Maintaining Quality of Care While Reducing Charges in the ICU

Ten Ways

JOSEPH M. CIVETTA, M.D., JUDITH A. HUDSON-CIVETTA, M.S.N.

We believed that the dilemma of controlling costs yet maintaining quality of care might be approached in 10 ways designed to improve efficiency of care: principles of management, elimination of standing orders, classification of patients, written guidelines, mandatory communication, no repetitive orders, single order for single test, removal of monitoring catheters, constant administrative attention, and feedback. We monitored quality of care using the therapeutic intervention scoring system (TISS), mortality, utilization of bed days in the ICU, and the total hospitalization of 50 patients treated in April 1983 and, 8 months after the interventions, 50 patients treated in February 1984. There were no differences in the patient population, severity, outcome, or days. The total lab bills were $10,000 in 1983 and $6300 in 1984 ($p < 0.01$). The total number of tests decreased by 2803 (42%) from 6685 to 3882, or 56 per patient per admission. Calculated ICU laboratory charges per patient decreased $3226 (53%) from $6210 to $2894. In 1983, while patients spent 15% of their hospital days in the ICU, they accumulated 61% of their total laboratory charges. In 1984, ICU days were 19% and ICU laboratory charges were 46% of the total. If the decrease of $3226 per patient is extrapolated to a year's population, this would decrease charges by over $2,000,000 in one 12-bed surgical ICU.

From the Departments of Surgery, Anesthesiology, Medicine and Pathology, University of Miami School of Medicine, Miami, Florida

CONTINUALLY RISING COSTS for medical care have been cited as the reason for instituting major changes in medical care financing that now have an impact upon the delivery of care. The principal concern of the medical community is that cost containment, if poorly conceived, could reduce access to care, as well as the quality of care, yet still might not achieve true savings. The complexities in legal, ethical, and social realities further confound the economic issues, and opinions are quite divergent about what should be done.

Stern and Epstein[1] recently discussed the implications for cost, quality, and access in the institutional response to prospective payment and stated, "Proponents of the diagnosis-related group (DRG system) believe that it will solve many of the ills now attributed to cost-based reimbursement. In his report to Congress, former Secretary of Health and Human Services, Richard Schweiker, suggested that a DRG based system will provide hospitals [with] an incentive to improve efficiency, will establish Medicare as a prudent buyer of hospital services, will reduce the administrative burden on hospitals, and will assure beneficiary access to quality health care." They went on to state, "We believe that institutional responses to these incentives are likely to decrease cost per case and have a moderate chance of decreasing total health care costs, but are also likely to have deleterious effects on the quality of patient care and on access to care." Avorn[2] stated, "Until a century ago, medical therapy was for the most part both cheap and useless, posing no great problems of distributive justice. Quite the opposite is now the case. The remarkable progress of biomedical technology since World War II has made it possible for physicians to keep sicker and sicker patients alive longer and longer, at greater and greater costs." A restricted focus upon rising costs misses Fein's important observation, "We live in a society, not in an economy."[3]

We could not hope to address these megaproblems but believed that a study of the high-cost surgical patients—the approximately 10% who consume 50% of the resources and who are often treated in intensive care[4,5]—could begin to uncover some ways to exert the "leverage" to affect cost savings and improve efficiency that was urged by Drucker.[4] We hoped to find bedside practices and habits that increased charges but had no discernible effect upon outcome. The high level of resulting ICU activity might have been interpreted as evidence of productivity. Thus, we might be able to alter practice without affecting the

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Reprint requests: Joseph M. Civetta, M.D., Professor and Chief, Division of Surgical Intensive Care, University of Miami School of Medicine, Department of Surgery (R44), P.O. Box 016960, Miami, Florida 33101.

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fundamentally necessary and important ICU functions. We wonder if the analogy between the conduct of military operations and the conduct of surgical operations made by the late E. D. Churchill and quoted by Moore[6] could be applied to intensive care as well: "You must have a lot more of everything available than you will ever use to avoid disaster." Perhaps, in the overly enthusiastic application of intensive care practices to greater numbers of patients in the last years, this observation has been reinterpreted to mean that you must use everything available to you all the time to avoid disaster. Investigation of our bedside habits could, we hoped, result in conservation of vital resources in the treatment of uncomplicated patients to insure that these resources would be available if disasters should develop.

