

Stricter adherence to preliminary screening method could reduce unnecessary CT scans

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A Henry Ford Hospital study has found that better use of commonly accepted diagnostic guidelines for detecting cervical spine injuries could reduce unnecessary CT scans and spare patients from radiation exposure.

The multi-phase study showed that a significant number of CT scans could have been avoided if physicians adhered to the National Emergency X-Radiology Study (NEXUS) criteria, which aid Emergency Department physicians with determining whether C-spine injuries exist. Key findings:

- In Phase 1, 24 percent of 1,524 CT scans were potentially unnecessarily.
- In Phase 2, 16 percent of 502 CT scans were potentially unnecessarily.

The findings are being presented at the annual meeting of the Radiological Society of North America in Chicago.

"While imaging testing is an important aspect of patient care, we have to make sure that these tests are ordered appropriately," says Brent Griffith, M.D., chief resident of Radiology at Henry Ford and the study's lead author. "With an emphasis nationally on decreasing [radiation exposure](#) and improving the use of [health care resources](#), it's important that both radiologists and clinicians address the appropriate use of all

[imaging tools.](#)"

An estimated 1 million people are treated for a potential C-spine injury from blunt trauma in the Emergency Department every year, with falls and [motor vehicle accidents](#) being the most common causes. Because a delay or failure to diagnose C-spine injuries can lead to permanent paralysis, physicians often have a low threshold for ordering imaging tests.

In 2000, the NEXUS criteria established low-risk guidelines to identify patients with a low probability of cervical spine injury that didn't need an imaging test. To be cleared of a C-spine injury, a patient must have the following:

- No tenderness at the middle of the neckline.
- No evidence of intoxication.
- Normal level of alertness.
- No evidence of focal neurologic deficit (numbness or weakness).
- No other painful distracting injury (e.g. long bone fracture).

The NEXUS criteria, coupled with the Canadian C-Spine Rule, a highly sensitive clinical decision rule for detecting C-spine injury, comprise the American College of Radiology Appropriateness Criteria for imaging a suspected C-spine injury.

Despite these preliminary screening tools, prior research has shown that patients continue to receive imaging tests without meeting the criteria. Henry Ford researchers sought to evaluate whether strict adherence to the NEXUS criteria could decrease the number of imaging tests ordered.

In the study's Phase 1, researchers evaluated 1,524 imaging tests

conducted from January-December 2008 that were negative for an acute c-spine injury. Of those tests, 24 percent showed no documentation of the NEXUS criteria being applied.

In the study's Phase 2, researchers enrolled patients who presented to the Emergency Department between March and November 2011 for whom a [CT scan](#) was ordered for detecting a c-spine injury. For each CT scan ordered, the requesting clinician was instructed to complete a survey about the type of injury, reason for ordering the scan and clinical suspicion of injury. The CT scans were evaluated by a board-certified radiologist blinded to the survey data to determine the presence or absence of C-spine injury.

Researchers theorize the heightened awareness of the survey was a factor in the reduction of CT scans to 16 percent in Phase 2 from 24 percent in Phase 1.

For the study's Phase 3, researchers established an education program to instruct physicians about the NEXUS criteria for ordering imaging tests for c-spine injuries. Preliminary findings demonstrate a trend showing improved but not statistically significant utilization of imaging tests using the NEXUS criteria.

Provided by Henry Ford Health System

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