*TASK FORCE ON THE COST OF GRADUATE*
*MEDICAL EDUCATION AND FACULTY PRACTICE PLANS*

September 19, 1972
9 a.m. - 4 p.m.
8th Floor, Room 827
One Dupont Circle
Washington, D.C.

I. Approval of Minutes, Meeting of July 19, 1972

II. Report on the September 13th meeting of the Committee On Financing Medical Education

III. Specific points to be discussed include the five major issues set forth on page three of the July 19th meeting minutes. Appropriate staff members will review each of these questions as follows:

A) How much of house staff costs can be allocated to the function of instructing medical students? For the most part, these data are available in the cost allocation study, although in some cases the data are "buried" in the faculty instruction data and may be difficult to retrieve.

B) How to estimate the cost for hospital space allocated to undergraduate students? This is an operating cost in two ways. First concerns the matter of "overhead" on this space and the extent to which it is allocated to the educational programs. Second, is the question of amortization, debt service and depreciation of this space as an operating expenditure of the hospital. The present state of the data from the cost studies needs to be reviewed in this area.

C) How to estimate the cost of nursing, technician, and other staff time devoted to teaching undergraduate medical students? (Letters a and c are equivalent to reduction #1 in the staff paper) For the most part, these data are available in the cost allocation study. The group did suggest that the costs in this area would most likely be relatively low.

D) How to estimate the effect of teaching undergraduate medical students on such items as length of stay of patients, outpatient clinic costs and utilization of laboratory and X-ray services? There was agreement

that if these costs are considered educational in nature, they would in large part be attributed to graduate rather than undergraduate education. There is a difficult measurement problem in this area, and once an educational cost is measured, an arbitrary determination would be necessary to differentiate the graduate versus undergraduate cost.

E) How dollars from faculty practice plans impinge upon the undergraduate medical education process, and how to account for them? There was agreement that these plans are related to the cost problem, but that a thorough analysis of the matter should be on the agenda as a long term study.

IV. Discussion of Further Action by the Task Force

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

SUITE 200, ONE DUPONT CIRCLE, N.W., WASHINGTON, D.C. 20036

TO: TASK FORCE ON COST OF GRADUATE MEDICAL EDUCATION AND FACULTY PRACTICE PLANS

FROM: Robert H. Kalinowski, M.D. and Richard M. Knapp, Ph.D.

SUBJECT: Minutes of July 19, 1972 meeting

NOTE: Next meeting of the TASK FORCE
Tuesday, Spetember 19, 1972
9 a.m. - 4 p.m.
AAMC Conference Room

Present:

Dr. William Anlyan
Dr. Christopher Fordham
Dr. William Grove
Dr. Robert Heyssel
Dr. Arnold Relman
Mr. Charles Womer

Guest:

Mr. Ronald Lochbaum

AAMC Staff:

Dr. Cooper
Miss Beirne
Miss Burt
Mr. Campbell
Mr. Hilles
Mr. Murtaugh
Dr. Kalinowski
Dr. Knapp
Mr. Rosenthal
Dr. Swanson
Dr. Wilson

Dr. Anlyan requested that Dr. Cooper report on the meeting on July 11 of the Committee and respective Task Force Chairmen. The purpose of that meeting was to review an outline of the Report by the Committee on the Cost of Undergraduate Medical Education which is to be completed by October, for presentation to the AAMC Assembly.

It was reported that there was increasing concern about continuing the present approach - that is, to present as a separate set of numbers identified as the real costs of undergraduate medical education. Essentially, the magnitude of dollars and effort devoted to undergraduate medical education is not large enough to encompass or account for the size of the financial problems being experienced. In other words, this group of insitutions is not in financial difficulty due solely to the undergraduate medical education process. Thus, the Report in October will view the matter in a much larger context.

Specifically, it was agreed at the meeting of July 11 that:

The Committee's report to the Assembly will seek to establish the view of the Association concerning (1) the complexity of the medical education process -- the interrelatedness of the elements that are integral to that process (instruction, research, service); (2) the indivisibility of that process, beginning with the curriculum leading to the M.D. degree through the years of internship and residency; (3) that only upon the completion of this continuum can the national objective to increase the number of persons capable of performing the functions of physicians in the delivery of health care be satisfied.

