

Sports and Injuries

Key Messages

- ※ Sport is one of the most widespread leisure activities which enhance one's physical, mental and social health. Taking proper precautions can prevent injuries from spoiling your enjoyment of sports.
- ※ Sports injuries result from a complex interaction of multiple risk factors, circumstances and events that may involve athletes' attributes (e.g. fitness or skill level) and behaviours (e.g. risk taking or safety practices), characteristics of sports (e.g. level of competitiveness or rules of play), playing situations (e.g. duration of the game) and the environment (e.g. weather conditions).
- ※ Acute (traumatic) sports injuries are often the result of a collision or fall during sports. For chronic (overuse) sports injuries, they are caused by repetitive or excessive use of muscles, tendons or joints, or result from an accumulation of damage to the bones.
- ※ In Hong Kong, a telephone survey in 2015 observed that 9.0% of the respondents who participated in sports activities in the 12 months prior to the survey had been injured at least once and the injury episode was serious enough to limit their normal activities. Running, playing soccer and basketball were the most frequently cited types of sports that resulted in injuries.
- ※ Many sports injuries can be prevented with safer sports equipment, use of protective gear, training programmes, modification of rules to prohibit aggressive or dangerous play, provision of safety guidance, upgrading sports facilities and environmental modification. Individual players should also 'play safe' to prevent or reduce the risk of sports injuries.

Sports and Injuries

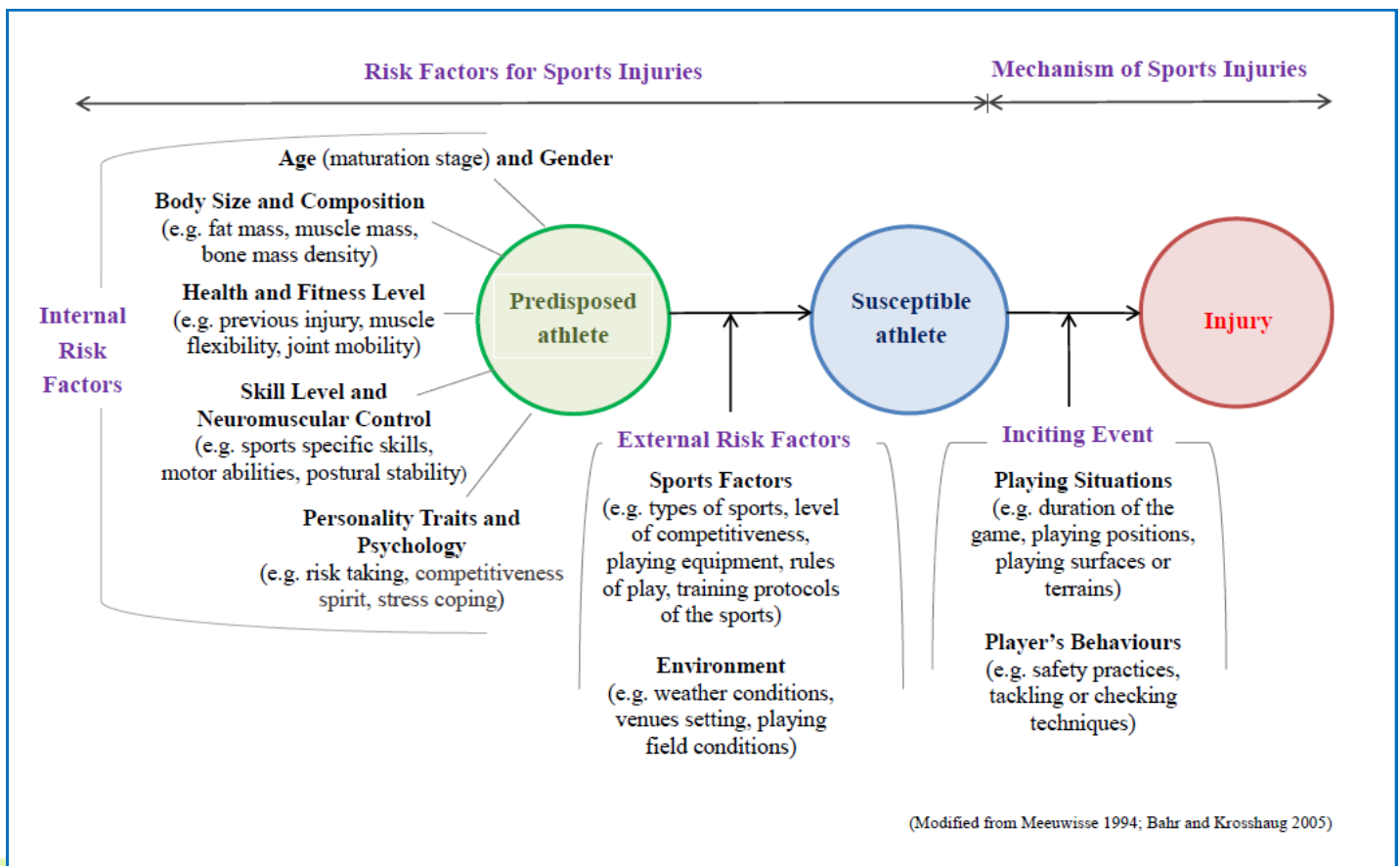
Sport is one of the most widespread leisure activities which enhance one's physical, mental and social health. However, it may seem inevitable for all ages to experience injuries at some point while playing sports. In the United States (U.S.), nearly 2 million people every year suffer from sports injuries and receive treatment in emergency departments.¹ In the European Union, an estimated 14% of all medically treated injuries are related to sports.² Although most sports injuries can be treated, taking proper precautions can prevent their occurrence.

