A person’s level of physical activity influences his/her risk of infection, most likely by affecting immune function. Regular moderate exercise reduces the risk of infection compared with a sedentary lifestyle, but very prolonged bouts of exercise and periods of intensified training are associated with increased infection risk [1, 2]. Acute bouts of exercise cause a temporary depression of various aspects of immune function that will usually last for up to 24 h after exercise, depending on the intensity and duration of the exercise bout. Several studies indicate that the incidence of symptoms of upper respiratory tract illness (URTI) is increased in the days after prolonged strenuous endurance events, and it has been generally assumed that this reflects the temporary depression of immune function induced by prolonged exercise. More recently, it has been proposed that at least some of the symptoms of URTI in athletes are attributable to upper airway inflammation rather than to infectious episodes [2]. Periods of intensified training lasting a week or more have been shown to depress immune function, and although elite athletes are not clinically immune deficient, it is possible that the combined effects of small changes in several immune factors may compromise resistance to common minor illnesses, particularly during periods of prolonged heavy training and at times of major competitions.

The most common illnesses in athletes (and in the general population) are viral infections of the upper respiratory tract (i.e. the common cold) which are more common in the winter months, and adults typically experience 2–4 URTI episodes per year. Athletes can also develop similar symptoms (e.g. sore throat) due to allergy or inflammation caused by inhalation of cold, dry or polluted air. In themselves, these symptoms are generally trivial, but no matter whether the cause is infectious or allergic inflammation, they can cause an athlete to interrupt training, underperform or even miss an important competition [2]. Prolonged bouts of strenuous exercise and periods of hard training with limited recovery
and/or inadequate energy intake may compromise the body’s immune system, reducing its ability to fight opportunistic infections [2]. Other factors such as psychological stress, lack of sleep and malnutrition [3] can also depress immunity and lead to increased risk of infection (fig. 1). There are also some situations in which an athlete’s exposure to infectious agents may be increased, which is the other important determinant of infection risk [4].

There are several behavioral, nutritional and training strategies (fig. 2) that can be adopted to limit exercise-induced immunodepression and minimize the risk of infection [4]. Athletes and support staff can avoid transmitting infections by avoiding close contact with those showing symptoms of infection, by practicing good hand hygiene, oral hygiene and food hygiene, and by avoiding sharing drinks bottles and cutlery. Medical staff should consider appropriate immunization for their athletes particularly when travelling to international competitions. The impact of intensive training stress on immune function can be minimized by getting adequate sleep (at least 7 h per night is recommended), minimizing psychological stress, avoiding periods of dietary energy restriction, consuming a well-balanced diet that meets energy and protein needs, avoiding deficiencies of micronutrients (particularly iron, zinc, and vitamins A, D, E, B₆ and B₁₂), ingesting carbohydrate (30–60 g per hour) during prolonged training sessions, and consuming – on a daily basis – plant polyphenol (e.g. quercetin)-containing supplements or foodstuffs (e.g. non-alcoholic beer) [5] and *Lactobacillus* probiotics [6]. Many other nutrition supplements, including β-glucan, colostrum, echinacea, glutamine, zinc and others, are on sale.
with claims that they can boost the immune system, but there is no strong evidence that any of these are effective in preventing exercise-induced immune depression [6].

References