Methods

We reviewed the itemized bills of 50 patients treated in our surgical ICU in April 1983. The average charge was $41,000, and each patient had received an average of 23 tests for each day spent in the ICU. Nursing procedures, respiratory therapists' activity, diagnostic imaging, the use of hyperalimentation, therapeutic goals, and interventions selected all seemed worthy of study and change. For the purpose of this study, we chose laboratory charges and frequencies of common ICU tests as markers, because an effect could be quantified in terms of numbers of tests and charges. We then designed 10 control measures that are briefly described. While increased efficiency was one goal, we also hoped to develop better teaching methods based upon improved decision making in the care of patients. Thus, investigation into our beside practice should improve our efficiency and increase our knowledge and understanding at the same time.[5]

Control Measures

1. *Principles of management.* We felt that changes could be made in any existing arbitrary practice if we could find that it had no scientific basis. We promulgated the saying, "Thinking, not widespread screening, discovers rare abnormalities." We intended to encourage the discriminating use of resources to avoid their being squandered when not needed. Finally, believing that many small economies might result in large savings, we examined each detail of bedside care.

2. *Elimination of standing orders.* We eliminated all standing orders for laboratory testing because they often created an unnecessary breadth and frequency of testing.

3. *Classification of patients.* ICU patients have been divided into three categories reflecting the highest necessary level of care given[7]: (1) monitoring/observation, (2) intensive nursing care, and (3) intensive medical care by physicians. Only 10 to 20% of patients fall into category 3 and may profit from extensive testing. Yet, the same orders are often written for all patients in the unit.

4. *Written guidelines.* With the elimination of standing orders that had been designed to minimize oversights caused by fatigue or inexperience, written guidelines were developed so that a unique set of necessary laboratory tests could be ordered for each patient. Guidelines were based on the location of the patient before admission to the ICU (emergency room, standard patient care area, or operating room), specific and frequent diagnoses (acute respiratory failure, myocardial ischemia/infarction, or stress and/or malnutrition), and common ICU problems (such as oliguria, hypotension, or fever). This mechanism, which provided a flow chart directed by responses to simple questions, would avoid oversights yet curtail unnecessary breadth of testing that had resulted from the use of standing orders.

5. *Mandatory communication.* Three separate teams of caregivers (the operating surgeons and ICU physicians and nurses) initiate laboratory testing independently. Communication through written orders, identification of "pending results," and dialogue among the teams help to eliminate the duplication of tests selected by different teams at different times for the same reason.

6. *No repetitive orders.* Ordering of tests repeated at specified intervals usually results in testing continued far beyond the clinical utility and was eliminated. In addition, if one must come to the bedside to order a test, there is an additional opportunity to examine the patient. The combination of clinical and laboratory information over time should improve subsequent decision making.

7. *Single written orders.* Casual multiple verbal orders are easy; the number of tests increases. Verbal orders were eliminated except for true emergencies. The necessity for a written order for each test discourages waste; only important tests continue to be ordered. The principle to ease the incorporation of a computer system into a new environment is to make it "user friendly." We, however, wished to use a different approach—when "friendly," "easy," or "automatic" become "nonthinking," inefficiency is created. Conscious written orders, which we hope will represent decisions, can be substituted for the easy and potentially wasteful verbal ordering.

8. *Remove monitoring catheters.* Monitoring catheters serve as conduits to obtain both arterial and venous blood specimens easily. If they are not necessary for monitoring purposes, they should be removed.

9. *Constant administrative attention.* Insecurity, inexperience, habits, training patterns, traditions, and fatigue seem to be factors responsible for the proliferation of testing. Personnel change frequently. The responsible physicians and nurses must maintain constant administrative attention to demonstrate their concern and commitment; both are essential to control.

TABLE 1. *Demographic Description**

	1983	1984	P
Number	50	50	
Age	54 ± 18	54 ± 17	NS
TISS (24°)	27.5 ± 9	27 ± 10	NS
TISS (48°	27 ± 8	24 ± 8	NS
TISS (7d)	22 ± 7	26 ± 9	NS
Mortality	10%	16%	NS
Days (ICU)	4.9 ± 6	5.8 ± 6	NS
Days (Hospital)	32 ± 21	31 ± 24	NS

* Numbers reported are mean plus or minus standard deviation. T-tests for two means were used to compare groups. Mortality was compared by Chisquare analysis.

