

# Fencing Injuries which Required Medical Time-out during Bout are Deferent among Disciplines: analysis of 25,976 fencers

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COI disclosure

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# Introduction

## • Fencing

- 1 on 1 combat sports using sword (weapon)
- On the linear "Piste"
- Wearing a distinctive bodysuit
- Several bouts in the same day  
(preliminary rounds followed by final tournament)
- 3 different disciplines (Epee, Foil, Sabre)

FIE home page: <https://fie.org/new-to-fencing/weapons>

Ruben

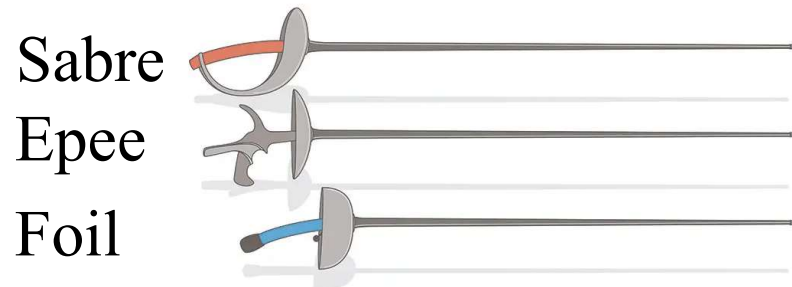
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# Differences in Disciplines

## ➤ Weapon:

Epee; heaviest and hardest

Sabre; shortest



## ➤ Target area

Foil; Torso

Sabre; Torso, Arm, Head

Epee; Whole body

## ➤ Priority for point: Foil and Sabre



FIE homepage: <https://fie.org/new-to-fencing/weapons>  
<https://www.seiko.co.jp/magazine/article/00084.html>



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# Medical Time-out



- ✓ A 5-minute break for any injury or other medical reason
- ✓ By the end of break, medical staff (we) will decide that the fencer should **continue** or **retire** (individual events) and/or **be replaced** (team events) .
- ✓ During the remainder of the same day, **a fencer cannot be allowed a further break for the same reason.**



# Materials and Methods

- Injury surveillance
  - ✓ Between April 2019 and March 2023
  - ✓ 93 fencing competitions held in Tokyo
  - ✓ 25,976 athletes (male 14,557, female 11,419) were included.
- Age, Sex, Discipline, Cause of Injury, Type of Injury, Body Part of Injury and Outcome were recorded<sup>1)</sup>.
- Characteristics of injuries among the disciplines were statistically analyzed using the multiple Chi-square test.

1) Bahr R, et al. Br J Sports Med. 2020.



# Results

Of the 25,976 fencers in 93 competitions

(134,638 AE)

✓ Athlete who needed medical care for any reason during those competitions      1691 (6.51%, 12.56/1000AE)

✓ Medical Time-out during the bout

330 (1.27%, 2.45/1000AE )

✓ Athletes who decided to Retire their bout

27 (0.10%, 0.20/1000AE)



# Medical Time-out (330 cases analysis)

Sex	Foil	Epee	Sabre	total
Female	52	32	14	98 (0.67%)
Male	90	63	79	232 (2.03%)
total	142	95	93	330 (1.27%)

Type	contusion	cramp	laceration	ligament	strain
Foil	32	40	16	15	14
Epee	19	48	5	10	5
Sabre	24	18	10	29	2

multiple chi square test:  $p < 0.01$ , residual analysis:  $p < 0.05$



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# Medical Time-out (330 cases analysis)

Cause	Contact-athlete	Contact-moving	Contact-stagnant	Non-contact	Overuse-gradual	Overuse-sudden
Foil	16	26	7	21	12	56
Epee	10	15	1	7	1	72
Sabre	19	20	1	27	2	29

Part	head/face	shoulder	Elbow	Finger	thumb	thigh	knee	L-leg	ankle	foot
Foil	5	2	7	15	4	25	14	26	18	9
Epee	8	1	2	2	3	27	7	25	5	3
Sabre	1	1	1	11	12	7	4	14	23	4

multiple chi square test:  $p < 0.01$ , residual analysis:  $p < 0.05$



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# Cause of Retirement (27 cases)

## Foil: 13

Calf cramp (3)  
Strain (2)  
Ligament (2)  
Contusion (2)  
Dislocation (1)  
Heat illness (1)  
Other (2)

## Epee: 4

Cramp (3)  
Strain (1)

## Sabre: 10

Ligament injury (5)  
Tendon rupture (1)  
Fracture (2)  
Dislocation (1)  
Strain (1)



# Discussion

- ✓ 184 Time-Loss Injuries (TLI) among 78,223 fencers over 5 years
- ✓ Overall TLI rate of **0.3/1,000AE**

Harmer PA. <sup>2)</sup>

This research;

- 27 TLI among 25,976 fencers
- TLI rate was **0.20/1000AE**



2) Harmer PA. et al. Clin J Sport Med, 2008.



# Differences in Disciplines

Average *time* of single attack during bout

Foil 5 sec.

Epee 15 sec.

Sabre 3 sec.

Average moving *distance* per bout

Epee 250-1,000 m

Sabre  $\leq 250$  m

Epee needs more **endurance**. Sabre is **more aggressive**.



# Differences in Disciplines

**Sabre** injuries were

➤ Relatively **high energy** injuries like,

**Ankle sprain and Thumb MPJ injury**



# Differences in Disciplines

Epee injuries were

➤ Characteristics of **endurance sports** injuries like,

## Muscle Cramps and Overuse Injuries

- ✓ The distinctive **whole body uniform** condition makes **body temperature risen easily even in a normal WBGT condition.**  
IF the bout become longer, it might cause muscle cramps, as same as **Heat Illness.**



# Discussion

Therefore,

Prevention strategy should be different in each discipline,

- ✓ Sabre fencers should be aware of **ankle sprain** and **thumb sprain**.  
e.g. Neuromuscular Training, Brace/Taping, Improving Initial Treatment...
- ✓ Epee fencers should manage their **body temperature** and **hydration**.  
e.g. Icing, Change of Clothes, Hydration, Minerals and Citric Acid...



# Conclusion

In **Fencing** competition,

- ✓ TLI rate was **0.20/1000AE**.
- ✓ The type, cause and part of injury which required **medical time-out** was significantly **deferent among disciplines**.
- ✓ We need **deferent prevention strategy** for each discipline.





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