

PERFORMING ARTS MEDICINE UCL



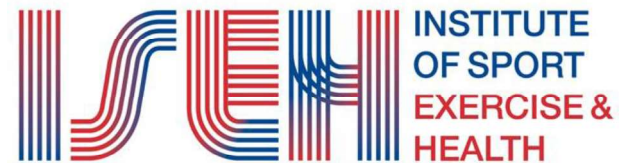
www.ucl.ac.uk/surgery/courses/msc-performing-arts-medicine

DIVISION OF SURGERY & INTERVENTIONAL SCIENCE
UNIVERSITY COLLEGE LONDON



Collaborations

- Institute of Sport
Exercise and Health



- British Association for Performing Arts Medicine



- Royal National
Nose Ear & Throat Hospital



Collaborations

- English National Opera



- Royal College of Music



- National Centre
for Circus Arts



**national centre
for circus arts**

Collaborations

- Royal Ballet



- English National Ballet



- British Institute of Modern Music



Structure

- **Postgraduate Certificate (PG Cert)** – 4 modules – 60 credits
- **Postgraduate Diploma (PG Dip)** - 8 modules – 120 credits
- **Masters (MSc)** – 8+1 modules – 180 credits

- Full-time: 1 year
- Part-time: 2 years
- *September start*
- ***Distance Learning PGCert***
- ***Short Courses***



1st
PAM DAY UK
17th June 2017
10am - 4pm

free event - 5 learning hours - lunch & coffee incl

at the
Institute of Sport Exercise & Health
170 Tottenham Court Road
London W1T 7HA

registration:

dsis.performingarts@ucl.ac.uk

Division of Surgery & Interventional Science, University College London

10:00 - 10:15 Welcome and Introduction - Dr Hara Troull

10:15 - 10:30 What is Performing Arts Medicine? - Dr Michael Shipley

10:30 - 10:45 PAM Research - Professor Howard Bird

10:45 - 11:00 Psychology for the Performing Artist - Carol Chapman

11:00 - 11:15 The Professional Voice - Mr John Rubin

11:15 - 11:30 COFFEE

11:30 - 12:00 MSc Course @ UCL - Professor Vivek Mudera & Dr Hara Troull

12:00 - 12:15 'Breathing in Musical Theatre Singing & Dancing Performers' - Tommie Siliden, Osteopath, MSc PAM

12:15 - 12:30 'Musculoskeletal Disorders in Flautists' - Dr Trish Halliwell, MSc PAM

12:30 - 12:45 'Single Leg Landing in Handling Rhythmic Gymnastics Ball Apparatus' - Louise Curley, Physiotherapist, MSc PAM

12:45 - 13:00 'Vocal Register Transition in Female Contemporary and Classical Singers' - Line Hilton, Vocal Coach, MSc PAM

13:00 - 14:00 LUNCH

14:00 - 14:15 The Travelling Performer - Dr Charlie Easmon

14:15 - 14:30 The PAM Clinic - Dr Hara Troull

14:30 - 14:45 Health & Wellbeing for Music Performance Students - Professor Jane Ginsborg

14:45 - 15:45 PAM Career Forum - panel and audience participation

15:45 - 16:45 Closing Remarks

Posters:

- Vitamin D Variations in Professional Ballet Dancers - F.Jawad, G.Rettier, A.de Medici (UCL, ISEH, Royal Ballet)
- Sleep Disturbances Amongst Performing Artists - K.Krell, D.Charnock, M.Shipley (UCL, BAPAM)
- Electromyography in Studying Musicians' Muscle Tension - H.Troull, H.Bird (UCL)
- Brachial Plexus Injury in a Japanese Drummer - N.Reissis, D.Reissis, M.El-Tayeb (NLG NHS Trust)



Κατηγορίες Μουσικών Οργάνων και Μυοσκελετικές Αναφορές

- Συντομη περιγραφή των κυρίων μουσικών οργάνων και των απαιτήσεων τους.
- Οι μουσικοί της ορχήστρας, η τοποθέτηση τους και ο μαεστρος.
- Οι ιδιαιτερότητες των μουσικών ποπ και ροκ.
- Αναφορά στις εργονομικές και φυσιολογικές διαδικασίες που επηρεάζουν και διαμορφώνουν τις μυοσκελετικές προσαρμογές των μουσικών.

- REFERENCES:
- BIRD, H.A. (2016) *Performing Arts Medicine in Clinical Practice*. 1st ed. London: Springer International Publishing
- RAMELLA, M. et al (2014) Postural Disorders in Conservatory Students: The Diesis Project. *Medical Problems of Performing Artists*, 29(1), pp. 19.

Ergonomics!

- Instrumentalists come in all sorts of shapes and sizes
- Instruments come in specific shapes and sizes
- So instrumentalists have to adapt to their instruments, often playing them for long periods in un-ergonomic positions



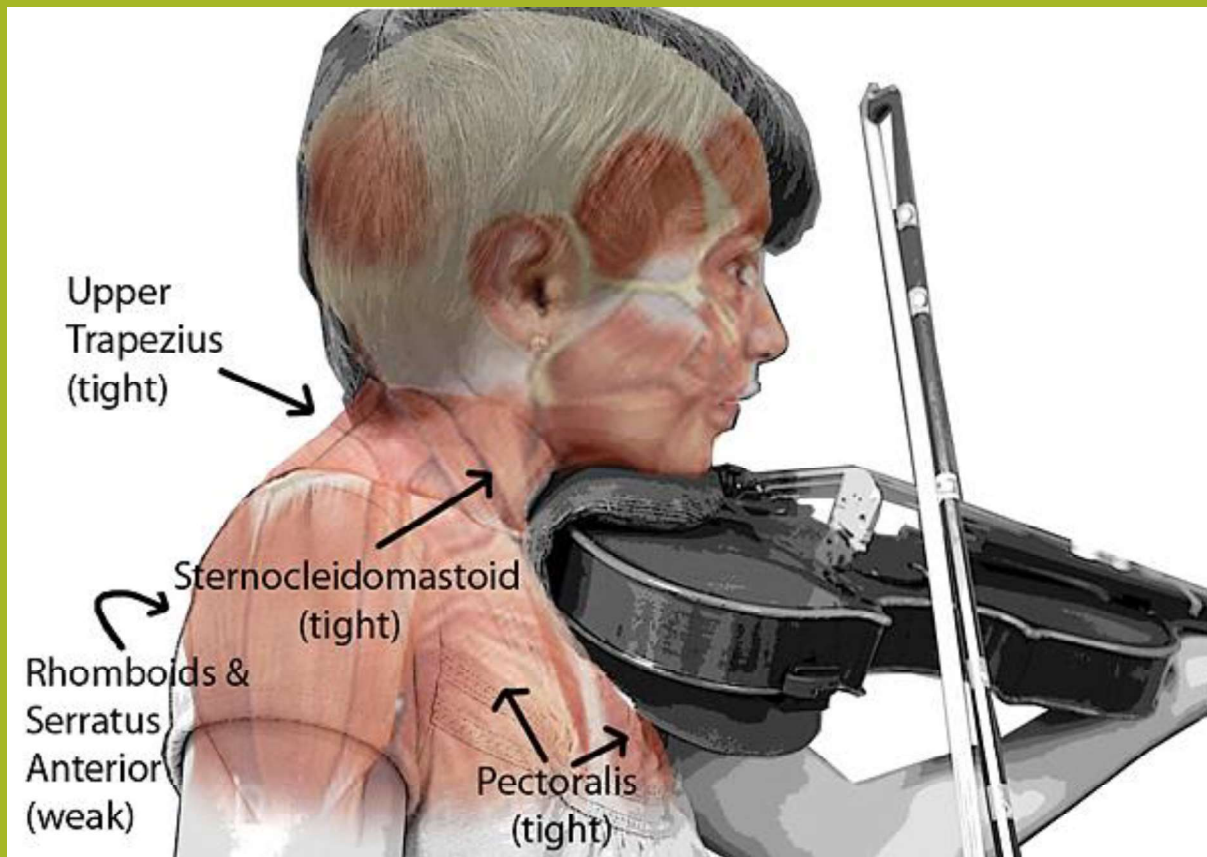
SYMMETRY!!

- SYMMETRICAL - **Woodwind**
PICCOLO / FLUTE / OBOE / CLARINET / BASSOON
- **Keyboards** *PIANO / ORGAN / KEYBOARDS*
- PARTIAL SYMMETRY - **Brass** *CORNET / TRUMPET / TROMBONE / TUBA / SAXOPHONE*
- ASYMMETRIC - **Strings**
VIOLIN / VIOLA / CELLO / DOUBLE BASS / GUITAR / HARP
- **FLUTE**



Violin injuries

Asymmetrical posture = muscular imbalances



Posture!!

- Sitting or standing ?
- Carrying ?
- Important factors:
 - Muscle strength
 - Flexibility
 - Stamina and endurance
 - Body Awareness





The Harp



brass instruments

- Shape, size and weight
- Trombone!
- Chest and diaphragm
- Embouchure, mouth and cheeks
- Fine control of the tongue



PERCUSSION

- Orchestral
- Jazz and Pop



keyboards

- Action – FINGER WORK & MUSCLE BALANCE
- Regulation - CONTROL
- Height of Piano Stool - POSTURE



Piano demands



- Heavy workload on upper limbs
- Brain activated to control complex motion

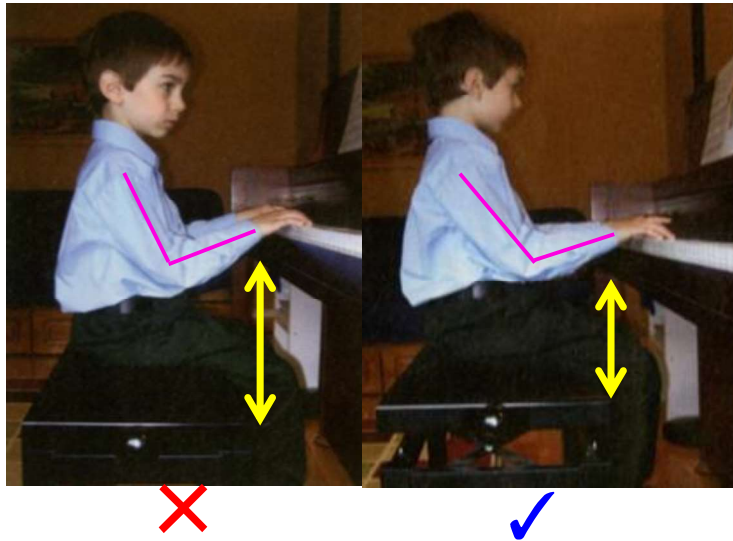
Etudes d'exécution transcendante
Erschienen 1851
Preludio Franz Liszt

1. Presto *Energico*

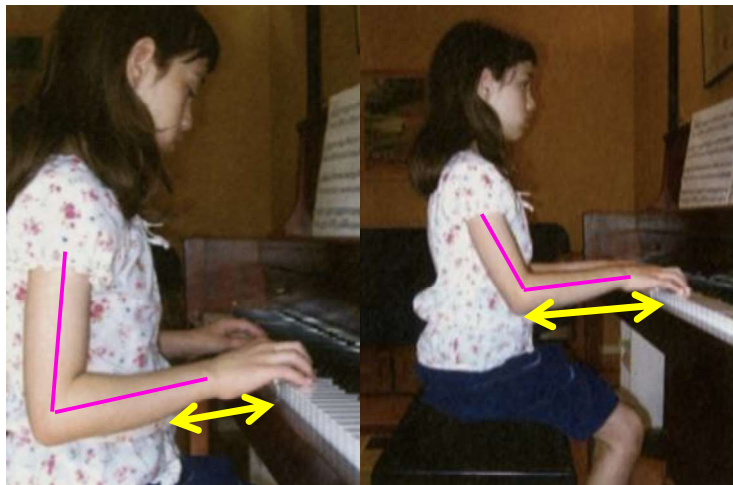
superhuman technique

Ideal posture

(Guptill C and Zaza C. 2010)

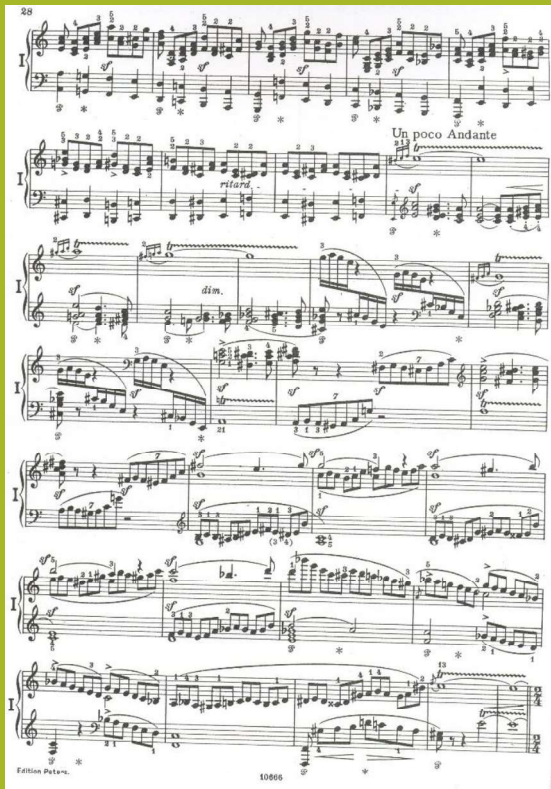


- ✗ Left : seated too low
 - elbow bending
 - too low wrist
- ✓ Right : correct



- ✗ Left : seated too close
 - Neck flexion
 - shoulder
 - elbow bending
- ✓ Right : correct

REPERTOIRE!!!



