

Risk factor of Jones fracture 103 Athletes, 81 soccer players in our hospital

Hiroki Ukita¹⁾, Yusei Funakoshi¹⁾, Yuto Nakamura¹⁾, Kousuke Suzuki¹⁾, Masanori Taki²⁾, Haruhiko Bito³⁾, Yoshimitsu Kobayashi¹⁾

1)Department of Orthopaedic Surgery and Sports Medicine.
Seirei Hamamatsu General Hospital

2)Department of Orthopaedic Surgery and Foot Surgery.
Seirei Hamamatsu General Hospital

3)Department of sports medical center.
Seirei Hamamatsu City Rehabilitation Hospital.



ISAKOS Congress 2023

COI Disclosure

Hiroki Ukita, Yusei Funakoshi, Yuto Nakamura,
Kousuke Suzuki, Masanori Taki, Haruhiko Bito,
Yoshimitsu Kobayashi

There are no COI with regard to this presentation

Introduction

Jones fracture is ...

- Known as a refractory fracture

- Significant “time loss” injury

- Most common stress fracture in football players

Ekstrand. 2012

Purpose

To describe risk factor
for preventing Jones fracture

Materials and Methods

Study design

Retrospective cohort study

Participant

103 athletes including 81 soccer players treated in our hospital between April 2006 and December

Data collection

From medical record and interview using google form

Ethical approval

Approved by our hospital's ethics institutional review board (No.3739)

Results

Total 103 athletes

81 soccer players 18 basketball players

2 baseball players 2 rugby players

81 Soccer players

Total **95** feet

35 Dominant legs , **48** Non dominant legs

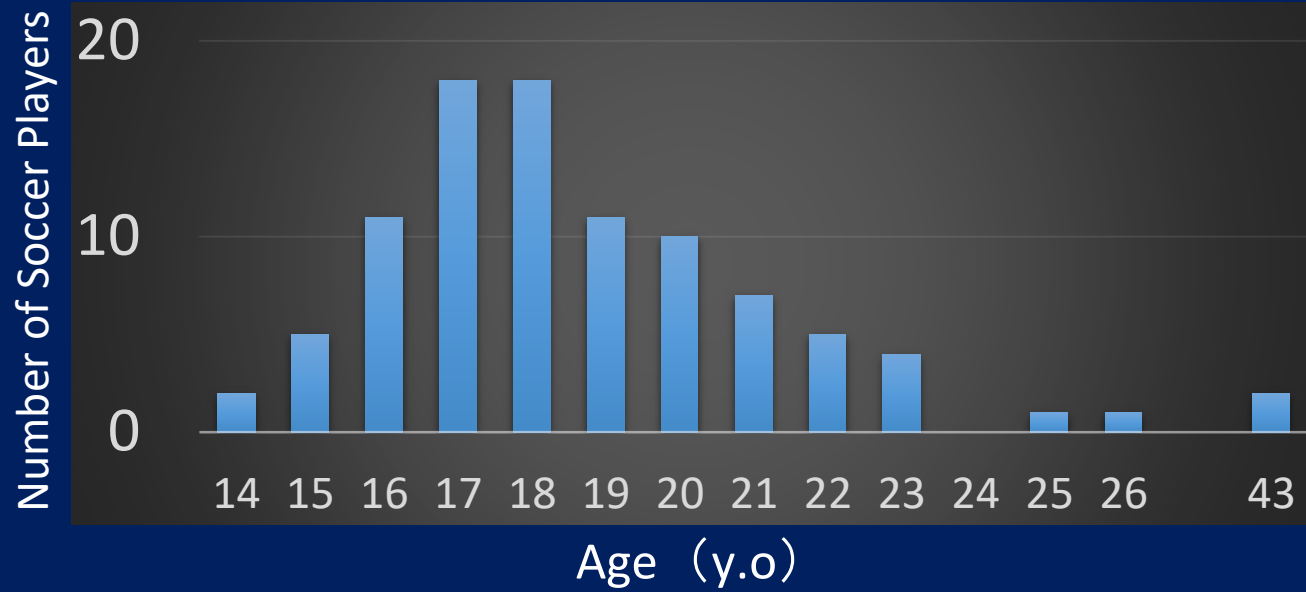
(Bilateral 8 players ,

Recurrence 6 , Unknown 6)

Age

Average 19.0 years old

Median 18 years old

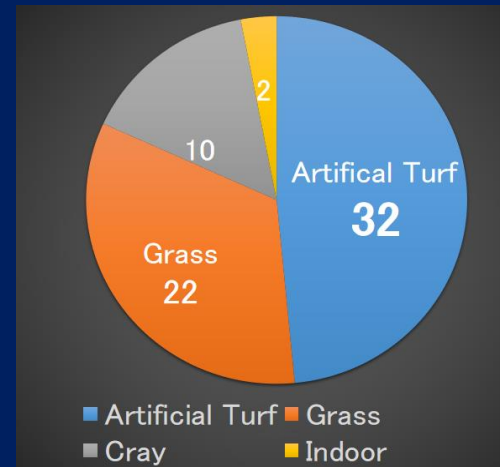


Level

78% of injured player was Elite.