The report will therefore stress the essentially arbitrary nature of efforts to establish estimates of the costs of undergraduate medical education, since this is a discrete concept only in the sense that a degree is awarded upon its completion and not in terms of the preparation of an individual for the independent practice of medicine.

However, because of pressures for such estimates, the Association will present a set of preliminary figures, for consideration as a guide to the probable costs of this segment of the continuum - to be followed by more definitive views of the entire medical education process, its costs, and financing, in the context of the broad range of activities of the contemporary medical center complex.

The Task Force groups will continue, therefore, to develop estimates of the costs of undergraduate medical education, for inclusion in the Committee's report.

At this point in the meeting, Dr. Anlyan expressed concern that the title of the Task Force was somewhat misleading. Following brief discussion, there was agreement that the charge to the Task Force is as follows:

.....Long Term Goal - to determine the patient care cost component of the continuum of medical education

.....Short Term Goal - to determine the patient care cost component of undergraduate medical education.

The Task Force then reviewed a draft staff paper entitled, "Medical Education -- The Patient Care Cost Component" (A copy of the paper is attached as Appendix A to these Minutes). The paper sets forth three reductions of the patient care cost component which could be included as educational costs:

1- Costs of those activities financed under the teaching hospital budget which can be appropriately considered as teaching in nature. This would include, for example, the teaching activities of the nursing and other hospital staff and associated expenses;

2- Increased hospital costs resulting from the conduct of teaching functions in the clinical setting. Examples would be increased laboratory testing and hospital days of care;

3- The question of whether the remaining patient care costs, after the above incremental costs have been shorn away, should be allocated to education.

An extensive and lengthy discussion followed concerning the third reduction. Additionally, the following items were reviewed:

1) "Unidentified Educational Costs In A University Teaching Hospital: An Initial Study";

2) "Cholecystectomies In University And Nonuniversity Hospitals";

3) "How Much Longer Do Patients Stay In Major Teaching Hospitals?";

4) A Comparison of Five Groups of Short-Term General Teaching Hospitals In North and South Carolina (attached as Appendix B);

5) A Comparison of Hartford and Yale New Haven Hospitals (attached as Appendix C).

Following this review, there was general agreement that reduction #3 should not be considered an educational cost. The other two reductions were considered as part of the set of questions as outlined in the Minutes of the first meeting on June 12. These questions and pertinent comments related to them are repeated below:

a- How much of house staff costs can be allocated to the function of instructing medical students?
For the most part, these data are available in the cost allocation study, although in some cases the data are "buried" in the faculty instruction data and may be difficult to retrieve.

b- How to estimate the cost for hospital space allocated to undergraduate students?
This is an operating cost in two ways. First concerns the matter of "overhead" on this space and the extent to which it is allocated to the educational programs. Second, is the question of amortization, debt service and depreciation of this space as an operating expenditure of the hospital. The present state of the data from the cost studies needs to be reviewed in this area.

c- How to estimate the cost of nursing, technician, and other staff time devoted to teaching undergraduate medical students?
(Letters a and c are equivalent to reduction #1 in the

staff paper) For the most part, these data are available in the cost allocation study. The group did suggest that the costs in this area would most likely be relatively low.

d- How to estimate the effect of teaching undergraduate medical students on such items as length of stay of patients, outpatient clinic costs and utilization of laboratory and X-ray services?
There was agreement that if these costs are considered educational in nature, they would in large part be atrributed to graduate rather than undergraduate education. There is a difficult measurement problem in this area, and once an educational cost is measured, an arbitrary determination would be necessary to differentiate the graduate versus undergraduate cost.

e- How dollars from faculty practice plans impinge upon the undergraduate medical education process, and how to account for them?
There was agreement that these plans are related to the cost problem, but that a thorough analysis of the matter should be on the agenda as a long term study.