26

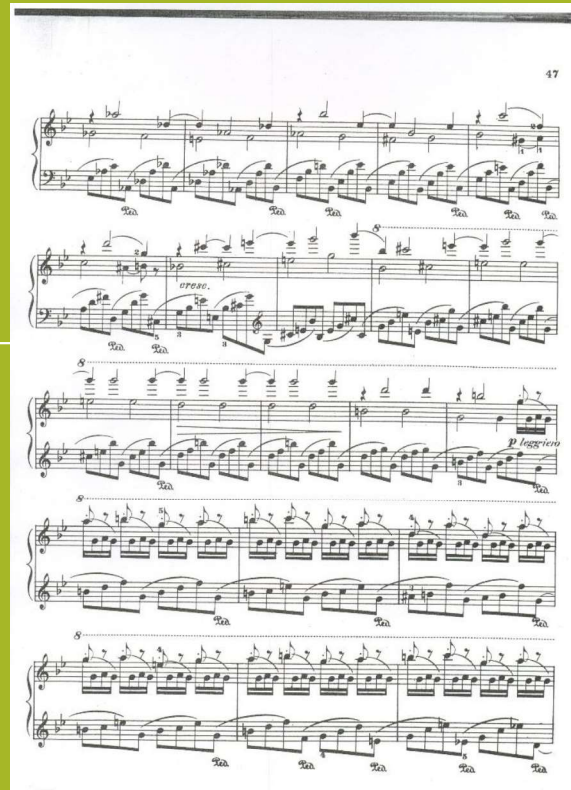
Un poco Andante

dim.

Felton Paton

10806

This page of a musical score, numbered 26, features six systems of music. Each system consists of a treble and bass staff. The tempo is marked 'Un poco Andante'. A dynamic marking 'dim.' is present in the third system. The publisher's name 'Felton Paton' and the number '10806' are at the bottom.



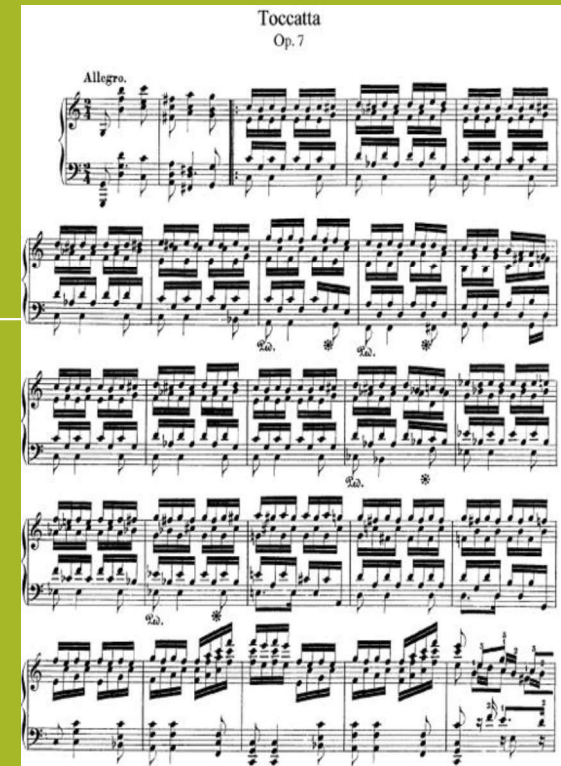
47

mp

ff

Allegro

This page of a musical score, numbered 47, contains six systems of music. It includes dynamic markings 'mp' and 'ff', and a tempo marking 'Allegro'. The notation is dense with various rhythmic patterns and articulations.



Toccata
Op. 7

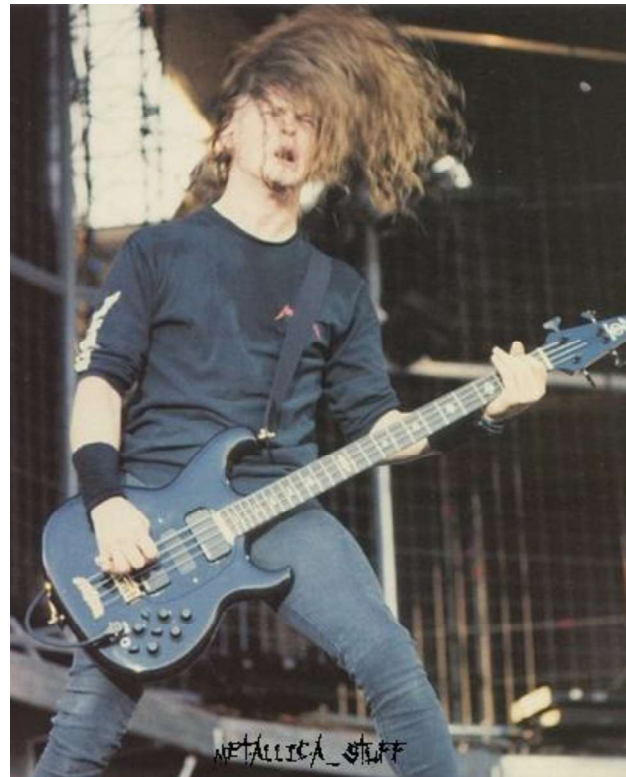
Allegro.

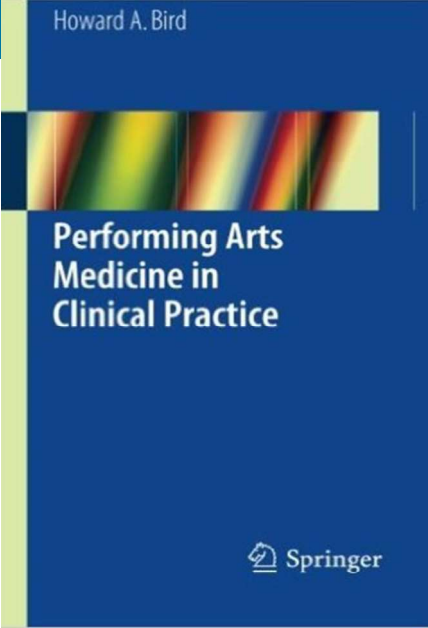
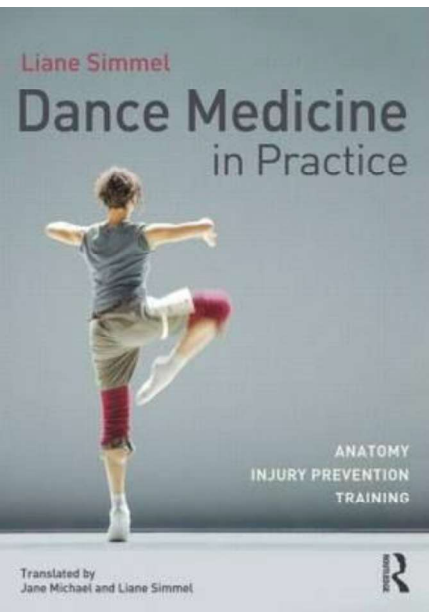
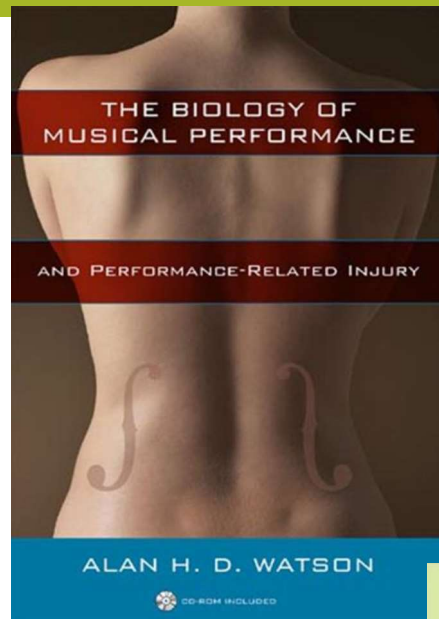
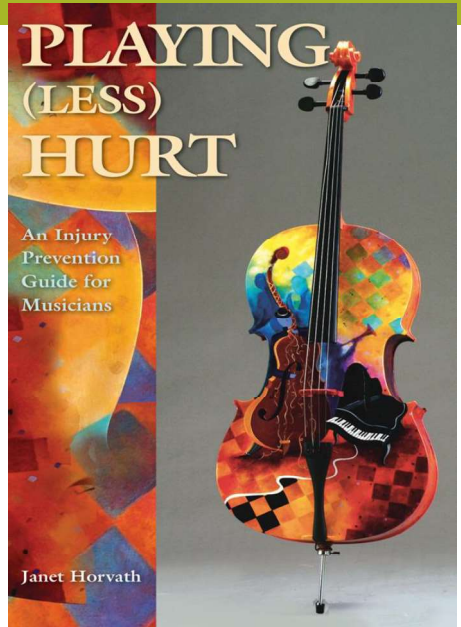
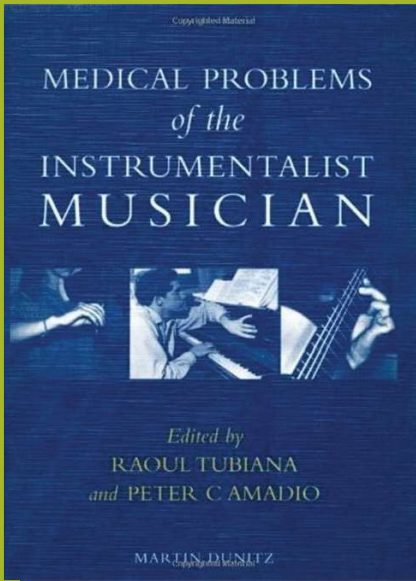
This page of a musical score is titled 'Toccata Op. 7' and is marked 'Allegro.'. It features six systems of music with complex rhythmic patterns and dense textures. The notation includes many sixteenth and thirty-second notes.

“Head and neck injury risks in heavy metal: head bangers stuck between rock and a hard bass” BMJ (2008)

“To minimize the risk of head and neck injury, head bangers should

- decrease their range of head and neck motion,
- head bang to slower tempo songs by replacing heavy metal with adult oriented rock,
- only head bang to every second beat,
- use personal protective equipment. “





‘Μυοσκελετικές Διαταραχές του Ανω Ακρου των Μουσικών’

- Το ανω ακρο και η εννοια της κινητικης και νευρομυικης αλυσιδας απο τον κορμο μεχρι τα δακτυλα.
- Οι διαταραχες που παρουσιαζονται στο ανω ακρο του μουσικου και πως προσεγγιζουμε την διαγνωση τους.

