posed arrangements will cause apprehension, to which may be added fears of cumbersome new administrative processes. It is reassuring to find in the report an emphasis on minimising bureaucracy.

Researchers are adjusting to research and development commissioning procedures and know that such commissioned work falls within priorities areas. They may fear that under the new arrangements clinical research driven by curiosity may be placed in double jeopardy from grant committees and by priority exclusion. There have been too many instances of medical advances of general importance deriving from such research—the field of cancer genetics is a topical example—for these fears to be ignored. Clear and fair criteria for allocating funds for all categories of research must be developed alongside methods for costing and accounting. Good information on the totality of research taking place in the NHS will be essential, and for this the proposals build on the national project register system already established under the NHS research and development strategy.

Hospital trusts with high research profiles should view the proposals for assured funding of research facilities with favour, although their managers may be less enthusiastic that the money will have to be spent according to contract and not simply added to the total hospital budget. However, academics in the associated institutions will have little enthusiasm for another recurrent research assessment as a basis for such awards. Conducting this exercise in parallel with that of the higher education funding councils would seem sensible. Medical schools will have to invest in the administrative capability to contribute to the new NHS arrangements for research. An inevitable consequence of the proposals is the death of knock for knock, and the proposals must foreshadow new costing of teaching under the service increment for teaching and research.

The proposals that funds for service support as well as the direct costs of research should be made available in the primary and community sectors and to the professions allied to medicine are overdue. The organisers of multi-centre clinical trials will also welcome clear criteria and arrangements for support from the NHS; the pharmaceutical industry should benefit from the development of standardised procedures and pricing. It is surely right that the funding for research facilities be available to any trust on merit and not restricted to teaching hospitals.

There will be winners and losers under the new arrangements as there is no promise of new money. Indeed, it is explicit that the new single funding stream will be created

by amalgamating existing budgets for research and covert spending. Previous attempts to unravel research expenditure from hospital budgets have had little success, and the hope that providers will “progressively declare” such hidden spending so that it may be rendered by their purchasers to the centre may be unduly optimistic. Nevertheless, it is generally agreed that there is reduplication and some poor research so the opportunity exists to retrieve and redirect some funds. The new accounting procedures should reveal whether the long held suspicion of a general underfunding of clinical activity in relation to research is well founded. The most reassuring recommendation in the present climate is that the single funding stream for research should be derived from a levy on all purchasers; devolution of all responsibility for funding NHS research to a multitude of purchasers would have been disastrous.

Money spent on the support of research by the NHS is diverted from direct patient care. It was only in 1988 that the House of Lords Select Committee on Science and Technology forcefully made the case that the NHS needed to undertake research, and it is only four years since the case was accepted by government. Much has been achieved by Professor Peckham since 1991, and he has been successful in generating enthusiasm for research and development among senior managers. But managers expect to see results and are unaccustomed to the timescale of research. They are more interested in systematic direct application of existing knowledge—that is, development rather than research. Some even go so far as to challenge the necessity to undertake any research within the NHS, arguing that reliance can be placed on research done elsewhere. The Culyer proposals provide a vital incentive for managers to recognise that research is their business, and the research community must argue with passion and conviction that investment in research is essential to the future quality and cost effectiveness of the NHS and thus to the wellbeing of the nation. The public at large will understand this argument.

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1 Research and Development Task Force. *Supporting research and development in the NHS*. London: HMSO, 1994. (Culyer report.)

2 Dillner L. NHS research needs separate funds, says task force. *BMJ* 1994;309:688.

Preparing medical experts for the courtroom

No need to learn by trial and error

All professions are having to respond to the irresistible call of the witness box, and the importance of competent and reliable expert witnesses cannot be overestimated in these increasingly litigious times. The potential for disaster for the untrained expert witness, and more importantly for his or her client, is considerable. Yet medical expert witnesses have traditionally learnt their courtroom skills by trial and error.

Happily for the people who retain their services, this trial and error approach is no longer needed. November sees

the launch of a new venture, sponsored by the *BMJ*, that offers doctors training in the skills required for the witness box (see advertisement in this issue). Queen's Counsels from the chambers of Stephen Coward QC will participate in a series of seminars offering practical training to doctors and will also lecture on preparing the expert's report, collecting evidence, and the responsibilities of the expert witness.

Doctors who are asked to prepare an expert's report should ensure that they fully understand the issue on

which they are being asked to give an opinion. Unless they understand what negligence means in law they should not express the opinion that a doctor has been negligent. Similarly, if causation is at issue experts should ensure that they understand exactly what it means. The language of the report should be as accessible as possible: the judge and the jury may not know anything about medicine.

