



CLARINET VS. CLARINETIST:  
DESIGN, PERFORMANCE, AND  
POTENTIAL INJURY



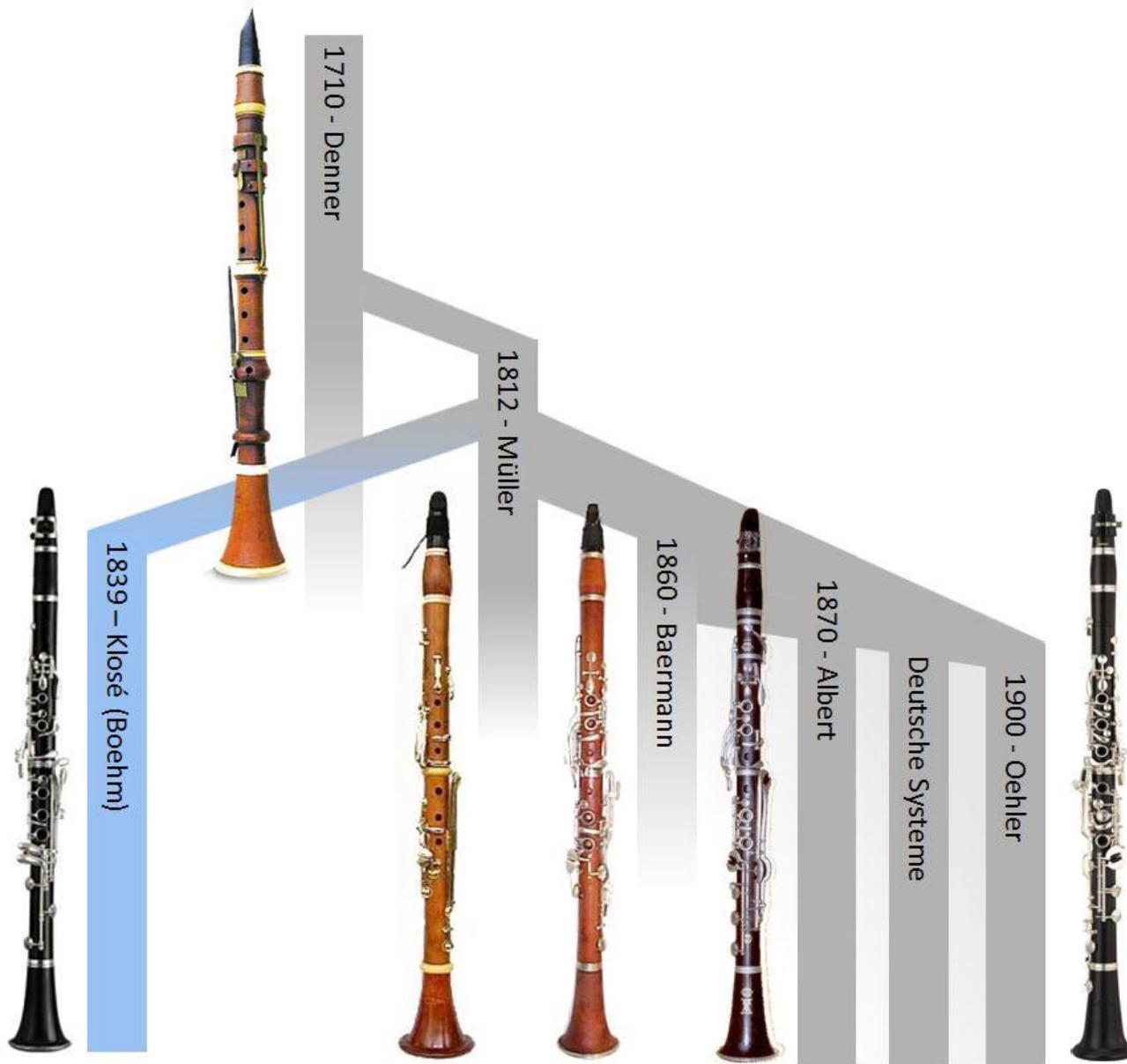
Caitlin Fisher

# Presentation Overview

- Historical background
- Design comparison of the French and German clarinets
- Injury definitions
- Personal narrative
- Comparison of clarinets through musical excerpts
- Injury statistics
- Injury causes in clarinetists
- Ways to avoid injury
- Conclusion
- Bibliography

# Historical Context

1710  
1720  
1730  
1740  
1750  
1760  
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...



