**Literatuur abstracts jet lag and respiratory infections**

Korzeniewski K, Nitsch-Osuch A, Chcialowski A, Korsak J. **Environmental factors, immune changes and respiratory diseases in troops during military activities**. Respiratory physiology & neurobiology. Elsevier; 2013;187:118–122.

Combat operations in contemporary theaters of war, as well as combat training, are carried out in all parts of the world, typically in a harsh environment. Specific environmental conditions, such as heat, cold, high-altitudes, desert climates, as well as chemical and biological pollution of both the atmosphere and soil, together with over-exertion, food restrictions, sleep deprivation, and psychological stress can all result in changes in the immune system and the occurrence of associated diseases. Respiratory diseases are one of the most common health problems among military personnel participating in combat training or deployed to operations in areas characterized by difﬁcult climatic and sanitary conditions. They are, therefore, one of the main reasons for military personnel requiring ambulant and hospital treatment. The aim of the study was to discuss the inﬂuence of environmental factors and the conditions in which active duty is performed on changes in the immune system and the occurrence of respiratory tract diseases in a military environment.

*Militair personeel loop een groot risico op luchtwegaandoeningen door hun stressvolle werk, de moeilijke omstandigheden en blootstelling aan nieuwe ziekteverwekkers bij training of missies in het buitenland. Het immuunsysteem wordt op de proef gesteld door psychologische stress, te weinig slaap, een negatieve energie balans, verschuivingen in het 24-uurs ritme en blootstelling aan hitte, kou en hoogte. Hierdoor kunnen ziekten ontstaan, met name luchtweginfecties.*

Leder K, Newman D. **Respiratory infections during air travel**. Internal medicine journal. Wiley Online Library; 2005;35:50–55.

An increasing number of individuals undertake air travel annually. Issues regarding cabin air quality and the potential risks of transmission of respiratory infections during flight have been investigated and debated previously, but, with the advent of severe acute respiratory syndrome and influenza outbreaks, these issues have recently taken on heightened importance. Anecdotally, many people complain of respiratory symptoms following air travel. However, studies of ventilation systems and patient outcomes indicate the spread of pathogens during flight occurs rarely. In the present review, aspects of the aircraft cabin environment that affect the likelihood of transmission of respiratory pathogens on airplanes are outlined briefly and evidence for the occurrence of outbreaks of respiratory illness among airline passengers are reviewed.

*Hoewel er regelmatig onrust is over de luchtkwaliteit en de verspreiding van luchtwegpathogenen in vliegtuigen, blijkt uit studies van zowel ventilatiesystemen als onder passagiers dat het verspreiding van micro-organismen zelden optreedt. Dit komt onder meer door de luchtverversing met relatief schone lucht van buiten, verhitting en koeling dat bacteriegroei tegengaan, gebruik van HEPA filters bij recirculatie, lage luchtvochtigheid, hoge ventilatie rate. Slechts bij nauw contact tussen passagiers worden micro-organismen mogelijk overgedragen.*

Wilder-Smith A, Mustafa F, Earnest A, Gen L, MacAry P. **Impact of partial sleep deprivation on immune markers**. Sleep medicine. Elsevier; 2013;14:1031–1034.

Background: Sleep quality is considered to be an important predictor of immunity. Lack of sleep therefore may reduce immunity, thereby increasing the susceptibility to respiratory pathogens. A previous study showed that reduced sleep duration was associated with an increased likelihood of the common cold. It is important to understand the role of sleep in altering immune responses to understand how sleep deprivation leads to an increased susceptibility to the common cold or other respiratory infections.
Objective: We sought to examine the impact of partial sleep deprivation on various immune markers. Patients and methods: Fifty-two healthy volunteers were partially sleep deprived for one night. We took blood samples before the sleep deprivation, immediately after, and 4 and 7 days after sleep deprivation. We measured various immune markers and used a generalized estimating equation (GEE) to examine the differences in the repeated measures.
Results: CD4, CD8, CD14, and CD16 all showed signiﬁcant time-dependent changes, but CD3 did not. The most striking time-dependent change was observed for the mitogen proliferation assay and for HLA-DR. There was a signiﬁcant decrease in the mitogen proliferation values and HLA-DR immediately after the sleep deprivation experiment, which started to rise again on day 4 and normalized by day 7.
Conclusions: The transiently impaired mitogen proliferation, the decreased HLA-DR, the upregulated CD14, and the variations in CD4 and CD8 that we observed in temporal relationship with partial sleep deprivation could be one possible explanation for the increased susceptibility to respiratory infections reported after reduced sleep duration.

*Onderzoek naar partiële slaap deprivatie gedurende een nacht op een aantal immuunmarkers bij 52 gezonde vrijwilligers. Bloedonderzoek voor, direct na, 4 en 7 dagen nar slaapdeprivatie. Voor CD4, CD8, CD14 en CD16 werden significante veranderingen gevonden in de tijd. De mitogen proliferatie was tijdelijk afgenomen evenals HLA-DR, verbeterd na 4 dagen en genormaliseerd na 7 dagen. De onderzoekers menen dat deze veranderingen een verklaring kunnen zijn voor de toegenomen gevoeligheid voor luchtweginfecties na een tekort aan slaap.*

Reilly T, Edwards B. **Altered sleep–wake cycles and physical performance in athletes**. Physiology & behavior. Elsevier; 2007;90:274–284.

Sleep – waking cycles are fundamental in human circadian rhythms and their disruption can have consequences for behaviour and performance. Such disturbances occur due to domestic or occupational schedules that do not permit normal sleep quotas, rapid travel across multiple meridians and extreme athletic and recreational endeavours where sleep is restricted or totally deprived. There are methodological issues in quantifying the physiological and performance consequences of alterations in the sleep – wake cycle if the effects on circadian rhythms are to be separated from the fatigue process. Individual requirements for sleep show large variations but chronic reduction in sleep can lead to immuno-suppression. There are still unanswered questions about the sleep needs of athletes, the role of ‘ power naps ’ and the potential for exercise in improving the quality of sleep.