# Scientists discover biological markers in saliva of kids who may experience prolonged symptoms after a concussion

Predicting which children will need more time and care to recover can help doctors develop effective treatment plans

Nationwide Children's Hospital

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### **NEWS PACKAGE**

#### **SUGGESTED TEASE**

HEAD INJURIES IN CHILDREN ARE NOT ONLY SCARY, BUT CAN BE DIFFICULT TO ASSESS AND TREAT.

COMING UP, SCIENTISTS HAVE UNCOVERED BIOLOGICAL CHANGES THAT CAN HELP PREDICT WHICH KIDS MAY NEED EXTRA TIME AND TREATMENT FOLLOWING A CONCUSSION.

#### **ANCHOR LEAD**

CONCUSSIONS CAN BE EXTREMELY DANGEROUS, AND GETTING THE RIGHT TREATMENT AS SOON AS POSSIBLE IS CRITICAL TO RECOVERY, ESPECIALLY FOR CHILDREN'S DEVELOPING BRAINS.

BUT CONCUSSIONS CAN BE ESPECIALLY DIFFICULT TO ASSESS IN KIDS, WHO OFTEN HAVE TROUBLE ARTICULATING THEIR SYMPTOMS.

BARB CONSIGLIO HAS THE DETAILS ON A NEW STUDY¹ THAT DISCOVERS BIOLOGICAL CHANGES IN KIDS WHO ARE MORE LIKELY TO NEED MORE TIME FOR CONCUSSION RECOVERY, AND HOW THIS CAN BE USED IN THE FUTURE TO MAKE SURE KIDS ARE GETTING THE TREATMENT THEY NEED.

## (PACKAGE START) ----

CG: Courtesy: Nationwide Children's Hospital Shots of Thomas running drills

with teammates

THE FIRST THING THOMAS HELSEL (HELL-sull)
REMEMBERS AFTER A HARD HIT ON THE FOOTBALL
FIELD IS BEING SURROUNDED BY HIS CONCERNED
COACHES.:05

CG: Thomas Helsel Concussion patient

"My head was throbbing and we decided that it was good to go in to get checked out." :05

Shot of doctor conducting concussion testing

DOCTORS IN THE EMERGENCY DEPARTMENT DID SOME STANDARD TESTING FOR A CONCUSSION, AND ONE TEST THAT WASN'T SO STANDARD. :04

Thomas Helsel (CG'd earlier)

"I remember because I thought it was so...I thought it was odd. They were asking me for a spit sample from a concussion. I was like, 'How does this relate?'" :08

Shot of sample testing in lab

THE SALIVA SAMPLE WAS PART OF A STUDY

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CONDUCTED BY NATIONWIDE CHILDREN'S HOSPITAL TO DISCOVER DIFFERENCES IN KIDS WHO RECOVER NORMALLY FROM A CONCUSSION IN A FEW WEEKS AND THOSE WHO EXPERIENCE PERSISTENT SYMPTOMS THAT LAST A MONTH OR MORE.:12 "If we can detect children who might be at risk to CG: Ginger Yang, PhD, MPH experience a persistent post-concussion symptom, the Nationwide Children's Hospital doctor can treat them differently.":12 THE STUDY IS A COLLABORATION BETWEEN Shot of CIRP researchers NATIONWIDE CHILDREN'S CENTER FOR INJURY RESEARCH AND POLICY, DIVISION OF SPORTS Shot of doctor talking to patient MEDICINE AND INSTITUTE FOR GENOMIC MEDICINE, WHOSE SCIENTISTS EXAMINED MOLECULES Shots of microRNA lab testing CALLED MICRO R-N-A IN THE SALIVA OF PEDIATRIC CONCUSSION PATIENTS AT INITIAL TREATMENT, AS WELL AS TWO WEEKS AND FOUR WEEKS AFTER THEIR INJURY.:16 "We can identify, in a tube, 800 different microRNAs, which one is which, and then, essentially, the technology CG: Katherine Miller. PhD Nationwide Children's Hospital allows us to count what microRNA is there and how much of it is there.":10 USING THIS METHOD, SCIENTISTS IDENTIFIED Shots of microRNA lab testing THIRTEEN MICRO R-N-A THAT ARE EXPRESSED DIFFERENTLY IN CHILDREN WHO EXPERIENCE PERSISTENT POST-CONCUSSIVE SYMPTOMS. :08 "And that's important because if we can identify that at Katherine Miller (CG'd earlier) the time of injury, it can lead to earlier clinical intervention and really, a more personalized approach for caring for these children as they recover from concussion, especially if they're at risk for extended or prolonged recovery.":15 AFTER SOME TIME OFF FOR A FULL RECOVERY, Shots of Thomas putting on THOMAS IS BACK ON THE FIELD FOR HIS SENIOR helmet YEAR.:05 "I'm healthy and I think I have big plans ahead of me." Thomas Helsel (CG'd earlier) :04 AT NATIONWIDE CHILDREN'S HOSPITAL, THIS IS Shot of Thomas running drills BARB CONSIGLIO REPORTING. :02 with teammates (PACKAGE END) ---THIS SALIVA TEST IS NOT ONLY A MORE **ANCHOR TAG** OBJECTIVE ASSESSMENT TO ADD TO EXISTING CONCUSSION TESTING LIKE QUESTIONNAIRES, BUT IT CAN BE ESPECIALLY HELPFUL IN YOUNGER