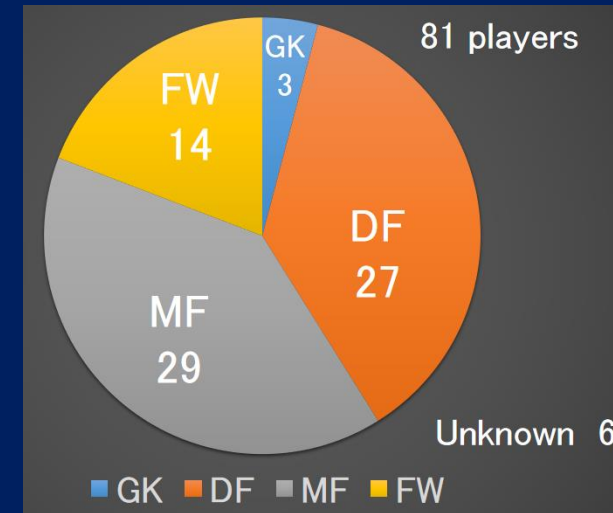
Field

40% of injured player were injured on Artificial turf.



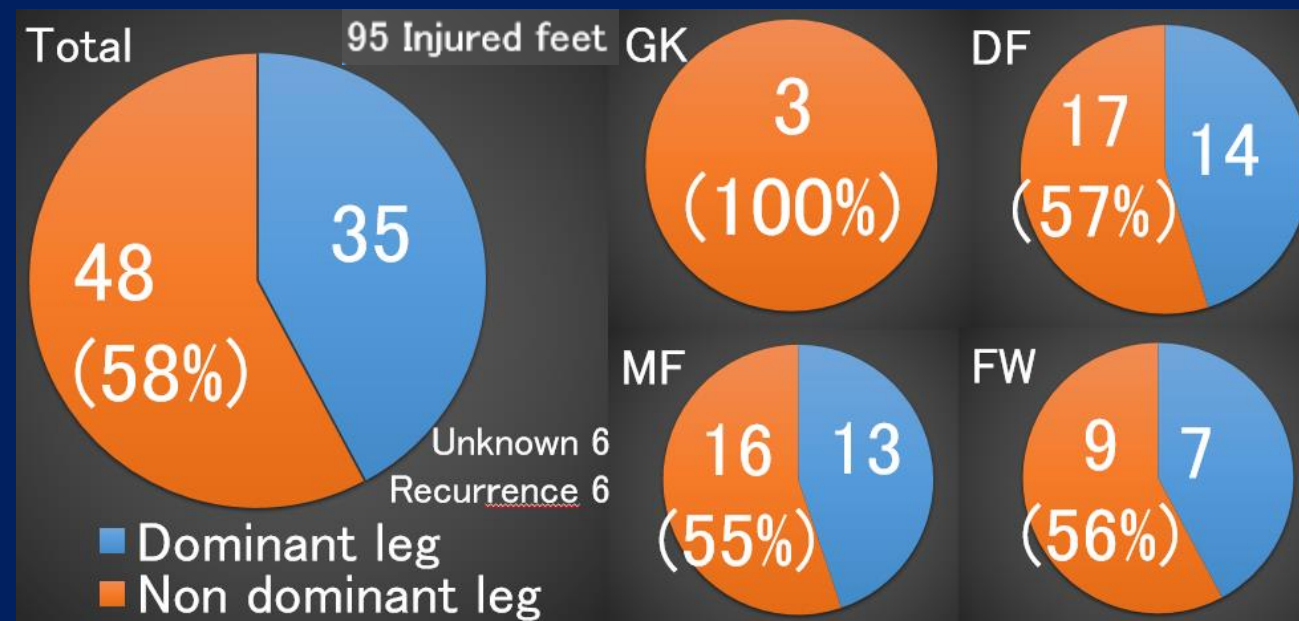
Position

GK 4% DF 33% MF 36% FW 17%

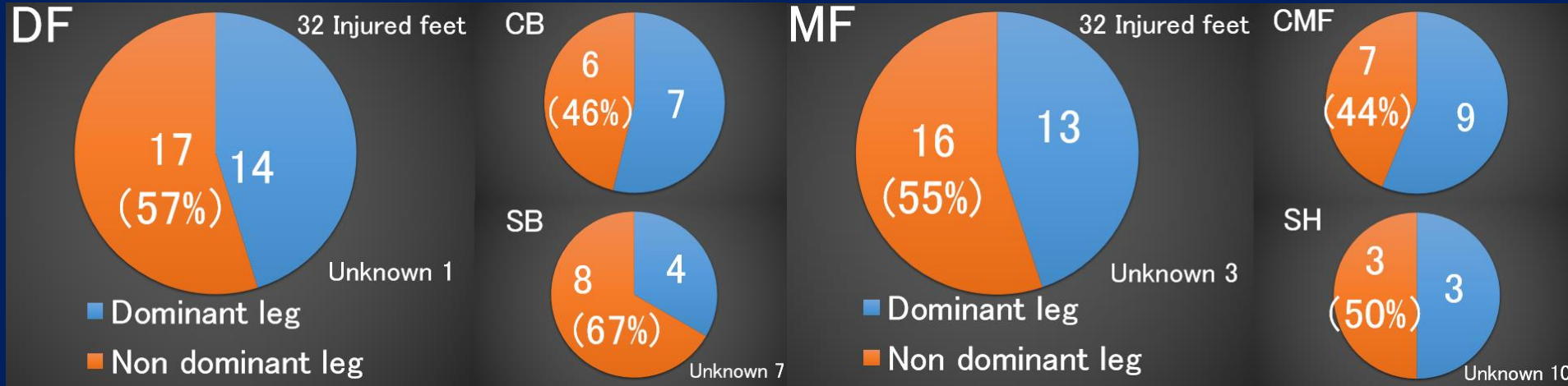


Injured foot

58% of injured foot was Non Dominant leg.