A brief discussion ensued concerning the medical student contribution to patient care, but there was a consensus that this matter should be excluded from any report made by the Task Force. A second point of discussion concerned the cost of providing care to medically indigent patients. There appeared to be some disagreement over whether or not costs associated with this point should be considered educational.

Finally, there was agreement the analysis should be an honest attempt to set forth the costs. The problem of "marketing" and financing these costs would then be addressed with a separate strategy.

The next meeting of the Task Force is to be held on Tuesday, September 19 from 9 a.m. to 4 p.m. in the AAMC conference room. The final meeting will be held on October 6.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

SUITE 200, ONE DUPONT CIRCLE, N.W., WASHINGTON, D.C. 20036

D R A F T -- For Discussion Purpo
JSM-- July 12, 1972

# MEDICAL EDUCATION -- THE PATIENT CARE COST COMPONENT

The Committee on the Financing of Medical Education has proceeded with the view that the undergraduate educational program requisite to the qualification of an individual for the M. D. degree is comprised of an integral mix of teaching, research and patient care activity--all three of which are essential to the process. Given this view then, the measurement of the costs of undergraduate medical education requires some method of deriving from the overall teaching, research and patient care expenditures of an academic medical center the proportion and amounts of such expenditures which can appropriately be attributed to undergraduate education.

The Association of American Medical Colleges cost allocation process does provide for distributing instructional costs among the various educational programs, but no firm conceptual approach or methodology has yet been devised for separating research and patient care costs on a program basis. The Research Task Force is engaged in assessing the utility of alternative approaches to the program distribution of

research costs. Similar effort must be directed to the problem of determining what part, if any, of the patient services expenditures of an academic medical center should be considered as applicable to education, specifically undergraduate medical education, and thus be included in the measurement of the costs of such programs.

The approach to the resolution of this problem would appear to involve submitting the total expenditures for hospital and clinic services of an academic medical center to a sequence of three reductions:

1. Teaching Function Costs

The first reduction is relatively straightforward and is already provided for in the AAMC cost allocation methodology. Included here are the costs of those activities financed under the teaching hospital budget of an academic medical center which can be appropriately considered as teaching in nature. This would include, for example, the teaching activities of the nursing and other hospital staff and associated expenses. As noted, methods for determining and allocating the costs of such hospital teaching functions are already a part of the current cost allocation program. Thus these particular costs are being identified and separated in the current cost allocation studies.

2. Incremental Hospital Costs Due To Teaching

The second reduction is conceptually a relatively

clear matter, but there is at present no agreed upon methodology much less an appropriate body of data to carry out the necessary quantification process. Included here are those increased hospital operating costs resulting from the conduct of teaching functions within the clinical setting. This would include, for example, the costs of increased laboratory testing, added hospital days, greater housekeeping costs, etc. which result from the conduct of teaching activities and specifically undergraduate teaching programs. There have been numerous observations of the substantial differences in operating costs between teaching and non-teaching hospitals. The major part of those differences has been considered to be the combined effects of the added costs of teaching functions, the greater expense involved in treating a more seriously ill patient population and the more extensive services provided. Almost nothing has been done in separately measuring these several factors of difference much less making any attempt to distribute these incremental costs due to teaching programs among the several educational programs involved. Advice on how to proceed in carrying out this second reduction is urgently needed.

3. The Sharing of Joint Costs

The third reduction of the patient care costs of an academic medical center in reaching for the full costs of educational programs is principally a conceptual and policy

problem, rather than a methodological one. Described thus far in the preceding steps one and two are those costs encompassed in the patient care expenditures of an academic medical center which result directly, and to a degree indirectly, from the conduct of teaching activities. Carrying out the reductions of these costs, as proposed in steps one and two, would leave as a remainder, those expenditures for what might be termed regular patient care activity shorn of teaching costs.

The question that remains is whether any part of this body of patient care costs should be allocated to the cost of medical education. The reason this question arises is the simple fact that the conduct of an undergraduate medical education program requires access to a particular volume of patient care activity. Without it there can be no medical education program. At the same time that patient care activity is being carried out to provide needed hospital care for sick people and thus serves another objective; namely, providing health care.

