

DOES DOSE MATTER?

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On the discovery of x-rays their use in medical imaging was immediately obvious. After the initial excitement about the wondrous “invisible light”, came a period of realisation where many martyrs to radiation fell. Technology for x-ray imaging developed rapidly and quickly became safer. Then there was a new expansion into new imaging technologies fluoroscopy, CT, and more advanced imaging techniques like angiography, and CT fluoroscopy. Although radiation increased with each of these examinations that was not considered to be significant as imaging examinations were few and far between. In the 1980s-computed tomography became increasingly more common, and patients were more likely to be exposed to a higher dose of radiation on a more frequent basis. The fear of radiation from x-ray examinations began to creep into the public concern. Articles began to appear in were leading newspapers such as the New York Times handwringing about the dangers of high-dose radiation, particularly to children. Now we have the combinations of these powerful x-ray examinations of CT with positron emission tomography (PET). The patient has an injection of a radioisotope at the same time as being exposed to ionising electromagnetic radiation. One theory, that of hormesis, would indicate that the body is well-prepared for these low doses of radiation than the normal repair pathways will be successful in repairing radiation damage at this level. In fact, hormesis might indicate that an initial low dose of radiation, could signal cells to prepare for upcoming higher dose of radiation. Alternatively, and perhaps more worryingly, the linear no threshold model indicates that no dose, is a safe dose. Proponents of this model indicate that modern radiation exposure to young children is leading to significant increases in cancer development and mortality. As we move forward with the use of PET/ CT, how worried should we be about the use of radiation particularly in young children?