HISTORICAL  
CONTEXT –  
THE *CHALUMEAU*  
(PLURAL  
*CHALUMEAUX*)



1690 – Johann Cristoph Denner  
invents the clarinet



# Baroque Era (1600–1750)

Register/speaker key (upper thumb),  
A key (upper first finger), low e or  
b' key (lower thumb)

Ambidextrous

Made in multiple keys (c', d', e-flat', f', g', a-  
flat', a', b-flat')

George Frideric Handel



Tomaszewicz, Grzegorz. "Baroque Clarinet in C / 415 Hz. Jacob Denner (1681–1735)." *Renaissance and Baroque Musical Instruments*, Grzegorz

Tomaszewicz, n.d., <https://gtmusicalinstruments.com/instruments/baroque-chalumeau/>.



## George Frideric Handel (1685–1759)

- Multiple two-keyed clarinets or one three-key clarinet
  - Difficult
- Accidentals required different concert pitch clarinets
- Composers were limited by fingering difficulties and poor tuning of some notes



# Handel, *Ouverture D-Dur*, HWV 424, *Andante*, measures 1-14

*Andante*

Clarinetto I

Clarinetto II

Corno da Caccia

8

# Handel, *Ouverture D-Dur, HWV 424, Allegro*, measures 1-24

Allegro

9

16

tr

tr

tr

tr

tr

# RANGES OF THE CLARINET



**Clarinet Range - Written**

Chalumeau	Throat Tones	Clarino	High Range
A musical staff in treble clef showing the written ranges for the clarinet. The Chalumeau range is from G3 to B3. The Throat Tones range is from B3 to D4. The Clarino range is from D4 to E4. The High Range is from E4 to G4. Brackets indicate these ranges. A diamond symbol is placed below the staff at the beginning of the Chalumeau range.			

**Clarinet Range - Sounds**

A musical staff in treble clef showing the sounds of the clarinet ranges. The notes are G3, B3, D4, E4, and G4. Brackets indicate the ranges. A diamond symbol is placed below the staff at the beginning of the Chalumeau range.			
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"Clarinet." *OnMusic Dictionary*, Connect for Education, Inc., 16 May 2016, <https://dictionary.onmusic.org/terms/722-clarinet>. Accessed 11 Mar. 2022.

# Classical Era (1750-1820)

- Four- to six-key clarinets
- Industrial Revolution
- German clarinets with L3 double hole
- Interchangeable right- and left-hand joints