10. *Feedback.* The changes described are difficult to implement and maintain because they differ significantly from existing practices. Positive individual feedback and group meetings are necessary to guide the educational process and behavioral changes required. Decreased laboratory testing can only be accomplished by the individual bedside practitioners who must be both educated and rewarded for these changes in behavior, which they may not have considered to be an element in the problem of continually rising medical costs.

Overall laboratory utilization was monitored from the monthly summary provided by the hospital's laboratory computer system. However, the laboratory provided only the total number of tests per month and could not identify tests or charges of individual patients or whether charges were generated in the ICU. We chose to abstract hospital and laboratory charges as well as the frequency of 28 commonly used tests in the ICU from the itemized patient bills. These tests constituted about 85% of the monthly usage. The April 1983 sample was used as the baseline. The changes were then implemented, and the total number of tests per month reported by the laboratory computer system was monitored. A decreased number of tests was noted initially, and, after 8 months, the number stabilized. We then analyzed a second sample of 50 patients in February 1984. We tried to assess the quality of care from the medical records by calculating mortality, severity of illness using the therapeutic intervention scoring system (TISS)[8]—a higher TISS reflects a greater severity of illness—utilization of bed days in the ICU, and total hospitalization. The two groups were compared with Chi square analysis or T statistics for two means.

TABLE 2. *Description of Severity**

	1983	1984	P
Class IV	10	12	NS
TISS (24°)	39	40	NS
Mortality	20%	33%	NS
Class III	32	30	NS
TISS (24°)	27	25	NS
Mortality	9%	13%	NS
Class II	8	8	NS
TISS (24°)	12	15	NS
Mortality	0	0	NS

* Number in each class and TISS were compared by t-tests for two means. Mortality between groups was compared by Chi square test.

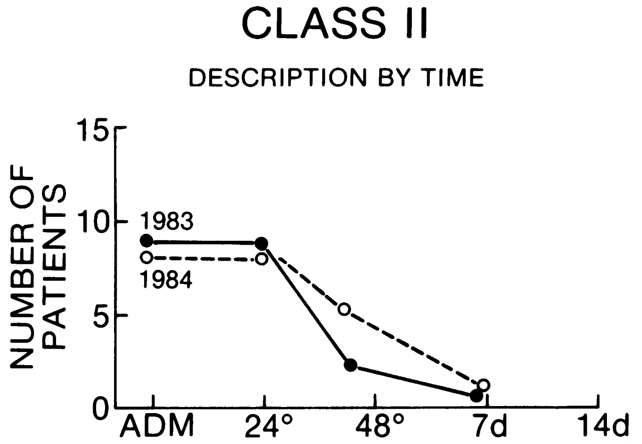


FIG. 1. The number of Class II (observation) patients on admission and the number who remained at the time periods designated.

Results

The average age was 54 in both groups (Table 1). The TISS score at 24 hours was 27.5 in 1983 and 27 in 1984. At 48 hours, the numbers were 27 and 24 and at 7 days, 22 and 26, respectively. Mortality rate was 10% in 1983 and 16% in 1984. These numbers were not different by Chi square analysis. The patient spent 4.9 days in the ICU in 1983 and 5.8 in 1984; total hospitalization was 32 days compared to 31, respectively. Again, none of these differences was significant. In terms of TISS classification, Class IV patients represent the most critically ill patients, requiring intensive or constant care by physicians, while Class II patients are usually admitted for monitoring or observation. Class IV patients numbered 10 and 12 with TISS scores of 39 and 40, with a 20% and 33% mortality (Table 2). None of these was statistically different. There were 32 *versus* 30 Class III patients. TISS scores were 27 and 25, and mortality was 9 and 13%. Class II patients numbered eight in each year with TISS scores of 12 and 15 and no mortality. The number of patients in each class was recorded at admission, 24 hours, 48 hours, 7 days, and 14 days. There were no differences between the number or distribution in 1983 and 1984 (Figs. 1, 2, and 3). Thus, the patients had the same severity of illness by TISS score, the same proportions of patients were in each class, and they stayed the same number of days in the ICU with mortality rates that were statistically the same.

