

# Cardiologists urged to reduce inappropriate radiation exposure

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Cardiologists are being urged to reduce patient radiation exposure in a European Society of Cardiology (ESC) position paper which outlines doses and risks of common cardiology examinations for the first time. The paper is published today in the *European Heart Journal*.

Lead author, Dr Eugenio Picano, FESC, said: "Cardiologists today, are the true contemporary radiologists. Cardiology accounts for 40% of patient radiology exposure and equals more than 50 chest X-rays per person per year."

He added: "Unfortunately, radiation risks are not widely known to all [cardiologists](#) and patients and this creates a potential for unwanted damage that will appear as cancers, decades down the line. We need the entire cardiology community to be proactive in minimising the radiological friendly fire in our imaging labs."

The paper lists doses and risks of the most common cardiology examinations for the first time. Computed tomography (CT), percutaneous coronary intervention (PCI), cardiac electrophysiology and nuclear cardiology deliver a dose equivalent to 750 chest X-rays (with wide variation from 100 to 2,000 chest X-rays) per procedure. These procedures are performed daily in all cardiology in- and out-patient departments, usually more than one procedure per admission. They are used for all forms of cardiac disease, from congenital to heart failure, but more intensively and frequently for ischemic heart disease.

PCI for dilation of coronary artery stenosis totals almost 1 million procedures per year in Europe. The additional lifetime risk of fatal and non-fatal cancer for one PCI ranges from 1 in 1000, to 1 in 100 for a healthy 50 year old man. Risks are 1.38 times higher in women and 4 times higher in children. Children's higher risk is because their cells divide more quickly and they have more years in which to develop cancer.

Dr Picano said: "Even in the best centres, and even when the income of doctors is not related to number of examinations performed, 30 to 50% of examinations are totally or partially inappropriate according to specialty recommendations. When examinations are appropriate, the dose is often not systematically audited and therefore not optimised, with values which are 2 to 10 times higher than the reference, expected dose."

The paper aims to reduce the unacceptably high rate of inappropriate examinations and reduce excessive doses in appropriate examinations. Dr Picano said: "In these hard economic times, 50% of the costly and risky advanced imaging examinations we do are for inappropriate indications. Politicians' top priority should be to audit and cut down on useless and dangerous examinations."

He added: "Decreased doses can best be accomplished by working with industry and many companies are now successfully fighting a 'dose war'. Companies who develop better ways of reducing doses will win in the future global competition. Radiological sustainability is becoming a competitive marketing advantage."

The paper says that patients should be given the estimated dose before a procedure and the actual dose in writing afterwards if they request it. This could become a legal requirement through the European Directive Euratom law 97/43 but application of the law is being delayed by

technical and practical difficulties.

Dr Picano said: "Patients can protect themselves by not self-prescribing screening examinations promoted by irresponsible advertisers. Second, before any testing they should ask their doctor what is the likely radiation dose they will get from that examination. After the exam they should receive the true delivered dose in a written report, which may differ by a factor of 10 from the theoretical reference dose."

He added: "The smart patient, and the smart cardiologist, cannot be afraid of radiation since it is essential and often life saving. But they must be very afraid of radiation negligence or unawareness. This paper will help to make cardiology wards and laboratories a safer place for patients and doctors through an increase of radiation awareness and knowledge."

Professor Patrizio Lancellotti, FESC, president of the European Association of Cardiovascular Imaging (EACVI) of the ESC, said: "The radiation issue was first brought to the attention of the international [cardiology](#) community by European cardiologists and now it is right and fitting that the ESC delivers this paper."

**More information:** The appropriate and justified use of medical radiation in cardiovascular imaging: a position document of the ESC Associations of Cardiovascular Imaging, Percutaneous Cardiovascular Interventions and Electrophysiology. European Heart Journal. 2014; [DOI: 10.1093/eurheartj/eh394](https://doi.org/10.1093/eurheartj/eh394)

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