Mechanism of Sports Injuries

Sports injuries usually result from a complex interaction of multiple risk factors, circumstances and events that may involve athletes' attributes and behaviours, characteristics of sports, playing situations and the environment (Figure 1).³⁻⁵

In general, sports injuries fall into two categories: acute and chronic.⁶ For acute (traumatic) sports injuries, they are often the result of a collision or fall during sports, such as clashing into another player, hit by a moving ball or fall from a bike. Examples include sprains (i.e. stretched or torn ligament) and strains (i.e. stretched or torn muscle or tendon), joint dislocations, bone fractures and concussions. Chronic (overuse) sports injuries are caused by repetitive use of muscles, tendons or joints, or result from an accumulation of damage to the bones. This can be due to too much workout in a short period of time or playing the sports in the wrong way. Common chronic sports injuries are muscle strains, tendonitis and stress fracture. While fatalities are very rare in competitive and individual sports, they do exist. The leading cause of death for sports is injury to the brain.⁷

Figure 1: Interaction between risk factors and inciting event in sports injuries



While each sport is played differently, team sports tend to bear a higher risk for both traumatic and overuse injuries compared with individual sports.⁸ Furthermore, each sport has a specific injury profile.⁹ For example, running is one of the most popular physical activities in adults around the world and many cities have their own running events. Studies find that acute running injuries consist mainly of muscle injuries, sprains, blisters or abrasions, and 80% of running injuries are overuse injuries. In long distance runners, a systematic review reported that the incidence of lower extremity running injuries ranged from 19% to 79%. The predominant site of these injuries was the knee.^{10, 11}

Basketball and soccer are popular team sports worldwide. Technically, basketball is considered a non-contact sport. However, there is usually a high level of physical interactions between players on opposing teams to fight for positions or using forearms and elbows to ward off defenders.^{12, 13} Epidemiological studies of collegiate men and women's basketball injuries in the U.S. and Canada reported that about half of the game injuries were resulted from player contact.^{14, 15} As basketball players require repetitive jumping and landing interspersed with running and rapid change of direction, in general, ankle sprains are the most common type of acute injury and patellar tendinopathies (or jumper's knee) are the most common overuse injury.^{12, 13, 16} As a contact/collision sport, soccer carries a significant risk for traumatic injuries as approximately 50% of the soccer injuries occur from direct player-to-player contact. Contact injuries occur when the player is tackling or being tackled, or heading the ball as one or more defenders are impeding the play.^{17, 18} Among adult male players, the injury incidence ranges from 12 to 35 injuries per 1 000 game hours.¹⁹ Among youth players aged 13 to 19 years, the overall injury incidence ranges from 2 to 7 injuries per 1 000 game hours.²⁰ Most soccer injuries occur at the lower extremities, in particular the thigh, knee and ankle. The most common injury types are sprains, strains, fractures and contusions.^{19, 20}

