decisions than does measuring plasma total cholesterol alone. The methods for HDL determination need to be standardised, and the unacceptably high coefficient of variation of the methods reduced. Additional measurements of plasma HDL cholesterol concentration will have budgetary implications for departments of clinical chemistry. In future, measuring HDL subfractions or apoprotein A1 may give better estimates of risk than total HDL cholesterol alone.

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Introducing aptitude testing into medicine

Surgeons lead the way

In many countries employers use techniques of objective assessment to select staff for key positions. In Britain these techniques are widely used in industry, commerce, the civil service, and the armed forces, but they have not been used by doctors. Now the Royal College of Surgeons of England has drawn attention to the potential of personality assessment techniques and aptitude testing as aids for selecting surgical trainees.¹ A working party has been set up by the college to establish these techniques not only for selection but also for assessment during training.

The techniques include using questionnaires to explore interests, motivation, and aspects of personality; ability testing of intelligence, aptitude, and attainment; and behavioural exercises that simulate problems typically encountered in the job under consideration. All these data are collected on a computer, scored, and then combined with the result of an interview with structured rather than random questions. The aim is to ensure that the applicant and the job are well matched. This is particularly relevant to specialties such as surgery, in which applications for entry outnumber training posts. The present subjective and haphazard forms of selection are no longer adequate.

The questionnaire and the tests used in selection must be relevant to the specialty, and so a criterion or task analysis must first be performed. Greenberg *et al* asked 115 surgeons and surgical residents which of 35 personality traits they considered to be the most appropriate for a surgeon; agreement was greatest for decisiveness, fairness, good team participation, flexibility, admitting to errors, discipline, considering all the facts, motivation, and an ability to listen.² Schueneman *et al* tested surgical residents and found that the two factors most predictive of operative skill were visuospatial organisation and stress tolerance.³ After observing surgeons at work in operating theatres, wards, and outpatient departments and interviewing surgeons and surgical trainees in The

Netherlands Van De Loo established criteria for selecting surgical trainees based on (a) intelligence (verbal, spatial, and numerical); (b) operative skill (dexterity, psychomotor ability, attention, and concentration); (c) stability and organisation (emotional stability, common sense, and organising and planning ability); (d) work attitude (motivation, accuracy and carefulness, energy, drive, and stamina); and (e) co-operation (sociability, independence, self criticism, and empathy).⁴

The techniques of assessment must be based on a sound rationale and be demonstrably valid; they must be economically feasible, taking account of the time taken to perform and mark the tests; and they must be politically acceptable to both those using the tests and those being tested.

The answers to the questionnaires and the test results may be weighted according to the criterion analysis for the specialty. For example, the test for visuospatial organisation might carry a higher score for a prospective urologist, who will have to perform much endoscopic surgery, than for a general or orthopaedic surgeon, who may expect to manage major trauma. The results of tests already performed on surgical trainees in The Netherlands suggest that there is not one profile of a surgeon but rather a series; this finding should reassure those who fear surgical "clones" emerging if such selection methods are adopted.

The armed services with their system of yearly review have had an unrivalled opportunity to validate their initial selection techniques. Since the early 1940s the Royal Air Force has developed and expanded its aptitude testing. Task analysis, and hence the definition of tests, exists not only for pilots but also for navigators, air engineers, air loadmasters, air electronics operators, air traffic controllers, and fighter controllers.⁵ The results have confirmed that factors other than aptitude are important for success in training, although aptitude is the most discriminatory factor. Weighting the

factors through regression equations has led to the ability to express as a percentage an applicant's likelihood of success in training.⁵ Four years ago the system was computerised for both the application and the scoring of results, which has opened the way to much further development. New tests, when confirmed and introduced, will give the air force selectors refinements for judging applicants' likelihood of success in training and service. Furthermore, the tests often provide evidence that is valuable in deciding the candidates' suitability for specialties other than those initially considered. All this is particularly important when training methods have to be improved to cope with the rapidly rising demands of technology despite fixed or diminishing budgets.