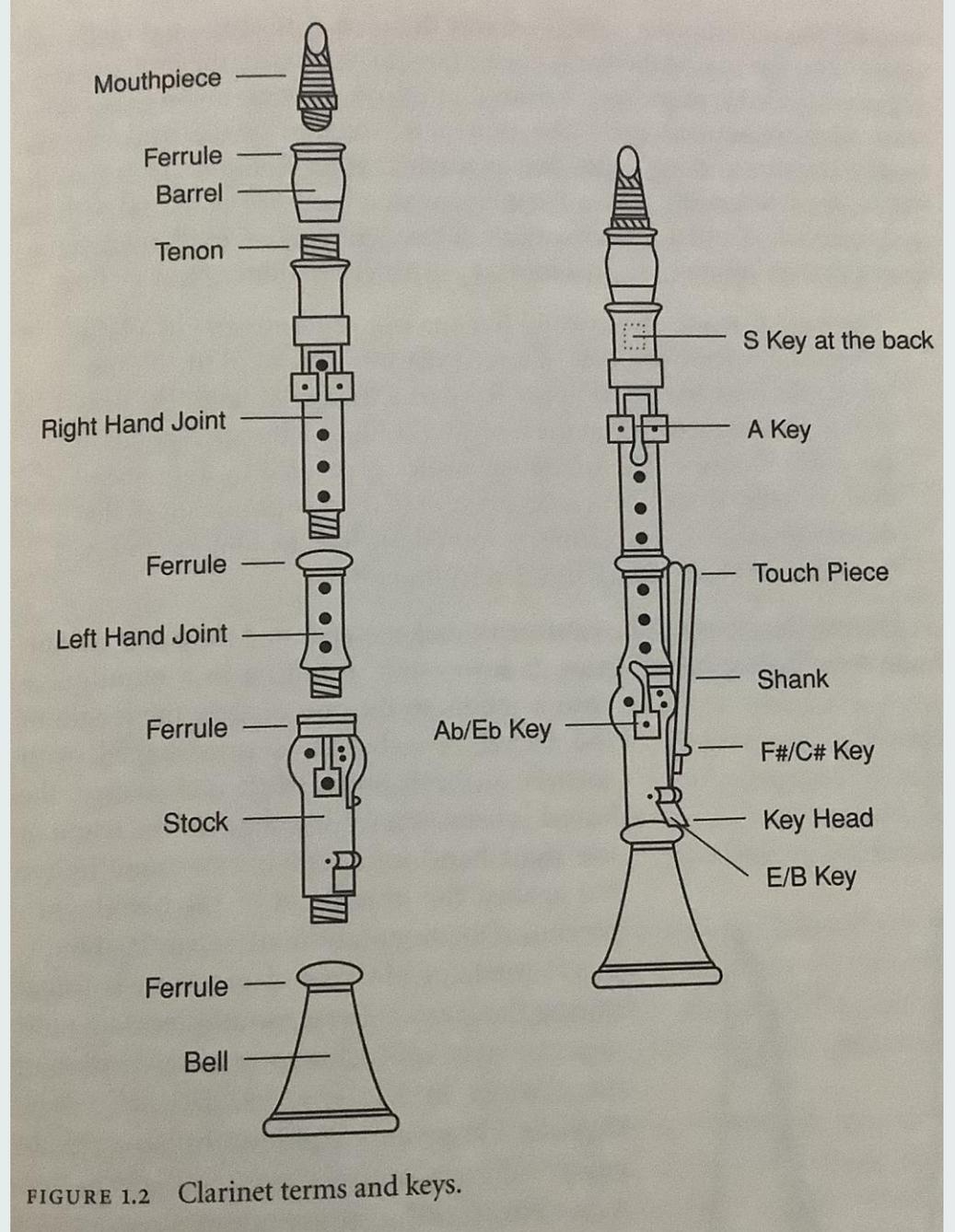


FIGURE 1.2 Clarinet terms and keys.

Classical Clarinet terms and keys with ambidextrous fingerings (The Clarinet in the Classical Period 15).

# MÜLLER'S 13-KEY CLARINET



Improved intonation  
Soprano clarinet rejected by Paris Conservatory



# Romantic Era (1820–1900)

- Introduction of different fingering systems
- Böehm-system (French) clarinet
- Baermann clarinet
- Oehler-system (German) clarinet

# French (Böehm-system) Clarinet

- Invented by Louis-Auguste Buffet and Hyacinthe Klosé
- Inspired by Müller clarinet and Theobald Böehm's flute fingering system
- Ringed-keys
- Circular key plates and axel keys



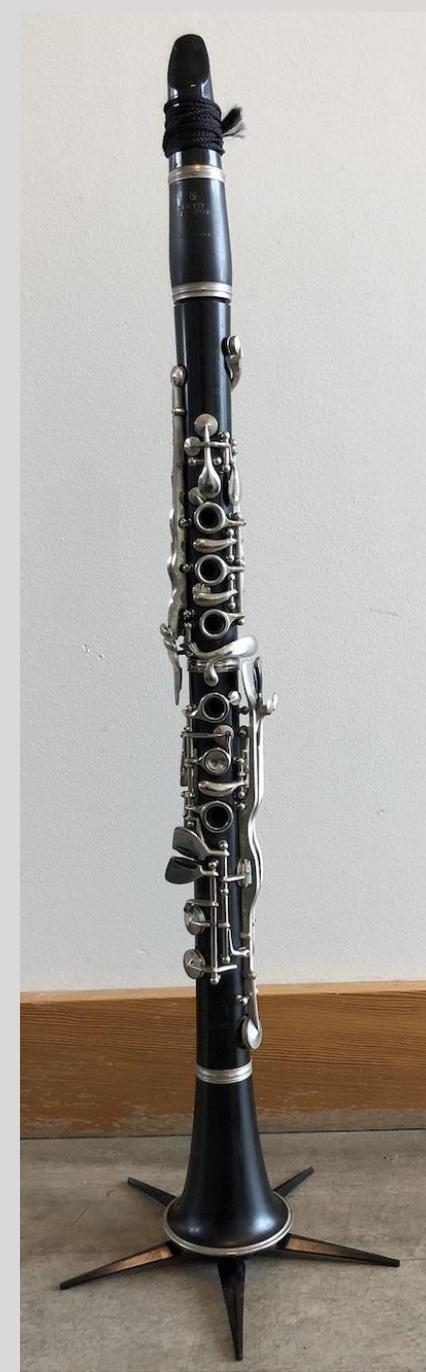
# Baermann Clarinet

- Invented by Carl Baermann and Georg Ottensteiner
- Goal: eliminate the jumbled alternate fingerings of the French clarinet
- No longer played



# German (Oehler-system) Clarinet

- Invented by Oskar Oehler
- Clarinet reflected German traditions
- Improved upon the Baermann clarinet
- 21 keys for venting and tuning



German



French



# COMPARISON

German: rollers, forked fingerings, hand joints are independent, widespread tone-holes