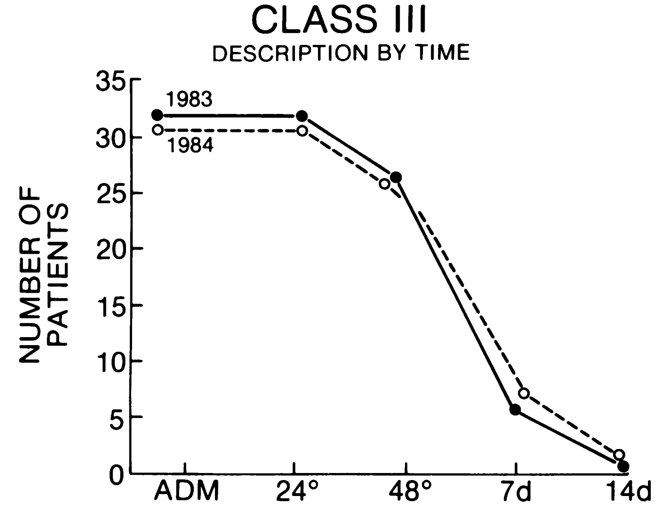


FIG. 2. Comparison of the number of Class III patients in 1983 and 1984. Similar numbers of patients were admitted, and the number who remained at each time period were the same.

TABLE 3. *Hospital Bills**

	1983	1984	P
All Classes:			
Total Bill	41 ± 29	33 ± 24	NS
Laboratory Charges	10 ± 9	6.3 ± 5	<.01
Class IV:			
Total Bill	59 ± 33	35 ± 16	<.025
Laboratory Charges	15 ± 12	7 ± 3	<.025
Class III:			
Total Bill	39 ± 26	40 ± 27	NS
Laboratory Charges	9.5 ± 8	6.6 ± 5	<.05
Class II:			
Total Bill	25 ± 19	19 ± 7.6	NS
Laboratory	4 ± 2.5	3.6 ± 2	NS

* Numbers are reported in thousands of dollars. Laboratory charges for entire hospitalization were partioned from total; ICU laboratory charges are contained within this figure. Decreased charges for monitored ICU lab tests accounted for essentially all of the decrease in total laboratory bills.

The patients' bills contained the total charges and the portions for certain types of items such as laboratory charges. The average bill in 1983 was $41 ± $29,000 and in 1984 was $35 ± 24,000 (Table 3). These numbers were not statistically different. The laboratory bill was $10,000 for the entire hospitalization in 1983 and $6300 in 1984, a difference that was significant at the 0.01 level. The system does not provide summary information concerning location in the hospital. Charges were recorded when received in the financial office, not when they were generated. Thus, manual extraction of the charges was necessary. The decrease in charges for the 28 monitored tests accounted for essentially all of this difference. When the patients were divided into severity of illness classes, both the total and laboratory bills were decreased significantly in the Class IV patients, and the laboratory bill was diminished significantly in the Class III patients. Class II patients whose total laboratory bill was $4000, considerably less than the $10,000 average for all patients, did not have a significant change in their laboratory charges.

In 1983, patients spent 15% of their hospital days in the ICU, yet their calculated ICU bill accounted for 61% of the total laboratory charges (Table 4). In 1984, the percentage of ICU days was 19%, while the ICU laboratory charges represented 46% of the total. The total number of tests decreased from 6685 to 3882 or by a total of 2803, which was 42% of the total and a decrease of 56 tests per patient per ICU admission. Calculated ICU lab charges for each patient decreased from $6120 to $2894. This decrease of $3226 per patient was 53% of the initial value.

In the initial quantification of laboratory tests for the patients admitted in 1983, 2254 blood gases were performed in the 50 patients, or 45 per patient. The cost for blood gases alone was $112,700, or $2250 per patient. The average cost per day for blood gases was $462. We made blood gases a focal point for change. Seven of the

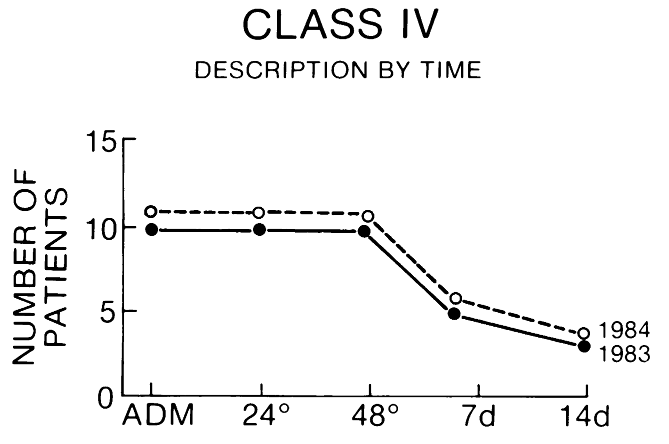


FIG. 3. Class IV patients (the most critically ill) comprised about 20% of the population in both 1983 and 1984. The numbers who remained at each time period were also the same.

