

# Recovery from sports-related concussion slower than believed

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This is Sanna Neselius, specialist doctor and research student, The University of Gothenburg, Sweden. Credit: University of Gothenburg

Scientists at the Sahlgrenska Academy have shown that analysis of the cerebrospinal fluid after concussion can be used to determine the magnitude of brain injury and to follow its course. The studies show that recovery from concussion takes much longer time than previously known, and this may be of major significance for athletes of all ages in return to play considerations.

Sanna Neselius is a scientist at the Sahlgrenska Academy and member of the medical commission of the Swedish Boxing Federation. Her previous studies have shown that amateur boxing causes damage to nerve cells, that can take more than two weeks to heal. This discovery led to her being offered a place in the International Olympic Committee's expert group for boxing-related head injuries.

Sanna Neselius has now defended her doctoral thesis at the Sahlgrenska Academy, in which she shows that sports-related concussion heals much slower than previously known.

## **Four months recovery**

"It has previously been believed that concussion heals in 7-10 days, and the Swedish Boxing Federation has decided the rest period to be of one month after a concussion, in order to be on the safe side. But our studies show that a concussion, such as may be experienced after being knocked out, can take more than four months to heal," says Sanna Neselius, who is herself a former boxer.

Further, the results show that repetitive head trauma in boxing, damages nerve cells in the brain, even though the boxer may not show any concussion symptoms.

## **Prevent resuming too early**

Concussion is one of the most common sports-related injuries, and more athletes experience it every year. In recent years, focus has been directed on the effects of repeated concussions, in which athletes in such sports as ice hockey may be affected by long-term effects.

The [cerebrospinal fluid](#) samples analysed by Sanna Neselius and her colleagues can be followed until normalization and thereby be a valuable tool to prevent athletes resuming sport too early.

"The assessment today is often based on physical symptoms, neuropsychological tests, and the neurological examination of the athlete. Our studies show that these tests are not sensitive enough, nor can we rely on the athletes self-reported lack of symptoms. Concussion symptoms usually pass after a few days, but the neurological damage may still be present," says Sanna Neselius.

## Safe rehabilitation

She continues: "The first sample is recommended to be taken 10-14 days after the concussion. This allows us to see the magnitude of the injury, and gives an idea of how long the healing process will be. I hope that [brain injury](#) markers in the cerebrospinal fluid, and hopefully also later in blood, can be used at all levels in all sports. By this we can use individual measurements to plan and guarantee safe rehabilitation."

Sanna Neselius points out that the brains of children and adolescents are more sensitive and require longer time to heal.

The thesis Diagnosis and monitoring of sport-related [concussion](#) – a study in amateur boxers was defended at a disputation on May 16.

**More information:** Thesis: [gupea.ub.gu.se/handle/2077/35195](https://gupea.ub.gu.se/handle/2077/35195)

Provided by University of Gothenburg

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