

Whole-body CT scans in trauma can prove but not exclude injuries

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For assessing severe trauma, single-pass whole-body computed tomography (CT) can prove but not definitively exclude the presence of injuries and should be performed later than 30 minutes after admission to an emergency department for optimal results, according to a study in *CMAJ (Canadian Medical Association Journal)*.

Traumatic injury, caused by major traffic collisions or a fall from a height, for example, has a significant impact on [health care costs](#), illness and death. In North America and Europe, it is one of the top 10 causes of burden of disease. The Canadian National [Trauma](#) Registry, which contains data from 8 of Canada's 10 provinces, registered 14 065 major injuries between 2008 and 2009.

"Recognize first what kills first" is the maxim of imaging during the resuscitation period in patients with major trauma. Whole-body [CT scanning](#) has been used since the late 1990s to speed injury diagnosis, but there has been criticism that patients are being overexposed to radiation with increasing and general use. The reliability of positive and negative findings of this compelling diagnostic tool has not been determined to date.

A team of German researchers conducted a study to determine the accuracy of whole-body or pan-scan imaging in identifying injuries in various parts of the body in [trauma patients](#). They looked at data from 982 trauma patients who had been immediately transferred to the emergency department at the Unfallkrankenhaus Berlin, Berlin,

Germany, a metropolitan trauma centre, after injury between July 2006 and November 2008.

They found that 360 patients (36.7%) were diagnosed with multiple trauma; 77 (7.8%) of pan-scans were found to be unnecessary, and selective scanning would have been sufficient in these cases. In 62 patients (6.3%), the pan-scan missed injuries that required monitoring in the [intensive care unit](#) or surgical treatment.

"We found that single-pass whole-body computed tomography is very effective (or specific) at determining where there is injured tissue but is variable in excluding injuries in patients with suspected blunt trauma," stated lead author Dr. Dirk Stengel, Center for Clinical Research, Unfallkrankenhaus Berlin and Ernst Moritz Arndt University Medical Center. "Screening tests in trauma are intended to immediately detect life-threatening injuries. Given this premise, high specificity — meaning that a positive test result shows injury — makes pan-scanning a valuable tool for priority-oriented treatment."

However, most scans are performed too early and may miss significant injuries to organs.

"The pan-scan performs best 30 minutes after admission, because the sensitivity of the scan increases after this interval," states Stengel. "The transfusion of fluids, blood, plasma and emergency interventions to stabilize circulation will restore organ perfusion, and make bleedings and hematomas visible on CT scans." Health care teams should verify negative results to rule out false-negative results with additional clinical observation, follow-up examination or additional imaging.

"Pan-scan algorithms reduce, but do not eliminate, the risk of missed injuries, and should not replace close monitoring and clinical follow-up of patients with major trauma," conclude the authors.

More information: Study online:
www.cmaj.ca/lookup/doi/10.1503/cmaj.111420

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