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Problems in the Classification of Prognosis for Purposes of Disengagement of Therapy in the Critically Ill Patient

William C. Shoemaker, M.D.

*You can not find a
medicine for life, when
once a man is dead.*
— Ibycus, 550 B.C.

The practicing physician whose patient is dying initially sees an operational and quantitative problem rather than a dilemma involving moral principles. From his point of view, the issue is, have I overlooked an obscure but correctible diagnostic possibility? Have I given the maximum therapy available in the optimal dose schedule? Could another consultant be of help? The attendants are acutely aware of the possibilities of errors, the time and effort that have already gone into the patient's care, as well as the pressing anxieties, false hopes and present recriminations. It is little wonder there is belated recognition that the time for action has come and gone, that further effort is futile, and that continued therapy, at best, will not save life,

but only prolong death. Often the last to recognize this situation is the patient's primary physician; the abrupt 180 degree change in direction is not as easy to appreciate in the real world as it is in the abstract. And once recognized it is not psychologically easy to deal with; the approach of "never give up under any circumstance" and other overstatements are well ingrained as the "party-line" in many institutions.

Moral and ethical considerations in the hopeless case have been lucidly discussed by Cassem¹ and others²⁻⁴ and are presented elsewhere in this journal in detail. In a real sense, these questions are in large measure definable; and where the issues are properly defined, eternal verities and logical thought may be applied. Unfortunately, however, the application of these principles to a particular patient is obscured by essentially unanswered or incompletely answered clinical and physiologic problems. The change from a salvageable to a totally hopeless, inevitably lethal condition is not heralded by a clearly definable event. There are no bridges burned, no

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Rubicon crossed; the Stygian shore is not well marked and road maps are hard to come by. Irrespective of the overwhelming number of anecdotal instances that may be mustered, categorical statements about a given patient's chances are elusive; prognosis is usually given in terms of probabilities, not certainties. As there are few atheists in foxholes, there are few absolutists on intensive care services. Operationally the problem is more often quantitative rather than qualitative; that is, the question becomes, "Is there one chance in 100?" Or, alternatively, "Is there less than once chance in a million?" Assuming that these two rhetorical questions could be answered, one in the affirmative, the other in the negative by all parties concerned in the decision-making process, what about the patient whose chances are one in a thousand, or one in 10,000? The question then becomes, where do we draw the line and, secondly, how sure can we be that the prognosis is one in 1000 as opposed to one in 10,000, if this is to be considered the dividing point.

The question of the probability of death is not only a quantitative one, but in the critically ill patient, it is an estimation that changes with time. Our patients are not all as considerate as Charles III, who apologized to his physicians because he took so long to die. Obviously, more certain measurements of the severity of illness are needed; that is, physiologic predictors of death

that can be used serially both as a measure of the effectiveness of therapy as well as the ineffectiveness of continued therapy. Until that day arrives — and it may not be too far off — we are left with the clinical guesstimate, which though fallible, is nevertheless an improvement over the indecisiveness that comes from having no estimate at all.

Despite these obvious limitations, Tagge et al⁷ have developed an operational approach that virtually forces evaluation and frequent reviews at regular intervals so that decisions would be made as soon as concurrence was possible and then translated into a systematic plan for the discontinuation of specific therapy in a concerted fashion. The principle advantage of the Tagge system of therapeutic disengagement is that it provides the mechanism by which all members of the therapeutic team are confronted with the necessity of giving full and complete therapy with periodic reevaluations until the time they agree not to initiate new therapy, to stop active therapy and finally to discontinue all life-support systems.⁸ This prevents the not uncommon situation where one physician continues to order full treatment while the others have abandoned their efforts.

Cullen et al⁹ have evolved a rating system of the intensity of therapy in the intensive care unit. This system attempts to develop a semi-qualitative index of severity of illness from the amount of time and effort expended on ther-

apy. This index also provides a useful means for cost-benefit analysis.

Our experience with the Tagge system over a two year period was entirely favorable. It provided the mechanism for early conscious decision to continue or to omit active therapy based on frequent reassessment, and it provided communication between the primary physician, ICU staff, and patient's family regarding prognosis and advisability of continuing therapy. Of major import was the salutary effect on morale of nursing personnel who frequently had been called upon to render extraordinary care to patients with no reasonable hope for survival long after the private physician had fled.

