guinea worm, which the World Health Organisation has already announced its intention of eradicating. This simple, single, safe public health measure will also considerably reduce the burden of several other diseases, including typhoid, cholera, and epidemic non-A hepatitis.

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Respiratory care in muscular dystrophy

Duchenne muscular dystrophy, the commonest neuromuscular disorder in childhood, is relentlessly progressive: most boys can no longer walk by the age of 12 and they die in their teens or early 20s. Adolescence is characterised by a steady fall in the vital capacity, resulting from increasing muscle weakness and scoliosis. At first the tidal volume is maintained, but eventually it also falls. A prospective study showed that almost three quarters of patients die from hypercapnoea due to chronic respiratory insufficiency.[1] When the vital capacity fell below 700 ml the risk of death was high and clinical signs of hypoventilation appeared.

Clearly there are considerable problems in respiratory management, and in a recent review Smith and his colleagues emphasised that an important component is to try to control the scoliotic contribution to the falling vital capacity.[2] Since scoliosis develops because the child can no longer walk its onset can be delayed by prolonging ambulation with lightweight knee-ankle-foot orthoses.[3] Once the child is permanently in a wheelchair wearing a spinal brace may prevent scoliosis but only if the curvature is minimal. If the scoliosis is 30° or more, and the boy is still growing, internal fixation of the spine is usually necessary, and the Luque operation has revolutionised this approach.[4]

Obesity, which is frequent in Duchenne muscular dystrophy, may also restrict breathing, and prophylactic dietary restriction is important.[5] Respiratory muscle training and intermittent positive pressure respiration may help to maintain the vital capacity, though these methods require more systematic evaluation.[2]

Ventilatory failure occurs late in the condition, and only when the boy has become confined to a chair. This is in contrast to the less progressive neuromuscular disorders, such as the congenital myopathies, where patients may have severe hypoventilation yet still be ambulant. In congenital myopathy the most severe hypoventilation occurs during sleep, and ventilatory support during the night may correct the chronic hypoxia and hypercapnoea with dramatic clinical improvement.[6-10]

It is not certain why there is this difference between Duchenne muscular dystrophy and congenital myopathy in the timing of ventilatory failure. It may relate to the greater diaphragmatic weakness in congenital myopathy, as the diaphragm is responsible for the major part of the ventilatory drive during sleep.[6] Weakness of the diaphragm can be assessed by measuring the transdiaphragmatic pressure with balloon catheters, but few young patients can cooperate with this technique. A simpler but indirect way is to measure the fall in the vital capacity in the supine as compared with the erect posture, a difference of 25% indicating definite diaphragmatic weakness. Smith and his colleagues found such a fall in a fifth of their boys with Duchenne muscular dystrophy,[2] and it occurs only in the non-ambulant phase of the disease.[11] They also found nocturnal hypoventilation in six out of 10 boys with advanced disease, and the more severe cases had apnoea related to rapid eye movement sleep with severe oxygen desaturation.

Ventilatory support, whether to treat or prevent hypoventilation, is the most controversial aspect of respiratory care in Duchenne muscular dystrophy. Some workers have used the rocking bed,[12] cuirass ventilator,[13] or positive pressure ventilator with a face mask.[14] These non-invasive methods may produce a worthwhile relief of symptoms. Ventilation using a tracheostomy is also effective,[1 15] but it raises the major ethical dilemma of prolonging life beyond the point at which the boy has incapacitating bulbar weakness. As Smith *et al* point out, we have few respiratory data to guide us over this contentious topic and no firm agreement about the type of management.[2] Future work should take into account not only the extension of survival that may be achieved but also the relief of symptoms and quality of life attained.

