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The Dilemmas of New Technologies

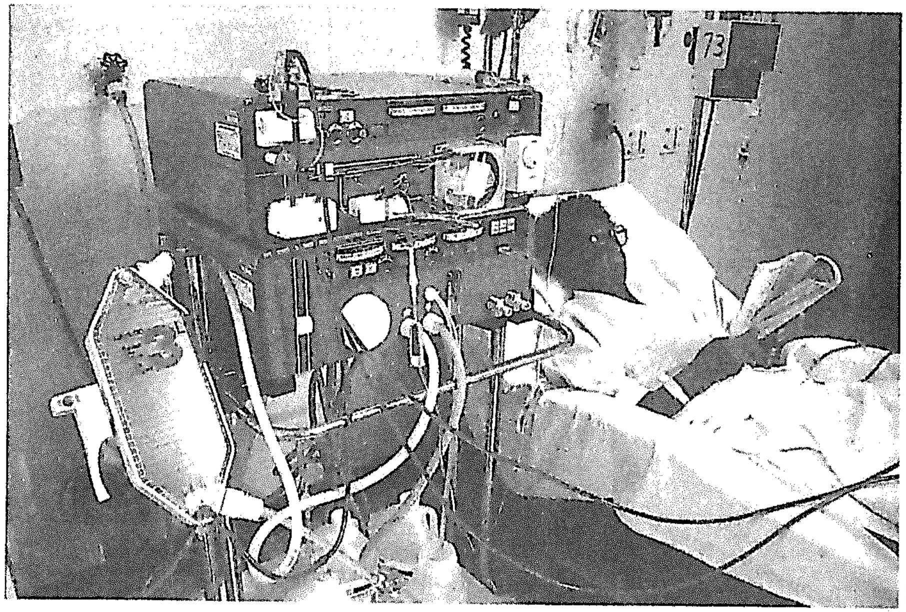
It is not always easy to scrutinize a particular medical technology in terms of costs, benefits, and general appropriateness—especially when it applies to us or someone close to us. Still, it is worth making the effort, if only to better comprehend the dilemmas often posed by the advance of medical technologies. The brief studies that follow should help to make the key issues more concrete.

The Case of Kidney Dialysis

Sophisticated technologies may be of limited importance to the population as a whole, but for many individuals they are literally the difference between life and death. The benefits of recent technological advances are nowhere more evident than they are to people suffering from kidney disease. In a healthy individual, the kidneys regulate the body's acid-base concentration, maintain proper water balance, and concentrate metabolic wastes that are subsequently excreted as urine. Complete or substantial kidney failure (known in medical jargon as "end-stage renal disease") usually results in incapacitation and premature death. Many are afflicted: urinary diseases are the nation's fourth-largest killer, right behind cardiovascular diseases, cancer, and pneumonia.

In the early 1940s a Dutch physician used a bathtub and parts salvaged from a foundry to construct the first device to successfully take the place of the kidneys. The inventor, Dr. Willem Kolff, later emigrated to the United States, and his device inspired the development of more refined versions at a number of American hospitals. At that time, cleansing the blood by means of an artificial kidney (a process known as dialysis) was confined to short periods of time. Use of an artificial kidney as a permanent replacement for a real kidney became possible in the early 1960s through equipment improvements and the invention of a connecting tube that obviated the need to use a new artery and vein every time that the machine was hooked up. This made long-term dialysis a practical proposition, but at the same time it generated a host of nonmedical problems that have yet to be resolved.

When dialysis became an accepted medical practice, the number of patients that could potentially benefit from it far exceeded the number of available machines. It was therefore necessary to select some patients for dialysis and to reject others. In order to make these choices, the nation's pioneering dialysis institution, the Seattle Artificial Kidney Center, established an Admissions and Policy Committee to screen applications and determine who would get dialyzed and who would not. The committee was intended to reflect the community as a whole, being initially comprised of a lawyer, a minister, a housewife, a labor leader, a government official, a banker, and a surgeon, as well as two physician-advisors.[6] The committee made their first selective cut by only accepting patients from the state of Washington, and by eliminating children along with adults over the age of forty-five. Having done this, the committee then applied a set of criteria that took into account the personal characteristics of prospective patients. According to one report, these included the "sex of patient, marital status and number of dependents; income; net worth; emotional stability, with regard to patient's ability to



