

The following text describes how I recovered from Digital Focal Dystonia.
(written 2005, revised 2012)

My name is Hung-Kuan Chen, I am a classical pianist. I suffered a hand injury while working on my old Victorian house in Boston. My right hand was caught between a retracting 30-foot aluminum ladder. It happened in 1991. My hand swelled up for over a week yet I continued to perform after this horrifying incident. A year and a half after the accident, I was diagnosed with Focal Dystonia by three renowned hand specialists in Boston, New York and Bethesda, MD.

I stopped playing the piano. In 1995 I ventured back onto the podium, performing Shostakovich's Piano Concerto, which I barely managed. Two years later, I gave my first full-length recital and steadily increased my ability to play. September of 2003 I declared my complete recovery from FD and now in 2012 I find myself playing and performing normally.

One thing I have promised myself is to share with others what I have discovered. I understand that there are many different causes and conditions, and there is no guarantee my suggestions will work for everyone. But my method has helped me to recover and it may help others.

When I realized that the medical world was in the dark about FD in 1992, I decided to begin my own research. I had the belief that no other could know my hands and psyche better than myself. Since I used to be a pianist with fantastic technical facility, I ought to know my hands and my capabilities. I took the matter "into my own hands," so to say.

One way to describe Focal Dystonia is to view it as a disorder; a disorder consisting of confused motor commands: When the brain is sending overly complex and conflicting messages, the commands are conflicting and the fingers become stiff in the process. A fitting visual analogy would be the old style telephone switchboard with tangled-up wires.

I believe the cause of FD is rather simple. But firstly, I would like to touch upon an aspect of physical tension in playing: A finger is tense when there are two or more antagonistic commands. For example, if you want your finger to extend and flex at the same time. The finger is caught in the middle, and the finger is stiff, because the command is unclear. In Mandarin, there is a word "KA", meaning "stuck", which consists of the character "up" and the character "down". Similarly, if you ask your finger to move to the right and at the same time to the left, it will freeze in the middle; therefore this finger is "stiff".

A pianist is said to have good technique when commands are relayed to the fingers with clarity. If these commands become confused or ambiguous, the hand tenses up. It can be caused if we do not warm up properly before playing; or by a hurried practice. Further, it

could also be a result of an imbalance in the body in which the fluid responsible for lubricating the tendons is limited. Injuries, such as in my case can be the catalyst.

In short, anything that impinges on the healthy function of the hands, even a tiny injury or disorder, from which the body is not given proper time to recover can destroy this fragile and complex system.

The workings of the piano, the action, can be quite unpredictable. They may sound very dull, or too soft. Powerful playing is necessary to project in a concert hall: Especially as soloist in a concerto with orchestra. But heavy pounding causes injuries. (Lots of unhappy memories with the infamous Teflon actions) Furthermore, the touch of these instruments can be quite unlike the instrument we use daily in a studio or at home. Since rehearsal time on the concert hall piano is terribly limited we force the fingers to comply, often tensing up muscles in the process. We need to do our job as pianists, and work with whatever instrument we are given. Therefore, the brain corrects the information sent back from the sensory nerves; yet this information does not get properly processed (in limited time). As a result the brain creates a kind of compensatory adjustments to the body just to get by — which means, for the same movement, the command has become more complex. Because these commands are forceful yet directly (or indirectly) antagonistic...over time, the accumulation of new commands may reach a level where the movement just breaks down. This of course, is if we play a good number of concerts.

The body will always carry out commands faithfully, even if flawed. As one pushes the body to overcome these faulty movements one sends out even stronger commands; it's cyclical. This can cause the electrical nerve signal voltage to become abnormally high (in order to overcome strong opposing commands) and cause damage to that nerve or causing misfiring by jumping to adjacent nerves. Once the adjacent muscles start to have 'involuntary' motions, new neurological pathways form. Every time one tries to move a finger, a myriad of strange finger movements result. It appears as if the body is making strange decisions, disobeying one's wishes! In reality it is the result of the accumulation of complex and faulty movements. From the body's point of view, it may even be to fulfill our needs, or even to "rescue" us. This is the how I perceive Focal Dystonia.

