



Back to the Future-Again! Ankle injuries, Arthritis and Walking on Mars?

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Issues

- Ankle injury remains a common presenting injury in sports medicine practice and incidence has remained consistent over last 10-20 years.
- Emergency department studies suggest ankle injury incidence ranging from 2 to 7 ankle injuries per 1000 person years.

- Kemler, E. van de Port, I. Valkenberg, H. Hoes, W. Backx F. (2015) Ankle injuries in the Netherlands: Trends over 10–25 years. *Scand J Med Sci Sports* 2015; 25: 331–337.
- Hølmer P, Søndergaard L, Konradsen L, Nielsen PT, Jørgensen LN. (1994) Epidemiology of sprains in the lateral ankle and foot. *Foot Ankle Int*: 15: 72–74.
- Bridgman SA, Clement D, Downing A, Walley G, Phair I, Maffulli N. (2003) Population based epidemiology of ankle sprains attending accident and emergency units in the West Midlands of England, and a survey of UK practice for severe ankle sprains. *Emerg Med J*: 20: 508–510.
- Waterman BR, Owens BD, Davey S, Zacchilli MA, Belmont PJ Jr. (2010) The epidemiology of ankle sprains in the United States. *J Bone Joint Surg Am*: 92 (13): 2279–2284.

Issues

- A significant number of these injuries do not present to ED.
 - There is evidence that the incidence of ankle injury is 5.5 times that of ED presentations.
- Kemler, E. van de Port, I. Valkenberg, H. Hoes, W. Backx F, (2015) Ankle injuries in the Netherlands: Trends over 10–25 years. *Scand J Med Sci Sports* 2015; 25: 331–337.
 - Hølmer P, Søndergaard L, Konradsen L, Nielsen PT, Jørgensen LN. (1994) Epidemiology of sprains in the lateral ankle and foot. *Foot Ankle Int*: 15: 72–74.
 - Bridgman SA, Clement D, Downing A, Walley G, Phair I, Maffulli N. (2003) Population based epidemiology of ankle sprains attending accident and emergency units in the West Midlands of England, and a survey of UK practice for severe ankle sprains. *Emerg Med J*: 20: 508–510.
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Issues

- Recurrence rates of ankle injury are reported to be as high as 70% with chronic symptoms as high as 74%.
 - Chronic ankle symptoms; subjective disability, mechanical instability and neuromuscular changes are defined as Chronic Ankle Instability (CAI).
 - Researchers suggest a direct link between CAI and post traumatic osteoarthritis in the ankle.
- McKay GD, Goldie PA, Payne WR, Oakes BW. Ankle injuries in basketball: injury rate and risk factors. *Br J Sports Med.* 2001;35(2): 103–108.
- Hintermann B, Boss A, Schafer D. Arthroscopic findings in patients with chronic ankle instability. *Am J Sports Med.* 2002;30(3):402–409.

Issues

- Reduced activity levels reported in individuals with CAI post ankle injury.
- CAI versus normal ankle participants step counts - the CAI group did not meet physical activity guidelines, the normal ankle group exceeded guidelines.
- Poor recovery from ankle injury significantly increases chronic disease risk for these individuals?

Issues

- Ankle injury involves a component of sensorimotor disruption.
 - Unilateral injury with bilateral effects.
 - CAI also correlates strongly with ankle proprioception scores.
- **Witchalls JB**, Waddington G, Adams R, Blanch P. Chronic ankle instability affects learning rate during repeated proprioception testing. *Phys Ther Sport* 2014; **15**: 106-111 .

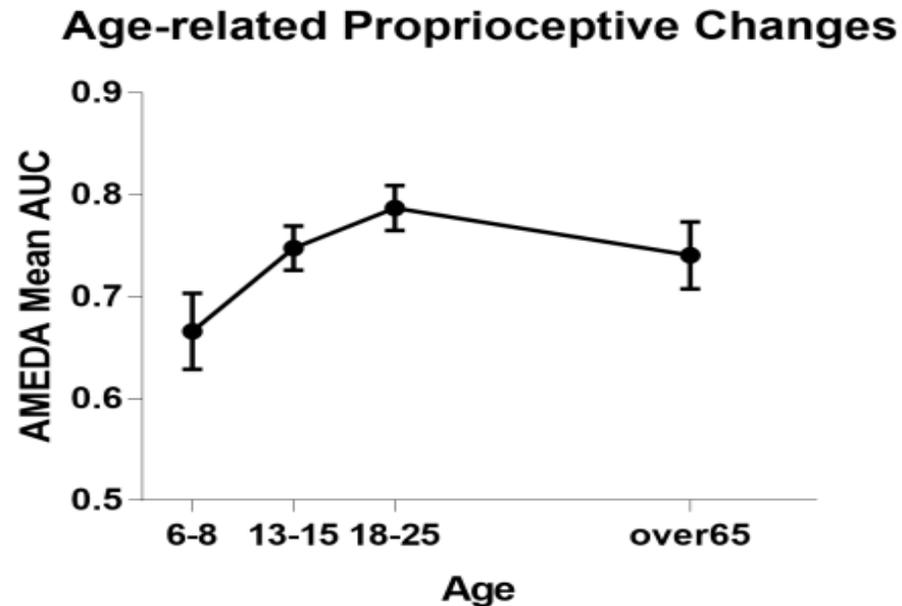


What is the link to walking on Mars?

- Prolonged exposure to microgravity produces significant degradation of somatosensory function in the lower limb, (tactile and proprioceptive function).
- Leads to a dramatic increase in falls risk for astronauts.

What is the link to walking on Mars?

- Is similar to that occurring in CAI (a bilateral reduction in neuromotor function).



What is the link to walking on Mars?

Development of novel mechanisms for the measurement and enhancement of lower limb motor performance in astronauts that has carry over to ankle injury rehabilitation.





The bottom line

- *Consider the neurological aspect of musculoskeletal injury at the ankle.*
- *Best predictor of future injury is previous history*
- *Need to pay attention to getting the best result possible in young ankle injury due to long term effects (subsequent risk of sedentary behaviour and OA, maybe falls risk with age??).*