Musicians in Pain: Empowering Change

Abstract

This paper explores the niche and holistic role of the hand therapist working with professional musicians who are experiencing pain in their upper limbs. The majority of those presenting have developed their symptoms from their work demands. Understanding the physical and mental health requirements of a career in elite music enables the hand therapist to take an analytical and practical role in nurturing this musician back to full health. Common disorders and different therapeutic modalities will be discussed.

Main Section

Over the last few years, an increasing number of musicians have been seeking help in my clinic in London, UK. It is reported that 60 – 90% musicians will suffer a play-related musculoskeletal injury over the course of their career[1]. The effect of these disorders is complex and can lead to significant psychological distress, interruption to family life and threaten work commitments[2]. Musicians often have a precarious financial situation therefore cancelling performances and time off their instrument will increase anxiety and eventually, this may lead to a shortening of their career.

From 106 musicians seen in my clinic in 2022, the instrument most represented was piano (N=18) however, when considering all string instruments together, this group represented 60% of those seen (See Fig.1). Where figures do not add up, this is explained by multiple instruments played or no single primary instrument.

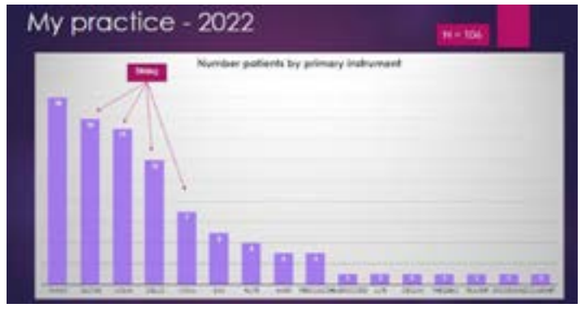

Fig.1: Number of patients by primary instrument

All age groups were represented from teenage to over 70. Most musicians were working as professionals either freelance or employed in orchestras and musical groups however, music students in undergraduate and postgraduate programmes in conservatoires as well as those at specialist secondary schools were also seen. Of those seen, 24% suffered a traumatic injury causally unrelated to their play. Most often, these musicians presented with soft tissue injuries, fractures of the phalanges, metacarpals or forearm. Two had mallet injuries.

Fig.2: Trauma by diagnosis

The vast majority of musicians seeking help, had a play-related musculoskeletal disorder (PRMD). Only one, of 60, had focal dystonia and five had osteoarthritis of the carpometacarpal joint of the thumbs. The remaining 54, had a work-related upper limb disorder (sometimes also called cumulative trauma disorder, non-specific arm pain orrepetitive strain injury).

Many studies have explored the risk factors associated with instrumental careers. Commonly cited factors include poor and awkward postures, change in musical load or instrument, poor overall fitness, challenges in lifestyle including diet and sleep, being a string player and cultural issues in the elite musical world[3,4]. It is very difficult for a musician to admit to pain and problems for many reasons including a misbelief that this is normal, an unwillingness to withdraw from commitments or have a reputation develop that they are injured or unreliable. Musicians in some work environments are also more vulnerable to injury for environmental reasons including poor locus of control and increased resentment of the employer demands[5].

It is my observation that many elite musicians, paralleling elite sports people, are high achievers, driven by their determination to aim for perfection. They are passionate, intense, focused and have to be competitive to reach the higher echelons of their profession. The musical instrument and their music are integral to their personality and often define who they are as well as providing their creative outlet. When injuries or painful symptoms emerge, this threatens both the career and the person themselves. Catastrophisation and anxiety is common. However, the deep determination to get back to playing makes most musicians dedicated to their rehabilitation and highly focused in their approach.

Evidence is strong that hand therapists, physiotherapists and occupational therapists have good skills to help musicians overcome their issues using teaching of good body mechanics, general fitness, upper body balance and sensible play habits[6,7,8,9,10]. In the excellent study by Wolff in 2021, a 90 minute injury prevention session was run for musicians at the beginning of a summer course. It was voluntary to attend. By the end of the course, those who had attended the course experienced a 38% reduction in MSK symptoms in comparison to an 8% increase in those who chose not to attend[11].