While this system of categorization was clearly feasible and useful, critical review of its accuracy was hard to assess. As the system was new and evolving, we chose not to make the categorization part of the patient's chart; rather we noted the category on the cardex file. An exact accounting of errors in categorization, therefore, is not possible. However, of over 1000 admissions annually, approximately one-fifth were temporarily classified as Category II and then placed into Category I as they improved; these changes did not affect the intensity of therapy in any way, but did provide all personnel with the assurance that we were mindful of the overall problem. There were 115 to 130 patients, or 11 to 13%, who died on the unit an-

nually; at least 75% of these patients were kept in Category II as the possibilities of survival could not readily be ruled out and their demise was sufficiently rapid that no one questioned the advisability of continuing therapy. There were three patients who were placed in Category IV; after due deliberation, the ventilator was turned off in two who had clearly evident brain death, and active therapy including transfusions withheld in the third patient. Two patients were placed in Category III for periods of 12 and 24 hours and subsequently redesignated Category II after unexpected spontaneous clinical improvement. The following are summaries of the salient features of these two cases.

Case 1

A 73 year old man with an aortic aneurysm, hypertension and chronic renal disease underwent aneurysm resection and replacement with a dacron graft. The patient was given nine pints of whole blood, two liters of Ringer's-lactate and two liters of 5% glucose, but by the end of the operation his blood pressure had fallen from 180/90 to 110/50, and the heart rate increased to 130. He was cold, clammy, and oliguric when he arrived in the ICU. He was resuscitated with an additional two units of whole blood plus 2000 ml of 5% albumin over the next 24 hours. The patient had a stormy postoperative course with fever, pneumonia, multiple PVC's and EKG changes, renal failure and coma. He was given

mechanical ventilation with high FIO_2 levels for over one week; his urine output was 200 to 350 ml/day; his BUN was 180 mgm/100 ml and creatinine 9 mgm/100 ml and rising, despite hemodialysis. On the fifth postoperative day he had a large upper gastrointestinal hemorrhage and was given five units of whole blood over the next two days with other supportive therapy. Discussions with the family and all consultants led to the unanimous decision that he had severe renal failure, respiratory failure, and unremitting hemorrhage and that there was nothing further that could or should be done as his prognosis was essentially nil. Accordingly, he was placed in Category III, maintained on mechanical ventilation with an FIO_2 of 70% and slowly administered I.V. fluids but no additional transfusions; no sedation was needed as he was semicomatose. Inexplicably, over the next 24 hours he spontaneously stopped bleeding and improved in terms of his level of consciousness and activity. It was felt that this change was sufficiently striking that he was reclassified to Category II. The FIO_2 was gradually reduced as tolerated over the next week and he was "weaned" off the ventilator. His renal failure also improved and his BUN fell to the range of 40 to 50 mgm/100 ml over the next few weeks; these were approximately his preoperative levels. He was discharged from the ICU and eventually from the hospital.

Case 2

A 78 year old woman with a previously documented myocardial infarction entered the hospital for multiple peripheral emboli, one which led to gangrene of the left lower leg. While in the X-ray department, she had a cardiac arrest. CPR was initiated, an endotracheal tube was inserted and she was transferred to the ICU. Despite mechanical ventilation for three days, FIO_2 values from .9 to .98 and other supportive measures she remained unresponsive. She was placed in Category III; the family, represented by her nephew who was a well respected physician in an affiliated hospital, requested that the ventilator and other supportive measures be abandoned, as all agreed that her prognosis was hopeless. However, it was pointed out to the family that we would like to observe the patient for at least another 24 hour period before resorting to this. After the next 12 hour period, the patient spontaneously improved in both her level of consciousness and respiratory function. Active and aggressive respiratory care was reinstated. After three days the patient was able to tolerate room air and was subsequently weaned off the ventilator. She subsequently made an uneventful recovery was discharged from the ICU and later, from the hospital. Three months later she celebrated her 50th wedding anniversary, surrounded by her grandchildren, and then went on a vacation to Mexico. Six months after dis-

charge she died suddenly at home, presumably of another myocardial infarction.

It was generally appreciated by all concerned that there had been sufficient deliberation, encouragement for input from all relevant sources, and appropriate exercise of critical judgement. All things considered, these two errors in categorization were acceptable to the medical community as well as the patients and their families. Moreover the errors did not appear to produce any permanent harm, as both patients eventually recovered and left the hospital.

These two cases remind us that, despite the track records of success, medical opinion is still shrouded by uncertainties and judgemetic errors which, like the poor, are always with us. A system of step-wise categories which relates therapy to prognosis after due deliberation by all involved parties provides, on the one hand, a reasonable guard against unilateral precipitous action and, on the other hand, undue prolongation of futile efforts. Moreover,

this system may continue to provide the mechanism for joint decision-making even as medical science gains more precise methods for assessing the severity of illness, prognosis and cost-effectiveness estimates of various types of therapy in life-threatening conditions.

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We extend our condolences to the family of Dr. W. B. J. Pemberton, who died on February 17, 1975. Dr. Pemberton was a physician of integrity and dedication, and served for several years as British correspondent for Linacre. We will miss his friendship. May he rest in peace.