Local Situation

Sports participation is actively promoted for its health benefit in Hong Kong. A territory-wide survey conducted by the Census and Statistics Department of some 10 000 households during September to December 2013 reported that more than half (56.2%) of Hong Kong residents aged 15 and over had participated in sports activities in the one month before enumeration. Among them, over four-fifths (81.0%) had participated in sports activities 4 or more times during the one month before enumeration. Their average duration of participation in sports activities on each occasion was 1.4 hours.²¹

However, sports injuries are also common. The Department of Health conducted the Injury Survey in 2008 to assess the burden of unintentional injuries in the population and estimated that there were about 95 500 sports-related injury episodes which were serious enough to limit the injured persons' normal activities in the 12 months before enumeration. Analysed by the type of sports activities these injuries involved, soccer (26.8%) and basketball (22.3%) topped the list.²²

Likewise, a telephone survey interviewed over 4 200 community-dwelling people aged 18 to 64 in 2015 found that over three-fifths (61.2%) of the respondents had participated in sports activities at least once a week in the 12 months prior to the survey. Overall, 9.0% of the respondents who participated in sports activities in the 12 months prior to the survey reported that they had been injured at least once by taking part in sports activities and the injury episode was serious enough to limit their normal activities. A relatively higher proportion of male respondents (12.5%), those aged 25-34 (12.4%) and service/shop sales workers (13.3%) reported so when compared with their respective counterparts (Table 1).²³

Table 1: Proportion of respondents reported that they had been injured by taking part in sports activities in the 12 months prior to the survey by gender, age group and occupation

Demographic variables		Proportion
Gender	Male	12.5%
	Female	5.8%
Age group	18-24	10.4%
	25-34	12.4%
	35-44	8.5%
	45-54	7.8%
	55-64	6.9%
Occupation	Managerial/Professional worker	11.0%
	Clerk	5.8%
	Service/Shop sales worker	13.3%
	Blue collar worker	7.9%
	Not working	8.0%

