Prevention and management of sporting injuries in the pharmacy

It's hard to believe it has been almost a year since the world was hit with the Covid-19 pandemic and with it came numerous restrictions on various sports and activities. However, despite these restrictions, Sport Ireland highlighted in a series of recent reports that the number of adults participating in sport and recreation during the Covid-19 restrictions is unprecedented in the history of Sport Ireland. These reports highlight that 51 % of adults are participating in sport, with exercise, running, and cycling being the predominant ones. Additionally the proportion of adults described as sedentary in the National Sport Policy has also declined to 11 % compared to 22 % during the same period in 2019. This is reported to be the lowest level of sedentarism ever recorded by Sport Ireland.

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Consequently, the Spring of 2021 is likely to see an increase in injuries in a variety of populations. Such as those who have been inactive for a period of time during lockdown and then suddenly increase their activities, those who have been filling their spare time with a significant increase in activity and those that have spent their time in their gardens.

The International Olympic Committee (IOC) define sports injury as a new or reoccurring musculoskeletal complaint incurred during competition or training that requires medical attention regardless of the potential absence from competition. The following are further subgroups that may present to a pharmacy. Acute injury refers to a single event that leads to a singular macrotrauma on previously healthy tissue, e.g. sudden ankle sprain, joint dislocation or a ruptured tendon. Overuse injuries, also referred to as chronic injuries, occur as result of repetitive loading, usually with inadequate recovery causing repeated injury to muscles, tendons, ligaments and bones, e.g. rotator cuff tendinopathy. An acute on chronic injury is an acute exacerbation of a chronic injury. Pain associated with any sport injury is generally classified as acute (pain duration up to 6 weeks), subacute (pain duration between 6-12 weeks) or chronic (pain duration of 3 months or longer). However, of note, the IOC advise how pain can occur without injury and sports injury may not necessarily manifest with pain, they are therefore not synonymous.

Whether adults are beginning exercise from a sedentary lifestyle or returning to activity from a period of lockdown, the following tips, that apply to all age groups, may help.

Wear correct comfortable clothing and shoes: Recent research advises people to choose footwear and clothing that are comfortable rather than succumbing to advertising pressures and marketing gimmicks suggesting certain sports clothing will make you perform better. If you are not comfortable you can't perform or enjoy your activity.

Ensure you include a warm up and cool down: The aim of a warm up is raise your heart rate and to prepare your body and neuromuscular system for performance. Equally important is a cool down, which aims to lower your heart rate and blood pressure. Warm-up examples include 5-10 min of jumping jacks or jogging on the spot and warm-down

examples include a light jog / walk followed by light stretching. Studies investigating sport specific warm-up programs such as the " FIFA 11" or "GAA 15" have shown injury rates can be reduced by as much as 70 %. Elderly patients may want to participate in a lower intensity warm up – such as a fast walk, however if they have any pre-existing health conditions they may want to speak to their GP first.

Always increase or start off any exercise programme gradually. It is estimated that 80% of running injuries are due to overuse. i.e excessive load by doing too much too soon.

Patellofemoral pain, patella tendinopathy and ITB syndrome are associated with a change in training volume and achilles tendinopathy, calf overuse injuries and plantar fasciopathy are associated with change in training pace. A general overall guide is don't increase both at the same time. Increase duration of training first followed by intensity and only increase by 10 % of each per week. For example, one week increase duration and the following week increase intensity.

Factor in sleep and recovery time. Always have 1 or 2 rest days within the week and try to follow a hard day with an easy day, equally follow a hard week with an easy week and within the month a rest / decreased activity week. While everyone's sleep needs vary, it is generally recommended to have at least 7-9 hours sleep per night. With adequate sleep, muscle protein synthesis occurs and human growth hormone is released, both of which are necessary for neuromuscular recovery and are essential for progression.

Include strength training and some variety to a routine. Strength training has been shown to reduce the risk of acute injury by 30% and overuse injuries by 50%. Increasing the strength in your muscles will allow them to take more load and demand. Equally adding variety to an exercise program, such as cross training, will work your muscle groups differently which will prevent repetitive stress on certain muscle groups. An example for both of the above includes body weight circuits. As we get older balance training should also become an essential part of our training regime. Persons over 65 years of age are at higher risk of falls and therefore would benefit from including balance exercises into their program.