There are two common PRMD seen in musicians namely overuse syndromes and adverse neural tension. Overuse is common in the common extensor muscles but can occur in all muscle groups. Various studies have explored why the wrist extensors are so vulnerable to this disorder and conclude that the flexors are task dependent and constantly move through the contraction / relaxation cycle whereas the extensors remain consistently contracted[12].

This presentation may be associated with a tendinopathy. Musicians and their technique teachers often concentrate primarily on the movement, sequencing and interplay of the fingers and wrist forgetting that the placement and recruitment of these muscles is dependent on scapula setting, shoulder strength and the whole kinetic chain of the upper limb. Leaning over the instrument, which is the position of many musicians sitting behind their instrument, can lead to shoulder protraction resulting in a tightness and overuse of the anterior muscles and a lengthening and under recruitment of the posterior muscles. The intrinsic and extrinsic muscles of the hand and wrist are small and therefore have lower capacity for strength and endurance than the larger proximal muscles. This education is rarely given to musicians in training.

The second common pathology seen is adverse neural tension. Nerves in the upper limb should glide and unfold up to 20% of its' length when the

whole arm is moved in specificpositions. These movements are essentially the opposite to postures adopted when playing.

Patients may present with sensory symptoms leading to other healthcare professionals diagnosing compression syndromes. Although sometimes this may be the case, more often the symptoms come from an irritation along the length of the nerve. Additional symptoms can include rapid onset muscle fatigue, stiffness along the whole upper limb and neck and underuse of the muscles supplied by this muscle. This condition develops over time and may also lead to overuse in other specific muscle groups. This phenomenon is shared with people who spend many hours each day hunched over a desk.

When evaluating the musician, it is important to cover all the "normal" hand therapy assessments including oedema, pain, movement, function, sensation and dexterity. A detailed history of the development of the symptoms and a deep dive into the professional workload is important. Take note of hours of play, types of play, different repertoire and any changes recently in workload or instrument. Whenever possible, the hand therapist should observe play. If the musician is unable to bring their instrument with them, as will be the case with piano and harp, ask for recordings or look on You Tube!

The core skills of hand therapy will be utilised regularly. Below are listed some pointers specifically relating to musicians drawn from my personal experience:

1. Exercise prescription
   a. Check intrinsic strength. This is surprisingly low in many musicians.
   b. Neural gliding. Be gentle and go slowly.
   c. Proprioception exercises. The better the proprioception, the better recruitment of the correct muscles
   d. Posterior upper back strengthening. The position of the instrument and the over-recruitment of the anterior muscles leads to tight pectoralis muscles and overuse of biceps. This, in turn, results in poor recruitment of the rhomboids, trapezius and other posterior muscles.
   e. General fitness. With the variable lifestyle, sticking to regular fitness activities is challenging. It is essential that musicians realise that they are elite athletes and staying fit is vital.

2. Oedema and scar
   a. Any swelling or tension at a scar site will put all tissues under strain. Be sure to assess the dorso-sensory branch of the radial nerve. Irritation to this nerve can cause pain over the dorsum of the radial hand and, in some, pain in the first carpometacarpal joint of the thumb.

3. Splinting
   a. The wearing of thermoplastic splints can be difficult for musicians to tolerate. Detailed understanding of the range of movement requirements enables the therapist to select and fabricate appropriate splints.
   b. Hypermobility is common among musicians and the proximal interphalangeal joint is vulnerable to adverse positioning especially when placing the fingers on a bow or guitar strings, for example. Oval 8 style splints work well. If they prove useful, having them made in silver encourages the musician to wear them when performing.
   c. Neoprene splints work well as they allow good movement but provide some support.

4. Kinesiology taping
   a. Muscle-enhance techniques work very well for musicians. The wrist extensors are very vulnerable to overuse and respond well to taping.
   b. Placement of tape to restrict any over-used motion is excellent for retraining. For example, in pianists who overuse ulnar deviation place tape with tension along the radial aspect of the wrist.
   c. Control of hypermobility can be attempted with kinesiology tape. This is easier to manage than a splint but take care not to cover the area of the finger which makes contact with the keys or strings.
   d. Any digit that needs to touch a string should never have tape near the tip as the adhesive can leave imperceptible residue on the string,

5. Other modalities
   a. Myofascial release – especially the wrist extensors
   b. Mobilisations – releasing stiff joints may be relevant after injuries
   c. Desensitisation – for any neural symptoms
   d. Joint Protection Techniques – the teaching of the biomechanics of the hand, how the fingers work, the way the muscles work and analysis of the use of the hands, wrists, and whole upper limb for this individual and their instrument is important. This helps emphasise the importance of the proximal muscles.