Patient undergoing kidney dialysis. (Nathan Benn/Woodfin Camp & Associates.)

accept the treatment; educational background; nature of occupation; past performance and future potential, and names of people who could serve as references."[7] As might be expected, making life-or-death decisions on the basis of the presumed worth of the patient generated a fair amount of indignation in some quarters. According to two critics, a psychiatrist and a lawyer, the published accounts of the selection criteria ". . . paint a disturbing picture of the bourgeoisie sparing the bourgeoisie, of the Seattle committee measuring persons in accordance with its own middle-class suburban value system: scouts, Sunday school, Red Cross. This rules out creative nonconformists, who rub the bourgeoisie the wrong way but who historically have contributed so much to the making of America. The Pacific Northwest is no place for a Henry David Thoreau with bad kidneys."[8]

The problem of controlling access to a potentially life-saving technology was mitigated as the number of machines increased and they were made easier to operate. It even became possible for a patient to routinely dialyze himself or herself at home. But formidable cost problems remained. In 1970 a twice-weekly dialysis cost $3,000 to $5,000 and required start-up expenditures of $9,000 to $13,000. For most patients these expenses produced grave financial pressures, and for some they were impossible to meet. The problem was apparently solved in 1972 when the U.S. Congress authorized payment for dialysis treatments through the government's Medicare insurance program.

The process whereby this policy was enacted illustrates the capricious way in which technologies are sometimes supported. The federal government's assumption of payments for dialysis treatments was in large measure the result of intense lobbying, an effort that was made all the more effective by connecting an abstract ailment with actual people. In one instance, the vice-president of the National Association of Patients on Hemodialysis and Transplantation not only testified but dialyzed himself in the presence of members of the House Ways and Means Committee.[9] The provision of Medicare payments for dialysis was only a small portion of a larger piece of legislation; only thirty minutes of debate on the floor of the Senate took place, culminating in a lopsided vote in support of the measure at a time when close to half of the senators were absent. The conference committee of the House and the Senate took only ten minutes to discuss the measure, which was only slightly modified as a result. Both houses subsequently accepted the conference committee's report, and the bill including the dialysis provision was signed into law by President Nixon two weeks later.[10]

Payment for dialysis through the Medicare program addressed a real need, but at considerable cost. Initial estimates of annual expenditures of $135 to $250 million were far too low; by 1991 dialysis was costing the federal government $4.8 billion a year. Of course, it is not the federal government that pays for this; the costs are ultimately borne by individual taxpayers, the vast majority of whom are not afflicted by end-stage renal disease. There is nothing inherently unreasonable or unfair about this. A catastrophic organ failure could happen to any of us, and we shouldn't begrudge helping people who have been less fortunate than ourselves. Still, questions remain about the equity of paying for dialysis and not for other ailments. Dialysis patients comprise only one-half of 1 percent of Medicare beneficiaries, yet their treatment accounts for 5 percent of total Medicare payouts.[11]

Currently, about a third of the patients receiving dialysis are over the age of sixty-five.[12] As the population ages it can be expected that the demand for dialysis will increase apace, putting further financial strains on the health-care system. In some countries this possibility has already been foreclosed. In Great Britain, the government-run National Health Service always has operated under tight financial constraints. Consequently, certain treatments are restricted. Dialysis is one of them: a person over the age of fifty-five is rarely given the opportunity to receive dialysis. The ostensible reason for this is that older patients do not have the kind of constitutions that would allow them to survive and flourish under a regimen of lifetime dialysis; one British physician candidly stated that people over the age of fifty-five are not suitable candidates, for they are all "a bit crumbly."[13] This may be true in a statistical sense, but in fact there is greater variation in overall levels of health among the elderly than there is in any other age group. Using age as a means of limiting access to an expensive medical technology is administratively convenient, but it dodges the issue of making choices on the basis of more relevant criteria.

Is the American policy of giving universal access to dialysis the correct one, or is the British policy more defensible? There are no easy answers. At the same time, the problems of distributive justice posed by the use of artificial kidneys are only a preview of what will have to be faced as new and even more expensive medical technologies become available and medicine gains the ability to successfully address hitherto untreatable conditions.