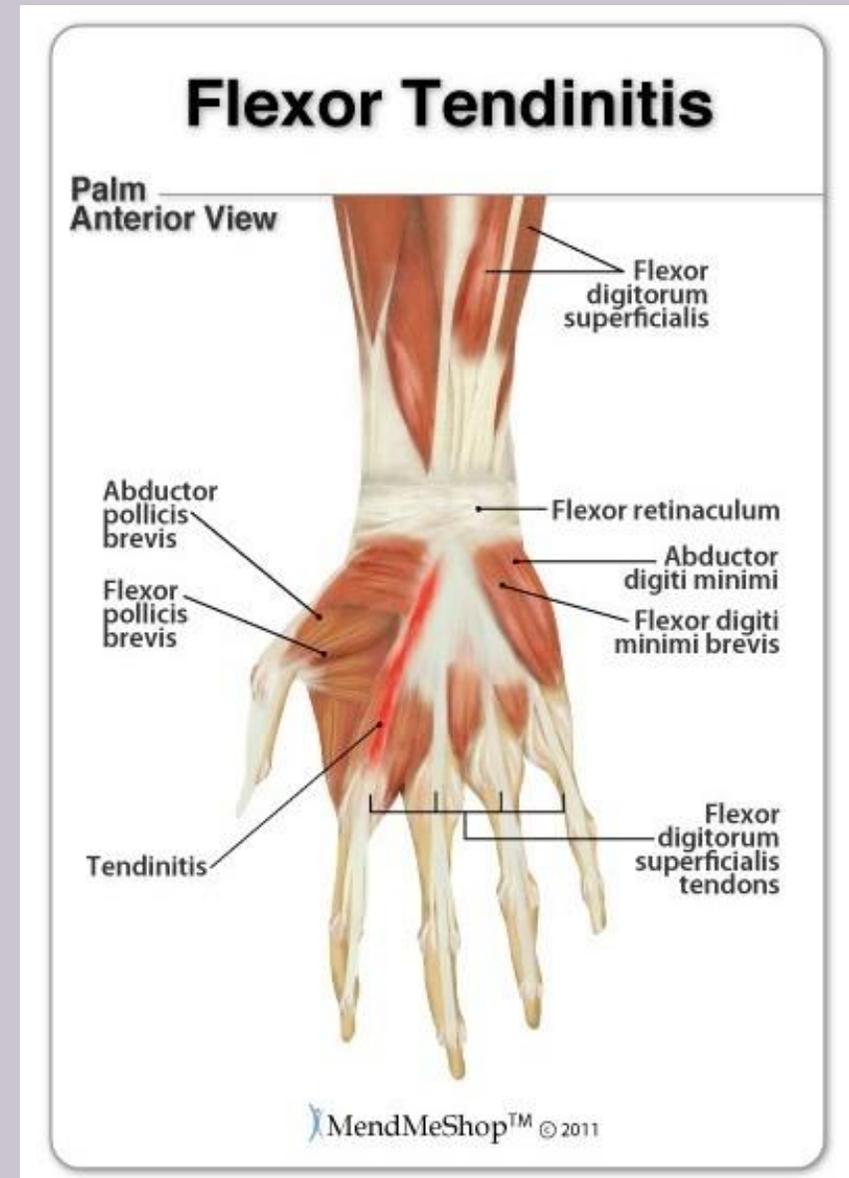


French: alternate fingerings, hand joints are reliant on each other, tone-holes are closer together