Musician specific modalities:
The role of the therapist extends beyond the above for the elite musician. All skills in activity analysis and graded rehabilitation will be recruited by the therapist. As will a combination of both physical health and mental health management skills.

1. Posture analysis
   a. Observe the musician with their instrument.
   b. Remember that many musicians are freelance and spend much time at their computer. Their posture and movement is important in this activity too.
   c. Ask for photos and video. Often professional musicians have You Tube and other online presence and this can be found through search engines or your patient can send you a link.

Figure 3: Music related physical modalities

2. Technique evaluation
   a. It is not expected that a hand therapist has intimate knowledge of every instrument. However, watching your musician playing can identify key factors such as holding tension in unused fingers, excessive work in a wrist flexed or ulnar deviated position or head immobile looking at the keys / strings.

3. Return to play planning
   a. This is an art. Wherever possible, keep your musician on their instrument. Taking the musician away from their instrument can cause a dissolution of their sense of self and lead to mental health issues.
   b. Balance the amount of time spent on instrument with mental practice (see below) and shadow practice.
   c. Try not to be specific with time (unless this suits you and the musician as the only option) otherwise this can become an obsession. Better to listen to the physical signs and grade it gradually.
   d. Warm up (see below) is essential before each and every session. Have a short and a long version.
   e. Depending on the underlying pathology, build gently. It may be necessary to spend time explaining that any muscle that is being built for strength and endurance will feel fatigued and this is a "good" feeling.
   f. Recovery is not linear and therefore it is

inevitable that some days will feel better than others. Comparing week on week rather than day by day is the key.

4. Mental practice
   a. Mental practice works. There is so much evidence from the neuroscience literature both in sport and in music.
   b. "Mental imagery facilitates multiple aspects of music performance. The deliberate use of anticipatory auditory (and/or motor and visual) imagery during performance may assist in planning and executing one's own actions—with potential beneficial effects on the control of parameters such as timing, intensity, articulation, and intonation"[13]
   Key elements include:
   i. There are many ways to do mental practice
   ii. It is a skill and therefore takes time and effort to become effective
   iii. Understanding the neuroscience helps with the belief that it will work. MRI studies have shown that the cerebral cortex lights up in a similar pattern irrespective of whether a movement is actually done or purely thought.
   iv. The more vividly the images are brought into the mind, the more effective the technique.
   v. This is a skill for life and not just for use when injured.
   c. Types of mental practice include:
   i. Hearing as yet unwritten music in your head.
   ii. Imagining the music in your head when away from your instrument.
   iii. Silent reading of musical scores.
   iv. Visualising the hands / fingers making the movements to perform a score.
   v. Actively hearing a score from memory.
   vi. Thinking about sound, speed, emphasis of a score.
   vii. Thinking about the kinaesthetics of play including pressure on fingertips, motion, air against skin

5. Instrument adaptation
   a. This takes imagination and knowledge of what is possible. This comes with time and exposure to many musicians. Here are some common solutions:
   i. Posture pegs on a cello to clear the inner edge of the neck of the cello to allow the musician to have free motion of their head and neck. The strings are managed by a key instead. This adaptation has to be done by a specialist cello maker.
   ii. Chair support for wind instruments to take the weight but allow the body to move.
   iii. Double straps for heavy base guitars to spread the weight over the left and right shoulders equally.
   iv. Contour foam plus coban overwrap on the end of a bow.

Fig.4: Additional music related physical modalities

6. Warm up and cool down
   a. Most musicians think of a warm up as something they do on instrument.
   b. Warm ups should
   i. raise the body temperature
   ii. increase the blood flow through the body
   iii. take the nerves through some gliding
   iv. warm up the specific muscles used (so this might mean different exercises for the right and left sides)
   c. Cool downs should stretch out the main muscles used and any tension that has developed during play.

It is not uncommon for musicians to play through their pain and present late for treatment with pain that has been present for many months or years. The pain has evolved from an acute to a persistent pain. It has been hard for the individual to admit to the pain for fear of loss of reputation and revenue.