REFERENCES:

TUBIANA, R. and CHAMAGNE, P. (1988) Functional Anatomy of the Hand. *Medical Problems of Performing Artists*, 3(3), pp. 83.

TUBIANA, R. (1988) Movements of the Fingers. *Medical Problems of Performing Artists*, 3(4), pp. 123.

TUBIANA, R. et al (1989) Fundamental Positions for Instrumental Musicians. *Medical Problems of Performing Artists*, 4(2), pp. 73.

What pain?

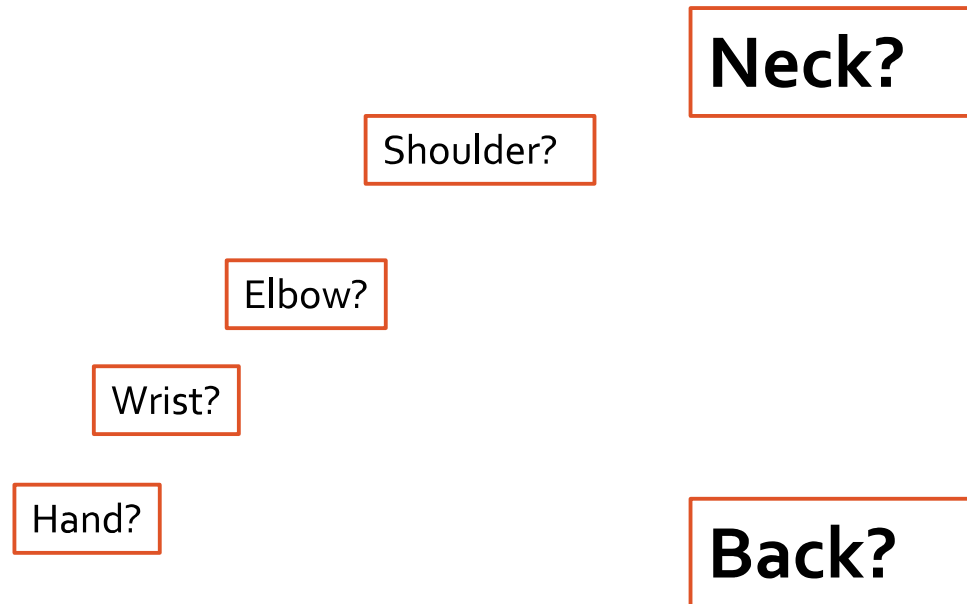
medical condition ?

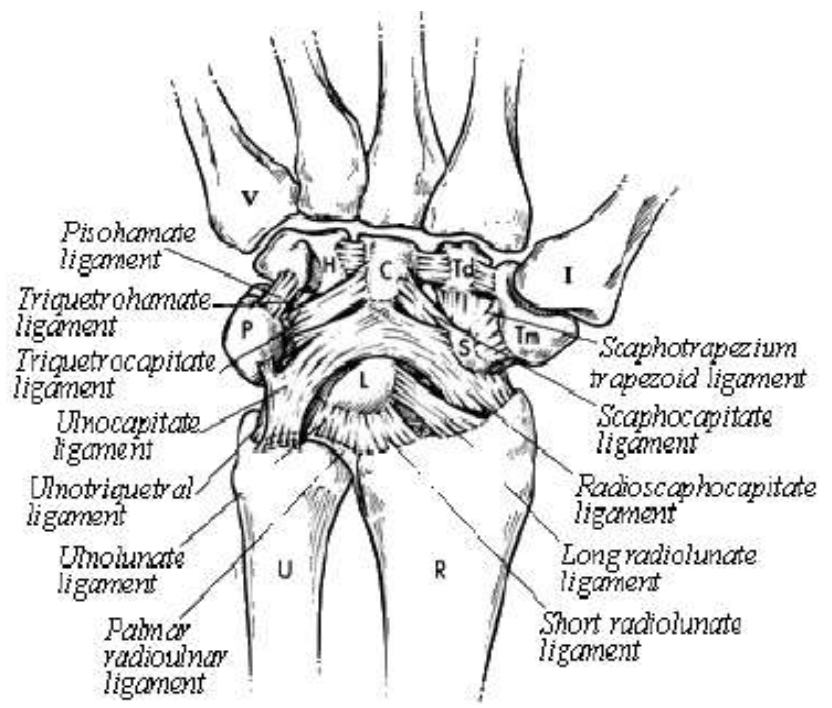
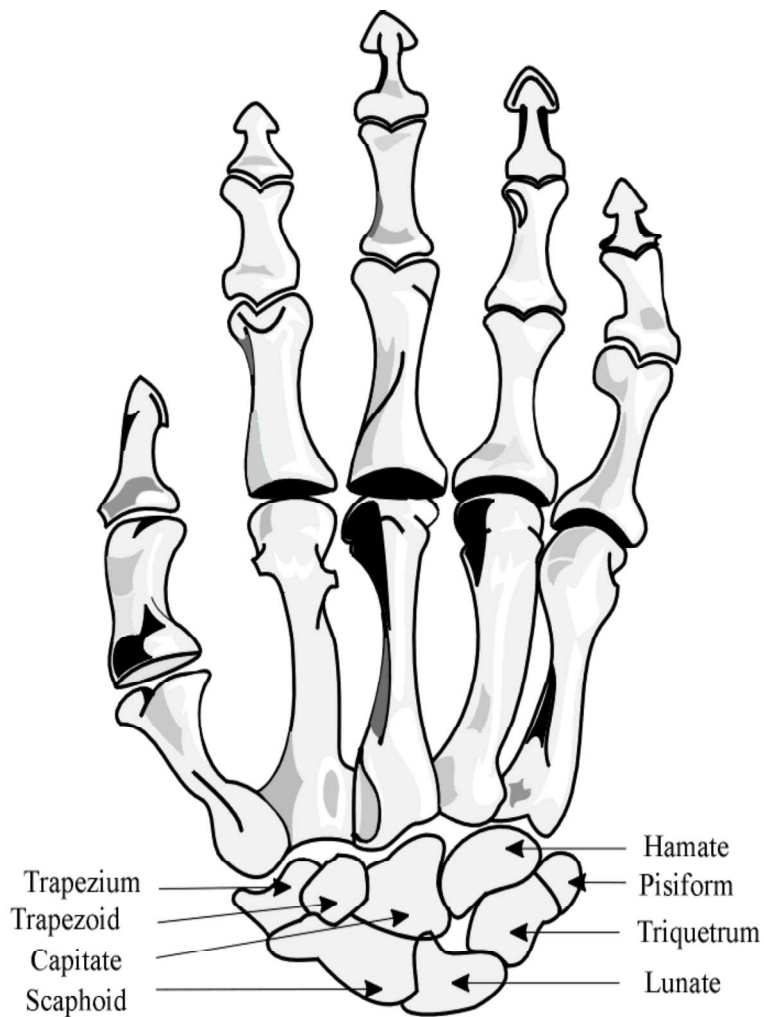
social / psychological issues ?

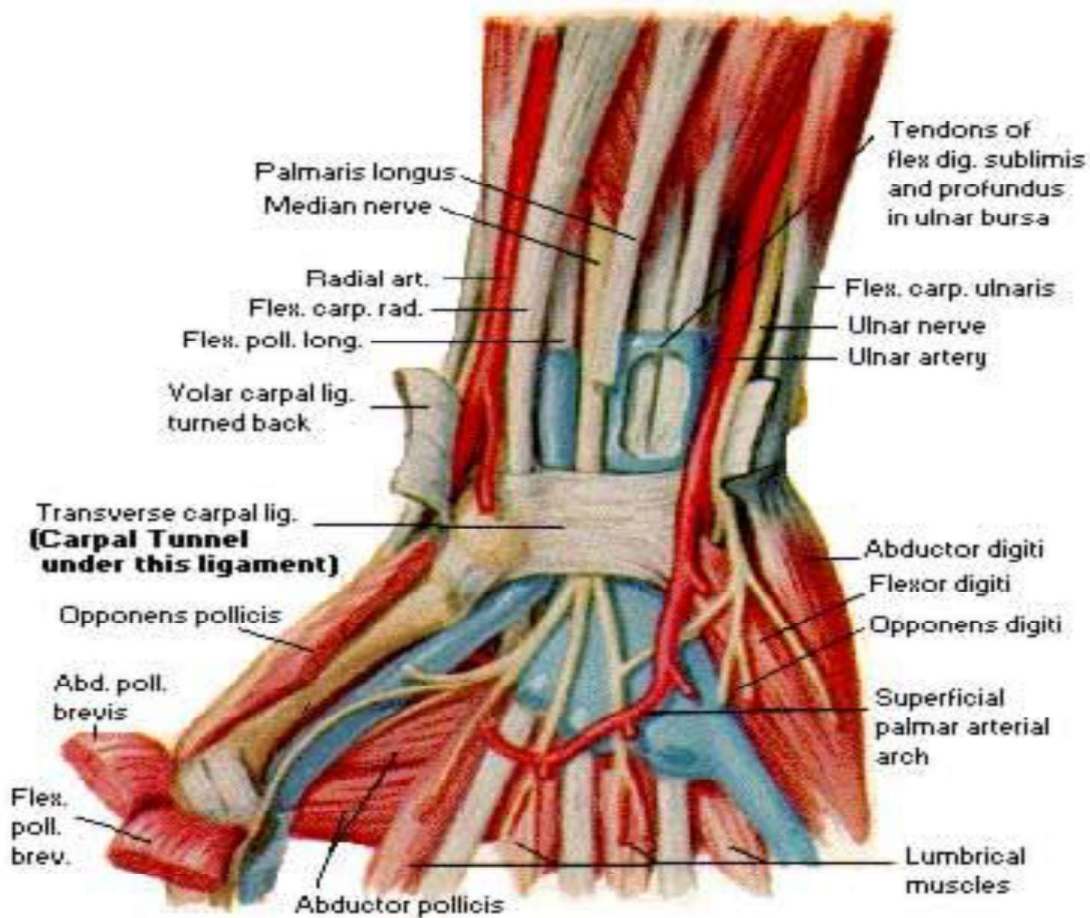
posture / technique ?

practice / repertoire habits ?

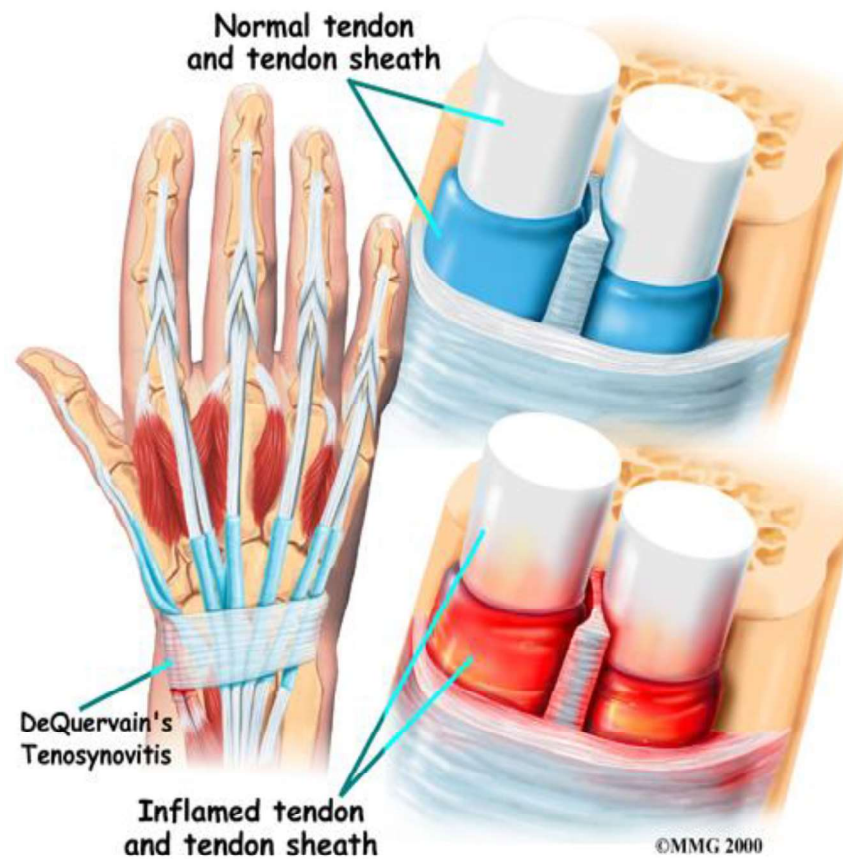
Where is the pain?
How does the pain behave?