A musician expresses musical meaning through the medium of sound. A good performance occurs when the image in the mind is instantaneously translated into sound without delay, as if both the synthesis and feedback take place at the same time. This is how I perceive to be "in the moment", in the "zone". To achieve this, the response time of all senses involved — audio, touch, visual — becomes lightning fast: Art at the highest level of abstraction and complexity. The performer becomes less and less aware of the physical self. The body becomes part of the instrument, and the performer, aware only of the final outcome, skips the mechanical detail. This may explain why so numerous musicians afflicted with FD tend to be "expressive" in nature. A performer that is endowed with the technical aspect of playing and follows carefully what body can do, is in sync with his body at all times and therefore avoids having physical problems. When the performer is "lost" in the music, these little "disorder" sneak in. I had such a high level of physical ability, yet as a perfectionist, an inordinately high level of sensitivity to

all parameters available to me in music making whereby I put great thought and exactitude into every work that came across my path.

Our brain implements new sectors and new commands as needed; it is flexible, it obeys your wishes faithfully; whatever you desire will be done. In case of an existing injury, it often does it by adding a new layer of commands to what already exists - rather than modifying it. This is why finding the way out of Focal Dystonia is such a challenge, because if we approach it from the point of *correction*, we only add more layers to the problem. To find the “cure”, we have to *undo* these layers.

This is why the concept that the original set of movement memory remains permanent is so important. The idea is that the movement memory from early training cannot be erased. Even when unaware, it stays somewhere in our memory bank. If it was a functional memory to begin with, we should be able to return to it.

In the weeks after the onset of my FD, I had strange experiences like suddenly waking up in the night. I would go to my piano half awake and play. Surprisingly, for the first minute the hands would play perfectly, but after that, I would witness in horror the onset of the dystonic movements as my fingers crawled up one by one, turning into an ugly claw. Each time, I would comfort myself with the thoughts that the hands were doing fine; they were not damaged, they were just in a temporary condition; one day they would return to playing normally! For a long time I was puzzled by what was happening exactly in that first minute. I didn't dare do this too often, afraid that this sign of “God's mercy” may disappear if I overdid. It did give me a chance to observe the onset of FD.

According to studies done in Vienna, the original ability of how we play an instrument, in form of muscular memory, stays in the brain and cannot be erased. Apparently this assumption helps explain why it is important for any instrumentalist to develop proper technique before reaching the age of 18. After this age it is difficult, if not impossible to correct or learn a new set of techniques. This seems to be an awful idea — a notion I rather disagree with; yet I have found it helpful. I suggest that FD is caused by a newer set of memory that has covered up the function of an older, original set. Our aim here is to find out how to bypass the newer memory and reach down to the older set.

A few basics about hands: Our hands have two general types of nerves: the sensory nerves and motor nerves. Motor nerves move fingers, and sensory nerves are responsible to relay data of position and touch back to the brain. For the hand, muscles responsible for finger's vertical movements are located in the forearms. These muscles are connected via tendons and ligaments to the bones. Tendons connecting to the fingers are quite long; they pass through the carpal tunnel and reach specific phalanges. There are two tendons per finger responsible for extension, another two for flexion and extra tendon connected to the index finger for extra strength and flexibility when used in conjunction with the thumb. The thumb itself has three muscles enabling it to rotate on a saddle joint. In addition, there are short muscles in between the fingers that enable them to move laterally; these are the *lumbricals* and *interosseuses*. The simplest movement requires a complex

coordination between all muscles involved, and within a single movement, the sensory nerves continuously monitor and relay data concerning position and touch, back to the brain. Upon registering, the brain then sends out new motor commands, creating a two-way communications for playing.