# Injury Definitions

# Tendinitis

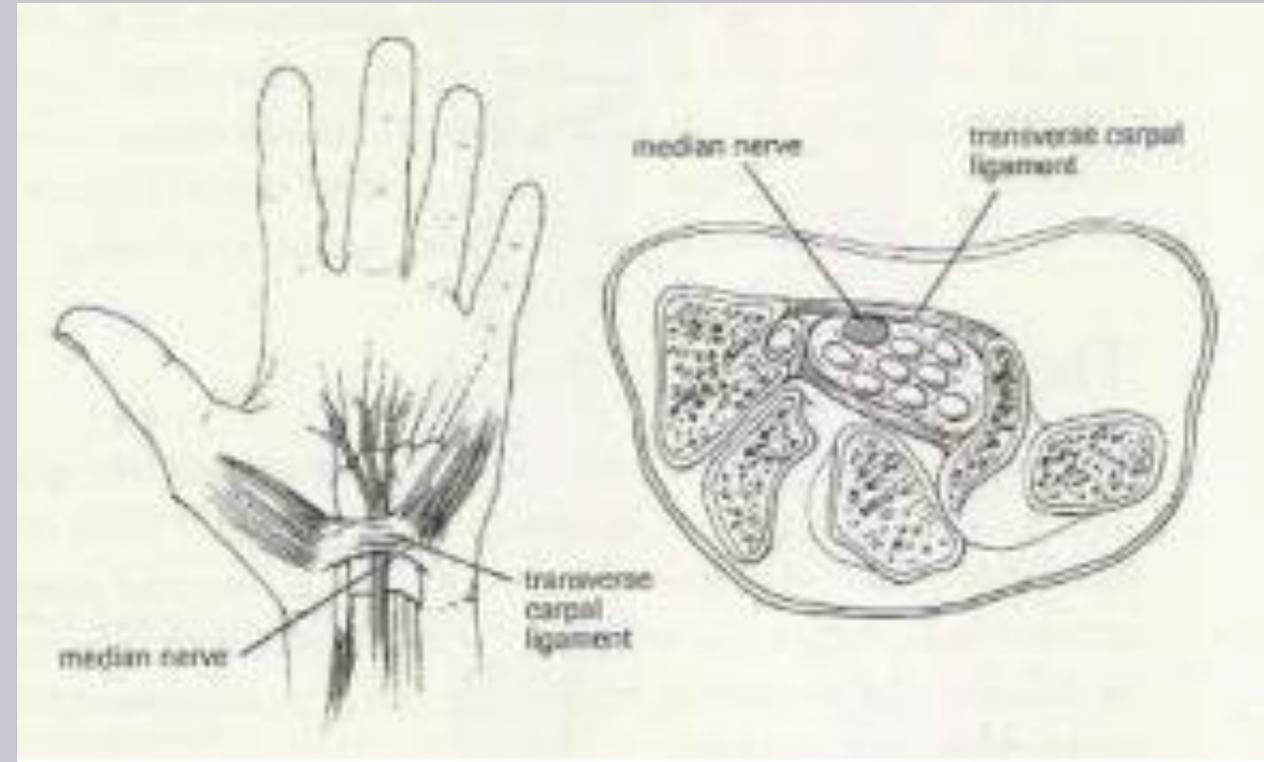
- Inflammation of tendons
- Small tendons are prone to injury
- Leads to scar tissue if untreated
- Treatment: non-steroidal anti-inflammatory drug (NSAID), Graston technique and massage, ice and rest



“Flexor Tendinitis.” *Aid Your Tendon*, In.Genu Design Group, Inc., 2011, <https://m.aidyourtendon.com/tendinitis-injuries/hand-wrist-tendonitis/flexor-tendonitis.php>. Accessed 31 Mar. 2022.

# Carpal Tunnel Syndrome

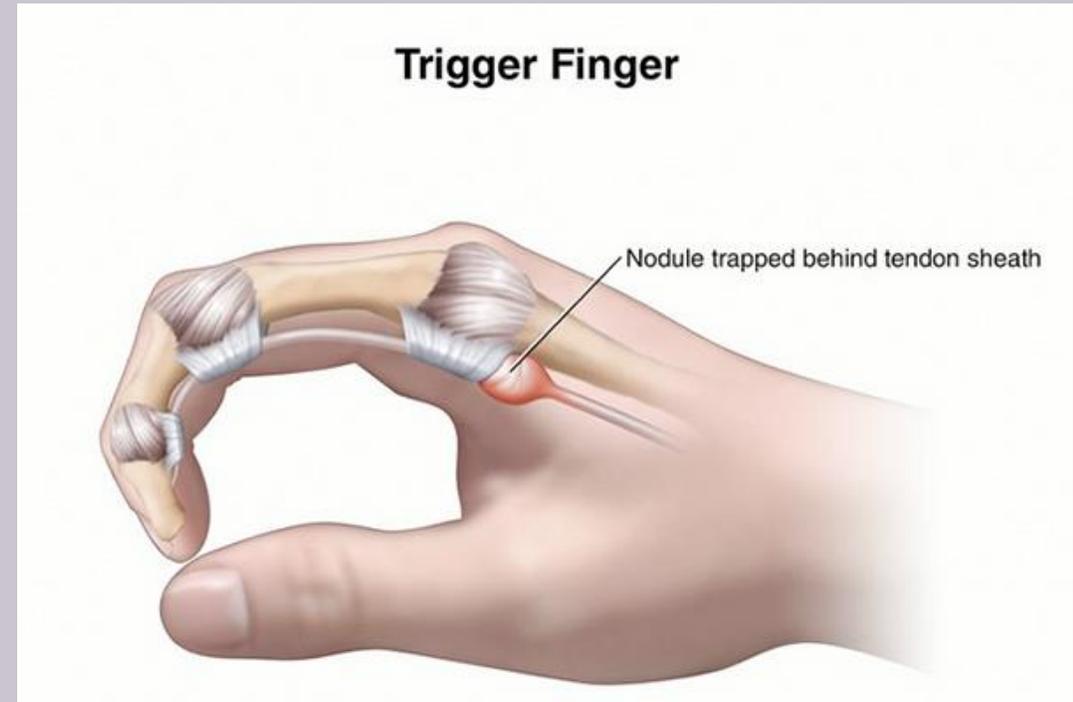
- Tendinitis that causes pressure on the median nerve in the carpal tunnel
- Symptoms: numbness, tingling, pain, aching, burning, limited ROM, muscle atrophy
- Contributing factors: typing without a wrist support, leaning head on the fist
- Treatment: splinting, NSAID, muscle therapy, acupuncture, surgery