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RAWP revisited

In the 10 years since the Resource Allocation Working Party (RAWP) devised its formula for equalising the distribution of resources to health authorities in England[1] the gap between the richest and the poorest regions has narrowed. In 1977 there was a difference of 26 percentage points between the most overprovided and the most underprovided regions; today only 11 points separate them (the most overprovided region is 7% above target, the most underprovided 4% below).[2]

In those 10 years few have questioned RAWP's underlying principle—that there should be equal access to health care throughout England. But many have criticised the mechanics of the formula. At present regions are allocated money on the basis of their populations weighted by age and sex and (as a measure of morbidity) by standardised mortality ratios. Adjustments are then made for patients treated from other health authorities (cross boundary flows), for teaching medical students, and for London weighting. The major criticisms have centred on using standardised mortality ratios as a measure of morbidity, the fact that the formula takes no account of social deprivation, and the inadequacies of the payments made for cross boundary flows and for teaching medical students.

Yet the most recent review of the formula, by the NHS Management Board, has reaffirmed the soundness of the formula nationally while conceding problems in implementing it within regions, where the board has recommended a less mechanistic interpretation.[2] In its interim report, published last year, the board suggested some minor adjustments to the formula, but its definitive report has been delayed to the end of this year because the board wanted more research and analysis done. In particular, it wants more research into measures of morbidity and social deprivation, the costs of teaching districts, and the inclusion of outpatient and accident cases in cross boundary flows.

That more research is still needed is also one of the messages of the series on RAWP by Gwyn Bevan and his colleagues at St Thomas's Hospital that we have published over the past few weeks (p 1039). Bevan cites the allowance for teaching medical students (the service increment for teaching, SIFT) as an example of RAWP's boldness of purpose producing "something designed to be immediately acceptable but which the succeeding decade has failed to improve on." In other words, the original working party was flying by the seat of its pants, and Bevan argues that today we still do not know whether the calculation for compensating teaching hospitals for the extra cost of medical students is generous or not (he thinks it probably is generous).[3] Meanwhile, the NHS Management Board fears that there may be an underlying conflict between teaching and service needs and wants it resolved.

Even when adequate data are available the implications are often uncomfortable. In the middle paper of their series Bevan and Brazier argue that, contrary to popular wisdom, problems in RAWP losing districts where there are heavy inflows of patients (generally teaching districts) are caused not by inadequate compensation for these cases in the formula but by "overuse" of services by a district's own residents and by the fact that authorities cannot control their residents' use of services because they cannot prevent them from going to neighbouring districts.[4]

This problem and that of the conflict between teaching and service needs both come to a head in inner city teaching districts, particularly in London. Yet these districts have not deliberately failed to grasp the nettle proffered them by RAWP. Indeed, as the King's Fund study showed for London[5] and as Langman's report showed for Birmingham,[6] they have greatly reduced their numbers of beds. But their workload (and hence their spending) has not declined proportionally—presumably because there are still enough doctors to do the work. Thus does supply continue to subvert the definition of need. The *Economist* has been the most recent to argue that it is no good simply redistributing cash—doctors and hospitals have to be moved as well.[7] Two weeks ago Bloomsbury Health Authority announced a plan for demolishing the Middlesex and University College Hospitals and centralising their services in a new medical and teaching centre.[8] Perhaps they should go a stage further and build it in the north of England—where the morbidity is.

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The sauna: killer or healer?

Sudden deaths have occurred in saunas, raising worries that they may be dangerous. But at the same time they are proliferating in sports centres and "health clubs," with claims being made that they are beneficial to health. The time is clearly ripe to examine the effect of the sauna on health, and two Finnish doctors have done just that, compiling a review with 104 references.[1]

The first problem that the reviewers met was to define a sauna. There are many variations from the Finnish prototype, which is in a small log cabin beside a lake. Inside the hut water is ladled on to stones covering a wood fire to create in the cabin a high temperature and to control the humidity. After a spell in the hut the person taking the sauna plunges into the cold lake; he or she then has the circulation restored by being beaten with birch twigs. The Sauna Society of Finland recommends that the temperature at the level of the face should be be 80-90°C and the humidity 50-60 g of water vapour for each cubic metre. The stay in the hot room is normally limited to about 10 minutes at a time, and three