I. *How to uncover/recover the original set of memory?*

To explain my experience of playing in the middle of the night, there seems to be different sets of memory available at different awareness levels. At the beginning, as I am only half awake, my original set of memory is readily functional; after one minute, the newer set of memory wakes up. Once online, it overwrites the original set and causes the dystonic response. Like it or not, it is in a “rescue mode”, created to help us overcome difficulties and trauma.

To make sense out of this, I call the changeover the “*threshold*”. Beneath the threshold is the original memory set; above the threshold is the dystonic memory set. What I have learned is the detection of the threshold. What differs here from other types of retraining is to “go *beneath* the threshold”. It is a process of re-acquainting oneself with the original movement memory set, rather than creating a new one. By re-energizing the original set, we bring it to the foreground. This is of course, more easily said than done!

Firstly, it is difficult to go beneath the threshold. Only by using tremendous concentration and imagery was I able to reach beneath the dysfunctional set, and connect with the original set of memory. I practiced meditation and Chinese Qigong, which helped me train the ability to utilize this imagery. Also, the breathing helped to decrease stress levels and increase oxygen everywhere in the body.

Next, I found that the finger pressure required to stay *beneath* the threshold was very light.

It has been observed in FD that fingers can move freely on tabletops for example, but the moment they touch a moving surface, dystonic movement results. Furthermore, the mind is conditioned to recognize “*piano playing*”, even before pressing a piano key. It recognizes the “piano” by the faintest touch and immediately switches over to the FD mode. Therefore, I searched around for a surface, which moved, yet the mind could not distinguish it as a piano key; I searched for something that I could press down, that was light to the touch and unlike the piano. A piano is too heavy and obviously, too recognizable. I looked for something soft enough not to trigger the FD – I finally found a very old TV remote control; one from the 60’s at a garage sale.

As I was readying myself to experiment, there was a thought in the back of my mind that these experiments could be impossible to repeat, and, if I failed, I might not get a second chance. Therefore I gave myself time to prepare mentally. It was on a warm pleasant Sunday afternoon that I started.

II. *The Experiment!*

1. I placed my right index finger on the button.
2. I made sure the rest of the hand was “incognito” — without any awareness, neutral.
3. Slowly I began to press, all the while paying attention to the state of the hand, arms, and body.
4. At the first sign of agitation or movement, I put down the remote control and walked around for a few minutes; returning when I felt calm and then, would begin again.
5. At each go, I managed to press down a little bit further.

After two hours I was able to press down completely without causing any other movement. I carried out the same experiment with the other four fingers as the week progressed.

Then I gradually increased the pressure. I repeated this step for each finger separately until the fingers were able to stay completely calm and clean in their vertical movements without any sign of FD.

1. I took another week before doing the same experiment on the piano.
 2. I chose 10:30pm. I was able to stay focused, yet *un-attached*. I had a tendency of course, to get involved emotionally, which could hamper this experiment. However, in the late night my mind was less critical and I could work without self-defeating thoughts, yet, I was alert.
 3. With all curtains closed, the room was pitch dark; it was important that I could not see the keys. This helped me to elude the mind of key recognition — The idea is to bypass the key recognition, so that the mind will not trigger the FD movement.
 4. I started from the last key in the highest register; the lightest in weight, and cautiously placed my index finger on surface of the key.
 5. I carefully monitored sign of key recognition in my mind as well as movements in my hand and body. If a problem arose, I stood up and walked around. First round was just to be able to contact the key.
 6. I took a walk and drank some water after some success.
 7. Then, I started to press down the key — just enough pressure to register a slight key movement— about half of a millimeter or so.
 8. I took regular breaks; at each successive attempt, the finger pressed deeper. After two hours I was able to press down all the way without triggering FD movement.
- I repeated with the other four fingers, one per night.

At this point I believed I had successfully removed the unwanted new compensatory movements caused by the faulty set of memory in the vertical direction. And this was the beginning of my recovery.

Over the next month I repeated these slow movements with absolute patience and calmness, and gradually increased the pressure. This helped to reestablish the original memory and bring it to the foreground.