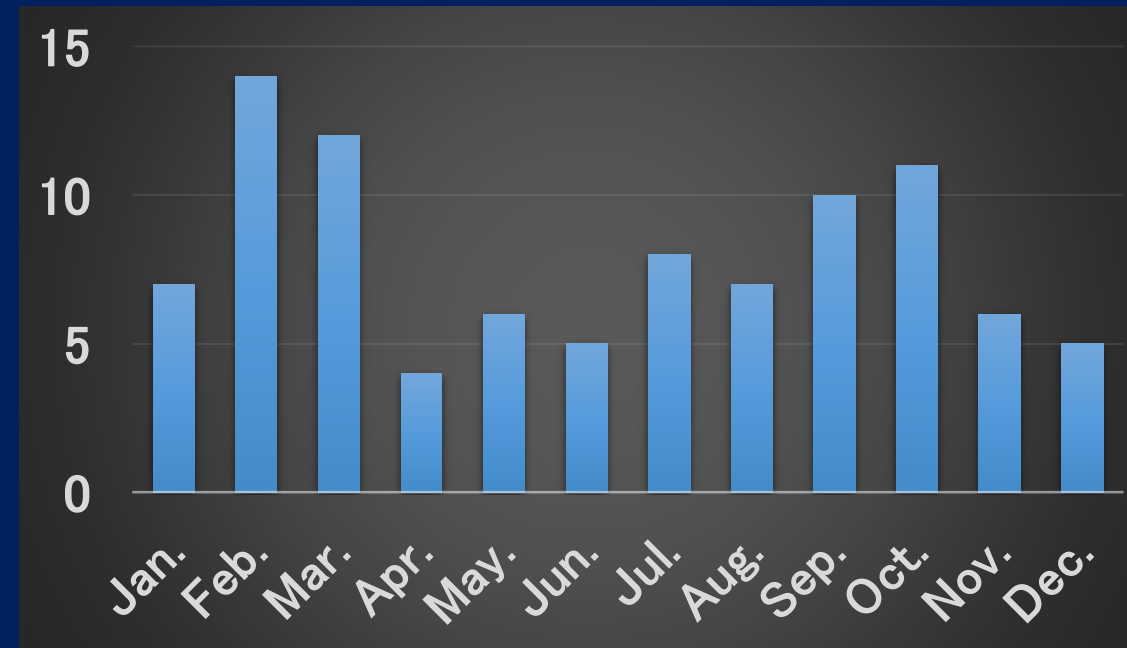
Position and Injured foot



Monthly distribution

February and March 27%

September and October 22%



Discussion

Field

Risk of ankle injury is increased on artificial turfs

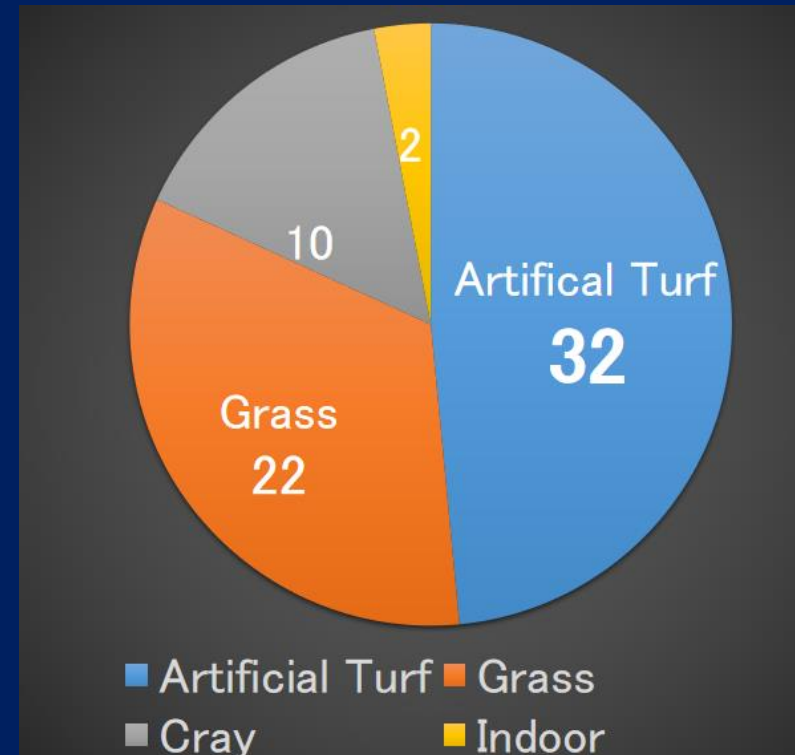
S Williams.2019

Increased playing time on artificial turf was a risk factor of Jones fracture

T Miyamori.2019

Our Data

Artificial Turf 40%

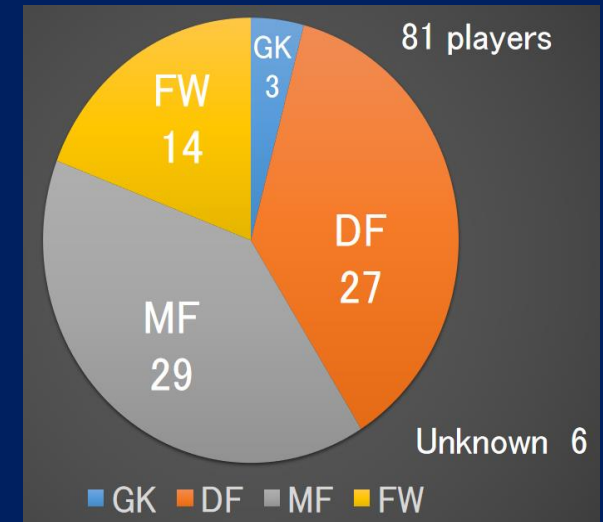


Position

MF had significantly higher rates S Matsuda.2017

Our Data

GK 4% DF 33% MF 36% FW 17%



Injured foot and Position

Significantly more frequent in non dominant leg K Fujitaka.2015

No significant difference between dominant leg and non dominant leg

S Matsuda.2017

Our Data

Non dominant leg **58%**

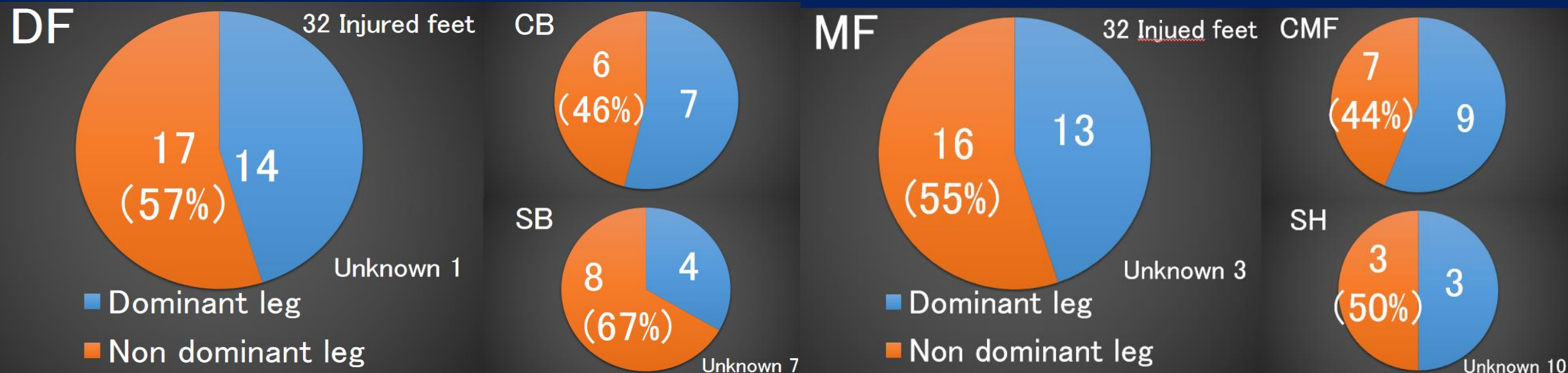
All 3 GK Non dominant leg



Injured foot and Position

Total Dominant leg < Non dominant leg

Center Dominant leg > Non dominant leg



Monthly distribution

The rate of stress fracture was higher in the preseason

K H Rizzone.2017

High load with large weekly changes in load was risk of injury

S Malone.2017

Insufficiency of Vitamin D is associated with Jones fracture

Y Shimasaki.2016

The mean serum 25-OHD level was lowest at the end of winter ,
and highest at the end of summer

