The development of the TRISS methodology has been a major advance in the measurement of injury severity. The detailed structure of the scales and the method of developing a single number to represent threat to life are, however, under constant review.

An alternative method of measuring anatomical injury has recently been described by using the root sum squares of the abbreviated injury scale scores of the head and trunk (anatomic profile). This has now been incorporated into a system for the characterisation of trauma (ASCOT), using different weightings for the revised trauma score and age.

These developments can be expected to lead to more accurate scoring systems, but for the present the TRISS methodology has a worldwide reputation for consistency and reasonable prediction of outcome. Immediate improvement in its usefulness could be made if, as is happening in some areas, ambulance crews measured the revised trauma score at the scene of the accident. This would allow a more scientific appraisal of the value of pre-hospital care. The accuracy of anatomical information could also be improved—particularly in necropsy reports: these are often inadequate for coding purposes and spinal cord injuries are rarely described in detail.

Measurement of outcome in terms of survival or death is, however, a crude yardstick. Further progress is required in measuring disability after non-cerebral injury. Most life threatening visceral injuries leave little disability. In contrast, musculoskeletal problems cause prolonged periods of disability and handicap. Some attempts have been made to measure permanent musculoskeletal sequelae, but the many more patients who sustain temporary incapacity are largely ignored in the statistics. Much more effort will be required to develop outcome measures based on disability; these are essential if the treatment of the multiply injured patient is to be based on sound scientific principles.

Definitions of impairment, disability, and handicap

Impairment has an anatomical or physiological basis and is usually a consequence of musculoskeletal or cerebral injury (for example, an amputated finger, anosmia). It is easy to measure but variably related to the patient's activity

Disability is a functional consequence of an impairment so that the patient cannot perform activities of daily life. Its measurement is relevant to the patient's needs but it is influenced by the environment

Handicap refers to disability within the patient's social and professional environment. It reflects a change in lifestyle, but it is difficult to relate it to specific injury and is very difficult to measure

The latest edition of the *Abbreviated Injury Scale Booklet* (AIS90) and information about the major trauma outcome study (UK) is available from the North Western Injury Research Centre, University of Manchester, Hope Hospital, Salford M6 8HD.

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The ABC of Major Trauma has been edited by Mr David Skinner, FRCS; Mr Peter Driscoll, FRCS; and Mr Richard Earlam, FRCS.

Letter from Chicago

Slippery slopes

George Dunea

A retired pathologist from Michigan has recently invented a suicide machine. This he achieved by connecting two bottles hanging from a rack and installing a switch that sets off consecutive infusions of thiopental and potassium chloride. To obtain marketing approval, according to the law of the land, he would have to prove safety and efficacy in placebo controlled trials. So far no manufacturer has as yet added monitors and air conditioners to sell an improved model for $20 000. Nor is production of a device for multiple use under consideration. Leasing arrangements would become feasible only if the clients could be persuaded to return the machine after using it.

The inventor calls himself a bioethicist and obitiatrist, after his new specialty of the medical management of death, but he has also been referred to as Doctor Death. So far he has treated only one patient, quite likely his last. A strong willed woman, said to have lived life to its fullest but suffering from Alzheimer's disease for a year and no longer able to spell or play the piano, she was reportedly well enough to win at tennis and understand the consent forms. She travelled with her family from Oregon to Michigan, where the doctor inserted the intravenous needle and set up his device in a van, no hospital being willing to grant him obitiatric admitting privileges. The woman pressed the switch and all went as planned. The judge, however, did not concur and forbade him to use the machine again, in a van or for that matter anywhere else. Some thought that the doctor himself belonged in the van or at least behind bars. There were conflicting legal precedents in Michigan, one man having been sentenced to life imprisonment in 1920 for placing poison within the reach of his crippled wife; another having been acquitted in 1983 after helping his drunk, depressed friend to buy a gun.

The doctor said that he had not broken any law, "though you never know what happens in a highly emotional society." Some people acclaimed him as a hero who had brought the issue of suicide out of the woodwork; others thought that he was a lunatic. "A

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Br Med J 1990;301:1094-5

gross moral outrage," said one ethicist. "The man is bad news and so is his machine," thundered the *Chicago Sun Times*. The Hemlock Society praised him for drawing attention to the plight of the dying; the Alzheimer Society had to withdraw its condemnation after its office was overwhelmed with telephone calls. Various polls suggested "the people were ahead of the government," half to three quarters of the respondents favouring suicide to avoid the degradation of illness and the agony of death.

