included participants with elevated levels of LDL cholesterol or VLDL cholesterol or both (Types IIa, IIb, and IV hyperlipoproteinemia). It is important to note that gemfibrozil has variable effects on LDL cholesterol: it tends to lower levels moderately in patients with Type IIa hyperlipoproteinemia, but may increase or decrease levels in patients with Type IIb and Type IV hyperlipoproteinemia. The Helsinki Heart Study investigators should explore whether the reduced incidence of coronary heart disease was evident in the various types of hyperlipoproteinemia and to what extent the changes in the various lipoprotein fractions produced by treatment were correlated with the reduced incidence of coronary heart disease.

As part of a comprehensive approach to the reduction of coronary heart disease, a National Institutes of Health Consensus Development Conference recommended a strategy for identifying and treating the one in four adult Americans defined as being at high risk for coronary heart disease because of high blood cholesterol levels.[2] Detailed guidelines for the management of high blood cholesterol in adults have recently been prepared by the National Cholesterol Education Program.[3] These guidelines emphasize reduction of LDL cholesterol and describe diet modification and weight control as the first step; if drug treatment is also necessary, then the bile-acid sequestrants — colestipol or cholestyramine — and nicotinic acid are the drugs of first choice for the treatment of high blood cholesterol without hypertriglyceridemia, because of their powerful cholesterol-lowering property, proved efficacy in reducing coronary heart disease risk in clinical trials, and long-term safety. The new class of 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors are exceptionally effective in reducing cholesterol levels and are regarded as representing a major advance in therapy, provided that their long-term safety and beneficial effects on coronary heart disease can be established. The guidelines, while not classifying gemfibrozil as a drug of first choice, noted that the recommended use of gemfibrozil would probably be expanded if the Helsinki Heart Study found a clinically beneficial effect. Such an effect of gemfibrozil treatment on coronary heart disease is apparent from the results of the Helsinki Heart Study. However, it is difficult at present to define its precise place in the treatment scheme because of its variable effects on levels of LDL cholesterol and because, when it reduces LDL cholesterol, it usually does so only moderately. Further analysis of the Helsinki Heart Study data may help to clarify this issue.

Until all the necessary data are available, it would seem appropriate to consider the use of gemfibrozil in patients with hypercholesterolemia (but without hypertriglyceridemia) that is insufficiently responsive to diet, weight control, and the resins or nicotinic acid or both, especially when HDL cholesterol levels are low. Its relative lack of side effects may ensure better compliance than is usual with the first-choice drugs. Gemfibrozil is also suitable for patients with hypertriglyceridemia, with or without hypercholesterolemia, but the effects of treatment should be carefully monitored to ensure that LDL cholesterol levels do not increase. Whatever the final place of gemfibrozil in the treatment scheme, it should be regarded as a welcome addition to that limited group of lipid-altering drugs that have been shown to reduce the incidence of coronary heart disease.

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SOUNDING BOARD

MUST WE ALWAYS USE CPR?

CARDIOPULMONARY resuscitation (CPR) as we know it today came into being after the invention of closed-chest cardiac massage in 1960.[1] This technique was originally developed for victims of sudden cardiac or respiratory arrest. As the introduction to one monograph on CPR, written in 1965, says, "The techniques described in this monograph are designed to resuscitate the victim of acute insult, whether it be from drowning, electrical shock, untoward effect of drugs, anesthetic accident, heart block, acute MI [myocardial infarction] or surgery."[2] At present, however, it is standard practice to attempt CPR on any patient in the hospital who has a cardiac arrest, regardless of the underlying illness. The exceptions, of course, are patients who request not to receive such treatment. The rights of patients to refuse this intervention have been

well delineated in the courts, yet despite 27 years of experience with CPR and approximately 10 years of experience with "do-not-resuscitate" (DNR) protocols, many questions concerning CPR remain, including who should be involved in decisions about DNR orders and under what circumstances such decisions should be made. Infrequently discussed (although perhaps not infrequently encountered) is the situation in which a patient wants CPR but the physician believes that it is contraindicated. In these cases, patients almost invariably remain "full code," and physicians feel obligated to provide a treatment that they have reason to believe will not be beneficial and may actually be harmful. Are they so obligated?