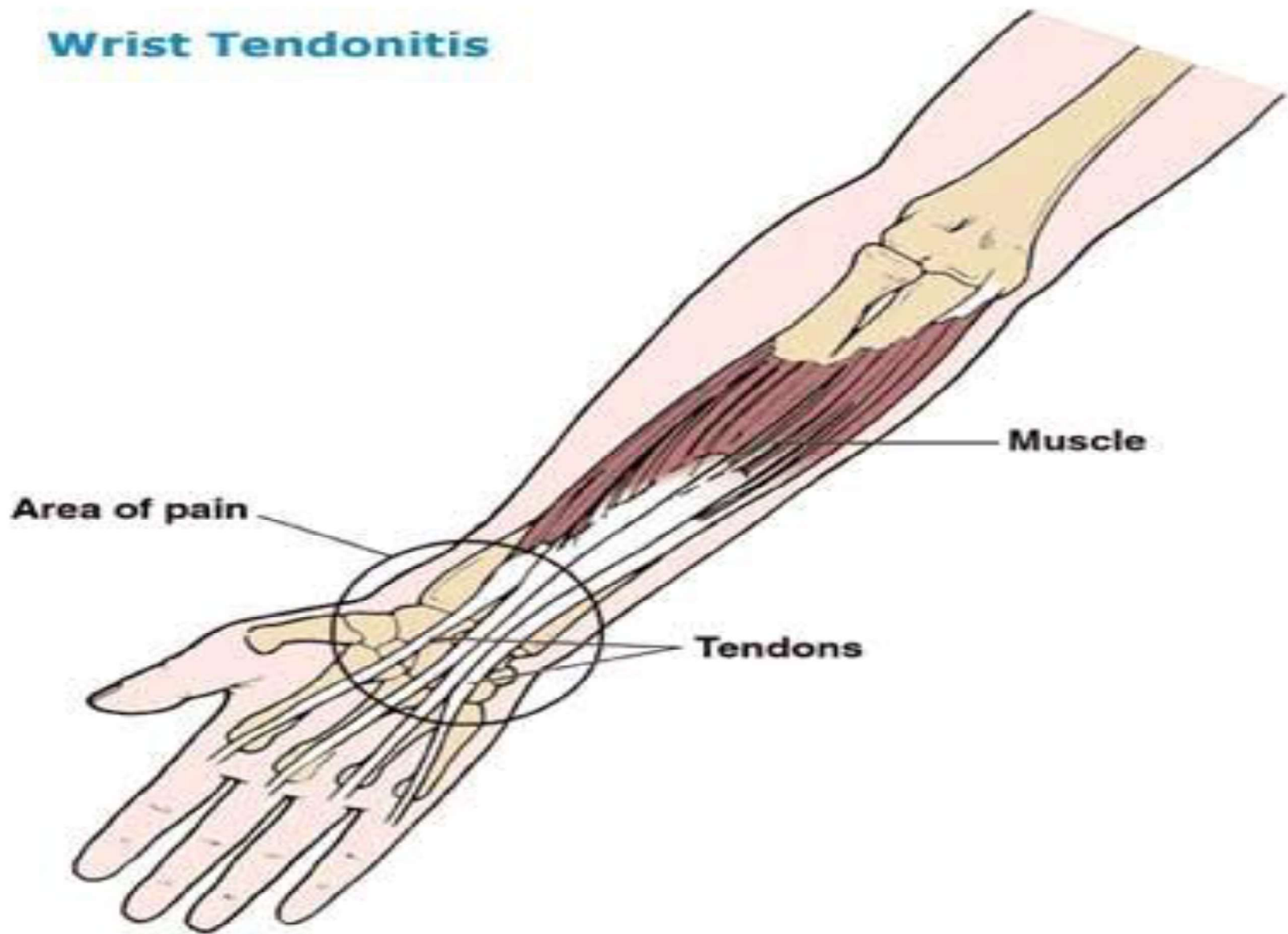




© Copyright, Clinical Symposia, Ciba Pharmaceutical Company.



Wrist Tendonitis



**WHEN WE KNOW THE
MEDICAL CONDITION:**

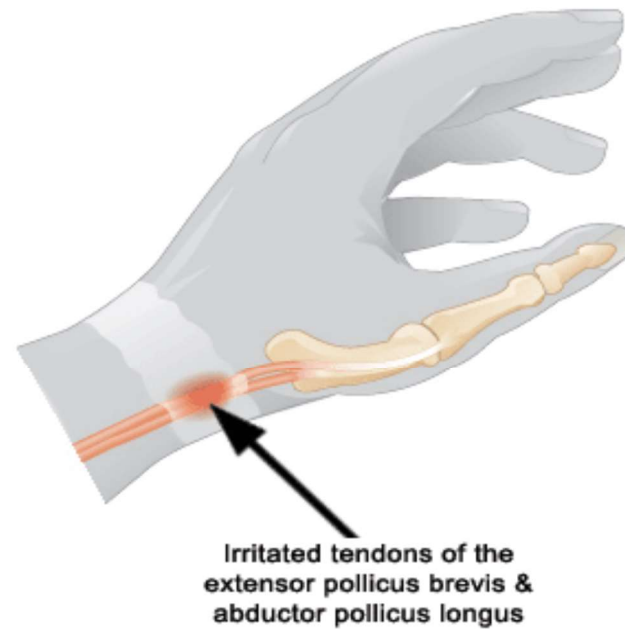
SPECIFIC PAIN

Carpal Tunnel Syndrome



De Quervain's Tenosynovitis

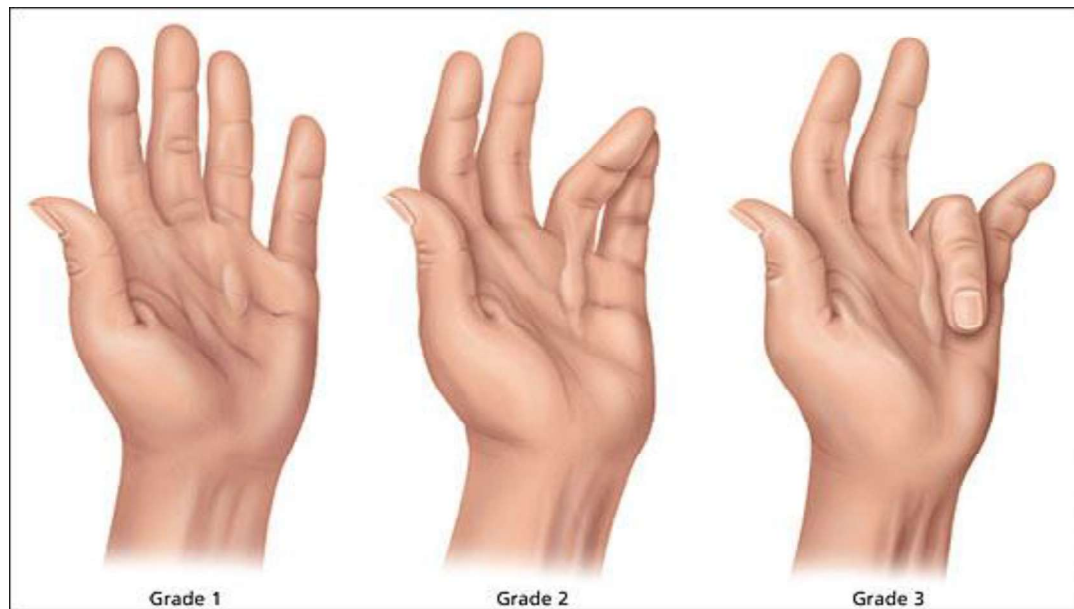
De Quervain's Tenosynovitis



Dupuytren's Disease

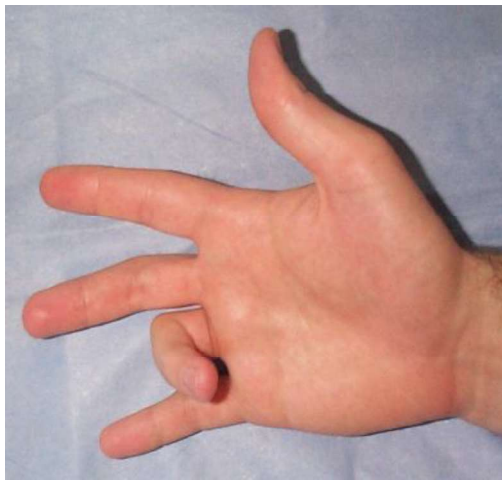
NO PAIN

nodules → thickening → contracture



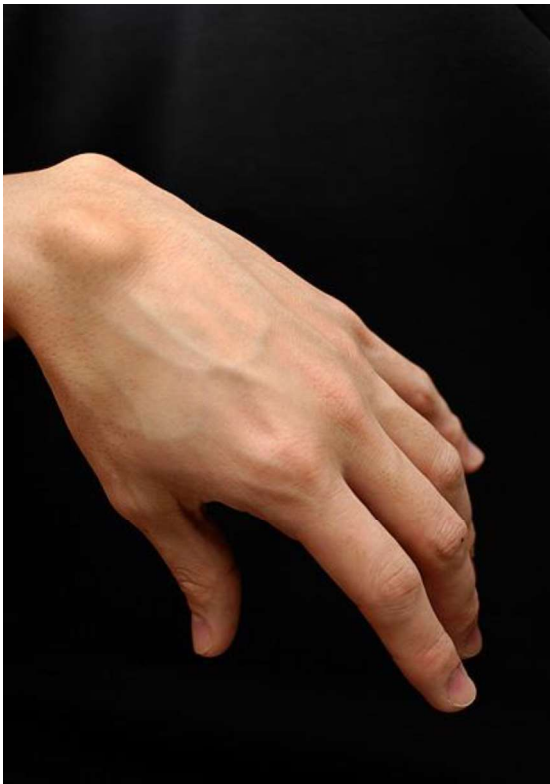
Trigger Finger / Thumb

maybe pain
'triggering'

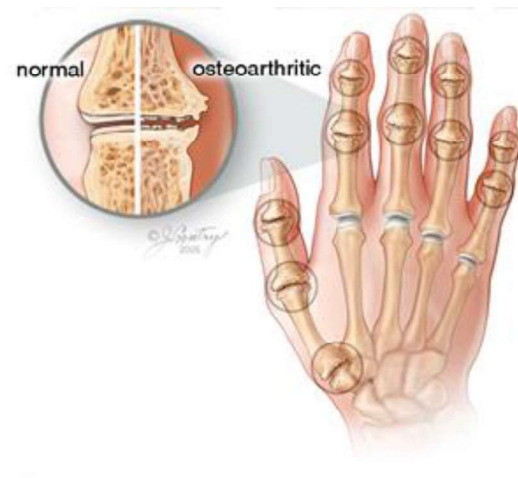
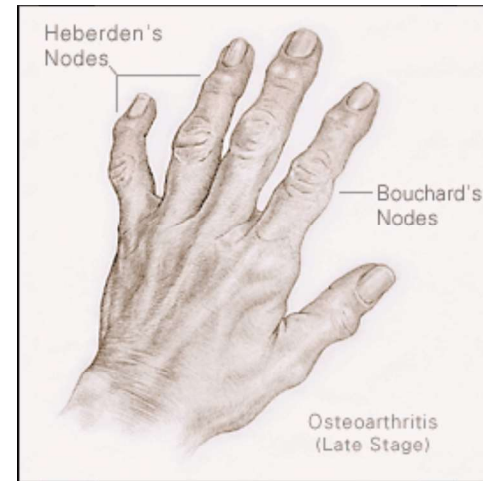