Several years must elapse before the results of applying selection techniques to surgical trainees will be available. Meanwhile others may wish to follow the example of the Royal College of Surgeons and a few medical schools in attempting to provide more objective and scientific methods

for selecting those who will take medicine into the next century.⁶

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Near death experience

Analogous to other stress induced psychological phenomena

A close brush with death has been known to change a person's view of life.¹ But does it also offer insights into death itself? Although a recent review of the so called near death experience concluded that it does not,² some of those reporting such an experience, who include C G Jung,³ have disagreed, often citing the consistent features of the experience in evidence. On cluster analysis these features divide into three groups: cognitive, including distortion of time and a review of one's life or panoramic memory; affective, usually a feeling of peace or joy; and transcendental, visual images of a heavenly world populated by deities and deceased relatives.⁴ Other common components are feelings of separation from the body, visions of oneself (autoscopic phenomena), and the "tunnel experience" of passing through a dark enclosed space to emerge into brilliant light.⁵

Such mental phenomena have been described by people who believed themselves to be in danger of dying through illness, surgery, or accident. Albert Heim, a Swiss geologist, collected the first series in 1892 from mountaineers who had survived falls.⁶ Most subsequent reports have been based on similar self selected samples, which makes it impossible to estimate how common the near death experience is, though two small studies of consecutive survivors of cardiac arrest found it to be unusual.^{7,8} No predisposition has been shown for age, sex, or religious conviction, but subjects have described more previous "mystical experience" than controls, such as communication with the dead or memories of a past life.⁹

Explanations have included the spiritual,^{10,11} the psycho-analytic,^{12,13} and the purely neurological¹⁴—all sharing only one attribute: each requires a form of faith. And, though the features of the near death experience are reproduced in drug induced states,¹⁵ this points to a physiological substrate rather than to their aetiology. Any comprehensive explanation must account not only for those who are ill and genuinely near death but for those who are healthy though in greater danger (such as Heim's mountaineers) and those who are ill but not in danger. In encompassing these, Roberts and Owen concluded that the near death experience is a complex hallucinatory phenomenon in people who perceive death as imminent.²

Thus the actual threat of death is less important than the perceived threat, as has been described in accident neurosis.¹⁶

It may be through analogy that the near death experience can be explored as each component occurs also in other circumstances. The founder of descriptive psychopathology, Karl Jaspers, likened the affective component to the peaceful inactivity of soldiers under battlefield barrage, representing a stunning of emotional response rather than true calm.¹⁷ Autoscopic hallucinations and depersonalisation are known manifestations of acute anxiety. Like other "dissociative" hallucinations, autoscopic phenomena may contain elements of wish fulfilment¹⁸—in this case meeting loved ones in a pleasant after life whereas depersonalisation combines temporal slowing and out of body experience and might be regarded as an adaptive mental response to overwhelming physical danger.¹⁹ One study of out of body phenomena found that positive emotions and life review were common whether or not there was a mortal threat. In fact no experience was exclusive to the near death experience, though its images were more likely to be linked with death, the immediate source of stress.²⁰

Culture also influences the images of the near death experience, though as with other mental symptoms the nature of the experience seems to be universal.²¹ No crossing of cultural boundaries—for example, meeting a god from another religion—has been described.²

Can any conclusion be drawn from the religious conversion that sometimes follows a near death experience? Probably not, as it is neither unique nor uniform. Conversion may also follow temporal lobe seizures,²² but did not occur in survivors of cardiac arrest, though some were confirmed in their pre-existing beliefs, both religious and atheistic.^{7,8}

Understanding and discussing attitudes to death and premonitions of it may reflect good clinical care of the fearful or dying patient.⁵ But the content of such experience reveals no more about death than delusions of being spied on reveal about surveillance technology. The near death experience seems to be comparable to other mental reactions to perceived threat, coloured by culture and current stress, and commoner in those with similar previous experience. Its importance lies