Y Ono.2005

Muscle fatigue increased bone strain

A Hadid.2018

Our Data

February and March 27%

September and October 22%



References

Ekstrand J. Stress fractures in elite male football players. *Scand J Med Sci Sports*. 2012 Jun;22(3):341–346.

Nishio H, Saita Y, Kobayashi Y, et al. 第5中足骨骨折 (Jones骨折) の多施設共同研究. *JOSKAS*. 2018 May;43(4):227.

Miller D, Marsland D, Jones M, et al. Early return to playing professional football following fixation of 5th metatarsal stress fractures may lead to delayed union but does not increase the risk of long-term non-union. *Knee Surg Sports Traumatol Arthrosc*. 2019 Sep;27(9):2796–2801.

Williams S, Hume PA, Kara S. A review of football injuries on third and fourth generation artificial turfs compared with natural turf. *Sports Med*. 2011 Nov;41(11):903–23.

Miyamori T, Nagao M, Sawa R, et al. Playing football on artificial turf as a risk factor for fifth metatarsal stress fracture: a retrospective cohort study. *BMJ Open*. 2019 Feb;9(2).

Matsuda S, Fukubayashi T, Hirose N. Characteristics of the Foot Static Alignment and the Plantar Pressure Associated with Fifth Metatarsal Stress Fracture History in Male Soccer Players: a Case–Control Study. *Sports Med Open*. 2017 Dec;3(1):27.

