and some university researchers. Why? They were engaged in commercial trials assessing the effects of expensive new drugs (so-called neuroprotective agents) on outcome measures of questionable importance to patients, and they did not wish to face competition for participants.

Another reason for tackling these unanswered questions is to help ensure that the precious resources available for healthcare are not being wasted. When human albumin solution, given as an intravenous drip, was introduced during the 1940s to resuscitate burned and other critically ill patients, theory suggested that it should reduce their chances of dying. Amazingly, this theory was not subjected to fair tests until the 1990s. At that point, a systematic review of the relevant randomized trials could find no evidence that human albumin solution reduced the risk of death compared with simple salt solutions. What the systematic review showed, in fact, was that if albumin had any effect on death risk it was to increase it.[3] The findings in this review prompted doctors in Australia and New Zealand to get together to do the first sufficiently large fair comparison of human albumin solution with saline (salt water), an alternative resuscitation fluid.[4] This study – which should have been done half a century earlier – could find no evidence that albumin was better than salt water. Since albumin is about 20 times more expensive than saline, huge sums of money from healthcare budgets worldwide must have been wasted over the past 50 years or so.

2. Design and conduct research properly

Stimulated by surveys revealing the poor quality of many reports of clinical trials, reporting standards have been developed and applied. Such standards make clear how many patients have been asked to participate in a study and how many declined the invitation. Results are presented according to the various treatment groups selected at the outset. But there is still a long way to go to improve: (a) the choice of questions being addressed in research; (b) the way that these questions are formulated to ensure that the outcomes of treatments chosen for assessment are those that patients regard as important; and (c) the information made available to patients. (See Chapters 11 and 12.)

To see whether a proposed trial might be feasible and acceptable, exploratory work involving groups of patients can be useful. This may highlight shortcomings in the design plans; or help to define outcomes that are more relevant; or even suggest that the concept is a non-starter.[5, 6]

This can save a lot of time, money, and frustration. The clinical trial in men with localized prostate cancer that we described in Chapter 11 (p140-141) showed how the research design was improved by careful consideration of the terms used by clinicians to describe the trial's purpose and the treatment options. Exploration of patients' views led to an acceptable study because the concerns and information needs of the men being invited to participate had been identified, and the information provided to potential participants took account of these findings.[7]

3. **Publish all the results and make them accessible** Selective reporting of the results of research can lead to serious biases. Some 'negative' studies are never published when the results do not match the expectations of the investigators or funders. Without a published report to tell the tale, these trials disappear without trace.[8] Furthermore, results within published trials may be selectively reported – that is, some of the results are excluded because they are not so 'positive' for the treatment being tested.[9] Patients have suffered and died because of biased reporting of research on the effects of treatments. This practice is unethical as well as unscientific.

4. **Produce unbiased and useful research reports** Even when studies are published, they often omit important elements that enable readers to assess and apply the findings. One review of 519 randomized trials published in reputable journals during December 2000 found that 82% did not describe the process of allocation concealment and 52% did not provide details of measures to reduce observer biases – both features that we suggested in Chapter 6 were crucial to good studies.[10] This poor reporting of details extends even to the description of the treatments used. A trial showing that giving a specific booklet (compared with no booklet) helped patients with irritable bowel