No other offers providing similar services have been forthcoming, nor do we expect to see minivans crisscrossing the country to provide death care to the needy. But in Illinois surgeons want to reduce costs by having 10 to 20 bed postsurgical and obstetric centres where patients could stay for one or two days after outpatient procedures. A bill approving a pilot programme of six regulated centres for a trial period of three years was supported by the state's medical society but withdrawn after a vigorous campaign by the hospitals. They thought that the centres would skim away some of their most lucrative business and were successful in having the bill put on hold. Why remove a mole in a surgicentre when you can do it in a fully equipped modern operating theatre? Why charge $350 for a night in a postsurgical centre when you can bill two to three times as much for a hospital bed?

The ethicists did not give two hoots about post-surgicentres but worried about euthanasia. They foresaw a long slippery slope leading in time from voluntary euthanasia to various involuntary euthanasias—such as killing chronically ill patients without their consent ("crypthanasia"), pressuring of people by relatives into agreeing to die ("encouraged euthanasia"), having them killed by consenting guardians ("surrogate euthanasia"), or selecting certain vulnerable groups ("discriminatory euthanasia"). They also thought that euthanasia violated the Hippocratic Oath and destroyed the relationship between patient and doctor, since doctors were supposed to be healers not killers.

Moving into roof mending

Yet doctors can diversify into all kinds of other activities, some of which can land them in trouble. Thus earlier this year a doctor was taken to court because he made a house call to an old lady and fixed her roof, then billed Medicare for it. The judge sentenced the doctor to a few weeks of community service (presumably fixing more roofs) as well as asking a committee of his peers to rule if he was fit to practise medicine. The unfairness of the judge's decision is underscored by his failure to ask for an evaluation of the doctor's ability to fix roofs. If the roof leaked again or fell off altogether the patient's mental stress could be extreme and even rheumatism could ensue. Plugging a hole in a roof is a cost effective procedure requiring fewer validation studies than having your carotids or coronaries reamed out. Already Medicare pays for canes, commodes, electric beds, and wheelchairs, so why not for roofs?

Meanwhile the state of Oregon is trying to plug a hole in its treasury by setting priorities on medical needs. In exchange for covering more people it wants to pay less, rationing payments for treatments according to their cost benefit ratio. After a series of public hearings; community meetings; consultations with doctors, ethicists, administrators, and consumer advocates; and even random telephone surveys to determine local preferences the local health department released a list ranking 1600 procedures according to a complex formula. This divides the cost of the treatment by the number of years the patient would benefit from it, also taking into consideration public preferences as shown by the survey. Bacterial meningitis and several other infections came out on top, and some of the tumours also fared well, as did thumb sucking and fixing crooked teeth. Hernias, dislocated elbows, head trauma, and established AIDS scored poorly. More computer work will be required to streamline the package, and final implementation requires a federal waiver before state legislators can go ahead without losing matching funds.

On the whole the plan was well received. The *New York Times* hailed it as a "brave medical experiment." Administrators and business leaders also praised the plan, hoping that winning the war on thumbsucking would make up for losing the war on drugs. But liberals worried about yet another slippery slope that would leave Oregon's least fortunate residents with deformed thumbs, crooked teeth, and leaking roofs.

Some form of slippery slope must have also been in the mind of the Supreme Court judges who ruled on the case of the unconscious Nancy Cruzan. The family had long wanted to stop tube feeding, the woman having been in coma for seven years, well beyond any reasonable hope of recovery. In an earlier ruling the state of Missouri, seemingly less cost conscious than Oregon, had decided that it had an interest in maintaining the woman alive. In their decision the judges affirmed people's constitutional right to forego life sustaining treatments, including tube feedings, provided that they had made their wishes known explicitly and unequivocally in the form of a living will. In the absence of such a document, however, the majority ruled that the states were free to carry out their interest in the protection and preservation of life. The court made no distinction between extraordinary means of supporting life and simple measures such as tube feeding. Although some doctors deplored this decision as an intrusion into the traditional relationship between patient and doctor, the court in fact left the states free to legislate how rigorous a proof of the patient's intentions they would require. Dissenting judges, however, argued that maintaining patients who were comatose indefinitely perpetuated their degraded existence, distorted the memory they left behind, and increased the family's suffering, thus failing to respect the patient's best interests. Currently an estimated 10 000 patients in a coma are being maintained in a vegetative existence at a cost of some $130 000 a year. Some could conceivably live on for 30 years. Yet taking the matter out of the courts and leaving it to the state legislatures is a reasonable solution for the 90% of people who lacked the foresight to write a living will.