Thus, some part or all of the patient care activity of an academic medical center serves more than one objective and therefore constitutes a joint endeavor serving dual purposes. Since this patient care activity is essential to each such purpose, there is reason to argue that its costs ought to be shared to the extent that they are truly joint. (In many instances, the patient care program of an

academic medical center may be of a substantially greater magnitude than that required to provide an adequate teaching program. Such additional patient care activity would be above and beyond that which could be considered as jointly serving educational programs, and its cost would have to be assigned to other program objectives.)

The fact that this regular patient care activity is reimbursable by its recipients or their agents does not change the theoretical problem of how its costs should be assigned. If, indeed, the costs of this regular patient care activity are fully reimbursed that would appear to have the practical effect of eliminating the problem. But, if they are not fully reimbursed, as could be the case if any number of indigent patients, not eligible for public support, are treated, the basic issue remains except that is presented in a somewhat more acute form; namely, who shall bear the burden of the deficit?

The inclusion of this third element of patient care costs related to medical education represents a substantial departure from existing cost measurement approaches. While it may be conceptually valid, it presents major policy considerations, but it does offer the possibility of clarifying and placing on a truly comparable basis, the cost measurement of medical education programs. The methodological process of obtaining this third level of cost involves an agreement on the volume of patient care activity requisite

to the teaching of a specific number of students, i.e. the number of patients or patient admissions per student.

In summary, advice is required on the elements of patient care expenditures in an academic medical center that should be assigned to medical educational and specifically undergraduate education programs and the appropriate methodology for deriving such data.

Short Term Hospitals In North and South Carolina

| | Major Teaching (4) | Teaching (8) | >150 (43) | 51-150 (83) | <50 (40) |
|---|---|---|---|---|---|
| erage Beds | 530 | 479 | 226 | 100 | 40 |
| ys of Care | 161,556 | 143,810 | 70,316 | 25,981 | 9,232 |
| patient Discharges | 17,212 | 17,018 | 9,782 | 3,654 | 1,348 |
| scharges 65 yrs. & over | 2,355 | 3,451 | 1,623 | 636 | 331 |
| Percent of Discharges | 13.4% | 16.0% | 16.4% | 19.3% | 25.3% |
| erage Stay* | 9.4 | 8.5 | 7.4 | 6.9 | 7.0 |
| Obstetrical* | 3.6 | 3.8 | 3.8 | 3.5 | 3.1 |
| Medical & Surgical* | 10.4 | 9.2 | 8.1 | 7.5 | 7.5 |
| tal Operating Expense PPD | $141.05 | $ 71.58 | 65.18 | $ 58.50 | $ 60.33 |
| erating Cost Per Occupied Bed | $48,840 | $ 24,911 | 22,528 | $ 20,585 | $ 21,057 |
| ployees Per Patient Per Day | 4.1 | 2.5 | 2.4 | 2.4 | 2.4 |
| ployees Per 100 Patients Per Day | | | | | |
| Nursing Service | 148.7 | 98.7 | 107.1 | 110.3 | 116.6 |
| Medical Records & Library | 11.7 | 4.9 | 4.6 | 4.9 | 5.4 |
| Radiology | 18.5 | 8.4 | 6.1 | 6.0 | 6.6 |
| Laboratory | 19.2 | 12.6 | 10.1 | 8.3 | 8.9 |
| Occupancy - Obstetrical Units | 64.67% | 76.16% | 65.77% | 46.06% | 33.77% |
| - Med. & Surg. Units | 83.70% | 88.17% | 85.17% | 78.42% | 66.19% |
| - Total | 82.52% | 87.60% | 81.60% | 74.69% | 66.32% |

Source: Duke Endowment

GROUP MEDIANS (Cont.)