As well as tackling the complexities of the expert's report the seminars will include opportunities for delegates to appear as expert witnesses and be cross examined just as they would in a real court case. Although delegates will be briefed on what to expect before taking part, they will have to rely mainly on their experience and their grasp of the matters on which they are giving evidence.

Adequate study of the papers in the cases used in the seminars is an essential prerequisite, as it would be in a real court case. Each participant will receive a critique on his or her "performance," highlighting its strengths and weaknesses. Workshops will feature examples of medical negligence and personal injury that are also based on real cases.

Expert witnesses may easily stray out of their field of competence because of overconfidence—leading to disastrous consequences in the courtroom. For example, in giving his evidence regarding the assault of a prisoner in his cell a pathologist expressed the opinion that the injuries that had been sustained were consistent with a violent struggle and not a prank that went wrong (as claimed by the defendants). When asked how he had formed this opinion the pathologist responded that when he examined the cell the furniture and personal effects were in considerable disarray, suggesting a violent altercation. Counsel for the defence said that the furniture had been moved by the medical team while it was attempting to resuscitate the victim, thereby undermining the expert's testimony and his credibility.

Not all the pitfalls of the witness box are as obvious as this one, and the seminars will guide delegates through the legal maze. In addition they will highlight some of the more subtle techniques that can help experts to be as effective as possible in the courtroom (box).

How to be a better expert witness

Stand still. Fidgeting in the witness box or swaying from side to side makes the expert appear shift and unsure.

Answer the question asked, not the tricky question that may or may not be hiding behind it.

If there are weaknesses in the client's case the expert should concede them rather than attempt to defend the indefensible at the expense of credibility with the court. Experts should never forget that they are expected to be independent.

Speak slowly and audibly.

Avoid arguing with counsel. This will irritate the judge and plays into the hands of counsel, who is far more experienced in such verbal combat.

Build up a rapport with the judge by speaking audibly and maintaining eye contact when answering questions.

Keep it simple. The expert should avoid jargon and long explanations where possible; the judge and jury may easily become lost.

Do not be afraid to pause before answering. A common mistake made by expert witnesses is that they panic if they can't answer every question instantly. A pause for thought can often create the impression that the expert is considering the question carefully.

If an advocate requests a "yes" or "no" answer to a question the expert should comply with the request only if such a reply would not mislead the court. If a "yes" or "no" answer would be misleading, the expert should explain this to the judge and ask for the opportunity to reply in more detail.

There is more to successfully giving evidence in court than one might at first realise. This new venture is designed to give medical experts a thorough understanding of their responsibilities and to generate personal confidence in courtroom technique.

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Screening for Down's syndrome

Ignorance abounds

Down's syndrome (trisomy 21) is the commonest cause of mental retardation and is also associated with major structural anomalies of the heart and gastrointestinal system and an increased risk of leukaemia. Early mortality is high, mainly due to congenital heart defects, but between infancy and 40 years of age mortality is similar to the norm. Most surviving adults go on to develop brain abnormalities that are typical of Alzheimer's disease.

At birth the incidence of the syndrome is 1.3 per 1000, with the risk rising with increasing maternal age. Until recently screening was confined to women over an arbitrary age limit of 35 to 37 and entailed amniocentesis or chorionic villus sampling. These procedures carry a small but important rate of miscarriage. On this basis, one in 20 pregnant women would be offered screening, and the risk of giving birth to a baby with Down's syndrome would be comparable to the risk of miscarriage due to the procedure. This screening programme was based on questionable

arguments relating to the provision of services and an assumption that the impact of giving birth to a baby with Down's syndrome equated to losing a pregnancy.

In population terms this method of screening was a failure. Hook estimated that prenatal diagnosis between 1980 and 1985 in England and Wales reduced the number of babies being born with Down's syndrome by 10%.¹ The reason for this failure lies in the fact that only 30% of babies with Down's syndrome are born to women over the age of 36, many of whom decline invasive prenatal diagnosis for fear of losing the pregnancy. The remaining 70% are born to younger women, who individually are at lower risk but who form 95% of the pregnant population and are excluded from this method of screening. The possibility that these younger women are at risk of giving birth to babies with Down's syndrome was rarely, if ever, discussed during their antenatal care.

Biochemical screening of maternal serum permits esti-

See articles on pp 769 and 776