Do remember there are several non-musculoskeletal factors that can place people at higher risk of certain injuries such as diet, age, high or low BMI, metabolic factors, e.g. Chrohns Disease and hormonal changes. Additionally there a numerous psychological factors that may contribute to injury that should be considered such as stress, mood, thoughts and beliefs, fear, motivation, rehab behaviours and attitude to exercise.

Most musculoskeletal (MSK) Chartered Physiotherapists are in a position to guide persons on all the topics discussed above. It is advised to build a relationship with the local Physiotherapists in your area, who patients can be referred to should they present with certain sports injuries or pathologies. Regardless of increased emphasis on injury prevention advice as described above, reinjury occurrence and presentations to Physiotherapists for musculoskeletal injuries remains prevalent.

Rehabilitation of soft tissue injuries can be complex and as reinjury rates can be high for certain injuries, initial optimal management is key. Over the years acronyms guiding their acute management have included ICE (Ice, Compression, Elevation) to RICE (Rest included), PRICE (introduction of Protection), then onto POLICE (Protection, Optimal Loading, Ice, Compression and Elevation). POLICE is predominantly promoted for the majority of injuries, with the 'Optimal loading' replacing Rest as the only major innovation from the older used acronyms.

Protection in the early stages (1-3 days) of injury is essential to reduce bleeding, reduce risk of aggravating an injury and prevent distention of injured fibres. This may involve shielding the area or restricting joint movement for various periods and at various levels of restrictions. This level of protection may require taping, a support or brace or even a short period of non-weight bearing. Essentially the level of protection is guided by the nature of the injury and should be advised following assessment by an experienced clinician. Therefore, while there are numerous products of braces and supports on the market the specific recommendation of one can be advised by an experienced clinician.

The afore-mentioned 'Rest' element in injury management is less definitive and risks misinterpretation, therefore has been replaced with 'Optimal Loading'. Prolonged rest can produce adverse changes in muscle strength, tensile strength, tissue morphology, and biomechanical properties. Thus, early progressive tissue loading is thought to be superior to rest as it can promote cellular responses that promote tissue structure change, restore mobility strength and function after injury. Again, this should be guided by an experienced clinician depending on the nature of the injury.

Ice, Compression and Elevation remain stable components of injury management. Ice, cold therapy, can be used to cool injured tissue

with the aim of reducing pain and tissue damage and enhancing function. Cooling skin to less than 15'C should be advised for 10-15 minutes every 2-4 hours. Whilst there is a common assumption that ice decreases inflammation, unfortunately muscle tissue cannot be readily cooled and thus is difficult reach low temperatures to reduce cellular metabolism.

Compression and Elevation : Oedema, i.e. excessive fluid, is a sign of inflammation post-acute injury and though aspects of inflammation are essential for tissue healing, prolonged excess fluid can lead to increased tissue pressure causing pain, movement restrictions and muscle inhibition. Compression, usually in the form of bandage application can assist with the above however depending on the time since injury and injury type, a bandage may be applied for protection purposes to prevent further bleeding, i.e pitch side management. Therefore, bandage application should be guided by a clinician experienced in acute care. Elevation is thought to decrease the fluid in the affected joint by raising it higher than the heart, as a general guide, and for the first 72 hours.

While following POLICE it is also important to. avoid HARM in the first 72 hours : Heat (e.g hot bath, sauna), Alcohol, Running and Massage).

The treatment of any musculoskeletal injury, either acute, chronic or acute on chronic, predominantly focuses on reducing pain, facilitating restoration of safe functioning or return to sports, while reducing the risk of re-injury / any other injury and any psychological stress, and promote health. To go into detail on the management of all injuries likely to be seen in the community pharmacy is beyond the scope of this article and thus the author has focused on 3 prevalent injuries.