III. Sideward movements

When I pressed the middle finger, my fourth finger curled and climbed up on top of the third finger, and my fifth finger climbed on top of my fourth. My hand was uncontrollable – like a nightmare for me! While my vertical movements have improved, when I attempted to move faster, the sideward movements were still a problem.

To correct this, I bought a book on anatomy (the Anatomy Coloring Book), and figured out what muscles were responsible for sideward movements. I used visualizations to relax all other muscles, which were making this involuntary motion. The Interosseuse and lumbricals of my fourth finger were responsible for the side motion. They contracted when I pressed my third finger.

1. I held the image of these muscles, according to what I saw in the book, firmly in my mind, and
2. by imagining seeing them turning from red to green (these are arbitrary colors; I choose red for tension, green for relaxation) I managed to relax those muscles one by one.
3. I could then press the third finger with minimal force so as to stay just *beneath* the threshold. Moments later I got the results: The third finger traveled vertically without the “sympathetic” side movement of the fourth and the fifth. Thus I had just re-introduced the pathway of the third finger “without” the unwanted participation of others. I did this very slowly (it took a few minutes to complete one vertical movement).
4. Afterwards I increased the pressure and speed gradually, and repeated these steps over and over.

It took a month to free up the simplest movement, and I had to monitor my state of mind all the while. Although my mind was focused, I did not allow it to be judgmental; I stayed neutral. I learned that my critical mind caused mood swings, which naturally interfered with the extraordinarily fine sensory work at this time.

Repeating these steps in endless positions and combinations. With just one vertical finger motion there are literally countless incidental and momentary positions. This is like points on a curve: at every point there is a different dynamic set (vector value) to be recognized.

1. I would place a finger on a key, press it down extremely slowly with minimum pressure, allowing enough time for the brain to recognize and register every step/point of the way — akin to computer programming; only it is in a recovery mode. After that
2. I will press again, this time with slightly different starting angles and allowing that to register.

This takes time, yet is highly effective. The brain and body has a way to register these movements on its own, all we have to do is to stay there long enough for it to register. Once registered and if it is from the original set, it will function with ease next time. I was surprised when, after I worked with my 4th and 5th fingers for just two hours, I was able to play a fairly rapid and long trill without getting nervous — something I couldn't do even when my hand was healthy.

In my case, it took me just four short months from not being able to play a straight 1-2-3-4-5 pattern to performing the Shostakovich First piano Concerto. It was definitely a daredevil move, but very liberating.

The initial improvement was gratifying, but the gradual and slow improvement that followed, required great patience. I realize that I had yet to recover from the initial neurological damages my hand suffered from the original accident. Nerves don't regenerate; they grow anew from the spinal cord. It takes on average 7 years to reach the hand. Doubts about the effectiveness of my method came up frequently whenever I rushed my retraining; life challenges threw me off course from time to time; yet I believed strongly that this method was fundamentally correct, and I persisted. Today I am playing and happy with being able to show my wonderful students and listeners the sound world I live in.

Afterthoughts:

I believe that the medical community plays a decisive role at the beginning of a healing process. It informs the patient of what the problem may be. With more data available, physicians will be able to take greater care of the entire healing process. Since my time, 1992, doctors have learned much about FD. I have visited the hand clinic in Hannover, Germany and talked to Dr. Altenmüller in 2009. He is very dedicated. In recent postings I have read about Dr. Farias of Spain. All news is encouraging. However, I want to stress the importance of one's own initiative in the search. The sensitivity required to detect threshold is so extraordinary, it would be difficult for a doctor to know what is in play with all the fine details associated with FD; and *your* hand. Dealing with FD, the secret is really in details. This might explain why it has been so difficult to recover from FD; but it is surely possible.