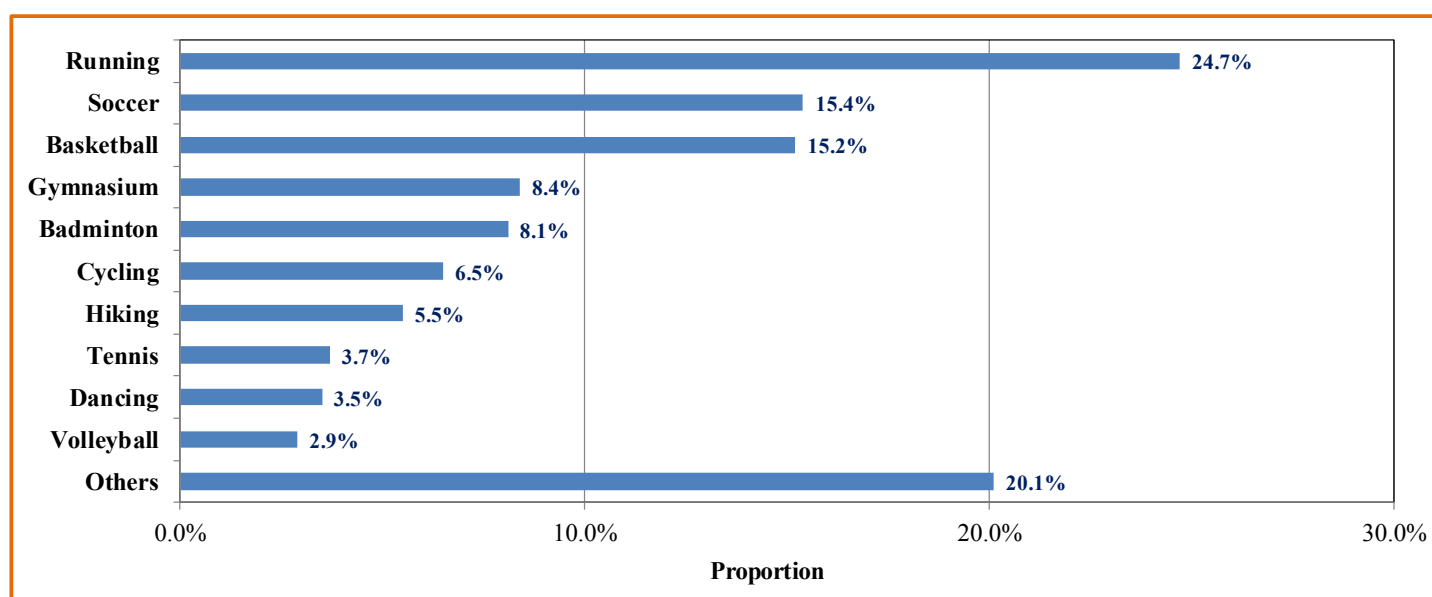
Base: Respondents who participated in sports activities in the 12 months prior to the survey in the respective gender, age or occupation sub-groups.

Source: Behavioural Risk Factor Survey 2015.

Analysed by the type of sports activities engaged in at the time of the injury, about one quarter (24.7%) of them got injured when they were running, 15.4% reported soccer and 15.2% cited basketball (Figure 2).²³ Furthermore, sports-related injuries are a common cause of Accident and Emergency (A&E) Department or Sports Injuries Clinic visit.

An epidemiological study of sports-related ankle injuries attending the A&E Department of the Prince of Wales Hospital in 2005 observed that sports injuries accounted for 12% of all A&E attendances during a 1-year period.²⁴ Every year, the Sports Injuries Clinic at the Prince of Wales Hospital manages over 5 000 sports injury cases.²⁵

Figure 2: Type of sports activities engaged in by the respondents at the time of injury



Note: Multiple answers were allowed.

Source: Behavioural Risk Factor Survey 2015.

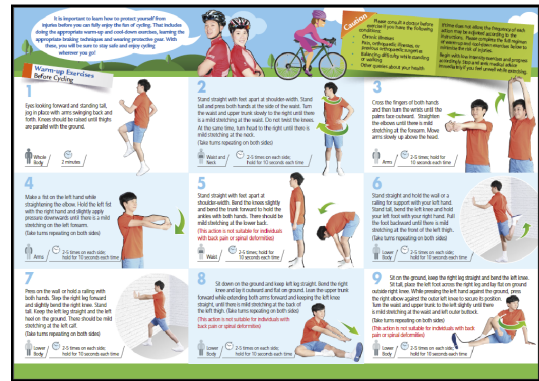
Prevention of Sports Injuries

Considering the manifold positive aspects of regular exercise, refraining from sports is no desired option for not getting injured. Besides, many preventive measures are proven effective in reducing risk of sports injuries. They include: safer sports equipment, use of protective gear, training programmes, modification of rules to prohibit aggressive or dangerous play, provision of safety guidance, upgrading sports facilities and environmental modification (e.g. modifying playing surfaces or increasing the depth of impact-absorbing surfaces around equipment).^{26, 27}

For individual players, the followings are some general sports safety tips that can help prevent or reduce the risk of sports injuries :