Back Pain

Almost everyone will suffer an episode of low back pain in their lives and it's important to note that even the most severe episodes of low back pain can resolve within 6-8 weeks. Additionally, research has shown that pain does not equal damage. Whilst most people believe having an MRI or X ray will identify the source of their pain, this is rarely the case and thus the NICE guidelines advise not to recommend imaging in a non-specialist clinic and to only consider imaging when it will likely change the management of their low back pain. Interestingly, usage of scans can lead to worse (not better outcomes) when used too frequently. A GP or Physiotherapist should be able to identify signs and symptoms which may warrant further imaging and if someone has severe, persistent or reoccurring low back pain they should see a GP or Physiotherapist to further assess, and educate the patient, and introduce possible interventions which may reduce the incidence and severity of low back pain flares ups. The NICE guidelines do recommend providing people with advice and information on the management of low back pain, (https://www.nhs.uk/conditions/back-pain/) and sciatica and encouragement to continue with normal activities. These guidelines advise limited use of paracetamol as a stand-alone treatment for low back pain and to consider use of oral NSAIDS for managing low back pain, taking into account potential differences in gastrointestinal, liver and cardio-renal toxicity, and the person's risk factors, including age. For a more in depth explanation please see https://www.nice.org.uk/guidance/conditions-and-diseases/musculoskeletal-conditions/low-back-pain

Ankle sprain

Lateral ankle sprain (LAS) injury is a highly prevalent injury in the general population. A first-time ankle sprain can lead to chronic ankle instability (CAI), which is defined as persistent complaints of pain, swelling and / or giving way in combination with recurrent sprains for at least 12 months. This in turn can lead to long term absence from activity / sport and in some cases work. There has been debate on the use of pharmacological treatments post LAS, however a recent systematic review has advised that NSAIDs may be used by patients for the primary purpose of reducing pain and swelling. Care should be taken in NSAID usage as it is associated with complications and may suppress or delay the natural healing process.

This systematic review further advises that the use of a brace or taping should be considered to prevent further ankle sprains.

It is important to note again that although there is a huge amount of supports and braces on the market it is difficult to recommend specific types as all injuries generally require an assessment first in order to advise on an intervention. It might be worth getting to know your local Physiotherapist and liaising with them on the braces and supports they are most likely to recommend for their patients for a variety of injuries.

Shoulder pain

Disorders of the rotator cuff (RC) tendons are the most common pathology of the shoulder, with RC tendinopathy accounting for 35 % to 50% of rendered diagnoses. RC tendinopathy is a generic term used to describe a pathology in a RC tendon and again a recent systematic review has advised the use of NSAIDS to improve pain and function however not beyond 2 weeks.

The IOC has recommended the use of oral paracetamol, NSAIDS and topical analgesics in the management of athletes with acute pain. Please see table 1 with reference, for more details. They also advise that medications should not be a stand-alone treatment and it is essential to diagnose the injury and the cause of the pain and to begin rehabilitation to address both. For those with chronic pain, non-pharmacological strategies addressed by a GP or Physiotherapist may be the best way forward. Long term use of pharmacology treatments is not recommended.

Whilst pharmacists may face numerous presentations in the community, it's important to note that most injuries have physiological contributing factors and should a patient wish to prevent reinjury, reduce pain further and maximise function they should be assessed by a Chartered Physiotherapist. However, if a patient presents with pins and needles, numbness, weakness, new loss of any function an onward referral to a Chartered Physiotherapist or GP is essential.

References available on request

Table 1 Medication management for acute pain and same-day return to play

mild to moderate pain	
Paracetamol (oral)	Loading dose up to 2 g, then 325–1000 mg PO every 4–6 hours, up to 4 g per 24 hours
NSAIDs (oral)	• ► Ibuprofen: 400–800 mg every 4–6 hours with food, up to 3200 mg per 24 hours • ► Naproxen: 250–500 mg 2× daily with food • ► Ketorolac: 10 mg every 4–6 hours with food, up to 40 mg per 24 hours • ► Celecoxib: 200–400 mg 2× daily • ► Etoricoxib: 90–120 mg once daily
Topical analgesics	• ► Rubefacients: methyl salicylate; turpentine oil; ammonia water • ► Cooling sensation: camphor; menthol • ► Vasodilation: histamine dihydrochloride; methyl nicotinate • ► Irritation without rebefaction: capsaicin; capsicum oleoresin

Taken from Hainlain B, Derman E, Vernec A, Budgett R, Deie M, Dvorak J, Harle C, Herring S A, McNamee M, Meeuwisse W, Moseley G L, Omololu B, Orchard J, Pipe A, Pluim B M, Raeder J, Siebert C, Stewart M, Stuart M, Turner J A, Ware M, Ziderman D and Engerbretsen L. (2017). International Olympic Committee consensus statement on pain management in elite athletes. *British Journal of Sports Medicine*. (51) pp 1245-1258.