used in hair replacement (both for traumatic loss and for male pattern baldness), scar and tattoo removal, ear and nose reconstruction, facial reconstruction, and in treating syndactyly, port wine stains, and giant pigmented naevi. Expanders are even available for closing cleft palates as a primary procedure and for restoring an alveolar ridge in edentulous patients to allow dentures to be fitted. They can be used almost wherever there is a defect to be covered.

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- 1 Austad Ed, Pasyk K, McClatchey K, Cherry G. Histomorphologic evaluation of guinea pig skin and soft tissue after controlled tissue expansion. *Plast Reconstr Surg* 1982;70:704-10.
- 2 Pasyk KA, Austad E, McClatchey K, Cherry G. Electron microscopic evaluation of guinea pig skin and soft tissues "expanded" with a self-inflating silicone implant. *Plast Reconstr Surg* 1982;70:37-47.
- 3 Cherry GW, Austad E, Pasyk K, McClatchey K, Rohrich R. Increased survival and vascularity of random pattern skin flaps developed in controlled, expanded skin. *Plast Reconstr Surg* 1983;72:680-7.
- 4 Manders EK, Schenden M, Furrey J, Hetzler P, Davis T, Graham W. Soft-tissue expansion: concepts and complications. *Plast Reconstr Surg* 1984;74:493-507.
- 5 Radovan C. Tissue expansion in soft tissue reconstruction. *Plast Reconstr Surg* 1984;74:482-90.
- 6 Leonard AG, Small JO. Tissue expansion in the treatment of alopecia. *Br J Plast Surg* 1986;39:42-56.

Risks and benefits in radiology

Medical radiology contributes ten times as much radiation exposure to the public as all the other man made sources combined. Clearly the government and the public need authoritative and independent advice about the scientific aspects of protection from all kinds of radiation, and in 1970 an act of parliament set up the National Radiological Protection Board to give this. Its role—which is not to regulate, police, pronounce on political policy, or impute blame in forensic issues—is well shown by two recently published surveys, one of the radiation doses received by patients and the other of the number of radiological examinations undertaken in Britain every year.^{1,2}

The first survey describes the results of thorough and extensive measurements of radiation doses to nearly 4000 patients undergoing routine examination. Carried out in 20 randomly selected large non-specialised hospitals, a group that accounts for four fifths of the radiological workload in England, it showed wide variations among them. Thus for particular examinations doses per film might differ by factors of 10 to over 100 and the average doses were considerably higher in some hospitals than in others. The wide ranges in dose cannot be explained solely by the range in the sizes of the patients, and the differences in averages suggest appreciable differences in radiological techniques among the departments.

The well known factors that result in a higher dose than necessary include unnecessary or inappropriate examinations, low tube filtration, low kV, short focus to skin distance, high unnecessary table top and grid absorption, slow screens, too wide fields, and wasted exposures through errors. The National Radiological Protection Board report shows that no fewer than a quarter of x rays sets were in error by over 5 kV and that tube filtration varied from 2 to 5 mm of aluminium.¹ Nevertheless, these data are insufficient to show which specific improvements could give the most reduction in unnecessary high doses without any loss of diagnostic

information. Continuing studies are needed for guidance as to the most effective compromise between ideal clinical information and low radiation dose.

Small doses of x or gamma radiation to children or adults, added to the natural background radiation, are probably deleterious to health and could cause cancer in some people, although it is hard to show this directly. Thus the benefits of medical radiology may come at a price, and that price—radiation induced cancer—may be higher than necessary. A further report by the National Radiological Protection Board shows that among the 24 million radiological examinations carried out each year² the numbers do not vary greatly according to age (in groups between 10 and 75 years). Every year, therefore, several million patients with little risk of early cancer and good life expectancy may be receiving a higher dose than necessary.

The Ionising Radiations Regulations already require x ray equipment to be able to restrict the dose. Attention to technique and quality assurance is expected and encouraged, although clearly more needs to be known and done. The European Community's directive on patient protection is moving the Department of Health and Social Security, in collaboration with the Health and Safety Executive, towards requirements on the choice of medical x ray procedures. All these activities need solid underpinning by scientific studies, and much remains to be done.

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- 1 Shrimpton PC, Wall BF, Jones DG, et al. A national survey of doses to patients undergoing a selection of routine x-ray examinations in English hospitals. London: HMSO, 1986. (NRPB R200.)
- 2 National Radiological Protection Board. An update on the frequency of medical and dental examinations in Great Britain—1983. London: NRPB, 1986. (NRPB-R201.)

Skeletal dysplasias

There are probably about 100 different skeletal dysplasias, and all are rare, some affecting no more than five or six people in Britain. Altogether about 10 000 people in Britain are affected, but about 4000 of these have only very mild disease. About 6000 have some disability, and half of these have severe physical handicap throughout their lives.¹ In all patients the development of cartilage and bone is faulty. Some patients are thus short, but others may have only one or two bones affected.

Most of the dysplasias—including osteogenesis imperfecta, achondroplasia, multiple epiphyseal dysplasia, and the mucopolysaccharide disorders—have a genetic cause, but some do not—for example, Ollier's disease and melorheostosis. Up to now these severely handicapped patients have been rather neglected: "It's a dwarf—it will die" was the attitude for far too long. But the proliferation of patients' organisations, medical genetics departments, and skeletal dysplasia clinics in many large orthopaedic centres is beginning to focus attention on their problems. Many of the patients have normal intelligence and a normal lifespan, but they may be of very short stature and perhaps arthritic from childhood or early adult life. Clinical delineation cannot be complete, but certainly about 80 separate (non-lethal) types of dysplasia can be identified.

