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The world of work is changing. How should you respond?

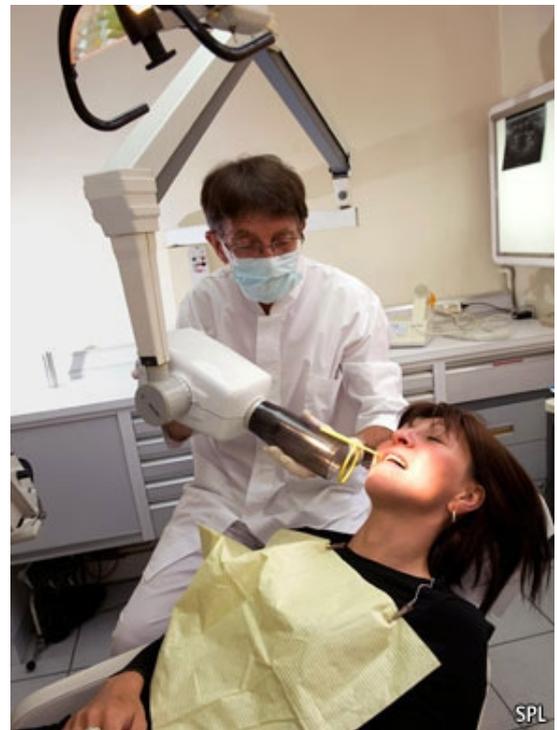
The
Economist**Dental X-rays****Little and not often, please****Confirmation that dental X-rays can be bad for you**

Apr 14th 2012 | from the print edition

IF YOU are a suspicious type you may be disturbed by the fact that, despite reassurances of the safety of the procedure, dentists and their technicians, when administering X-rays, usually step out of the room while the deed is done. Not only that, they often drape a lead-lined apron over your body to protect your vital organs. Well, all but one: your brain.

A study by Elizabeth Claus, of Yale University, just published in *Cancer*, suggests your suspicions might be justified. Dr Claus thinks she has identified, in those who have had dental X-rays often, a significant rise in the admittedly small risk of developing a brain tumour.

In rich countries, five men in every 200,000, and twice as many women, develop tumours called meningiomas that affect the membranes surrounding the brain. Meningiomas account for a third of primary brain tumours. Only about 2% of them are malignant, but non-malignant does not mean non-dangerous. Even a "benign" meningioma can kill. Around 30% do so within five years of diagnosis. Symptoms can include seizures and blindness, and treatment may involve surgery, chemotherapy or, ironically, radiotherapy.



Less is more

Ironically, because past research studying the after-effects of exposure to things like atom bombs and radiation treatments for cancer suggests the most important environmental risk factor for meningiomas is ionising radiation. These days, however, the main source of ionising radiation for most people is neither fallout from bombs nor radiotherapy; it is dental X-rays. Despite that, surprisingly little research has been done on those X-rays' effects.

Dr Claus and her colleagues have tried to plug the gap. They studied 1,433 Americans who have had meningiomas and compared them with 1,350 others who have not. These others were chosen to match the study group's age profile, sex ratio and dwelling place. The researchers then inquired about both groups' family, medical and dental histories.

In the case of their dental histories, participants were asked whether they generally had standard X-rays, known as bitewings, every year, or never had them, or fell somewhere in between. They were also asked how often they had had panoramic X-rays—so-called panorex—taken of their entire mouths, and whether they had ever had braces, the fitting of which often involves a panoramic X-ray.

The researchers found that people who had had a meningioma were more than twice as likely as those who had not to have had at least one bitewing X-ray. And the more bitewings they had been given, the greater that likelihood was.

Even more troubling was the finding that people who had been given a panorex when they were under ten had 4.9 times the normal risk of developing a meningioma. To be fair, only 22 participants in the study had both had a panorex and developed such a tumour. But according to Dr Claus, the panorex was not common when most of the people in the study had been children. "Nowadays", she says, "before getting braces all the kids have it."

What these results mean in practice is debatable. The radiation dose from an individual dental X-ray, Dr Claus points out, has gone down by about half over the past 30 years or so. In addition, some dentists and orthodontists—though far from the majority—have turned to digital methods that expose patients to even lower levels. But others are using fancy new techniques like cone-beam computerised tomography which actually expose people to much higher levels of radiation.

Moreover, guidelines from the American Dental Association state that healthy adults should have a bitewing X-ray no more than once every

two or three years, and that there is little reason to X-ray patients who do not have symptoms. These are policies which Dr Claus describes as “quite reasonable”. But if what her participants told her is true, not all dentists are heeding their own professional body’s advice. Most of those who took part in the study reported having at least one X-ray a year. Dr Claus’s work, then, is a timely reminder that X-rays are dangerous, that dentists should use them sparingly and that patients who have suspicions about their use are not necessarily paranoid.

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