TABLE 4. *Overall Utilization**

	1983	1984	Comment
ICU Days (% hospitalization)	15%	19%	not different
Laboratory charges	$10,000	$6,300	p < .01
Calculated ICU laboratory charges	61%	46%	% total lab
Total tests	134	78	↓56 (42%)
ICU Laboratory charges	$6,160	$2,894	↓$3,226 (53%)
Blood gases per patient	45	16	↓19; p < 0.025
Charge per day	$462	$225	↓$237

* Mean values per patient are reported. T-test for two means used for statistical comparisons.

TABLE 5. *Principles of Management**

	1983	1984	P
Each detail examined:			
ACC	5.2	7.5	<.05
CBC with Differential	5.5	2.3	<.005
Change when no data:			
Creat (U)	4.7	0.7	<.005
OSM (U)	2.2	0.9	<.005
Elec (U)	3.0	1.2	<.01
Thinking not screening:			
Amylase (S)	3.7	1.2	<.0005
Amylase (U)	2.5	0.08	<.0005
K	7.0	2.6	<.01

* Mean number of tests per ICU admission per patient. Groups compared using t-test for two means.

10 methods described, in fact, are applicable to the control of the ordering of blood gases. In 1984, the number was 1313, or 26 per patient; the daily charge had dropped to $225 per day, which represented a difference of $237 per patient per day.

Twenty-three of 28 monitored tests decreased significantly. We examined the effect upon selected tests to illustrate the specific ways implemented. For example, under the principle of examining each detail of care, we learned that the laboratory changed its terminology from complete blood count (CBC), which included an unnecessary daily differential white blood cell count to automated cell count (ACC), which served our need and was $10 cheaper (Table 5). We decreased our usage of CBCs and increased the usage of ACCs. Since there were no data to support that daily calculation of creatinine clearance and a long list of renal calculations contained in an available computer program were necessary in patients without renal dysfunction, they were omitted. The number of creatinine, osmolarity, and urine electrolyte determinations decreased significantly. Amylase creatinine clearance ratios were also computer calculated and had become a common screening test for any patient with a remote possibility of developing pancreatitis; this practice was stopped. With the elimination of standing orders for fever workups, the total number of cultures decreased, especially the number of blood cultures (Table 6). Routine cardiograms were no longer performed, which decreased usage by an average of one per patient. Using written guidelines or "flow charts" to replace standing orders in selecting tests (Table 7), we were able to decrease the ordering of cardiac enzymes, CPK-MB, liver enzymes, calcium, and magnesium determinations in a significant manner. By eliminating repetitive orders (Table 8), the number of profile 8's, partial thromboplastin times, platelets, fibrinogens, and serum osmolarities could all be reduced. However, in the Class II patients, who were admitted for observation only, numbers were not decreased.

TABLE 6. *Elimination of Standing Orders**

	1983	1984	P
All cultures:	5.2	2.3	<.025
Blood	4.3	1.1	<.025
Urine	1.3	0.4	<.005
ECG	2.9	1.8	<.025
Blood gases	45	26	<.025

* Average number of tests per patient per ICU admission. T-test for two means used to compare groups.

TABLE 7. *Written Guidelines*

	1983	1984	P
"Cardiac enzymes"	2.3	1.2	<.01
CPK-MB	2.2	1.4	<.05
"Liver enzymes"	2.2	1.5	<.05
Ca^{++}	3.5	2.8	<.05
Mg^{++}	3.3	1.3	<.0005

* Average number of tests per patient during ICU admission. Groups compared using t-test for two means.