I was recently involved in a case that illustrates this conflict. A 30-year-old woman with acute myelogenous leukemia who had relapsed from her second remission approximately one month earlier was started on an experimental chemotherapeutic regimen that left her with profound neutropenia and thrombocytopenia for almost four weeks. After four weeks, a bone marrow biopsy revealed regeneration with blasts, indicating failure of the chemotherapy. The patient also had pneumonia thought to be fungal, which was not responding to treatment with broad-spectrum antibiotics, including amphotericin. She (with her family) was asked, "If your heart or lungs stop working, do you want us to pump on your chest and put you on a breathing machine?" The patient and her family decided that she should receive a full CPR effort. The house staff and nursing staff were opposed to this decision, and much conflict ensued.

We use CPR in the way we do for a variety of medical, historical, and psychological reasons. Although CPR was initially used selectively on patients with acute illness — mainly because those trained in its use were cardiologists, anesthesiologists, and surgeons, whose patients tended to have the reversible causes of cardiac arrest described in the quotation above — the increased training of nurses and physicians in the technique and the development of "code teams" rapidly expanded the patient population undergoing CPR. The development of code protocols in hospitals, whereby CPR was promptly begun on any patient discovered to have no pulse, extended the indications for this technique to include all patients with cardiac arrest, regardless of the underlying illness. These changes were instituted to improve the chances of a response to CPR and to ensure good neurologic function in patients who did respond. They created a problem, however, because many physicians recognized that there were some patients for whom CPR was inadvisable because of terminal illness or poor quality of life. The dilemma was how to decide when not to do CPR. After many court cases and much discussion among physicians, DNR orders were developed to encourage open discussion of these issues and to allow patient participation in the decisions. Analysis of the legal and ethical aspects of such orders has focused on the issue of patient autonomy and the right of competent patients to refuse any procedure and of incompetent patients to refuse through a surrogate. Thus, although the DNR order is written by a physician, its legitimacy comes from the patient; the order signifies that the patient has refused a procedure. The development of DNR protocols has not solved all the problems associated with CPR, however. Since CPR is performed routinely in the absence of a DNR order and because physicians frequently do not offer their patients a choice between CPR and a DNR order,[3-7] the decision to perform CPR is usually made without the patient's involvement.

The case I described earlier, however, presents a different problem. In this case the patient and family were consulted. The problem was that their decision ran contrary to the physician's medical judgment. The conflict that then arose was difficult to resolve, but in such cases it seems insufficient for physicians to cite patient autonomy and wash their hands of further responsibility. When a patient's request for treatment is in conflict with a physician's responsibility to provide what he or she believes to be good medical care, the calculation is difficult. A recent paper concerning this type of conflict concluded that there is no ethical imperative requiring physicians to perform procedures in the absence of at least a "modicum of medical benefit."[8] A review of the literature on the medical aspects of CPR, therefore, may aid us in our analysis of the ethical aspects of this case.

Kouwenhoven et al., in a paper that first described closed-chest cardiac massage, reported a long-term survival rate of 70 percent (14 of 20 patients).[1] This impressive rate has never been duplicated. In 13 papers published since 1960, the rates for survival until hospital discharge ranged from 5 to 23 percent.[9-21] Most papers report a survival rate of less than 15 percent, and one of the three studies with rates higher than 15 percent excluded patients with cancer, repeated arrests, or chronic illness and total dependence — all conditions associated with poor outcome. It is clear that survival after CPR is related to the underlying illness that leads to the arrest and that patients with certain conditions very rarely survive. For example, Bedell et al., in a study of 294 consecutive patients who had cardiac arrest at the Beth Israel Hospital in Boston, found that although 44 percent initially responded to CPR, only 14 percent survived until discharge. No patient with metastatic cancer survived until discharge, nor did any patient with an acute stroke, sepsis, or pneumonia. Only 2 percent of patients with severe cardiomyopathy and 2 percent of patients who had had hypotension for 24 hours survived. Only 3 percent of the patients with renal failure (defined as a blood urea nitrogen level >50 mg per deciliter) survived, and no patient who required dialysis or had oliguria for 24 hours before the cardiac arrest survived until discharge.[7] These dismal results only confirmed what numer-

ous other studies had shown before — that CPR is frequently ineffective, even in patients in whom it has the best chance of succeeding: those with acute myocardial infarctions or complications due to anesthesia. It is almost never successful in patients with chronic debilitating illnesses.