Antenatal diagnosis is rarely available in these non-lethal

skeletal dysplasias because there is no appreciable shortening of the limbs in early fetal life. (The mucopolysaccharide enzyme disorders are an exception in that they can be diagnosed biochemically.) Severe achondroplasia, for example, can be diagnosed by weeks 20-22 of pregnancy but not any earlier, and the milder form cannot be detected antenatally at all.

A positive approach to clinical management can achieve much to help these patients. Patterns of inheritance can be identified and genetic advice given. Advances in orthopaedic surgery have opened up possibilities of correcting deformities such as limb malalignment and spinal curvature, as well as leg lengthening and replacement of joints, that would not have been considered 20 years ago. In addition, this group of disorders provides a fascinating and fruitful topic for both prenatal and postnatal research.

These patients deserve more recognition, help, encouragement, and skills than are offered in many parts of the country, and the Skeletal Dysplasia Group for Teaching and Research was formed in 1979 with the aim of speeding up progress. It has already attracted over 100 members, including orthopaedic surgeons, radiologists, paediatricians, medical geneticists, histopathologists, and biochemists. Its activities are funded partly by the annual membership fee of £10 and partly by donations from individuals and organisations: the society is now a registered charity. Funds also come from royalties for the recently published *Atlas of Skeletal Dysplasias*.² Membership is open to any medically or scientifically qualified individual, and further information is available from Mr M A Smith, Orthopaedic Department, St Thomas's Hospital, London SE1 7EH.

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1 Wynne-Davies R, Gormley J. The prevalence of skeletal dysplasias. *J Bone Joint Surg [Br]* 1985;67:133-7.

2 Wynne-Davies R, Hall CMH, Apley AH. *Atlas of skeletal dysplasias*. Edinburgh: Churchill Livingstone, 1985.

Twelve dead and a complacent report

In the past fortnight 12 people have died and 19 been seriously injured in two much publicised crashes on British motorways. Both accidents were the result of human error, and yet the refusal to deal adequately with the direct approach to influencing human error is one of the worst failings of a recently published government report on road safety.¹ The report is the result of the first full review within government for more than 10 years of British road safety and has proved a disappointment. The interdepartmental working group that took three years to produce the report talks of the importance of gaining an "accurate understanding of the nature of the road casualty problem" and then limply concludes that "for the majority of road safety functions we simply do not know what returns are being achieved in terms of casualties and moreover have little prospect of finding out."

The World Health Organisation has long argued that an epidemiological approach is needed to road traffic accidents,²

yet those responsible for road safety in Britain have never heeded this advice. The first step should be to examine the quality of the data that we do have on road traffic accidents, and we know that about a third of injuries seen by hospital doctors do not appear in police returns^{3,5} and that the correlation between the opinions of the police and doctors on the severity of the injuries is not good.⁷ That is why we need record linkage, which is feasible⁶ and produces valuable data.⁷ The report fails even to mention these important attempts to improve the basic data.

Human error is the prime factor in 70% of accidents and a contributory factor in all but 5%. The working group claims that much human error can be reduced only indirectly by creating safer vehicles and a safer environment, but we may well be approaching saturation point in the cost effectiveness of such modifications. Direct measures to influence human behaviour are to be given priority "only in the longer term." The group emphasises that tackling the drinking driver "continues to stand out as a task of particular urgency and importance" yet ignores the fact that we have no information on the distribution and range of blood alcohol concentrations among drivers. "Few new opportunities [exist]," says the group, "for legislation which would be acceptable and offer cost effective means of reducing casualties," although a poll earlier this year showed that three quarters of drivers would be in favour of random breath tests. The report does not even mention random breath tests, which have been shown to be effective in several countries, nor does it discuss enforcing speed limits.

The Secretary of State for Transport's foreword to the report is complacent, pointing out that Britain's accident rate compares well with those of other European countries and has been falling recently. He does not mention that among 5 to 9 year old pedestrians Britain has a higher mortality than almost any other country in the European Community and that among 10 to 14 year olds it is twice the community average. Neither the Secretary of State nor the working group seems to want to upset the motorist by interfering with dangerous habits.

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- 1 Department of Transport. *Road safety: "the next steps."* London: DoT, 1987.
- 2 World Health Organisation. *Report of the inter-regional seminar on the epidemiology, control and prevention of road traffic accidents, Alexandria, 25 October-1 November 1965*. Geneva: WHO, 1966. (Document WHO/Accid rev/66.6.)
- 3 Bull JP, Roberts BJ. Road accident statistics—a comparison of police and hospital information. *Accident Analysis and Prevention* 1973;5:45-53.
- 4 Hobbs CA, Grattan E, Hobbs JA. *Classification of injury severity by length of stay in hospital*. Crowthorne, Berkshire: Transport and Road Research Laboratory, 1979. (Report LR871.)
- 5 Grattan E, Keigan ME. Patterns and severity of injury in a hospital sample. Paper read at the *Fifth International Conference of the International Association for Accidents and Traffic Medicine*, September 1975. London: IAATM, 1975.
- 6 Stone RD. *Computer linkage of transport and health data*. Crowthorne, Berkshire: Transport and Road Research Laboratory, 1984. (Report LR1130.)
- 7 Tunbridge RJ. *The use of linked transport and health road casualty data*. Crowthorne, Berkshire: Transport and Road Research Laboratory, 1987. (Report RR96.)

Correction

The blood transfusion service and the National Health Service

We regret that an error occurred in last week's leading article by Dr John Cash (p 617). The final page proof was correct when it left the editorial office. The error arose at the printers.

The fifth paragraph should have begun: "What went wrong with the National Blood Transfusion Service—which in the 1950s and 1960s was regarded as pre-eminent in the world? There is no simple answer to this question but part is that the notion that the service was pre-eminent is a misconception. There is and has been no such organisation: it is a myth, a central government fantasy."