The carpal tunnel (McIlwain 11)

# Trigger Finger

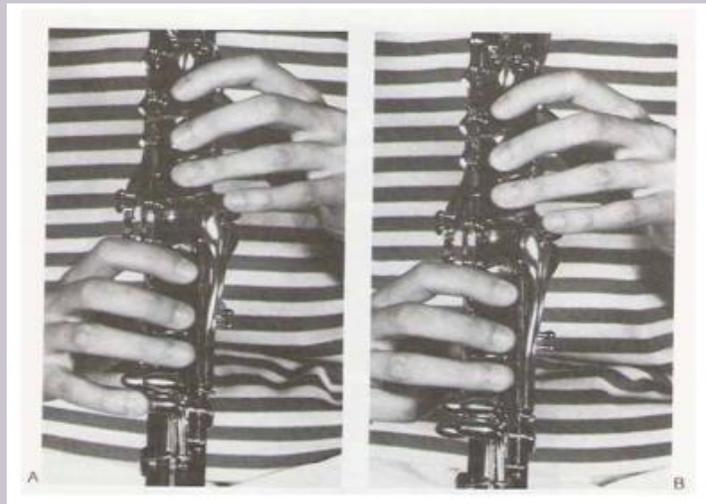
- Inflammation of the tendon (fingers and thumb)
- Common in women
- Caused by repetitive motions
- Treatment: steroids and/or surgery, splint



Trerutdilokkul, Thawatchai. "Trigger Finger." *Vichavej International Hospital Group*, Vichavej International Hospital Group, 2017, <https://www.vichavej.com/en/article-detail.php?item=131>. Accessed 11 Mar. 2022.

# Focal Dystonia

- Occupational cramp
- Rare neurological injury found in the arm and/or jaw of musicians
- Curling of fingers involuntarily
- No successful treatments



29-year-old clarinetist with history (1 ½ years) of difficulty controlling the right little finger while playing. A: Hand position as she begins to play. B: After playing less than 1 minute, the right little finger begins to curl involuntarily, pulling the finger off the key" (McIlwain 27).

# Overuse Injury

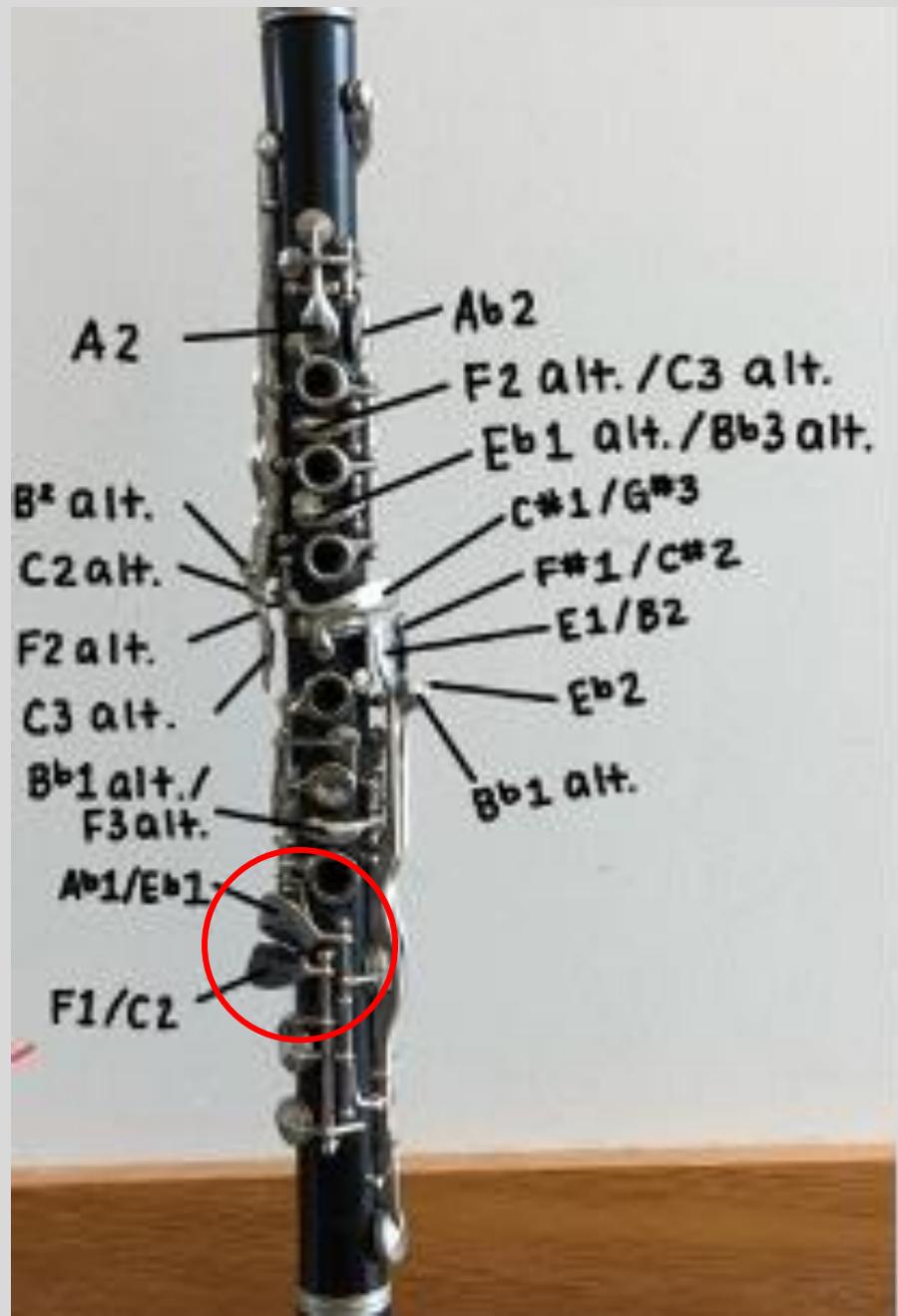
- Injuries when any biological tissue is stressed beyond its physical limit
- Treatment: rest, ice and heat therapy, NSAID, Alexander Technique, and Feldenkreis

