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(P100062)

**Where are we headed? Evidence to inform future heading guidelines**

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**Introduction:** Football is one of the few sports whereby the head is purposefully used as a key requirement of the game, with the skill of heading taught from a young playing age. There is current scientific and public concern over the uncertainty of short-, medium- and long-term consequences of heading on brain health. Hence, a precautionary approach to mitigate any possible risks is desirable whilst the evidence remains equivocal. One such approach is being proactive about developing and implementing strategies and guidelines that help reduce the burden (volume and intensity) of heading in young and beginner players, which requires integration of a multitude of topics to inform such strategies.

**Objective:** This narrative review explores the current evidence underpinning strategies that could be incorporated into future heading guidelines to reduce heading burden in players across all levels of football.

**Methods:** A four-step search strategy was utilised to identify all data-based papers related to heading in football. Eligibility criteria for inclusion: 1) original data; 2) study population included football players, 3) outcome measures included one or more of the following: number of headers, measurement of head acceleration during heading, or head injury incidence; and 4) published in English or an English translation available.

**Results:** In total, 62 papers were included. Evidence suggests that future heading guidelines should consider the following: 1) Developing a heading coaching framework which emphasises the technical proficiency of heading, 2) greater emphasis on small-sided games, particularly in young players, to limit the total number of headers per week. This is particularly focused on training for players who complete higher numbers of headers in games, whilst also reducing headers from goal kicks and punts. 3) Neuromuscular neck exercises integrated into general injury reduction exercise programs (such as FIFA 11+), 4) enforcement of rules related to deliberate head contact and 5) using lower-pressure match balls.

**Conclusion:** To mitigate the potential risk of heading on long term brain health, scientific evidence suggests that there are a number of pragmatic strategies that can be incorporated into future heading guidelines. It is also recommended that an implementation and evaluation plan which is co-designed by health professionals, researchers, coaches, players and other important stakeholders is developed in tandem to optimise the potential adherence to, and benefits from, any future heading guidelines.

**Impact/Application to the field:** This review is the first to outline the current evidence and make recommendations for the inclusion of different strategies into future heading guidelines to reduce heading burden in football players. These results can assist football governing bodies worldwide when drafting and standardising heading guidelines to protect the long-term brain health of current and future generations of players.

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**Occupational risk factors for the development of disc herniation in physically demanding occupations: a rapid review**

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**Introduction:** Herniation, also known as prolapse, of the intervertebral discs is a common cause of back pain and sciatica. Risk factors include genetics, trauma, and repetitive activity arising from recreation or working in physically demanding occupations. Disc herniation can limit mobility and the ability to handle and move objects, reducing the capacity to work. The aim of this rapid review was to identify and review studies that reported occupational risk factors for the development of intervertebral disc herniation in physically demanding occupations.

**Method:** This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA), and methods were detailed in a protocol published in advance. PubMed, SPORTDiscus, CINAHL, and ProQuest databases were systematically searched using terms derived from four themes: 'disc', 'herniation', 'work', and 'risk'. Eligible studies were critically appraised with specific tools for each type of study design to assess their methodological quality, and a narrative synthesis of the findings was completed.

**Results:** Eleven articles were included that reported on physically demanding occupations and occupational tasks. Operators of earthmoving machines with high perceived workload, high vibration, and moderate spinal load were found to experience a greater 12-month incidence of lumbar disc herniation (9.6%) than drivers less exposed to these factors (2.3%;  $p=0.012$ ). Results also revealed that retail workers exposed to biomechanical overload were at an increased risk of lumbar disc herniation compared to those not exposed (aOR=3.82; 95% CI 3.08-4.74). Truck drivers exposed to loading vehicles more than three times per day appear to have a higher prevalence of cervical disc herniation than those loading their trucks less than twice a day; however, this difference was not statistically significant (OR=9.0; 95% CI, 0.4-182.8). Occupational tasks including physical overload, handling heavy loads, self-reported hard work, and exposure to moderate and high levels of manual handling of loads were all associated with increased risk of lumbar disc herniation. Additionally, handling loads with trunk inclination appears to exacerbate the risk.

**Discussion:** Specific physically demanding occupations and tasks with a high physical workload, a high requirement for manual materials handling, and trunk inclination appear to place workers at increased risk of disc herniation. Occupations which are perceived as involving hard work also appear to increase the risk of disc herniation. Data reporting on cervical spine disc herniations is limited, with most of the research being on lumbar spine herniations.

**Impact:** The identified factors and tasks known to increase the risk of disc herniation must be carefully managed in staff with existing back pathologies and as part of return-to-work plans.

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