

## Commentary

# Chiropractors' use of X-rays

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According to chiropractors' own definition, "chiropractic is a discipline of the scientific healing arts concerned with the pathogenesis, diagnosis, therapeutics and prophylaxis of functional disturbances, pain syndromes and the neurophysiological effects related to static and dynamic disorders of the locomotor systems particularly the spine and pelvis" [1]. It has been suggested that chiropractic is effective in the treatment of acute uncomplicated low back pain [2]. However, a more recent review concluded that there is no convincing evidence for the effectiveness of chiropractic in acute or chronic low back pain [3]. Many other conditions are also treated by chiropractors [4], and for these there is little or no evidence for efficacy [5].

Chiropractic techniques are associated with an unknown frequency of adverse events [5], some of which are severe [6, 7]. Thus the safety of chiropractic is an important, albeit neglected issue. In addition to direct risks associated with the intervention, such as bone fracture due to spinal manipulation, there may be indirect risks associated with chiropractic. Indirect risks are related to the "philosophy" and clinical practice of a given "school". The following discussion will focus on one potential indirect risk of chiropractic, namely chiropractors' use of X-rays.

Computerized literature searches were used (Medline and Embase, 1966–1997) to access studies of the use of X-rays within the chiropractic profession. The bibliographies of all studies and reviews located were scanned for further relevant reports. Publications were included in this review if they contained factual information on the usage of X-rays by chiropractors.

### Frequency of X-ray use

Breen conducted a survey of 48 members of the British Chiropractic Association in 1973–1974. 82% of them had X-ray facilities in their clinics. 71% of 1598 patients with low back pain had been

X-rayed [8]. A more recent survey from the same source recorded that 74% of chiropractors had their own X-ray equipment. Unfortunately, no data on the frequency of X-ray use were reported [9].

In a much larger, pan-European survey, Pederson sent questionnaires to all chiropractors working in the European Union [10] and 715 returned completed forms. X-rays were used in 72% of patients with low back pain. 64% of all the patients seen by chiropractors were X-rayed. 25% of patients were X-rayed in chiropractic practices, 18% in hospitals and 11% in private radiological clinics. There were considerable national differences; for example, 93% of all chiropractic patients in Italy were X-rayed, but only 25% in Sweden. X-ray facilities were available in about 80% of the UK practices while in France chiropractors are forbidden by law to have X-ray equipment on the premises.

A survey of a random sample of members of the American Chiropractic Association suggested that 96% of new patients and 80% of patients at follow-up visits were being X-rayed [11]. The percentage of surgeries with X-ray equipment had increased from 79% in 1986 to 86% in 1994.

A 1992 survey of 60 licensing boards in the US and Canada had a 90% response rate [12]. One question related to the legitimacy of X-ray use. Full spine, skull, soft tissue, barium and topography studies were permitted in 100%, 98%, 96%, 36% and 56% of the boards, respectively.

A survey of all members of The Netherlands Chiropractors' Association showed that 80% of chiropractors would often or always use radiography in the work-up of a new patient [13]. Only 6% would employ it seldom or never. Virtually all thought that it was "desirable" or "absolutely desirable" to have access to X-ray equipment.

In a recent clinical trial testing the effectiveness of various approaches to treat acute low back pain, 208 practitioners were randomly selected from six strata: urban or rural primary care physicians, urban or rural chiropractors, orthopaedic surgeons and primary care providers at a health care maintenance organization [14]. Plain spine radiographs were used most frequently by the chiropractors (67% of all patients).

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## Reasons for X-ray use

In 1994, Pedersen stated that “there is currently no agreement regarding indications for taking X-rays” within the chiropractic profession [9]. Osteoporosis is a relative contraindication for several chiropractic techniques, yet plain radiographs of the spine do not allow osteoporosis to be diagnosed unless bone density has decreased by at least 40% [15, 16]. Chiropractors could therefore use X-rays in order to detect malignancies, fractures, infections, inflammatory spondylarthropathies and other contraindications [10]. Yet a chiropractic textbook states that “bone disease is not immediately revealed by X-rays” [17] and unsuspected pathological findings seen on routine lumbar radiographs are as infrequent as 1 in 2500 [18].

Many chiropractors employ X-rays for diagnosing “misalignment” or “subluxation” of the spine [19], although mainstream scientists have demonstrated experimentally that “subluxation of the vertebra as defined by chiropractic... does not occur” [20]. Neurologist Scott Haldeman stated “minor misalignments of vertebrae are normal and not necessarily a sign of trouble” [21] and the executive director of the National Association of Chiropractic Medicine feels that such irregularities “show up on almost anyone’s X-ray” [22]. Thus the question of why chiropractors frequently use X-rays is not easily answered. Table 1 summarises the reasons Dutch chiropractors gave for using X-rays [13].

## Comment

The usage of X-rays by chiropractors seems exorbitantly high, particularly considering that experts on low back pain uniformly agree that plain radiographs are usually not useful in this condition [23, 24]. Major texts on chiropractic point out that “routine radiographic investigation of the lumbar spine should be avoided because of the radiation hazard but also because inappropriate X-ray examination contributes little to the

solution of a particular problem and may even obscure it” [17], and that chiropractic practitioners “tend to over-utilize X-rays, especially full spine studies” [25]. Recent guidelines therefore recommend that radiography is unnecessary for the management of uncomplicated acute low back pain [26]. Apparently the chiropractic profession was involved in producing these guidelines [27] yet there are no data to suggest that X-ray use by chiropractors is decreasing.

It is indisputable that patients’ risk of cancer is increased through the frequent use of X-rays. Full spine radiography has been calculated to be more likely to cause than to detect bone cancer in the average patient of chiropractors [28]. The gonadal radiation from one unshielded lumbar series has been estimated to be equivalent to the gonadal radiation from one chest radiograph per day for 6 years [29].

While around three-quarters of all chiropractors’ patients are submitted to X-rays, this figure does not take into account repeat X-rays on individual patients. At present there are few data on multiple X-ray usage by chiropractors. However, the figure could be high: 80% of patients seem to be X-rayed on follow-up visits in the US [11]. Financial considerations may play a role: “If in doubt about the payment or the return of the patient, take only the small X-rays on the first visit but ostensibly X-ray fully” [30]. Common clinical practice and training in the UK is to take regional spinal radiographs and to avoid full spinal radiography.

The validity of chiropractors’ X-ray diagnoses is not well established. Small vertebral displacements or malalignments have no proven clinical relevance [31], dynamic studies have no proven value [32, 33], and plain radiographs yield little relevant biomechanical information [34, 35]. An advert has been placed by chiropractors in the national press promising free radiographs to new customers: “the first 100 patients will be given FREE spinal X-RAYS” [36].

In conclusion, the current, albeit incomplete, data suggest an overuse of spinal radiography by the chiropractic profession. This constitutes a safety problem that deserves to be taken seriously and requires further research.

**Table 1.** Reasons for using X-rays

Indication	Frequency of use		
	Rarely	Occasionally	Often or always
Diagnosis	2	2	47
Exclusion of contraindications	1	3	47
Prognosis	6	4	41
Indication for therapy	2	13	34
Stature analysis	10	13	27
Follow-up	36	7	2

Answers are based on a large survey of all Dutch chiropractors.

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