



Risk of Developing Cancer from Exposure to Computed Tomography Radiation in the Pediatric Population: An Opinion

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Editorial

The field of medicine has evolved dramatically over the past few decades, especially with the advent of advanced imaging. This has led to an over reliance on imaging studies and less reliance on physical examination, which has unfortunately become a dying art [1,2]. Sir William Osler epitomized the state of today's medicine with his saying, "He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all" [3]. The highly efficient and specific imaging found nowadays throughout the hospitals of the world have changed the role of physical examination from hypothesis confirmation to hypothesis generation; moving away from the real patient and closer to computer-related tasks [3]. Too much reliance on advanced technology in relation to patient care does not necessarily translate into improved patient care. In fact, medical errors can arise due to little attention to physical examination [4]. In a recent cross-sectional study, lack of physical examination led to unnecessary exposure to radiation in 17% of patients [3]. Part of the reason for this over dependence on diagnostic imaging may be related to the fact that doctors are uncomfortable with diagnostic insecurity and fear of being sued. Computerized Axial Tomography (CT) have proven to be a very useful imaging modality that have revolutionized patient care ever since its development in 1972 by a British engineer named Sir Godfrey Hounsfield in the United Kingdom and by Dr. Alan Cormack of Tufts University in Massachusetts. Both of whom were jointly awarded the Nobel Prize in Medicine in 1979. Tomography is derived from the Greek word "tomos" meaning "slice" and "graphia" meaning "describing". A CT scan produces cross-sectional images of a scanned object, allowing one to see the inside the object utilizing numerous ionizing X-ray radiations taken at different angles. Prior to CT, X-ray imaging was employed to image patients and did not provide any detailed imaging of any organ structures inside of the human body. With the advent of CT, it has now become the mainstay for diagnosing medical diseases allowing doctors to visualize small tumors, which cannot be seen on plain X-ray film. The first CT scanner developed took several hours to image a single "slice", and now with the advanced multi-slice CT system, one can scan an entire chest in less than 10 seconds. The uses of CT scan to diagnose various causes of acute surgical abdomens have steeply risen over the past few years [5]. One of those surgical conditions is acute appendicitis, an acute surgical condition, which warrants early intervention. Appendicitis is the most common acute surgical condition of the abdomen, with the peak incidence occurring between 10-30years of age. Mortality rate of appendicitis is <1% in non-perforated, with significant morbidity occurring in young and elderly patients in whom diagnosis is often delayed, thus likely to present with perforated appendicitis [6]. Diagnosing acute appendicitis has traditionally relied on clinical acumen, but CT scan has been increasingly used to make the diagnosis. A paper published recently [7] has linked for the first time radiation exposure from CT scan in the pediatric population to subsequent development of leukemia and brain tumors [8]. One should make a conscious effort to rely more on physical examination or with the use of an abdominal ultrasound as an adjunct in the pediatric population in diagnosing appendicitis rather than relying on the CT scan. Teaching medical students the basic physical exam of eliciting rebound tenderness and Rovsing's sign in a patient with appendicitis is essential as it is our duty to reduce radiation exposure to children. Avoiding radiation exposure in the pediatric population for diagnosing the commonest cause of an acute abdomen will help reduce future development of cancer in radiation sensitive bone marrow and neuronal tissues.

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References

1. Jauhar S. The demise of the physical exam. N Engl J Med. 2006;354(6):548-51.

2. Feddock CA. The lost art of clinical skills. *Am J Med.* 2007;120(4):374-8.
3. Puri B, Shankar Raman V. Physical examination: The dying art. *Medical journal, Armed Forces India.* 2017;73(2):110-1.
4. Verghese A, Charlton B, Kassirer JP, Ramsey M, Ioannidis JP. Inadequacies of Physical Examination as a Cause of Medical Errors and Adverse Events: A Collection of Vignettes. *Am J Med.* 2015;128(12):1322-4.
5. Rao PM, Feltmate CM, Rhea JT, Schulick AH, Novelline RA. Helical computed tomography in differentiating appendicitis and acute gynecologic conditions. *Obstet Gynecol.* 1999;93(3):417-21.
6. Paranjape C, Dalia S, Pan J, Horattas M. Appendicitis in the elderly: a change in the laparoscopic era. *Surgical Endoscopy.* 2007;21(5):777-81.
7. Pearce MS, Salotti JA, Little MP, McHugh K, Lee C, Kim KP, et al. Radiation exposure from CT scans in childhood and subsequent risk of leukaemia and brain tumours: a retrospective cohort study. *Lancet.* 2012;380(9840):499-505.
8. Berrington de Gonzalez A, Mahesh M, Kim KP, Bhargavan M, Lewis R, Mettler F, et al. Projected cancer risks from computed tomographic scans performed in the United States in 2007. *Arch Intern Med.* 2009;169(22):2071-7.