Panic will set in fast leading to catastrophising and anxiety. Understanding pain is a critical part of the hand therapy approach. Signpost your musicians to the various excellent videos available from institutions such as NOI (Butler and Moseley), COPE with pain and Flippin Pain (Ryan) – all on You Tube.

Key points I teach in clinic include:

- Pain is a normal response.
- Being in pain changes our behaviour.
- The brain can associate movements, activities, smells and sounds to pain.
- The more important the part of the body that has the pain is to the individual, the more it will hurt.
- The amount of injured tissue is not in proportion to the experience of pain.
- The brain decides each and every time it feels pain whether it is important.
- All pain receptors have a life of a few days so they have the capacity to change.
- A body under threat can produce more pain sensors.
- All tissue heals but pain can persist beyond healing.
- Pain causes responses in the autonomic and parasympathetic nervous systems.
- Emotional and physical pain are felt in the same area of the brain.
- The pain response of fight, flight or freeze causes the production of cortisol and adrenaline which heightens our awareness of pain.
- Our body produces "happy" hormones (endorphins, dopamine, oxytocin and serotonin) which dampen our awareness of pain.
- Physical responses to pain are wide-reaching including in the muscles, blood flow, nervous system, heart, gastro-intestinal system and genito-urinary system.

Hand therapists from an occupational therapy background will be able to utilise their mental health skills to explore these concepts with their musicians including explaining the science of pain, understanding how the catastrophising presents for that individual, developing cognitive behavioural approaches including neurolinguistics to explore the counterarguments and redirecting the focus in the body. Stimulation of the happy hormones is important through analysis of activity which excites the individual and brings on happiness and laughter.

However, there are occasions where it is important to bring in a psychologist to address the issues if the skills required to resolve the situation lie beyond the professional skills of the hand therapist. A holistic approach is essential and working collaboratively with surgeons and physicians is vital as summarised by Ulrich Mennen in his previous article in Ezine February 2102[14].

Conclusion

Healthy play requires good physical and mental health and working in this field is demanding and rewarding in equal measures. Teaching healthy play approaches is holistic and includes conversations around sleep, nutrition, alcohol, drugs, relaxation, fitness and wellbeing. Changing the mindset to understanding that working at an elite level in music makes for being a musician athlete is the most important message to be given. Understanding demand, warming up effectively, promoting good posture and movement when playing, cooling down and staying fit are all important but addressing the stresses and challenges facing professional musicians makes this a very holistic and satisfying area of work for the hand therapist.

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NICOLA GOLDSMITH
MS SROT

Nicola Goldsmith is Immediate Past President of IFSHT and runs a private practice in London, UK specialising in the management of musicians. She is a registered practitioner with the British Association for Performing Arts Medicine. Nicola loves the meshing of physical and mental health skills needed for effectively working with musicians. She also works as a partner in NES Hand Therapy Training, as the Clinical Ambassador for Performance Health and is the project lead for Hand in Hand with Ukraine, an initiative she initiated in 2022 to help develop hand therapy skills in Ukraine since the outbreak of war.

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IFSHT NEWSLETTER – REACH VOLUME 4, NO. 1

Issue 1 of volume 4 of the IFSHT newsletter is now available on the IFSHT website. Please check out the following link to access it:

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The publication aims to collate Research, Education, Achievement and Clinicians in Hand and upper limb therapy around the world.

This edition of REACH takes on a sports theme! Inside we have clinical pearls from Hamish Anderson (accredited hand therapist with Hawthorn Australian Football Club) and a fresh look at strength and conditioning in the context of hand therapy from Dr. Jim Wagner (certified hand therapist, certified strength and conditioning coach and bodybuilder) along with many of our regular features.

We call on hand and upper limb therapy clinicians and researchers to submit any contributions for consideration to: informationofficer@ifsht.org

UPCOMING EVENTS

At the time of writing two events are happening in April. These are the Spanish Hand Therapist Association Conference 2024 and the Canadian Society of Hand Therapists 2024 Conference. Please check out their websites for more details on these events: https://secmacongreso.es/programa-cientifico/
https://csht.org/

Now fast approaching is the next Joint Triennial Congress in Washington in 2025. Submission of abstracts is now open until Monday, May 20, 2024: https://www.ifssh2025.org/s/