patients in this country are litigious, unlike many across the Atlantic. I feel that in this context the lawyers call the tune and the doctors have to toe the line. We need the lead to come from coroners who are qualified in both professions and hope that they will put our case to lawyers and bring them up to date in their medicolegal thinking.

An example which happens to come into my own field is the problem of head injury. The missing by a radiologist of a linear fracture may be regarded as a heinous crime by the law. But doctors know that the linear fracture *per se* is not important: the damage or lack of it to the brain is what matters. If a patient dies from an undiagnosed subdural hæmatoma, which is seldom accompanied by a fracture, that is probably not negligence in the eyes of the law, but could be in the eyes of the medical profession.

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Clinical and Economic Aspects of the Use of X-rays in the Accident and Emergency Department

A retrospective and prospective analysis of accident department radiology is in progress at St George's Hospital. The retrospective study represents an evaluation of all types of radiographic examinations performed during the twelve months of 1975. For each clinical situation (e.g. rib injury, ankle injury) the films, X-ray request form, radiologist's report and the casualty card of 100 consecutive patients are reviewed. Thirty-five questions are applied to each of these patients and the information recorded on data sheets. Two of the aims of this analysis are to evaluate the clinical value of the examination and to assess economic aspects of the investigations performed.

The prospective analysis is still in progress. This involves the stamping of all casualty cards with a rubber stamp on which the casualty officer answers certain questions. Amongst other data thus recorded the purpose of the X-ray examination is specified. This prospective study using the rubber stamp is primarily designed to determine the number of X-ray requests performed for medicolegal reasons.

One group of patients from the study was taken to illustrate the retrospective findings. Approximately 10 000 X-ray examinations were performed in the Accident and Emergency Department at St George's Hospital, London SW1, in 1975. Patients presenting with rib injuries represented 3% of this total. One hundred patients examined radiologically for rib injuries were analysed on the data sheet. The analysis revealed: 84 patients had no evidence of rib fracture, 13 patients had a rib fracture and no complication, and 3 patients had a rib fracture and a complication. In each case the complication was a pneumothorax. Three of the 100 patients were admitted, 2 because of the pneumothorax, and one who did not have a rib fracture had a head injury and was admitted for observation. In the 2 patients with radiological evidence of a pneumothorax this was clinically obvious prior to radiography. The third patient with a pneumothorax was initially sent home, but was recalled when the shallow pneumothorax was reported by the radiologist. It was concluded from this analysis that, for clinical management, routine radiography in these 100 patients was noncontributory as in the 2 patients requiring treatment for the complication of a rib injury the pneumothorax was detectable clinically. Moreover, in no case did demonstration of an uncomplicated rib fracture affect patient management.

The second aspect illustrated by the analysis was economic. Patients attending St George's Hospital in whom radiography is requested for rib injury have a frontal chest radiograph and an oblique view of the ribs. These films, whether normal or abnormal, are assembled in an X-ray packet which is ultimately filed away in storage. The cost of materials for this assembly alone is one-third of the cost of the materials involved in the examination; the other two-thirds of the material cost is for the X-ray films. This present method of examination and assembly cost approximately £400 for all the patients examined for rib injury at St George's, SW1, in 1975. This does not include the cost of wages or equipment. The analysis has shown that the present system of X-ray examination has a very minimal return in clinical value, and that the demonstration of a fracture *per se* does not affect clinical management. It is suggested that an alternative method of

performing these examinations should be considered. One method suggested is to take a frontal chest view alone to detect a possible complication of the injury and not to take rib views. Furthermore, there should be no assembly or storage of normal films (84% of all cases examined). If during 1975 this latter protocol had been carried out the total cost of examining these patients would have been £147. The difference between £400 and £147 by itself may not be great, but when applied to numerous casualty departments throughout the country this represents a very significant and sensible economy. At the same time, such a protocol would not in any way deleteriously affect the clinical management of these patients.

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I am sure we would all agree that the proper treatment of patients is the first priority, that the competing demands upon limited resources lies second, and that the protection of the doctor from risk of litigation comes a poor third. These considerations are not always in conflict and certainly not necessarily mutually exclusive.

To the patient the question is simply one of black-or-white right or wrong, with no intermediate degrees of opacity. Having met with an accident in which he sustained a fracture or dislocation, a pneumothorax, or harboured a glass or metallic foreign body, then he may believe without question that he should have been X-rayed on first seeking medical attention, and that had he been so X-rayed he would have made a complete and early recovery, with minimal pain and suffering, no disfigurement and no residual disability.

He may be sustained in his argument by the employer or vehicle driver at whose hand he suffered his injury and who wishes to shed some or all of his liability upon the hospital or doctors who treated him, it is so alleged, with negligence.

The lawyer whom he instructs will be less naïve but is bound to do his best for his client, although bearing no animosity against the doctors.

The clinician who treated the patient may be distressed, affronted or ashamed by the allegations levelled against himself in the claim for damages but is usually thankful to hand over the matter to a medical protection society for defence or settlement. We do not adopt the attitude that all claims in respect of most fractures or foreign bodies should be settled where there was delay in effecting treatment due to lack of X-ray examination and we do consider each case upon its merits, but in many instances we cannot find a suitable expert witness who under pressure will still maintain that in the circumstances of that particular case the failure to X-ray was compatible with the exercise of due skill and care.

The judge, if the case proceeds to trial, will base his judgment partly upon the facts as established in evidence and partly upon the weight of expert opinion produced on either side. Since the expert witnesses will be medical men of some standing and experience, the actions or omissions of the doctor concerned will be assessed by medical standards, and where there are clearly two opposing schools of thought, each commanding the respect of a responsible section of the profession, he will not be judged negligent simply because he has acted in accordance with only one of the two schools.

For his defence to stand a reasonable chance of success the doctor must be able to show that he obtained an adequate account of the accident, carried out a proper physical examination of the injured part, and applied his careful clinical judgment to the diagnosis and treatment of the injury. The fact that he erred in diagnosis, thereby failing to provide correct treatment, does not in itself constitute negligence, and of course to enjoy any entitlement to compensation it must be shown that some damage to the patient flowed from any negligence that occurred. Where the delay in commencing appropriate treatment was very small then damages are likely to be minimal, but where it was prolonged or resulted in permanent disability which could otherwise have been avoided they may be substantial.

Many accident departments are staffed by relatively inexperienced young casualty officers, with a minimum of supervision and inadequate facilities for observation. At times they are submitted to severe pressures of work and almost always they are handling patients of whom they have no previous knowledge. There is little opportunity to develop the rapport and mutual trust which is the basis of successful doctor-patient relationships, and certainly the patients are not inhibited by any sense of loyalty or