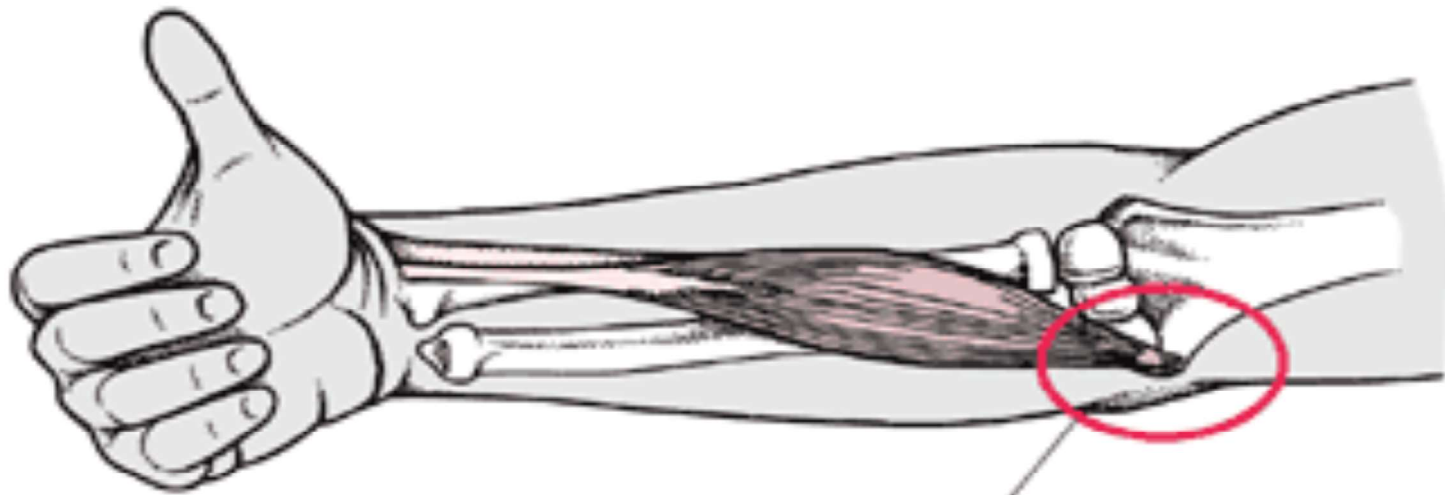
Ganglion Cyst

pain & size vary and exacerbated by repetitive movements



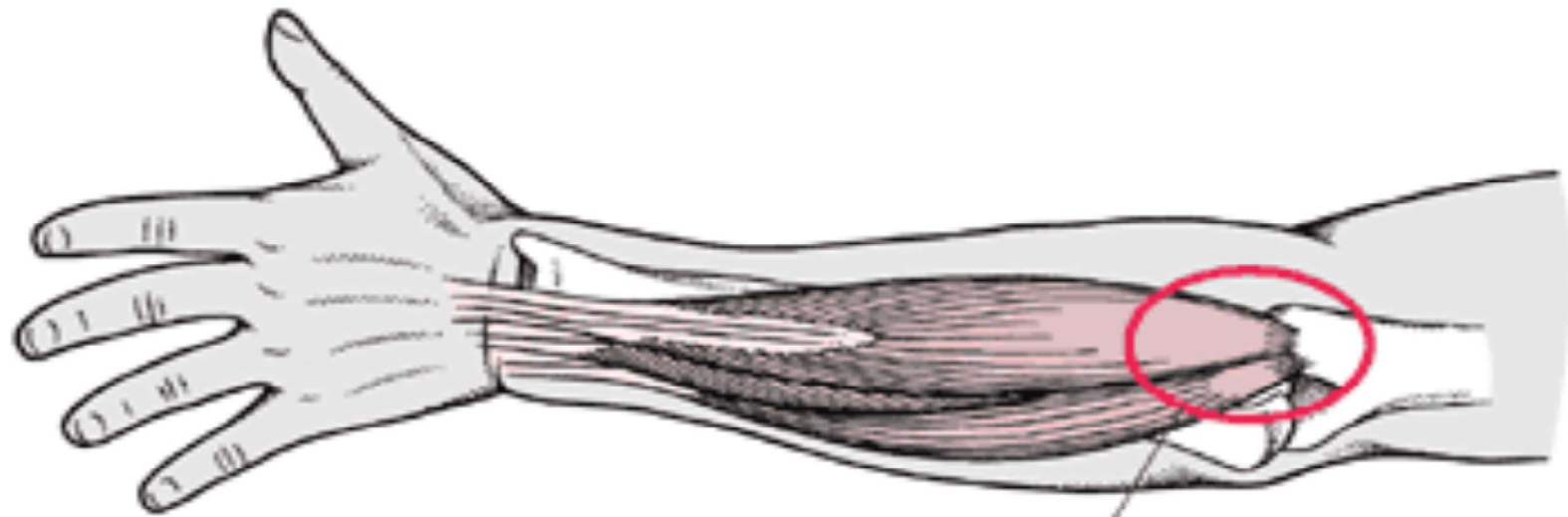
Osteo-arthritis





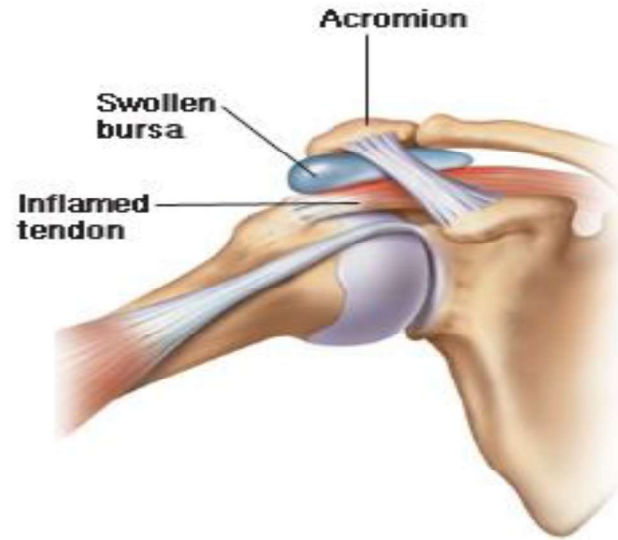
Forehand Injury

Area of pain on inside of forearm

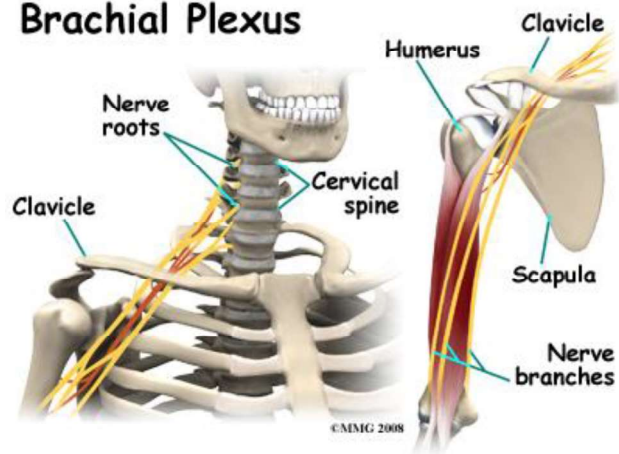


Backhand Injury

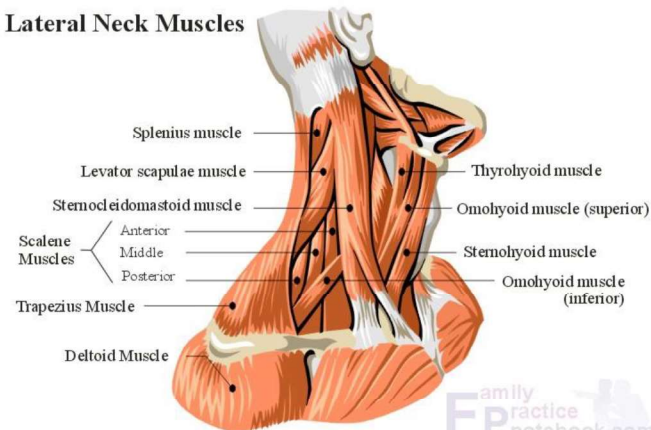
Area of pain on outside of forearm



Brachial Plexus



Lateral Neck Muscles



Adapted from Corel Draw 9.0

**WHEN WE CANNOT
FIND A MEDICAL
CONDITION:**

NON-SPECIFIC PAIN

Technique

Tension in the right hand is impeding bowing ability!!



WE NEED:

- Flexible bow-hand fingers
- Refine large movements
- Enough energy on string

Healthy Bow Hold

- No gripping
- Fingers curved
- Relaxed manner
- No stiff joints
- Soft palm



- Position of least strain
- Balance

POSTURE

Risky postures:

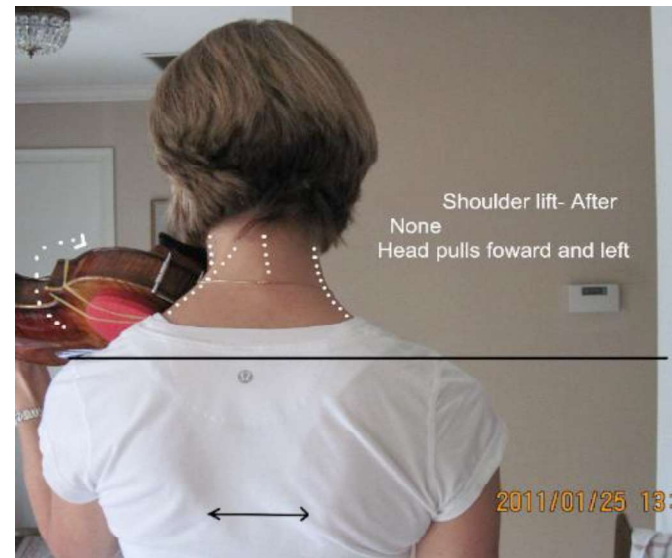
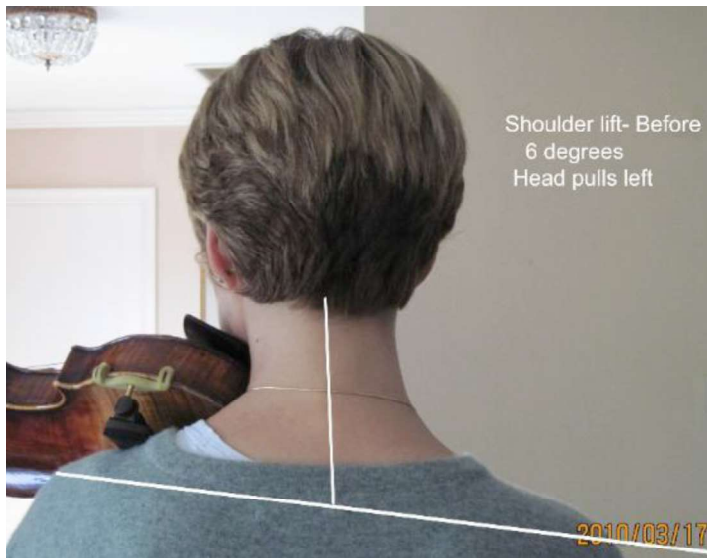
Neck

Torso

Shoulders



Shoulder down



Music Stand & The Conductor

- Keep head level
- Look directly forward
- Adjust whole body



POSTURE

The Lower Back



- Keep natural curves
- Shoulders down



- Watch them play!

Wrist & Hand

Tension?

Biomechanics?



BOWING!!