| | Major Teaching (4) | Teaching (8) | >150 (43) | 51-150 (83) | <50 (40) |
|---|---|---|---|---|---|
| Nursing MH PPD - Med. & Surg. | 7.46 | 5.20 | 5.75 | 6.03 | 6.77 |
| % Registered Nurses | 26.95% | 33.55% | 27.50% | 22.07% | 22.00 |
| Total Nursing Service DC PPD | $ 31.31 | $ 17.61 | $ 17.10 | $ 16.41 | $ 17.05% |
| Operating Room DC Per Visit | $ 113.71 | $ 59.61 | $ 50.23 | $ 48.36 | $ 51.85 |
| Operating MH Per Visit | 18.78 | 12.35 | 11.12 | 10.95 | 12.36 |
| Clinical Lab IP Tests Per Adm. | 38.92 | 12.31 | 13.82 | 13.06 | 12.66 |
| Total Laboratory Tests Per MH | 7.23 | 3.28 | 3.95 | 4.06 | 4.12 |
| Total Laboratory DC Per Test | $ 1.77 | $ 2.33 | $ 1.94 | $ 1.79 | $ 1.95 |
| X-Ray Diag. Procedures Per Adm. | 3.03 | 1.76 | 1.39 | 1.39 | 1.36 |
| Total X-Ray MH Per Procedure | 1.67 | 1.16 | 1.09 | 1.04 | 1.20 |
| Total X-Ray DC Per Procedure | $ 11.24 | $ 8.95 | $ 9.52 | $ 10.84 | $ 12.60 |
| Med. Rec. MH Per Discharge | 3.42 | 2.26 | 1.68 | 1.73 | 2.16 |
| Medical Records DC PPD | $ 1.86 | .92 | .78 | $ .83 | $ .83 |
| Plant DC Per Bed | $ 168.33 | $ 79.72 | $ 73.88 | $ 63.94 | $ 57.07 |
| Plant DC Per 1,000 Sq. Ft. | $ 123.80 | $ 126.85 | $ 110.93 | $ 113.23 | $ 109.15 |
| Housekeeping DC Per Bed | $ 94.59 | $ 56.78 | $ 53.31 | $ 54.05 | $ 42.95 |
| Administrative & Fiscal DC Per Bed | $ 351.58 | $ 227.36 | $ 143.77 | $ 125.76 | $ 119.02 |
| Administrative & Fiscal MH Per Bed | 62.25 | 39.22 | 30.02 | 29.89 | 29.23 |
| Salaries & Fees - % of Total Exp. | 60.35% | 61.63% | 61.58% | 62.27% | 60.80% |

| | Yale-New Haven | Hartford | Yale-New Haven | Hartford |
|---|---|---|---|---|
| | Salary Expense (Average Number Employees) | | Net Expense | |
| SERVICE DEPARTMENT | | | | |
| General Administration | 447,549 ( 35.4) | 507,195 ( 36.68) | 933,124 | 1,149,038 |
| Employee Benefits | 61,264 ( 5.7) | 48,065 ( 3.75) | 2,357,528 | 2,772,359 |
| Accounting | 101,439 ( 11.0) | 734,429 (103.26) | 108,000 | 930,662 |
| Admitting Office | 663,873 (100.1) | 222,396 ( 30.72) | 969,846 | 235,869 |
| Automatic Data Process | 281,987 ( 33.8) | 256,102 ( 27.59) | 849,117 | 564,341 |
| Communications | 461,297 ( 15.6) | 136,969 ( 20.37) | 423,004 | 407,849 |
| Personnel | 143,679 ( 14.8) | 224,029 ( 27.41) | 252,482 | 290,585 |
| Public Relations | 54,021 ( 6.0) | 35,477 ( 3.28) | 104,956 | 60,316 |
| Purchasing | 167,328 ( 21.7) | 116,163 ( 13.05) | 227,199 | 139,013 |
| Volunteer Services | 18,009 ( 2.0) | 16,109 ( 1.47) | 21,686 | 19,540 |
| Interest Expense | --- --- | --- --- | 43,189 | --- |
| Dietary | 1,626,131 ( 78.4) | 1,728,461 ( 74.20) | 1,610,800 | 2,737,476 |
| Housekeeping | 1,114,527 (170.7) | 1,290,014 (214.26) | 1,218,836 | 1,493,406 |
| Laundry & Linen | 476,906 ( 77.4) | 402,887 ( 62.72) | 750,063 | 589,459 |
| Maintenance of Personnel | 77,931 ( 12.6) | 38,804 ( 5.62) | 73,954 | 14,394 |
| Operation of Plant | 224,704 ( 26.1) | 328,476 ( 39.93) | 846.209 | 1,183,056 |
| Repairs and Maintenance | 912,111 (103.6) | 938,104 (102.02) | 1,026,228 | 1,190,628 |