PATIENTS, WHO OFTEN HAVE TROUBLE

EXPRESSING THE EXTENT OF THEIR SYMPTOMS.

SCIENTISTS PLAN TO EXPAND ON THIS RESEARCH AND HOPE THAT, EVENTUALLY, SALIVA SAMPLES CAN BE COLLECTED ON THE SIDELINES AFTER A CONCUSSION TO HELP DOCTORS ASSESS A CHILD'S RISK AND DEVELOP THE MOST EFFECTIVE TREATMENT PLAN POSSIBLE.

#### **SOCIAL MEDIA**

Share it! Suggested tweet:

A new study by <u>@CIRPatNCH</u> discovered biological differences in the saliva of pediatric concussion patients that may help predict which kids will experience prolonged symptoms after a concussion, so they can get the care they need to make a full recovery. <a href="https://bit.ly/3Ejpilg">https://bit.ly/3Ejpilg</a>

Suggested post:

Any traumatic brain injury in children can be scary, and getting the right treatment as early as possible is critical to recovery. But it is difficult to predict which kids will recover within a few weeks and which will have persistent symptoms that affect their lives for months. Now, a new study by doctors in the <u>Division of Sports Medicine</u>, researchers at the <u>Center for Injury Research and Policy</u> and scientists in the <u>Institute for Genomic Medicine</u> at <u>Nationwide Children's Hospital</u> has identified biological changes in the saliva of pediatric concussion patients that can help predict those who will need more time and treatment after a concussion. https://bit.lv/3Ejpilg

### **EXTRA BITES**

Yang says it is helpful for doctors to know if a child is at risk for prolonged symptoms:

"If we provided this information to clinicians earlier during the acute period post-injury, they can use that information to create individualized treatment plans.":14

CG: Ginger Yang, PhD, MPH Nationwide Children's Hospital

Yang explains the goal of the study:

"We want to find out if any microRNAs can serve as biomarkers to detect those children who have persistent symptoms or those children who have a typical recovery." :18

Yang says kids with concussions should be treated as early as possible:

"The advice we usually give to families and children when they have a concussion is seeking care as soon as possible and also seeking the right care. So if they get treated earlier, then their symptoms will be gone earlier." :18 Miller says current measures to predict prolonged recovery can be difficult to assess:

"The current system for identifying someone at risk of prolonged recovery involves a set of questions. And depending on the child's age or their altered mental status from the concussion, they might not answer those questions very well. So having a more scientific and objective way to measure that is important.":16

# CG: Katherine Miller, PhD Nationwide Children's Hospital

Miller explains how the research will be expanded: "So we need to look at saliva from kids without concussion to start to establish a baseline level, if we can, for these microRNAs. So then we have an even better understanding of how these change during injury and then, furthermore, how it changes for kids who have prolonged recovery from the injury." :15

Miller says this research could lead to a sideline test to predict post-concussive risks:

"We could, for example, have a sideline test where a child provides a saliva sample, we process it in the laboratory and those results can compliment all of the other care that they're getting. And I think this is important because it can lead to earlier clinical intervention and really more personalized care for the child depending on their needs and their risk.":19

CG: Thomas Helsel Concussion patient

Thomas explains some of the testing done at the hospital after his concussion:

"They checked my blood pressure and my height and weight. And then we went into the exam room and they basically just asked me a series of questions, memory questions, I feel like." :12

Thomas explains the restrictions he faced after his concussion: "I had a lot of restrictions. I couldn't do a lot of things just because of the state of my injury. I couldn't look at screens for very long. I remember I missed school for — it was about two weeks." :14

Thomas recommends seeking treatment after a concussion: "You don't want to risk anything. So my advice would just be, if you think you've experienced a head injury, just be safe, go check, get checked out." :07

#### References

<sup>1</sup>Salivary miRNA Expression in Children With Persistent Post-concussive Symptoms, Frontiers in Public Health, May 30, 2022. Online: https://www.frontiersin.org/articles/10.3389/fpubh.2022.890420/full

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