Fujitaka K, Taniguchi A, Isomoto S, et al. Pathogenesis of Fifth Metatarsal Fractures in College Soccer Players. *Orthop J Sports Med*. 2015 Sep;3(9):2325967115603654.

Rizzone KH, Ackerman KE, Roos KG, et al. The Epidemiology of Stress Fractures in Collegiate Student–Athletes, 2004–2005 Through 2013–2014 Academic Years. *J Athl Train*. 2017 Oct;52(10):966–975.

Malone S, Roe M, Doran DA, et al. High chronic training loads and exposure to bouts of maximal velocity running reduce injury risk in elite Gaelic football. *J Sci Med Sport*. 2017 Mar;20(3):250–254.

Shimasaki Y, Miyamori T, Aoba Y, Fukushi N, Saita Y. Evaluating the Risk of a Fifth Metatarsal Stress Fracture by Measuring the Serum 25–Hydroxyvitamin D Levels. *Foot Ankle Int*. 2016 Mar;37(3):307–11.

Ono Y, Suzuki A, Kotake M, et al. Seasonal changes of serum 25–hydroxyvitamin D and intact parathyroid hormone levels in a normal Japanese population. *J Bone Miner Metab*. 2005;23(2):147–51.

Hadid A, Epstein Y, Shabshin N, et al. Biomechanical Model for Stress Fracture–related Factors in Athletes and Soldiers. *Med Sci Sports Exerc*. 2018 Sep;50(9):1827–1836.

Winter SC, Gordon S, Brice SM, et al. A Multifactorial Approach to Overuse Running Injuries: A 1–Year Prospective Study. *Sports Health*. 2020 May;12(3):296–303.