Discussion

We had been astounded to learn that the daily practices in our unit resulted in an average of 23 tests per patient per day. As a result of the interventions planned and implemented, this number was reduced to 13 in February 1984. In 1983, 9.2 blood gases per patient per day were performed and in 1984, 4.5. No change in severity of illness (TISS), distribution of patients, duration of ICU stay, length of hospitalization, or hospital mortality was noted. The therapeutic intervention scoring system assesses severity of illness from the number of interventions chosen by the medical team. Given the same team and the same approach to illness, a similar level of intervention correlates with similar degrees of illness. While compar-

TABLE 8. *No Repetitive Orders**

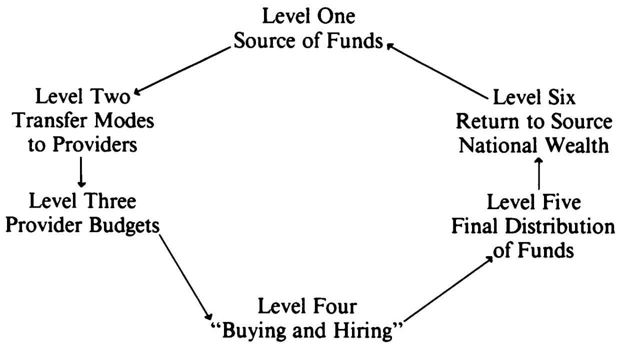
	1983	1984	P
All classes:			
P8	2.8	1.1	<.0005
PT/PTT	5.4	2.4	<.0005
Platelets	5.5	1.7	<.0005
Fibrinogen	1	0.4	<.005
Osmolarity	2.9	0.4	<.0005
Class II:			
PT/PTT	2.4	2	NS
Platelets	1.9	2	NS
Fibrinogen	0.9	−.6	NS

* Average number of tests per patient during ICU admission. Group comparisons performed using t-test for two means.

isons among different ICUs may not be valid due to differences in the physicians' perspectives and, thus, interventions chosen, in a single unit, this system has been useful to judge severity.[8] For our 12-bed unit, the decreased numbers could be extrapolated to diminish the total tests by more than 40,000 per year and total charges by more than $2,000,000 per year. The reduction in blood gases alone would be more than $700,000 per year. The total number of tests today is nine, and we use 3.3 blood gases per patient per day. We wonder if similar practices exist in other busy intensive care units where their particular habits, traditions, and bedside practices result in many laboratory determinations.

The crucial issue, however, is the ultimate effect of reducing charges. Moore[6] recently described the surgical streams in health-care financing using a six-level model (Table 9). He pointed out that many mistakenly focus their attention just on level 3, which is the budget of care providers, and level 4, which represents "hiring and buying." He later traces these dollars to level 5, which represents the final distribution of funds as investment, taxes, living expenses, and the income of vendors. Ultimately on level 6, the funds return to their source, the national economy, reposing in national wealth, governments, and disposable income. We wondered if diminishing laboratory testing would result in real savings. Moore suggested that true economies can result from reduction in the occurrence of disease, the demand for care, and the response of physicians. We believe that the response of physicians was changed in our unit. Drucker[5] suggested that substantial changes in attitude and an increased understanding of the quality of care and micro-economics would be necessary. We have learned much concerning the micro-environment of ICU laboratory ordering and achieved a change in attitude that has persisted despite the inevitable changes in the bedside practitioners—the nurses, fellows, residents, and students. Since he urged all segments of society to participate, we felt a mandate to examine our own practices. We had encountered, as had many before us, an impenetrably confused relationship between costs and charges. However, there were some encouraging aspects to suggest that, in addition to reducing charges for testing, with some lesser effect on costs, we might achieve an impact on total care for this specific population, which could then fulfill Moore's criteria for true savings. We had a specific population (Table 10) nearly identical to that described by Drucker.[5] His high-cost patients had hospital bills of $35,000, and hospitalizations of 31 days, and spent 19% of their days in the ICU; blood gases were the most frequent laboratory test. We were further encouraged in our efforts to decreased testing by Robin's description of four types of harm[9] to patients that occur as a result of unnecessary measurements. All of these would be decreased if overall testing could be safely diminished: (1) technical errors in the laboratory reported as erroneous results, which lead to incorrect decisions; (2) iatrodemics or the epidemic of systematic misdiagnosis or mismanagement of patients caused by the poor application of science or technology to patient management, or, more simply, interpretive errors leading to incorrect decisions; (3) physical injuries to patients from invasive procedures selected or performed inappropriately (these are true iatrogenic problems); and (4) informational overload that distorts and prevents the correct identification and selection of the proper priorities. We felt that if unnecessary testing was decresed, no benefit would be lost and all of these risks would be eliminated for each omitted test. Furthermore, Moore pointed out that maintenance of the highest quality in American surgery would be the single most important factor in cost containment because surgical complications increase costs by a factor of eight- to 20-fold. Many of these costs, we believe, are generated by the resulting necessity for intensive care of the patient, and, with these methods, we could reduce the greatly increased costs of the patient with complications. Further, if we could improve the quality of intensive care, this could have at least an additive effect, because the complications of intensive care, and their added costs, would