| | Yale-New Haven | Hartford | Yale-New Haven | Hartford |
|---|---|---|---|---|
| | Salary Expense (Average Number Employees) | | Net Expense | |
| PROFESSIONAL SERVICES | | | | |
| Medical Care Administration | --- --- | 367,390 ( 20.60) | --- | 401,447 |
| Nursing Service Admin. | 223,300 ( 20.1) | 621,775 ( 45.51) | 238,837 | 635,850 |
| RN Education | 314,328 ( 34.2) | 663,112 ( 60.97) | 338,895 | 661,773 |
| LPN Education | 73,653 ( 7.0) | 628,719 ( 80.69) | 81,369 | 272,234 |
| Nurse Aid/Orderly | --- ---- | --- --- | --- | --- |
| Intern/Resident | 1,923,514 (190.5) | 1,338,935 (136.81) | 1,173,229 | 1,402,017 |
| Medical Records | 398,117 ( 60.8) | 303,244 ( 45.16) | 438,441 | 379,907 |
| Social Service | 389,587 ( 30.1) | 157,994 ( 12.97) | 334,331 | 153,891 |
| SERVICES | | | | |
| Operating Room | 861,702 (103.4) | 1,149,117 (149.07) | 1,438,450 | 1,531,205 |
| Recovery Room | 187,085 ( 20.8) | 136,067 ( 18.22) | 216,392 | 193,285 |
| Anesthesiology | 735,629 ( 28.3) | 81,250 ( 6.73) | 1,039,180 | 55,930 |
| Delivery Room | 241,905 ( 28.1) | 472,008 ( 46.44) | 291,574 | 406,740 |
| Diagnostic Radiology | 882,586 (111.2) | 547,062 ( 97.15) | 1,903,880 | 902,956 |
| Radioisotopes | 79,681 ( 9.1) | 64,746 ( 4.76) | 265,679 | 106,007 |
| Radiation Therapy | 232,684 ( 26.9) | --- ( 8.36) | 337,048 | --- |
| Laboratory | 1,438,724 (163.5) | 2,045,375 (225.18) | 3,287,223 | 2,490,940 |
| Electronecephalography | 28,734 ( 3.9) | 68,041 ( 4.91) | 70,623 | 75,538 |
| Electrocardiology | 62,701 ( 9.2) | 170,507 ( 8.31) | 173,506 | 197,839 |

| | Yale-New Haven | Hartford | Yale-New Haven | Hartford |
|---|---|---|---|---|
| | Salary Expense (Average Number Employees) | | Net Expense | |
| Medical/Surgical Supplies | --- ( ) | --- ( ) | 387,443 | 352,728 |
| Central Sterile Supply | 196,029 ( 32.7) | 208,675 ( 35.65) | 542,954 | 669,349 |
| Physical Medicine | 185,841 ( 23.1) | 259,787 ( 22.39) | 200,169 | 236,853 |
| Inhalation Therapy | 358,033 ( 37.7.) | 538,260 ( 64.71) | 365,821 | 569,915 |
| Pulmonary Disease | --- --- | 27,717 ( 2.46) | --- | 39,733 |
| Intravenous Therapy | 63,724 ( 6.9) | 644,076 ( 65.08) | 266,954 | 1,026,091 |
| Shock Therapy | --- --- | 14,347 ( 1.77) | --- | 16,394 |
| Pharmacy | 358,479 ( 38.6) | 153,187 ( 15.01) | 1,483,957 | 1,089,219 |
| Emergency Room | 454,009 ( 56.7) | 481,736 ( 58.72) | 625,135 | 436.358 |
| Cost of Drugs Sold | --- --- | --- --- | --- | --- |
| ROUTINE SPECIAL SERVICES | | 130,157 ( 8.83) | | 248,834 |
| Renal Dialysis (Yale) | 71,654 ( 8.3) | | 118,825 | |
| Urology (Yale) | 19,263 ( 2.3) | | 27,392 | |
| Prepared Child Birth (Yale) | 17,032 ( 2.1) | | 18,514 | |
| Clinics (Yale) | 911,200 (115.0) | | 665,239 | |
| Circumcision (Hartford) | | 1,867 ( .25) | | 2,434 |
| Audiology (Hartford) | | --- --- | | 16,056 |
| Cardio-Resperatory (Hartford) | | 169,785 ( 12.50) | | 466,244 |
| Cystoscopy (Hartford) | | 36,742 ( 4.10) | | 46,235 |