Peatfield et al. assessed the results of CPR in 1063 patients over a 10-year period. The initial response was 32.4 percent, but only 8.7 percent survived until discharge. All patients with cancer or gastrointestinal hemorrhage died. In contrast, 15 percent of patients with acute myocardial infarction who required CPR survived.[11] In a study by Hershy and Fisher, 14 percent of all patients undergoing CPR survived, but only 6 percent of patients on the general wards survived.[12] The authors attributed this to the fact that most patients with the acute, reversible causes of cardiac arrest were in critical care units or the emergency room, whereas the patients on the general wards had the types of chronic illnesses associated with a poor outcome. No patient with cancer or an acute stroke survived CPR in their study. Similarly, a study by Johnson et al. of 552 patients showed that 32 percent were alive at 24 hours but only 14.9 percent survived until discharge. No patient with sepsis, cancer, or gastrointestinal hemorrhage survived until discharge, and only 3 percent of patients with renal failure survived.[13]

In all these papers, we see a discrepancy between the initial response rate (16 to 45 percent) and survival until discharge (5 to 23 percent overall, with less than 5 percent survival in many groups). Studies that considered the length of survival of patients who were initially resuscitated but died before discharge found that these patients lived an average of 2 to 14 days, usually in an intensive care unit.[11,12,14] The risk of the development of a chronic vegetative state after CPR was 2 percent in the paper by Johnson et al.[13] and 2.7 percent in a paper by Messert and Quaglieri[15] (10 percent of the patients who survived CPR in their study). Thus, although the number of patients who are in a chronic vegetative state after CPR is small, in many disease categories, it approaches the number who survive CPR.

With the above data in mind, let us look again at the case of the young woman with leukemia unresponsive to chemotherapy, bone marrow regenerating with blasts, and lungs affected by a rapidly progressing pneumonia. Despite experimental chemotherapy and treatment with broad-spectrum antibiotics, her condition was rapidly deteriorating. From the medical perspective, was there a "modicum of benefit" to be obtained from CPR? In the light of the data on survival after CPR among patients with cancer, as well as what we know about our ability to reverse the course of this patient's underlying illnesses, we are forced to conclude that her chances of surviving until discharge were virtually nonexistent and could not be improved by CPR. Furthermore, we can see that there are risks involved in performing CPR, including the development of a chronic vegetative state — which many believe is worse than death — or, more likely, survival after the initial resuscitation but with death occurring after an indefinite stay in the intensive care unit. This was what the house staff feared. For them the choice was clear: death on the oncology ward, surrounded by family members and the nurses and doctors who knew the patient well, versus death in the intensive care unit after multiple invasive, painful, and dehumanizing procedures. From the perspective of the patient and her family the choice was less clear. When asked to make their choice, they were not well informed about the likely outcome of CPR. They had never been in an intensive care unit or seen a respirator. For them the choice appeared to be between a chance of life and certain death. When they chose CPR, they were actually choosing something that did not exist — a chance for the patient to live.