- ◇ **Use personal protective gear**, such as helmets, faceguards, eye goggles, knee or elbow pads for specific sports, and ensure they are properly fitted. Check sports equipment regularly and before play to ensure that they are in good condition.
- ◇ **Dress appropriately**, e.g. footwear appropriate to surface and conditions, clothing that is comfortable and suitable for the weather.
- ◇ **Comply with the sports rules**. Treat other players with respect. Follow the safety guidance (such as the 'Safe Cycling Guides' produced by the Transport Department; 'Guidelines on Water Sports Safety' or 'Safety Hints for Hiking' produced by the Leisure and Cultural Services Department).
- ◇ **Learn and use proper techniques and correct postures** for the sports.
- ◇ **Warm up properly before exercise** (e.g. progressive phases of stretching exercises for the trunk and lower extremities, jumping jacks, brisk walking or easy jogging for 10 to 15 minutes) as to prepare the musculoskeletal system for the exercise. **Cool down after exercise** (e.g. with gentle and sustained stretches or walk for about 5 minutes) as to restore the body to its original state.

Cyclists can refer to the pamphlet 'Cycling-specific Warm-up, Cool-down Exercises and Performance Enhancement', which can be accessed and downloaded at http://www.change4health.gov.hk/en/injury_prevention/safety_info/materials/index.html.



- ◇ **Know the body's limit and do not overdo it**. Take breaks and allow adequate recovery time between sessions. Pay attention to body signs, such as pain or swelling. Stop playing and seek medical advice immediately if feeling unwell, including dizziness, nausea, vomiting and shortness of breath.
- ◇ **Stay well hydrated** before, during and after exercise.
- ◇ **Do not play with an empty or full stomach, if feeling unwell or under the influence of drugs and alcohol**.
- ◇ **Pay heed to weather warnings and forecast**, especially undergoing outdoor activities. Members of the public can visit the Hong Kong Observatory website (<http://www.hko.gov.hk/>) for weather information and warnings before hiking and mountaineering, water sports and aviation sports.

For people suffering from chronic diseases or morbid obesity and those who have not exercised in the past or for a while, they are advised to consult their family doctors before starting any sports programmes, increasing or altering the level of exertion. Remember, sport is fun and learning to play a sport can lead to lifetime enjoyment. Although sports injuries sometimes occur, many of them can be avoided. Players should play safe in accordance with ones' capacity and include injury prevention as part of the games.