- Movement starts in Upper Back
- Shoulder joint is the pivot
- Elbow, wrist, and fingers passive motions.
- Free to move
- Minimum energy



Musicians' Medicine: Musculoskeletal Problems in String Players

Han-Sung Lee, Ho Youn Park, MD, Jun O Yoon, MD, Jin Sam Kim, MD,
Jae Myeung Chun, MD, Iman W. Aminata, MD*, Won-Joon Cho, MD, In-Ho Jeon, MD

Department of Orthopedic Surgery, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea

There is increasing attention to medical problems of musicians. Many studies find a high prevalence of work-related musculoskeletal disorders in musicians, ranging from 73.4% to 87.7%, and **string players have the highest prevalence of musculoskeletal problems**. This paper examines the various positions and movements of the upper extremities in string players: 1) basic postures for holding instruments, 2) movements of left upper extremity: fingering, forearm posture, high position and vibrato, 3) movements of right upper extremity: bowing, bow angles, pizzicato and other bowing techniques. These isotonic and isometric movements can lead to musculoskeletal problems in musicians. We reviewed orthopedic disorders that are specific to string players: **overuse syndrome, muscle-tendon syndrome, focal dystonia, hypermobility syndrome, and compressive neuropathy**. Symptoms, interrelationships with musical performances, diagnosis and treatment of these problems were then discussed.

Keywords: *Upper extremities, String players, Musculoskeletal problems*

Kinematic Chain!!!!

a biomechanically efficient pattern of motion

Sequence of Muscular Events – XL > L > M > S > XS



*The musician needs to know
which muscles to engage*

Stretch...

BAPAM FACTSHEET 1

DON'T CRAMP YOUR STYLE!

Warm-up exercises for performers

You should get into the habit of doing at least 20 minutes of warm-up exercises every working day. These exercises are beneficial for all performers, whether you are practising/rehearsing or performing. Think of yourself as a 'performance' athlete; you need to prepare yourself physically.

The first eight exercises should ideally be done sitting down. When doing these exercises, stretch as far as you can without straining or inducing any pain. Do each exercise 3-5 times, breathing slowly and deeply throughout. For the standing exercises, make sure your feet are firmly on the ground but don't lock your knees, otherwise you will create problems in your back. If there is any pain, STOP, and discuss this with a healthcare professional.

1. Head turns

- Turn your head to one side and then the other.



2. Head tilts

- Tilt your head sideways on both sides without raising your shoulder.

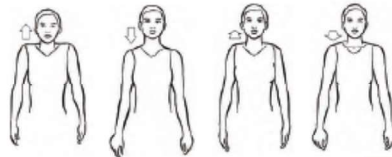


3. Back twist

- Sitting down and with your arms crossed over your chest, twist your back from side to side.

4. Shoulders

- Shrug and release shoulders, then roll them forwards and backwards through a full circle.



By Dr Saanchita Ferozque and Jill Goymer FCSM, BAPAM

Acknowledgment: George Odum, Guildhall School of Music and Drama, Institut de l'Art

Illustrations: Luke Skretnio

BAPAM FACTSHEET 1

5. Forearms

- With your elbows by your waist, bend (flex) your elbows to 90°. Rotate forearms first inwards and then outwards.



6. Wrists

- Put your fingertips together and try to bring your fingers into contact along their complete length. Don't raise or lower your elbows and keep the palms of your hands apart.
- Do the same thing with your knuckles together and fingers down.



7. Finger spread

- Slowly spread your fingers as far apart as you can, and then bring them back together. You can also do this exercise with your palms together.



8. Hand

- Hold the back of one hand in the palm of your other hand and bend it forward at the wrist.
- Then bend your wrist back keeping your fingers and arms straight.



9. Shoulders and upper back

- Bring your arms over your head, hold your hands together and stretch.
- With your elbows straight, reach behind you and stretch your arms.



10. Lateral stretch

- With your arms above your head, take hold of one wrist with your other hand and pull it up and to one side. Feel the stretch in your side.

11. Lower back

- Against a support if possible, push thumbs into lower back and arch backwards, keeping knees straight and head forward.

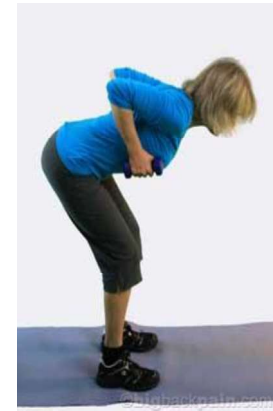


12. Back

- Sitting on a chair or stool, let your upper body fall forward with your arms hanging at the sides of your legs. Arch your back fully from your head down and feel the stretch in your back.



Strengthen...



Discipline of Biomedical Science Sydney Medical School

- *Inj Prev* 2013;**19**:257-263

- **Development of a specific exercise programme for professional orchestral musicians**

- Cliffton Chan¹, Tim Driscoll², Bronwen Ackermann¹

- Using available evidence on exercise prescription in collaboration with clinical consensus and current best practice, a specific exercise programme was developed to prevent and/or reduce occupational injuries in professional orchestral musicians.

- **Shoulder series**

- A progressive series of scapular stability and rotator cuff exercises were included focusing on restoring shoulder muscle balance and movement control. This progressed to stages that added resistance and increased the functional context of the exercises into instrumental performance biomechanical patterning.

College of the Arts University of South Florida

- [Med Probl Perform Art.](#) 2012 Jun;27(2):85-94
- **Intervention program in college instrumental musicians, with kinematics analysis of cello and flute playing: a combined program of yogic breathing and muscle strengthening-flexibility exercises.**
- [Lee SH¹, Carey S, Dubey R, Matz R.](#)
- College musicians encounter health risks not dissimilar to those of professional musicians. Fifteen collegiate instrumental musicians participated in the intervention program of yogic-breathing and muscle-strengthening and flexibility exercises for 8 weeks. Pre- and post-intervention data from the Health-Pain-Injury Inventory (HPI) and the Physical & Musical-Performance Efficacy Assessment Survey (PME) were analyzed for the effects of the program on the musicians' physical and musical-performance efficacy. HPI results showed that the majority of our sample had healthy lifestyles and minimal pain and injuries but irregular eating and exercise habits. The pre-intervention PME data showed a high level of musical efficacy (i.e., awareness of music technique, tone, and flow) but a low-level of physical efficacy (i.e., awareness of posture, tension, and movement flexibility). Post-intervention data showed that the program improved physical efficacy by increased awareness of posture and tension. In 2 volunteer musicians, kinematics motion analysis was conducted for exploratory purposes. Our cellist played the scale using a larger range of motion (ROM) in right-shoulder flexion and abduction and slightly increased rotation while keeping decreased right elbow ROM after the intervention program. The flutist shifted the body weight from one foot to the other more in the second playing post-intervention. These changes can be attributed to the increased physical efficacy that allowed freedom to express musicality. Findings from these case scenarios provide empirically based hypotheses for further study. We share our experience so that others may use our model and instruments to develop studies with larger samples.

Royal Welsh College of Music and Drama, Cardiff

- [Work](#). 2011;40(3):317-24. doi: 10.3233/WOR-2011-1238.

- **Postural problems of the left shoulder in an orchestral trombonist.**

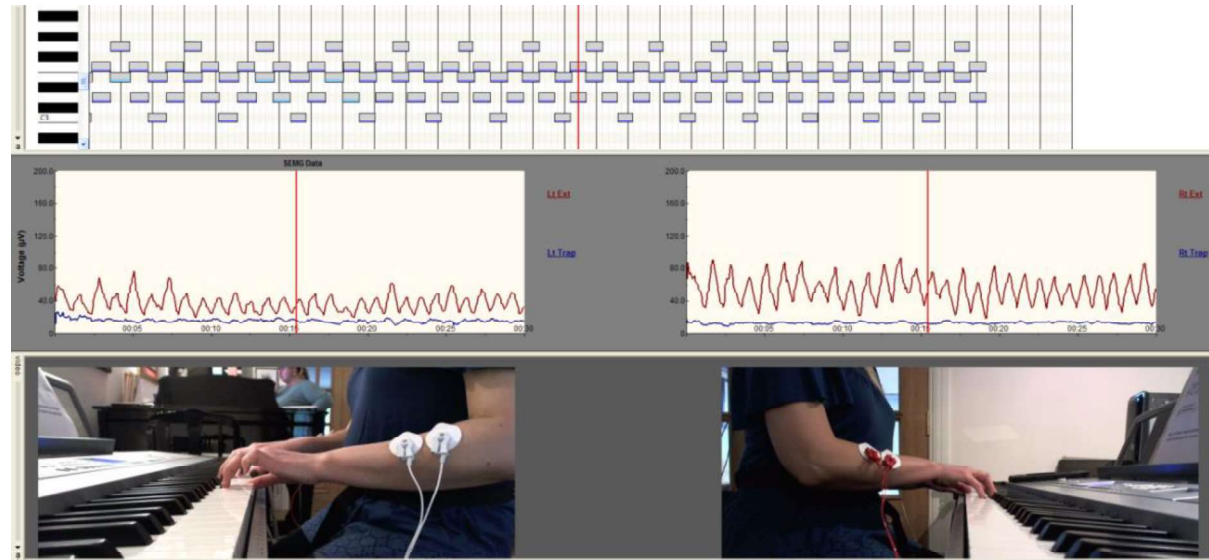
- [Price K¹](#), [Watson AH](#).

- Professional musicians require a disciplined and balanced regime of practise and performance to enable them to cope with the physical challenges of their chosen instrument and to reduce the risk of work- related injury. If practise or performance strategies are suddenly changed, permanent damage may occur even in a player with a mature, well-established technique. The trombone presents unique physical challenges which are heightened by recent developments in instrumental design as well as by orchestral working conditions. This study presents the experiences of a professional orchestral trombonist who worked as a principal player in a UK orchestra until his performing career was cut short by a performance related injury. His personal approach to practise is discussed in the context of the physical and professional challenges associated with contemporary orchestral practises. The case study demonstrates the importance of considering the **interplay between psychological and physical factors** in the development and treatment of injury in musicians.