# Personal Narrative

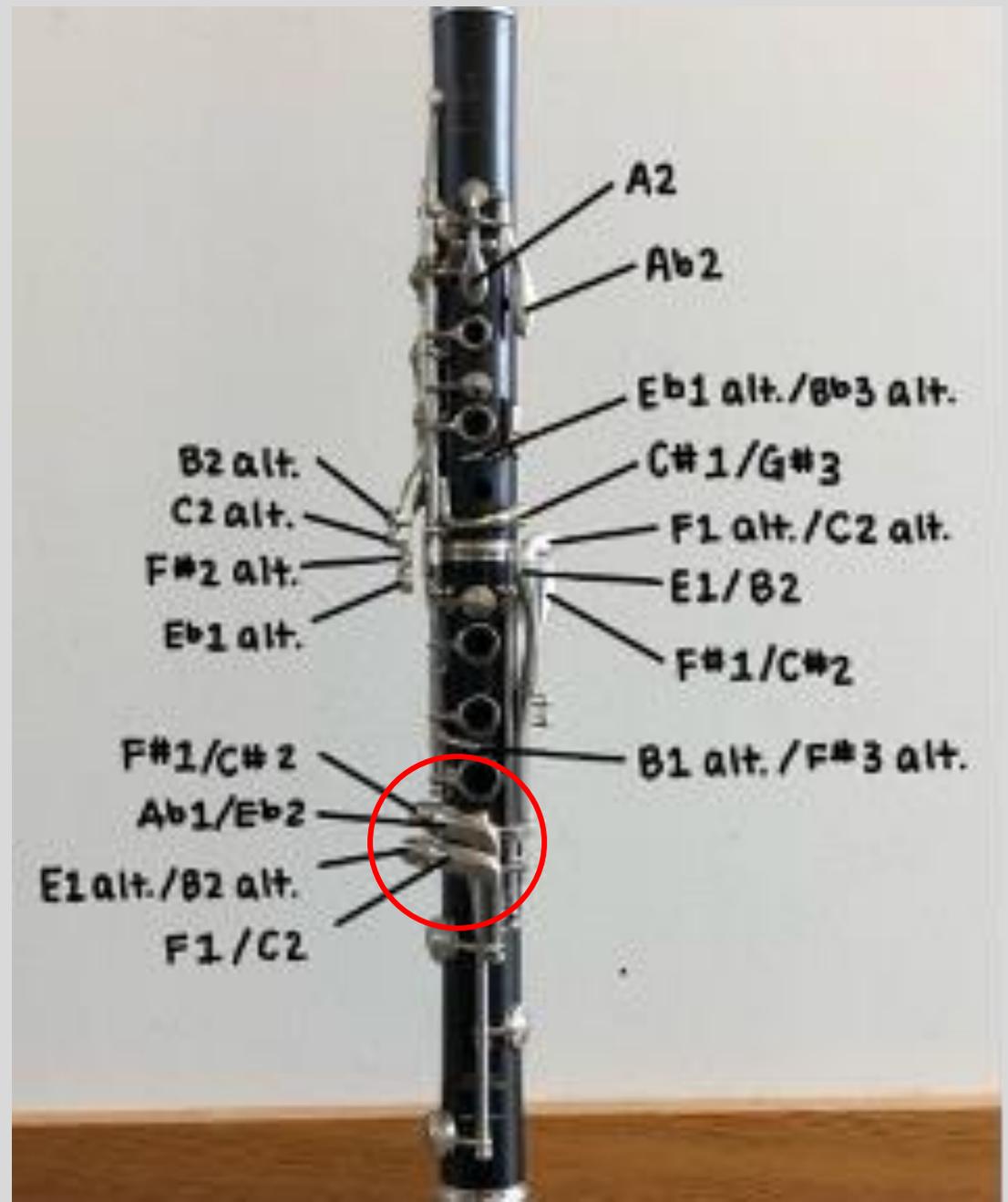
- Timeline: 2017–present
- Diagnosis: Tendinitis and overuse injury
- Possible cause: learning to play with small hands