TABLE 9. *The Six-level Model of U.S. Health Expenditures (1981 Data)**



* Modified and simplified from Moore.[6]

TABLE 10. *High-cost Patients**

	Drucker	Present Study
Patients studied	1980	1983
Total bill (M)	$35	$41
Hospital days	31	32
% ICU	19%	15%
Blood gases	#1	#1

Comparison of Drucker's high cost patients[4] with present series. Total bill is displayed as thousands of dollars. "% ICU" indicates per cent of total hospitalization spent in ICU. Hospital days for Drucker's patients were calculated by dividing total days of hospitalization by the number of hospital admissions.

not be superimposed upon the catastrophes already present.

We wished to examine our daily practices in the present rather than be forced to wait for the future resolution of the very serious medical, legal, and ethical considerations that attend every discussion of these high-cost patients. Investigations into the expenses of intensive care have raised concerns because so much and such a high percentage of the resources are expended during the patient's last illness, on diseases with poor but not hopeless prognoses, or for diseases with societal, not merely medical, implications.[2,4,10] These issues today end in yet unresolved ethical and legal considerations. It has recently been proposed[11] that hospitals facing declining occupancy rates and weakening financial positions may be forced to discontinue or decrease provision of medical intensive care units and other types of high technology care to severely ill patients. Others[12] have suggested that more restrictive admission policies might be implemented. Neither solution addresses the issue of whether the costs now consumed are necessary. Elimination of the low-cost monitoring or observation-only category from the total ICU population will artifactually raise the costs of the remaining patients to even higher levels. Monitoring-observation patients are now admitted for only short periods, have low morbidity and mortality, and have low bills.[7] If unnecessary laboratory testing is restricted, charges can be kept low, and these admissions, which permit efficient monitoring and rapid treatment if complications develop, can continue. We must remember the devastating sequels to untoward complications that occurred in the routine floor care area. The clustering of equipment and personnel in order to respond rapidly to potential complications was one of the rationales for the creation of ICUs. The monitored patient should not be excluded; rather, the care should be limited to observation.

In short, most discussions end in an arena characterized by gaps in our knowledge, ambiguity, and uncertainty, and even in fear that the changes in health care financing may lead to inequitable access and distribution of medical care and an undesirable retreat from high technology and other advances in the science of medicine solely because of financial limitations. While no single or practical immediate solutions to these complicated interrelationships can be proposed, we chose to investigate what Stern and Epstein[1] identified as "physician practice style": we examined how tests were generated, the reasons cited for initiating testing, the validity of the reasons, and the factors responsible for repetitive testing. More than half of the charges were eliminated without affecting the quality of care. Further, our experience led to the hope that the diminished activity could have salutary effects. Physicians and nurses could return to assessment, decision-making, and thinking instead of frenetically ordering, reacting, and intervening, which could describe the environment in our ICUs created by informational overload. Perhaps, in one way, this study is a response to Fuch's often quoted request to physicians to "consider the possibility of contributing more by doing less.[13]" We must not forget that the social—not merely the economic—impact of medical care must remain our principal consideration.

We believe that we must first "contribute more" by achieving a greater understanding of the medical care process that generates these charges. Only after this expense of effort can "doing less" be actualized and validated. This model of decreasing laboratory testing demonstrates that the quality of care was not necessarily dependent upon our practice style and that "costly" and "high quality" were not necessarily synonomous. We must learn to distinguish the necessary/costly elements from overutilization/overload. Bedside ICU care can be simplified; quality will be maintained while charges can be diminished.

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