| | Yale-New Haven | Hartford | Yale-New Haven | Hartford |
|---|---|---|---|---|
| | Salary Expense (Average Number Employees) | | Net Expense | |
| ROUTINE SERVICES | | | | |
| Adult Medical Surgical | 4,765,500 (750.4) | 5,611,865 (865.10) | 6,359,567 | 6,051,839 |
| Intensive Care Unit | 737,766 ( 12.6) | --- --- | 815,153 | --- |
| Pediatrics | --- --- | --- --- | --- | --- |
| Psych. Clinic (Hartford) | | 113,980 ( 9.38) | | 67,739 |
| Newborn Special Care (Yale) | 268,279 ( 31.4) | | 534,126 | |
| Psych. Testing (Hartford) | | 43,033 ( 3.54) | | 44,261 |
| N I H Beds (Yale) | 259,718 ( 30.3) | | 296,305 | |
| Maternity | 676,858 ( 63.4) | 298,509 ( 39.09) | 420,267 | 286,234 |
| Newborn Infants | --- --- | 369,884 ( 42.67) | 203,269 | 381,550 |
| Clinics (Hartford) | | 502,972 ( 54.86) | | 297,526 |
| Private Referred | --- --- | --- --- | 1,925 | --- |
| Psych. Day Care (Hartford) | | 77,415 ( 6.65) | | 84,279 |
| Speech (Hartford) | | --- --- | | 13,519 |
| Home Care | --- --- | --- --- | --- | --- |
| OTHER EXPENSE | | | | |
| Real Estate/Property Tax | --- --- | --- --- | --- | --- |
| Research | --- --- | 141,365 ( 12.75) | --- | 182,790 |
| Fund Raising | --- --- | 11,093 ( .89) | 28,039 | 12,304 |
| Ambulance Service | --- --- | --- --- | --- | --- |

| | Yale-New Haven | | Hartford | | Yale-New Haven | Hartford |
|---|---|---|---|---|---|---|
| | Salary Expense (Average Number Employees) | | | | Net Expense | |
| Patient Guest Meals | --- | | --- | | --- | --- |
| Pay Cafeteria | --- | ( 39.3) | 224,592 | ( 36.48) | (154.415) | (251,228) |
| Coffee & Gift Shop | --- | | --- | | 3,050 | 1,481 |
| Rented Real Estate (Hartford) | | | 2,002 | ( .39) | | 67,627 |
| Barber Shop (Yale) | --- | | | | 4,960 | |
| Canteen (Yale) | --- | | | | 571 | |
| Guest Rooms (Hartford) | | | --- | | | 379 |
| T.V. Rental (Yale) | --- | | | | 132 | |
| Miscellaneous (Yale) | --- | | | | 40,376 | |
| TOTAL | 24,276,062 | | 25,550,821 | | 37,081,670 | 36,069,262 |

# HARTFORD HOSPITAL

## STUDY OF THE COST OF EDUCATION PROGRAMS

YEAR ENDED SEPTEMBER 30, 1971



ERNST & ERNST

HARTFORD HOSPITAL

HARTFORD, CONNECTICUT 06115

A COMMENTARY ON THE SIGNIFICANCE OF THE ERNST AND ERNST STUDY

1. PURPOSE: The purposes of this study were two:

a) to determine as exactly as possible the total cost of Hartford Hospital's educational programs in fiscal 1971;

b) to estimate what the impact on the Hospital's operating costs would have been if all formal educational activities were abolished.

