips. It's amazing how aware you become when doing this activity.
- * During the post-therapy process of recovery occasional twinges are still felt when pushing boundaries. Do something else immediately and avoid the compulsive temptation to tough it out.
- * Learn to reverse the fight/flight response. When I saw a passage coming up that looked 'dystonia-inducing' I automatically relaxed to the maximum possible state, letting the radius turn around the ulna like a key in a lock to pass over the thumb, which remains motionless.

Developing a kinaesthetic sense where you 'visualise' correct movement before it actually occurs will help.

* Avoid any isometric exercises that are supposed to strengthen muscles. There are doubts over its effectiveness at the best of times and such exercises will almost certainly make your dystonia worse. You sometimes hear of people spending hours on isometric exercises and then claiming they feel empowered as a result. This is akin to spending hours on a cramped car journey and enjoying the sensation of stretching your legs afterwards. The CIMT therapy I used eliminates unnecessary muscular activity and does not increase it.

* Take great care to avoid any co-contraction such as actively curling the fingers and then trying to raise them at the same time or abducting them while playing rapidly. Keep the arm behind each key instead.

* Though probably nothing to do with FD, take notice of your sleeping position. I used to sleep with my right arm, palm down, curled under the pillow and would lie on top of it all night. Since sleeping in the sentry position I've achieved greater sensitivity of the fourth and fifth fingers by not compressing the ulnar nerve for hours every night.

While I don't believe there will ever be a medical cure for focal dystonia, it can be completely eliminated. The ideas above are an account of what worked for me and they might not be apposite for everyone. I was also 'fortunate' in that my involuntary clenching was limited to the thumb, which in piano playing can be easily assisted by rotary movement of the forearm. Finding the right path is very difficult and there are many cul-de-sacs, but hopefully my account will not only give hope, but some help in the process.

CIMT - Constraint Induced Movement Therapy

SMR - Sensory Motor Retuning

MCP - Metacarpophalangeal joint

PIP - Proximal interphalangeal joint

CMC - carpometacarpal joints

Volarflexion - high wrist, hand angled down

Dorsiflexion - low wrist, hand angled up

Pronation - palm of hand turned down

Supination - palm of hand turned up

Ulna - one of two forearm bones. Situated on the little finger side, it articulates with the humerus (upper arm bone) and cannot rotate in relation to it.

Radius - one of two forearm bones. Situated on the thumb side, it articulates with the carpal bones of the wrist. When the forearm is fully supinated it is parallel with the ulna. When the forearm is fully pronated it crosses over the top of the ulna.