

Useful References for Professional Musicians

In preparing this material I kept a list of several references that are based more on our current scientific knowledge and are more consistent with my personal experience in evaluating and successfully treating actual patients. I would recommend them to musicians who would like to understand upper extremity conditions in greater detail. They are not presented in any particular order.

1. ***Hand Disorders in Musicians***
<https://www.scottwolfemd.com/pdf/musician-hand-wolfe-jupiter.pdf>
Good scholarly review for all aspects **except treatment** – recommends 3 months of rest! This is still “*standard-of-care*” but **should not be** in the 21st century
2. ***Curved Fingers — and Tension?***
<http://www.musicandhealth.co.uk/articles/tension.html>
A subtle but important distinction for pianists based on correct anatomical observations about optimal muscle stretch
3. ***On Intelligence: How a new understanding of the brain will lead to the creation of truly intelligent machines*** by Jeff Hawkins with Sandra Blakeslee
[https://papers.harvie.cz/unsorted/Jeff Hawkins - On Intelligence.pdf](https://papers.harvie.cz/unsorted/Jeff%20Hawkins%20-%20On%20Intelligence.pdf)
A new framework for understanding how the human cerebral cortex performs tasks that have been impossible for existing artificial intelligence and neural network computer models, bringing our knowledge of brain function into the 21st century
4. ***Less Is More: Latent Learning Is Maximized by Shorter Training Sessions in Auditory Perceptual Learning***
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3351401/>
A scholarly article on why short frequent practice sessions may be much more effective than prolonged sessions
5. ***Why Things Hurt (Video)***
<https://www.youtube.com/watch?v=gwd-wLdIHjs-t=8s>
A TED talk by an Australian neuroscientist that is fun to watch as he discusses some elements of what is currently known about the nature of pain – not specific to musicians but valid for all humans
6. ***The Prevalence of Chronic Pain in Orchestra Musicians***
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5238713/>
Based **only** on a questionnaire with an 8.6% response rate but still of significant interest. Almost 750 German musicians responded: 66% had some element of chronic pain with about 40% in the upper extremities

7. ***Muscle Injuries***
<https://pdfs.semanticscholar.org/ef8a/e534e7bbffeed21db61165a6569ea2f3153f.pdf>
 A scholarly comprehensive review of our current knowledge of the physiology of muscle injury
8. ***Assessment of sensorimotor cortical representation asymmetries and motor skills in violin players***
<https://www.ncbi.nlm.nih.gov/pubmed/18028115>
 Right/left asymmetry in cortical representation with right side (left hand) significantly larger in violinists
9. ***What can studying musicians tell us about motor control of the hand?***
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2100211/>
 A scholarly look at how the modified cortical representation seen in musicians may be related to the development of focal dystonia
10. ***Treatment of deQuervain's tenosynovitis with corticosteroids: A prospective study of the response to local injection***
<https://onlinelibrary.wiley.com/doi/epdf/10.1002/art.1780340703>
 A scholarly article clearly documenting the value of local steroid injections in wrist tendinitis
11. ***Lateral epicondylitis of the elbow***
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5367546/>
 An excellent scholarly review article with up-to-date information about this highly misrepresented topic
12. ***The Quality and Strength of Evidence for Etiology: Example of Carpal Tunnel Syndrome***
[https://www.jhandsurg.org/article/S0363-5023\(08\)00008-7/fulltext](https://www.jhandsurg.org/article/S0363-5023(08)00008-7/fulltext)
 Extensive meta-analysis of 117 original articles on the etiology of carpal tunnel syndrome concluding that the ... *"etiology of carpal tunnel syndrome is largely structural, genetic and biological, with environmental and occupational factors such as repetitive hand use playing a minor and more debatable role."*
13. ***Playing-related musculoskeletal disorders in musicians: a systematic review of incidence and prevalence***
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1229223/>
 Unfortunately, this study lumps together the subjective category of "PRMD's" (playing-related musculoskeletal disorders, with many being **debatable**) but the review does **not** find them to be more common than in other occupational groups – remember that ALL conditions found in musicians are also present in the general public

14. **A Guide to Better Movement: *The Science and Practice of Moving with More Skill and Less Pain***, Hargrove, Todd, 2014. ISBN: 978-0-9915423-0-7. This is a book written by a well-informed physical therapist that may be worthwhile if you suffer from chronic back or neck pain that doesn't seem to respond to your efforts at finding optimal muscle stretch. It is one of the few books that is based on research from the 21st century and doesn't just re-hash classic beliefs – you can visit <https://www.bettermovement.org/> and look through some of the blogs to get the flavor
15. **A Thousand Brains** by Jeff Hawkins, 2021. ISBN:9781541675803, 1541675800. This book provides the most recent information available on the functional processes at work in the human brain – in a format that is readable and understandable. <https://numenta.com/wp-content/uploads/2021/02/A-Thousand-Brains-Table-of-Contents.pdf>
16. **Enlightenment Now: The Case for Reason, Science, Humanism and Progress** by Steven Pinker, 2018. ISBN: 978-0-525-42757-5. This book gives us insight into how our intuitions may mislead us in a social environment that has changed dramatically from the one in which we evolved. It emphasizes the need for data and critical thinking in the 21st century. <https://stevenpinker.com/publications/enlightenment-now-case-reason-science-humanism-and-progress>

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If you have questions, comments or corrections regarding any of this material, please contact me: dgordonmd@gmail.com

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**This material is intended ONLY as an educational resource for understanding the physiology of the hand and wrist as it applies to high-level and professional musicians in the 21st century. Some of the more recent concepts discussed are not yet part of mainstream medical practice though hopefully they will be in the years to come. It is not intended and should not be used as a substitute for professional medical care or as a justification for ignoring medical advice. Though I AM a retired physician and surgeon, I am not YOUR physician or surgeon and thus cannot be aware of the nuances of your individual*

circumstances. Once you have a professional that you trust, I STRONGLY recommend following her or his advice to the letter. You may and should however, openly discuss the concepts you glean from this document. D.G

Version 5.5, June 2023