Problems like these are not easily solved. Sometimes all that is required is more information about the choices involved. At other times, for a variety of reasons, including guilt and unrealistic hopes for a medical miracle, patients or their families continue to request CPR even when it would clearly be futile. In cases like these, in which CPR offers no conceivable benefit and much possible harm, I believe that patient autonomy cannot be our only guide. The principle of autonomy, which allows patients to refuse any procedure or choose among different beneficial procedures, does not allow them to demand nonbeneficial and potentially harmful procedures. On the other hand, if patients continue to request CPR even after being informed of its futility, can we justify the use of CPR on the basis of compassion, the desire not to desert our often desperate patients? Although there may be times when we use CPR for this purpose, we should recognize the patient's impassioned plea for a form of therapy that he or she knows to be futile for what it is — a cry for help, an acute expression of the dying patient's distress at his or her condition. There are usually better ways to deal with this distress than offering CPR as a sort of high-technology placebo; these include listening to the patient's hopes and fears, reassuring him or her that the doctors will continue to be there and provide appropriate therapy, and if necessary, referring the patient to psychiatric personnel or clergy trained to help patients who are dying.

A closer look at this problem, however, shows us that it is usually not simply a case of a patient demanding something. The young woman with leukemia and her family, for example, were in fact *offered* a choice between CPR and no CPR. Why did the physicians involved even consider CPR an option? What purpose was served by offering the patient a treatment that was known to be of no benefit? If it was done to preserve the patient's autonomy, her autonomy still did not extend to choosing useless procedures. If it was done to relieve her family of guilt, so that they could rest assured that they had really done every-

thing, that purpose could have been better achieved by having the doctors assure the family that everything had been and was being done and that CPR would not add to the therapy. If it was offered to give the family hope, then it was a cruel hope indeed — not only a false hope but a hope that led them to make decisions that could only increase the patient's suffering. Since we were offering her not the chance to survive until discharge but the chance to survive for a couple of days or weeks in the intensive care unit — intubated and sedated and with an arterial line, central line, Foley catheter, and nasogastric tube in place — the choice should have been presented as such, if it had to be presented at all. I believe that the choice should not have been offered. Offering CPR to this patient represented bad faith because doing so implied a potential for benefit when there was none.

What I suggest is a different way of using CPR that takes into account not only the patient's autonomy but also the physician's responsibility to provide care consonant with medical reality. In cases in which CPR has been shown to be of no benefit, as in patients with metastatic cancer, it should not be considered an alternative and should not be presented as such. In these cases physicians could write DNR orders on the chart, with the following type of documentation: "This patient has a condition for which CPR has been shown not to be effective. In case of cardiopulmonary arrest, CPR should not be performed." Because there is a potential for misuse, the type of diagnosis for which such an order could be written should be strictly limited to those for which there is clear documentation of the ineffectiveness of CPR. Consensus needs to be reached, probably on the national level, about what those diagnoses are.

Many cases will not be so clear. Patients with some chronic diseases, such as renal failure, have long-term survival rates after CPR that are low (usually less than 5 percent) but real. In such cases, patient autonomy is the overriding principle and informed consent for CPR should be obtained. Physicians should be strongly encouraged to discuss the preferences of their chronically ill patients with them. The discussions should include the provision of information about the chances of survival after CPR and the risks involved. If a patient's preferences have not been ascertained before cardiac arrest (and it is our responsibility as physicians to see that this seldom happens), CPR should be initiated and continued until the patient's wishes can be ascertained.

Patients who have a cardiac arrest as a result of an acute insult, such as a drug overdose, a complication of a procedure or anesthesia, or an acute myocardial infarction, make up a third category. They are the patients for whom CPR was originally designed and the patients in whom it is most frequently successful. There is usually no question about the appropriateness of CPR in these patients, and CPR should be initiated unless the patient has previously expressed a desire not to have such treatment.

CPR is a desperate technique that works relatively infrequently, and in many types of patients, virtually never. To solve the ethical dilemmas posed by CPR we must first face that medical fact. Furthermore, as we have seen, there is potential harm in CPR in that patients may be kept alive for days to weeks undergoing painful and dehumanizing procedures with no conceivable medical benefits. Because of these facts, we need to reevaluate the ways we use CPR. Too often CPR just happens, without inquiry into the patient's wishes or consideration of its chances of success. Both patient autonomy and physician responsibility are important factors in making decisions regarding CPR. In cases in which CPR has any potential for success, the principle of patient autonomy dictates the patient's right to choose or refuse such treatment. In order for patients to exercise this right, however, two conditions must be met. First, patients need to be given sufficient information concerning the likely outcome of CPR and the risks involved, so that an informed decision can be made. Second, because CPR is attempted unless patients have been asked whether they wish it and have refused it, physicians need to involve their patients earlier and more frequently in the decision to use CPR.

