

# New study tracks perils of water polo head injuries

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Water polo athletes take note: A new study by University of California, Irvine researchers maps out the frequency of head injuries in the sport and reveals which positions are the most vulnerable.

The first-of-its-kind report, which tracked several dozen male collegiate water polo players over three seasons, was published today in *PLOS One*, a peer-reviewed, open-access scientific journal.

"For years, water polo's [head](#) trauma risks have been downplayed or overshadowed by football-related brain injuries," said study co-author James Hicks, professor and chair of UCI's Department of Ecology & Evolutionary Biology. "Our data quantifies the extent of the problem and sets the stage for additional research and possible rule changes or [protective gear](#) to improve water polo safety."

During the study, players wore caps embedded with electronic sensors. Over time, every participant got bopped in the head by balls or rival players, but some fared worse -occasionally far worse—than others.

Offensive players were more likely to get battered than defensive and transition positions (60 percent

versus 23 percent and 17 percent, respectively). And swimmers attacking from the left side of the goal suffered more head hits than players on the right, possibly because right-handed athletes commonly throw shots from the left zone, so there's more activity in that area, researchers theorized.

The most unsafe position, according to the study, was offensive center. On average, those players endured nearly seven blows to the skull per game, which amounted to 37 percent of all head impacts recorded by UCI scientists. In contrast, the second-most vulnerable position, defensive center, averaged two head strikes a game, the study found.

Overall, researchers counted an average of 18 head hits per game. Although no concussions were diagnosed, the force of the blows was "similar to those observed in collegiate soccer, another sport that is commonly studied for the risks associated with repeated head impact exposure," Hicks said.

Next up, UCI researchers are preparing a manuscript that details how [water](#) polo head shots affect brain function.

Hicks got interested in the subject while watching his three sons play the sport. "People who've never seen a game may not realize how physical it is," he said. "Head-butts and elbows. Balls flying up to 50 mph. I've witnessed players get dragged out of the pool in a daze after a blow to the head, and I've sat in an emergency room while my kid received stitches from being struck in the face. I began to wonder what the concussion rate was."

After discovering a dearth of studies, he launched his own. In the first, published three years ago in *Frontiers in Neurology*, Hicks and Dr. Steven Small, UCI professor of neurology, surveyed 1,500 USA Water Polo members and discovered that 36 percent recalled suffering at least one concussion during their playing career.

**More information:** Nicholas J. Cecchi et al, Head impacts sustained by male collegiate water polo athletes, *PLOS ONE* (2019). DOI: [10.1371/journal.pone.0216369](https://doi.org/10.1371/journal.pone.0216369)

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