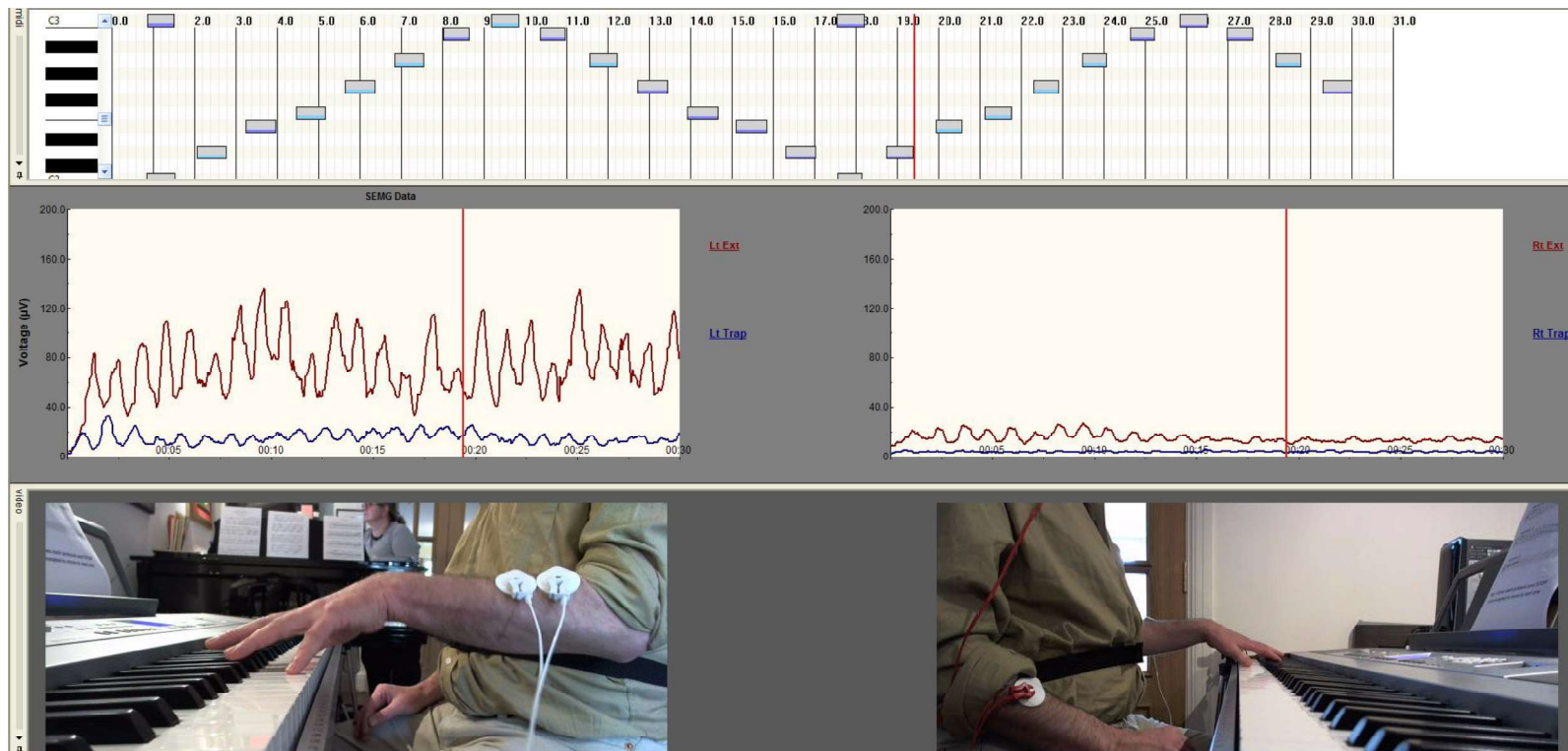
Musician's Focal Dystonia



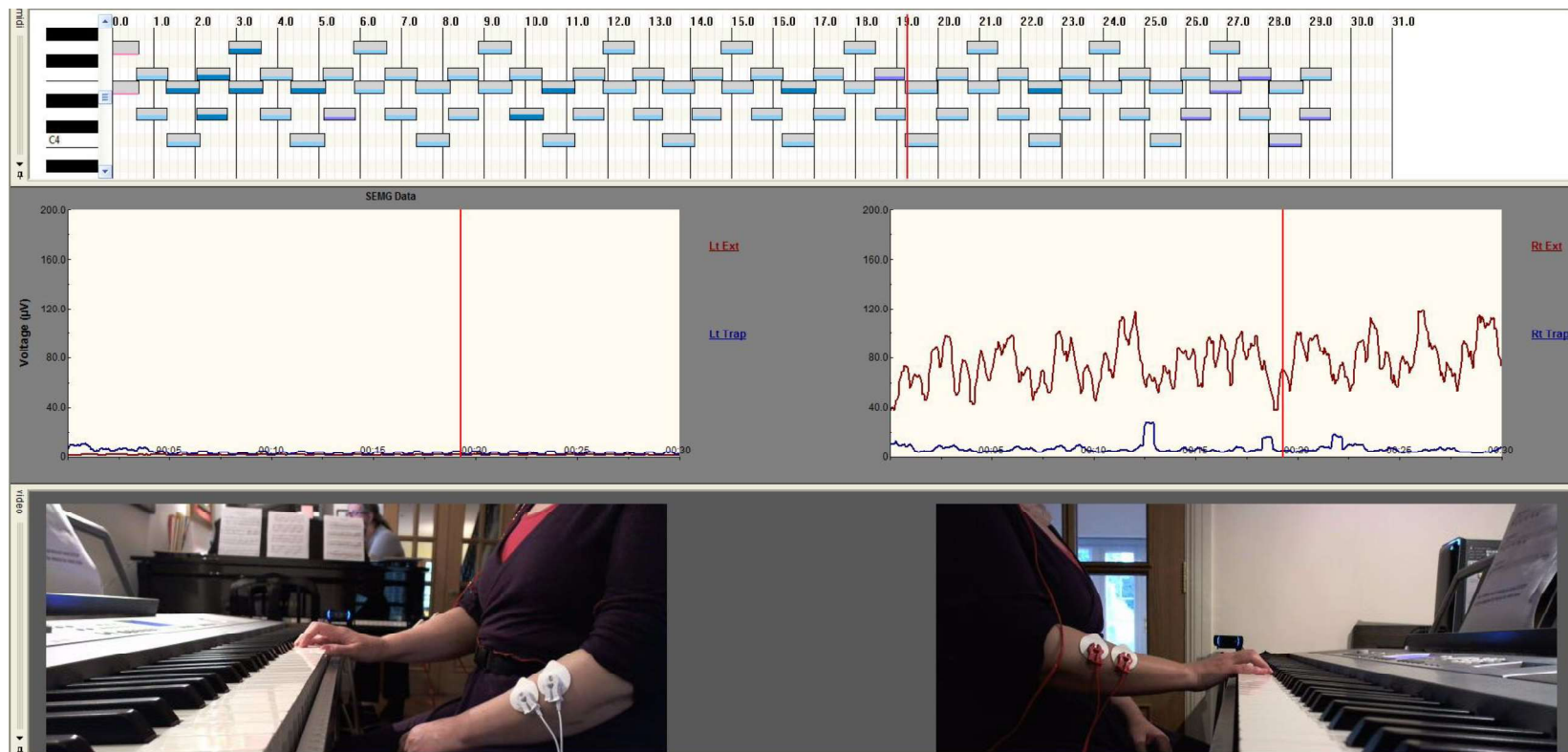
Method



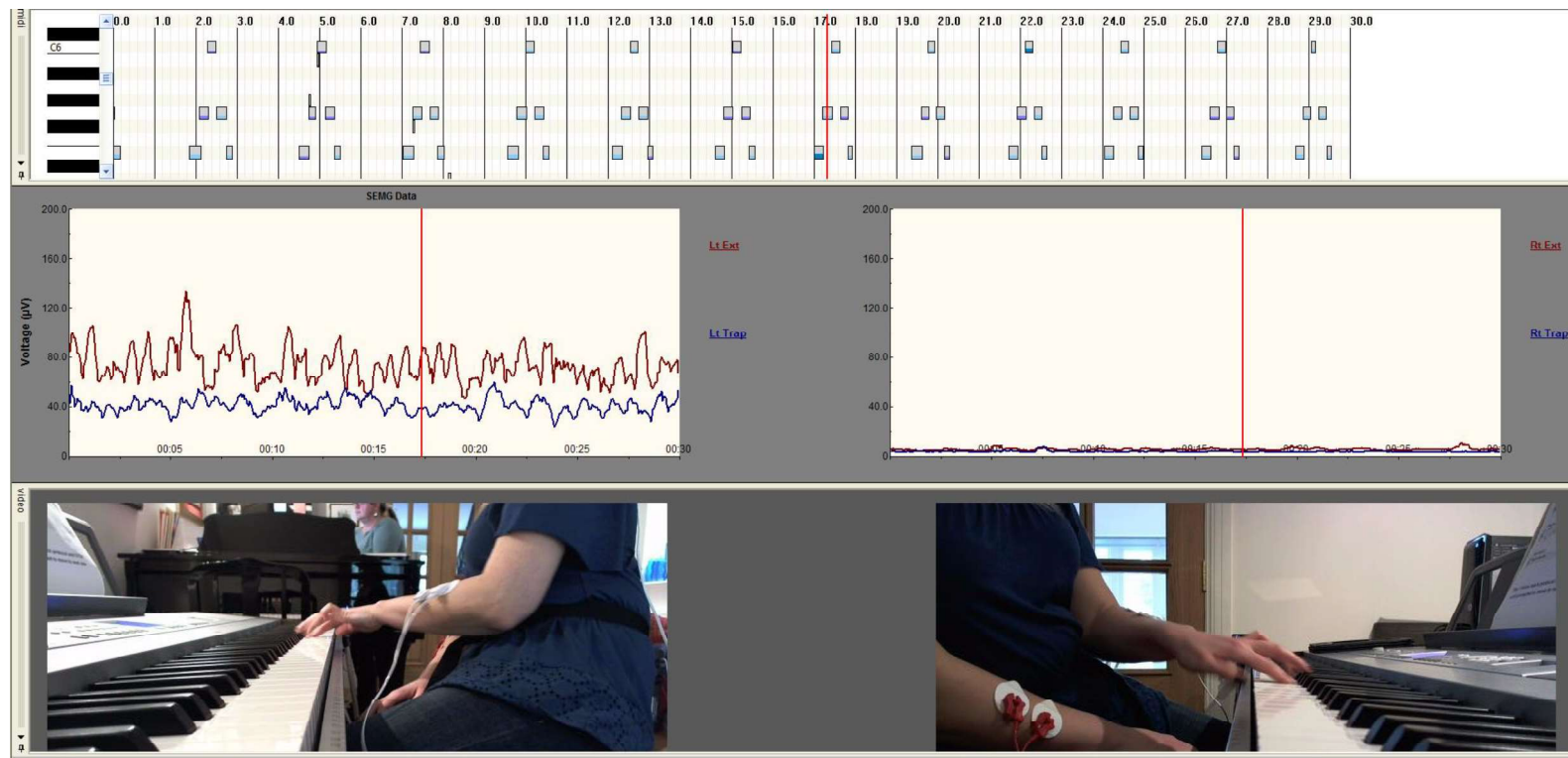
ID 002 – Octaves Left Hand



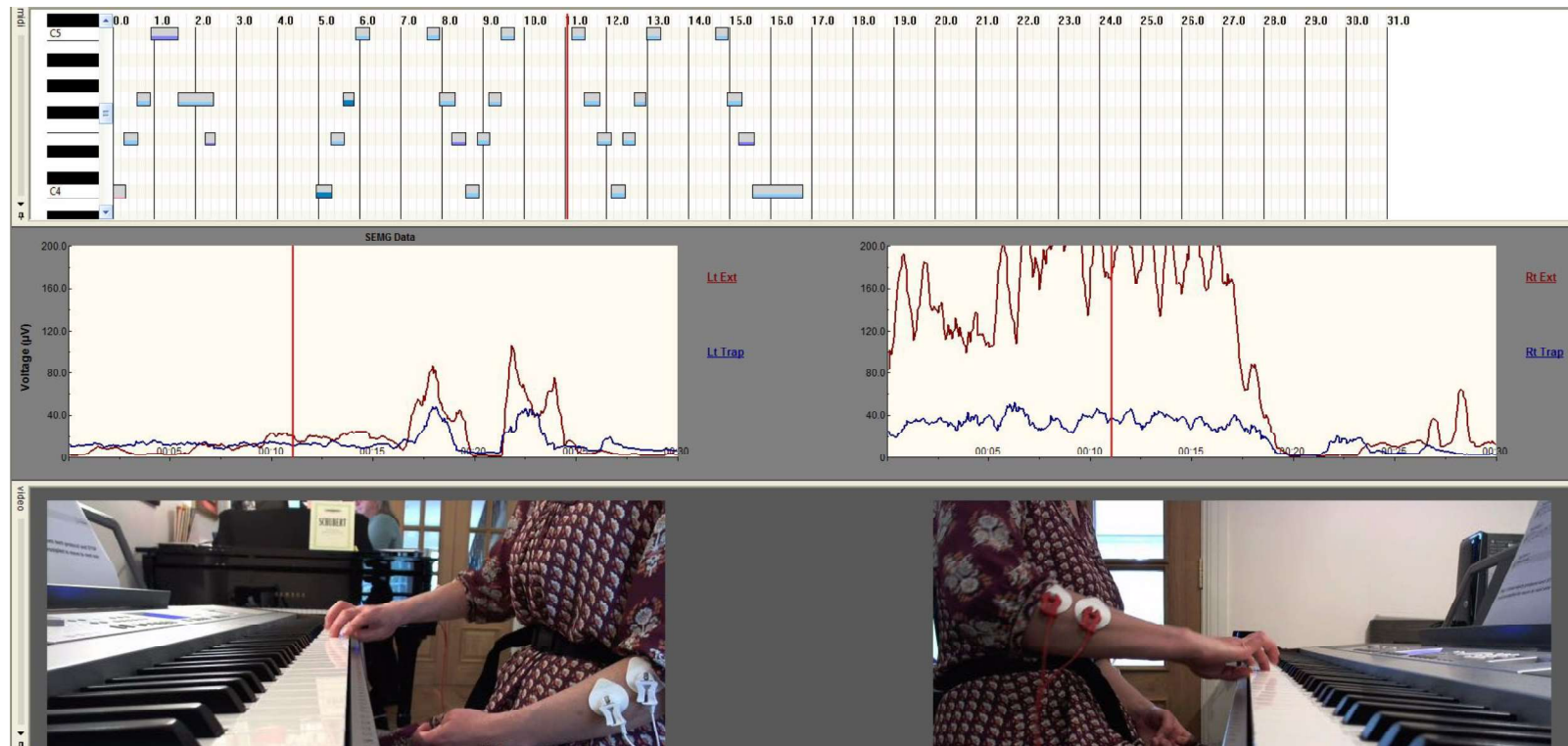
ID 003 – 3rds Right Hand