I don't reject the idea of a "miracle" cure (all cures are miracles in a sense). I too looked for one, for years. I didn't 'find' it. I have explored acupuncture, different kinds of massage, different playing techniques, visited gurus, as well as a number of other untraditional practices. Perhaps two are interesting here:

It is a healing method called cupping, using the suction effect of vacuum cup. It is widely used in Asia, but popular in Latin America and parts of Europe. When applied along the tendons and muscles, produces almost instant relief of physical tightness in the area and greatly eases movement. Even though it is temporary in nature it boosts morale, which can be a powerful healing agent. I applied it usually three days in a row, followed by one week's rest. I viewed it as a kind of "negative massage", raising the flesh, rather than pressing down. A set of these inexpensive cups is widely available in Chinatown.

By pure coincidence I discovered a supplement that helps joint and tendon movement. It is marketed as Cetyl Myristoleate, a fatty acid popularized as arthritis supplement. After taking it I was able to triple my playing time! It probably helped the connective tissues and fluids. I took this for five years! I am not sure what role it played exactly in my recovery, but it certainly helped my moral.

What I have described here is based entirely on my own observations, trials and error. Early on I had brief visits with a psychiatrist, but I discontinued after she prescribed Prozac after just four visits – which I refused to take. And yes, I have gone through the most serious life changes as well. In retrospective I have benefitted from many of the changes.

I have received one call from a former doctor inquiring into my cure shortly after I made a recital comeback. I was not able to say much at that time ('98) except that it was a long, difficult but fascinating journey. I suggested to him that if the cause of such conditions such as FD cannot yet be explained, it might be better not to use the term Focal Dystonia. Perhaps it would be better not to give a label; at that time FD had no cure, therefore it sounded like a terminal condition. I felt branded, and it took me a good two years to overcome the stigma. The power of labeling and word is amazing and all Interns and Residents should be taught this early on!

Traditional piano exercises have often included some notoriously mechanical aspects such as practicing loud and hard or with excessive movements. After doing a new kind of soft-touch practice, I found it to be highly effective and less annoying. The results in my students are surprisingly good.

Piano manufactures have often escaped the blame in the past. I mentioned the Teflon bushing, which could have caused many playing related injuries due to the excessive friction. Any sluggish and uneven response in a piano action is a perfect breeding ground for FD. Further more, many pianos are not weighted correctly, especially if they are rebuilt. I had David Stanwood check my rebuilt NY Steinway D, and had him put in a Stanwood action for \$3,000. It's well worth the expenditure, considering what bad action can cause; I highly recommend. A maladjusted action is the greatest enemy to pianists. A badly voiced piano can do the same. Substandard piano hammers produce poor tone quality. Upon hearing ugly sound, it can cause us to tense up unnecessarily. I have found that poor piano tuning can also cause confusion in our response time. An apt technician is hard to come by, and we are at the mercy of his or her ability. I have since taken over the responsibility of tuning, regulation and voicing my working instruments, and worked on the concert instrument whenever allowed. Furthermore, from the piano mechanical point of view, I recently discovered that the lubrication of the "knuckle" (that is the cylindrical part made of buck skin under the hammer shank) is of great importance. It guarantees the smooth travel of the keys, and reducing ambiguous touch sensation.

Although it is an added load, I feel much better performing on a trusted instrument. Come to think of it, does any music critic know the instrument he/she is listening to? A bad instrument can never reveal the full artistry of the performer. Recently I listened to

several recordings made in earlier days and was amazed by the poor quality of many of the instruments used and could hear the struggle of the artist.

Occasionally I notice certain playing habits, which induce FD response in me. One typical one is playing with heavy arm weight and grabbing or stretching action. Although it might be interesting and expressive in slow playing, when used at higher speed, it can cause overlapping commands and inducing this affliction. I have experimented with certain approach and noticed the immediate FD response.

Lastly I want to say I believe every healthy movement can be brought back. The secret is to do each movement extremely slowly with full concentration, and if necessary, stay at any troubling spot with minimum effort for a good amount of time. The brain registers everything when you give it time to do so; after it is registered, the work becomes much easier. To create a continuous series of movements, the ideal, is to first visualize the movement, and *then* allow your body to follow through. The idea of creating it mentally first is very intriguing. And with it there is this new awareness that we can project our music out into the space in the thought form with minimum physical effort.