The issue of patient autonomy is irrelevant, however, when CPR has no potential benefit. Here, the physician's duty to provide responsible medical care precludes CPR, either as a routine process in the absence of a decision by a patient or as a response to a patient's misguided request for such treatment in the absence of adequate information. In such cases it is not the physician's responsibility to offer CPR. Both physicians and patients must come to terms with the inability of medicine to postpone death indefinitely.

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CORRESPONDENCE

ALCOHOL AND BREAST CANCER

To the Editor: The editorial on alcohol and breast cancer (May 7 issue)[1] underscores the need for more research on the topic because of several shortcomings of the epidemiologic information available: (1) the incidence of breast cancer is higher in upper socioeconomic groups, (2) follow-up studies in the past have been based on insufficient numbers of subjects or have had too short a period of follow-up, and (3) selection bias in hospitals may be due to admission practices or a particular organization of the health care delivery system in a given general population. To this list could be added a lack of record linkage and means of identification.

Since most of these difficulties were overcome in the Gothenburg Population Cohort Study,[2-4] it might be of interest to report that in the general population of Gothenburg, no association at all was evident between breast cancer and alcohol-related conditions among native-born Swedish women who were 30 to 59 years old at the outset of 10 years of follow-up (Table 1). Moreover, although alcohol-related conditions varied significantly with the preceding marital status, breast cancer did not (Table 2).

Thus, within the study design of a general white population that was both ethnically and socioeconomically homogeneous, among the 1123 cases of breast cancer seen at the only general hospital serving this population during a 10-year follow-up period, we were unable to confirm the suggested association between breast cancer and alcohol consumption.

Table 1. Expected and Observed Cases of Breast Cancer with Coexisting Alcohol-Related Conditions among Gothenburg Women Followed for 10 Years.*

	EXPECTED†	OBSERVED
Breast cancer (n = 1123) and alcoholism (n = 229)	3.19	5
Breast cancer (n = 1123) and liver cirrhosis (n = 232)	3.23	3
Breast cancer (n = 1123) and pancreatitis (n = 204)	2.84	3

*The Gothenburg Population Cohort Study population contained 80,563 subjects.[2-4]

†Values are underestimates because of excess mortality and, hence, a reduced average period of observation.

Table 2. Ten-Year (1970–1979) Prevalence Rate of Breast Cancer and Selected Alcohol-Related Conditions, According to Age Group and Preceding Marital Status.*

	NEVER MARRIED	MARRIED	DIVORCED	WIDOWED
	WOMEN BORN IN 1911–22 (AGED 48–59 AT START OF FOLLOW-UP)			
	(N = 3665)	(N = 27,497)	(N = 3577)	(N = 2479)
	cumulated prevalence rate/1000 general population, as of November 1969			
Breast cancer	21.8	19.2	18.5	17.4
Alcoholism	1.1	2.3	8.1	5.7
Liver cirrhosis	2.2	3.4	6.2	5.7
Pancreatitis	3.0	2.7	5.9	4.0
	WOMEN BORN IN 1923–40 (AGED 30–47 AT START OF FOLLOW-UP)			
	(N = 4795)	(N = 34,120)	(N = 3826)	(N = 604)
	cumulated prevalence rate/1000 general population, as of November 1969			
Breast cancer	11.1	9.2	9.2	6.6
Alcoholism	2.1	1.9	11.5	1.7
Liver cirrhosis	1.7	1.6	7.8	3.3
Pancreatitis	2.1	1.7	4.7	5.0

*Distributional heterogeneity with marital status for breast cancer non-significant (P>0.05), for alcoholism P<0.001, for liver cirrhosis P<0.01 (older women) and P<0.001 (younger women), and for pancreatitis P<0.01 (older women) and P<0.001 (younger women).

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