# Clarinet comparison through musical excerpts

# German



# French



# Clarinet Comparison

## Carl Baermann Etude 31

Complete School for the Clarinet book

C2 to E-flat2 leap

### French Clarinet

- Sightreading C2 to E-flat2 (B-sharp2 to D-sharp2)
- Tendon strain

### German Clarinet

- Can easily play C2 to E-flat2
- Possible tendon strain after long uses



The image displays a musical score for Carl Baermann's Etude 31, specifically focusing on the interval of a C2 to E-flat2 leap. The score is written on two staves. The first staff contains measures 11 through 16, and the second staff contains measures 17 through 21. A red circle highlights the leap from C2 to E-flat2 in measure 16. The leap is indicated by a double bar line and a fermata over the C2 note, followed by a double bar line and a fermata over the E-flat2 note. The notes are marked with a sharp sign (#) and a flat sign (b) to indicate their specific pitches.

# Clarinet Comparison

## Cyrille Rose Etude 28

40 Studies for Clarinet, Book II

C2 to E-flat2 leap

Trill keys

### French Clarinet

- C2 to E-flat2 leap
- B-flat2 to F-sharp2
- Descending leaps to the chalumeau register

### German Clarinet

- Easy C2 to E-flat2 glide
- B-flat2 to F-sharp2
- Descending leaps and steps into the chalumeau register

The image displays two staves of musical notation for Cyrille Rose's Etude 28. The top staff is for the French Clarinet, and the bottom staff is for the German Clarinet. Both staves show a C2 to E-flat2 leap circled in red. The German Clarinet staff includes trill markings (tr) and descending leaps into the chalumeau register.

# Clarinet Comparison

## Hector Berlioz, *Symphonie Fantastique*, Op. 14, III. *Auf dem Lande*

C2 to E-flat2 leap

B2 to B-flat2

Clarinet solo, mm. 44

The image shows a musical score for a clarinet solo. The top staff is marked "solo" and "mf dolce". It contains a melodic line with a red circle around a specific measure. The bottom staff is marked "cresc." and "sf", followed by "cresc. - sf dim" and "mf". A red circle highlights the measure number "44" in the bottom staff. The score is in G major (one sharp) and 3/4 time. The top staff also includes the marking "(Echo)" and "pppp".

# Injuries

Statistics, Causes, and How to Avoid Them

## Injury Statistics

N = 601

- 67 percent – tendinitis
- 23 percent – carpal tunnel syndrome
- 6 percent – trigger finger and de Quervain's disease
- Others: temporomandibular dysfunction (TMJ), ganglion cysts, tennis elbow, myofascial pain syndrome, arthritis, overuse syndrome, thoracic outlet syndrome, focal dystonia

## Treatment Statistics

- 12 percent – physical therapy
- 10 percent – stretching regiment
- 10 percent – medication
- 2 percent – occupational therapy
- 1 percent – surgery
- Others: chiropractor referral, massage therapy, Alexander Technique, yoga, ice therapy, rest, steroid injections
- 72 percent – pain after treatment

# Causes for Clarinetist Injuries

- Abrupt increases of practice time
- Instrument weight
- Inadequate rehabilitation of previous injuries
- Body size, anatomical variations, and gender
- Equipment set-up
- Environmental factors
- Muscle imbalances due to the demands of playing clarinet
- Stress levels

# Ways to Avoid Injury

- Physical warm-up (flexibility, endurance, muscle balance, body alignment, strength)
- Use alternate methods to hold instrument weight (neck strap, ERGOclar stand)
- Allow for physical and mental breaks
- Slowly increase playing time to meet the requirements for a concert or class



# Conclusion

- French vs. German clarinets
- 3.0 inches vs. 3.75 inches
- Modify your instrument to fit your needs
- How to improve the clarinet: adjust the speaker key and arch support for right hand

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