References

- Misra A. ASPE Issue Brief. Common Sports Injuries: Incidence and Average Charges. Bethesda, MD: U.S. Department of Health and Human Services, 2014.
- Kisser R, Bauer R. The Burden of Sport Injuries in the European Union. Research Report D2H of the Project 'Safety in Sports'. Vienna: Austrian Road Safety Board, 2012.
- Bahr R, Krosshaug T. Understanding injury mechanisms: a key component of preventing injuries in sport. *Br J Sports Med* 2005; 39(6):324-9.
- Meeuwisse WH. Assessing causation in sport injury: a multifactorial model. *Clin J Sport Med* 1994; 4(3):166-70.
- Meeuwisse WH, Tyreman H, Hagel B, Emery C. A dynamic model of etiology in sport injury: the recursive nature of risk and causation. *Clin J Sport Med* 2007; 17(3).
- What Are Sports Injuries. Bethesda, MD: National Institute of Arthritis and Musculoskeletal and Skin Conditions, National Institutes of Health of the U.S. Department of Health and Human Services, 2014.
- Patient Information. Sports-related Head Injury. Rolling Meadows, IL: American Association of Neurological Surgeon, 2014.
- Theisen D, Frisch A, Malisoux L, et al. Injury risk is different in team and individual youth sport. *J Sci Med Sport* 2013; 16(3):200-4.
- Kujala UM, Taimela S, Antti-Poika I, et al. Acute injuries in soccer, ice hockey, volleyball, basketball, judo, and karate: analysis of national registry data. *BMJ* 1995; 311(7018):1465-8.
- van der Worp MP, ten Haaf DS, van Cingel R, et al. Injuries in runners; a systematic review on risk factors and sex differences. *PLoS One* 2015; 10(2):e0114937.
- van Gent RN, Siem D, van Middelkoop M, et al. Incidence and determinants of lower extremity running injuries in long distance runners: a systematic review. *Br J Sports Med* 2007; 41(8):469-80; discussion 480.
- Basketball Injuries - Definition and Anatomy Munich, Germany: FIBA Europe. Available at http://www.fibaeurope.com/cid_VVN9zdHHJOEO8iyoqkT3E3.coid_T2xDfdLXH1sp8bKWk28ka1.articleMode_on.html. [Accessed on 10 March 2016].
- Drakos MC, Domb B, Starkey C, et al. Injury in the national basketball association: a 17-year overview. *Sports Health* 2010; 2(4):284-90.
- Agel J, Olson DE, Dick R, et al. Descriptive epidemiology of collegiate women's basketball injuries: National Collegiate Athletic Association Injury Surveillance System, 1988-1989 through 2003-2004. *J Athl Train* 2007; 42(2):202-10.
- Dick R, Hertel J, Agel J, et al. Descriptive epidemiology of collegiate men's basketball injuries: National Collegiate Athletic Association Injury Surveillance System, 1988-1989 through 2003-2004. *J Athl Train* 2007; 42(2):194-201.
- McKay GD, Cook, J. Basketball. In Caine DJ, Harmer PA, Schiff MA, eds. *Epidemiology of Injury in Olympic Sports*, Volume XVI. Oxford, UK: Wiley-Blackwell, 2009.
- Koutures CG, Gregory AJ. Injuries in youth soccer. *Pediatrics* 2010; 125(2):410-4.
- Rahnama N. Prevention of football injuries. *Int J Prev Med* 2011; 2(1):38-40.
- Constantinou D. Football injuries - surveillance, incidence and prevention. *CME* 2010; 28(5):220-5.
- Faude O, Rossler R, Junge A. Football injuries in children and adolescent players: are there clues for prevention? *Sports Med* 2010; 43(9):819-37.
- Thematic Household Survey Report No.56. Pattern of Participation in Social and Leisure Activities. Hong Kong SAR: Census and Statistics Department, 2015.
- Injury Survey 2008. Hong Kong SAR: Department of Health.
- Behavioural Risk Factor Survey April 2015. Hong Kong SAR: Department of Health.
- Fong DT, Man CY, Yung PS, et al. Sport-related ankle injuries attending an accident and emergency department. *Injury* 2008; 39(10):1222-7.
- Sport Medicine and Arthroscopy: Clinical Service. Hong Kong SAR: Department of Orthopaedic & Traumatology, The Chinese University of Hong Kong. Available at www.ort.cuhk.edu.hk/clinical-sport.html [Accessed on 31/05/2016].
- Action Plan to Strengthen Prevention of Unintentional Injuries in Hong Kong. Hong Kong SAR: Department of Health, 2014.
- Woods K, Bishop P, Jones E. Warm-up and stretching in the prevention of muscular injury. *Sports Med* 2007; 37(12):1089-99.

Leisure and Cultural Services Department
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全民運動日

Sport For All Day

7.8.2016

日日運動 半個鐘 Stay Active Scale New Heights

免費康體活動 (在各區指定體育館舉行)
Free Recreation and Sports Programmes
(Available at designated sports centres in all districts)

7月18日上午8時30分起於各區康樂事務辦事處及指定場地接受報名
Enrolment starts at 8:30 am on 18 July at relevant District Leisure Services Offices and designated venues

免費使用康樂設施 (除沙灘足球場、運動場及營地設施外)
Free Use of Leisure Facilities
(Except turf soccer pitches, sports grounds and camp facilities)

7月31日上午9時起於各康體通訂場櫃檯接受預訂
Booking starts at 9:00 am on 31 July at all Leisure Link booking counters

先到先得 First come, first served

查詢 Enquiry: 2414 5555 | www.lcsd.gov.hk
青島康樂事務辦事處 District Leisure Services Offices

To know more about the 'Sport For All Day 2016', please visit <http://www.lcsd.gov.hk/en/sfad/2016/index.html>.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.

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