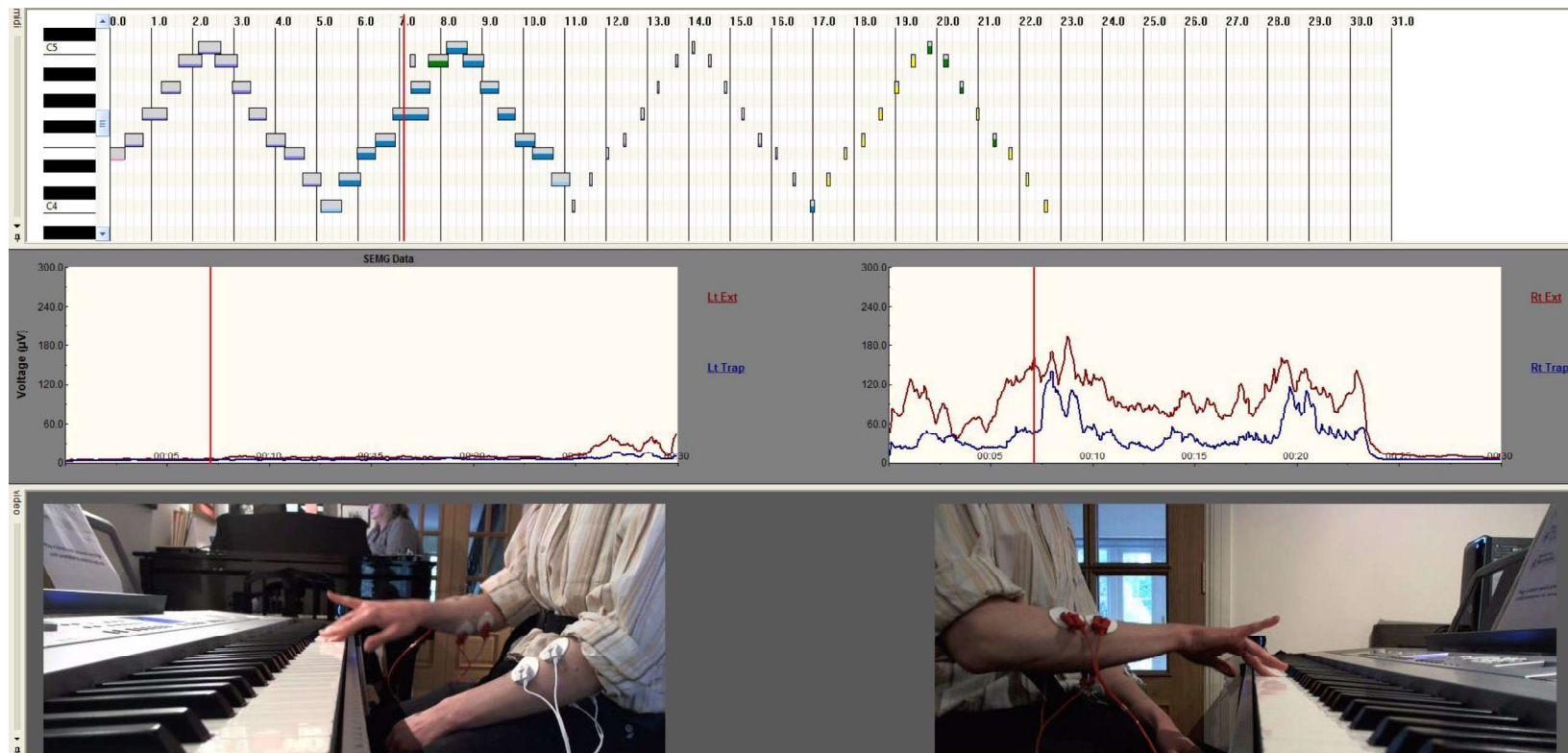
ID 004 – Arpeggio Left Hand



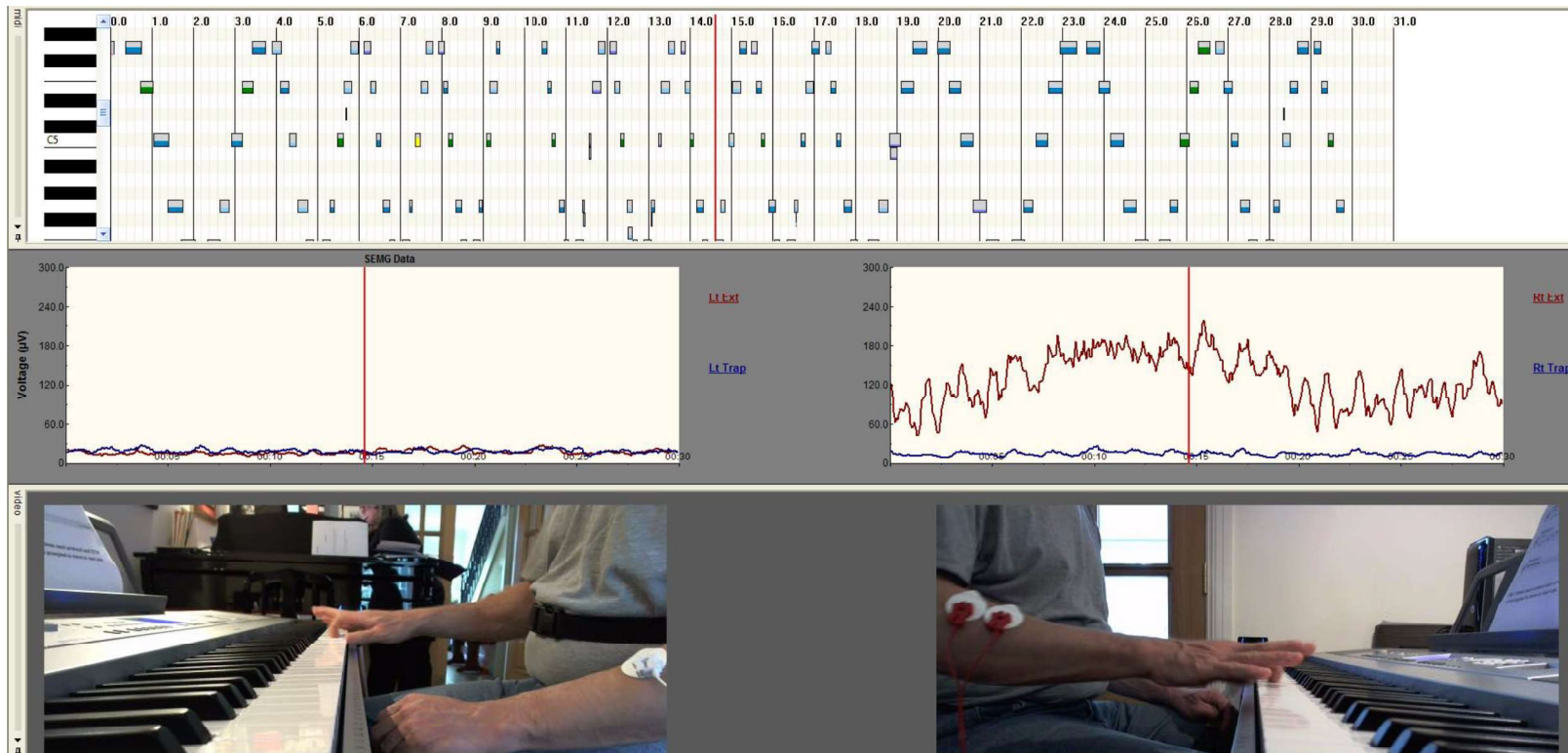
ID 005 – Arpeggio Right Hand



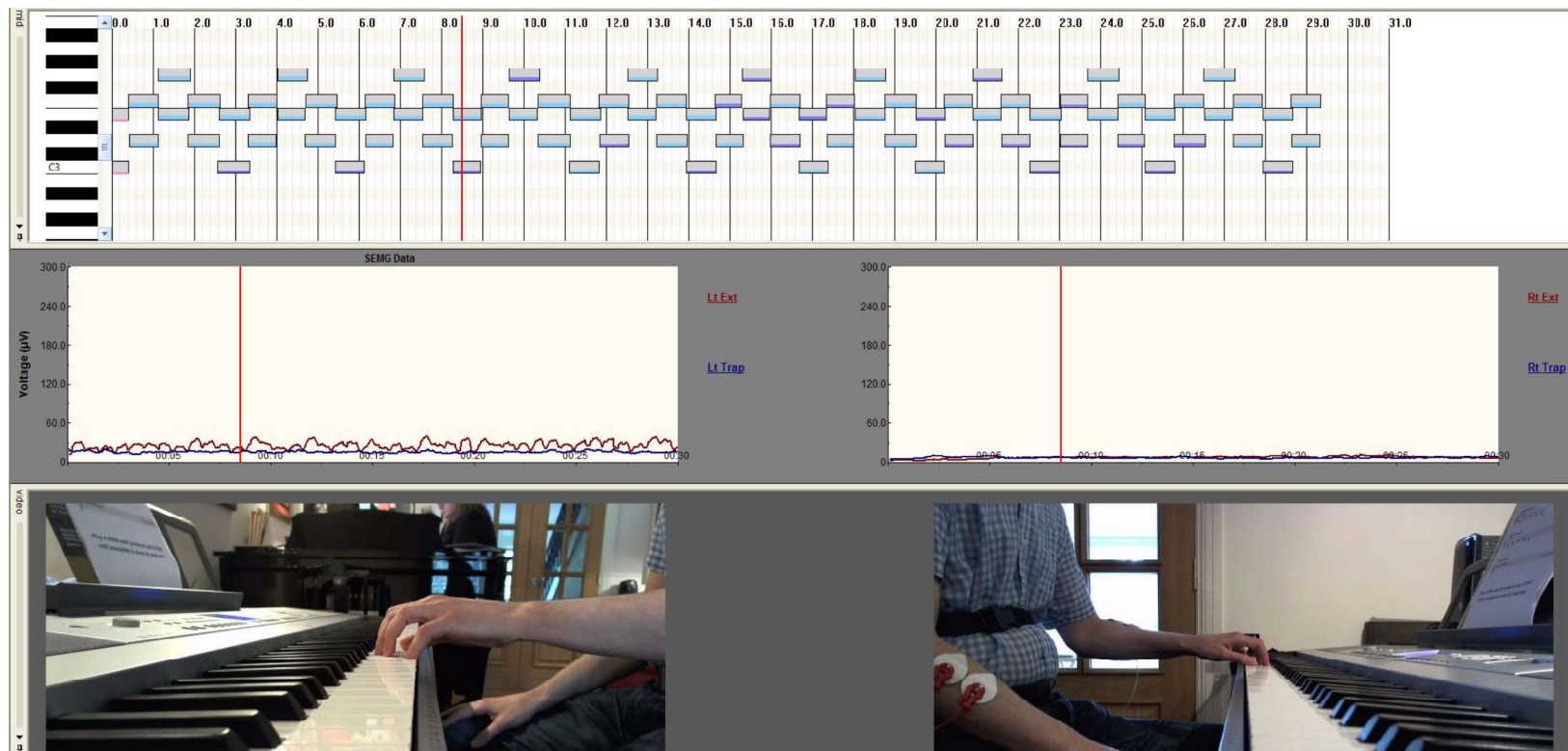
ID 006 – Scale Right Hand



ID oo8 – Arpeggio Right Hand



ID 007 – 3rds Left Hand



hara.trouli@ucl.ac.uk