2. METHODOLOGY: Previous attempts to place a value on education have been frustrated by two problems; namely, the difficulty in defining exactly what activities are educational, and the impossibility of putting a dollar value on the quality which education is believed to impart to the delivery of health services. To our knowledge, this is the first study of education in a hospital which has used the negative postulate; i.e., what would it cost the Hospital to maintain the same level of services without an educational program? This removes the quality variable, for we assumed that quality would be constant if the same services were delivered by qualified personnel other than students. It also helps solve the difficulty in defining education vs. service. In surveying activities which did not fall clearly into one sphere or the other, the student was asked: "If you were not performing this act, would someone else have to do it?" If the answer was "Yes," the act was considered to be of a service nature. If the answer was "No," the activity was considered an educational one.

3. WHAT THE STUDY IS NOT: It is important to emphasize the limitations of this study:

a) It does not attempt to evaluate or reorder the priorities in hospital care. We assumed that the values and priorities presently placed on various aspects of care would have been constant in 1971 with or without an educational program.

b) It is not an industrial engineering study; i.e., an evaluation of whether the most efficient possible use is being made of manpower. Although manpower might be more efficiently used or less expensive personnel might perform the same functions equally well, we assumed that the way manpower was utilized in 1971 would have remained constant whether or not there was an educational program. (This matter is worthy of study, however, and we have subsequently commissioned Community Systems Foundation to do an industrial engineering study of how allied health students are being used in service roles.)

c) It draws no universal conclusions. It applies only to one fiscal year at one institution, and we will not know how applicable it is elsewhere until similar studies are carried out in other hospitals.

4. SIGNIFICANCE OF THE ANALYSIS OF EDUCATIONAL COSTS:

a) The gross cost of education constituted 13.4% of Hartford Hospital's total operating budget in fiscal 1971.

b) Of the total educational costs, 65.6% were direct and 34.4% were indirect (overhead and depreciation). The latter figure, amounting to $1.7 million, is an index of the long-term investment the Hospital has made in education. The fact that it would not be eliminated if all educational activities ceased should not disguise the fact that this investment would not have been made if the Hospital had not embarked upon its educational endeavors in the first place.

c) The costs of nursing and allied health education are not balanced by the services these students render, but they are compensated by the value of medical house staff services. This is in part due to the greater discrepancy between the income of students and practitioners in medicine as compared to the difference between salaries paid students and practitioners in the other health professions.

5. SIGNIFICANCE OF THE VALUE OF SERVICES RENDERED BY STUDENTS:

a) The dollar figures given are not a measure of the value of all services rendered by students. They measure the cost of replacing only those services performed by students which the Hospital would have to continue in order to maintain its current level of service. All services essential to the delivery of good health care are not necessarily hospital-essential. For example, personnel available around the clock to resuscitate patients are both hospital- and medical-essential. On the other hand, admission histories and physical examinations are medical-essential but not services that the hospital must provide.

b) The 132,750 house staff manhours devoted to hospital-essential services indicates the extent to which the hospital has gradually assumed medical-essential functions without the hospital, the medical staff or the community being fully aware of it.

c) In theory, voluntary physicians could provide all hospital-essential services, but since this would require the annual contribution of 5 sixty-hour weeks by every member of the medical staff it would be financially impossible. Even if every physician was able to contribute this much time, his costs would presumably be transferred to the community; i.e., the time would be "free" to the hospital, but not to society.

d) Although subjectivity entered into the estimates of personnel needed to replace students, the margin of error is reduced by the fact that in no instance were more than three individuals involved per shift. Arguing whether 2.5 full-time equivalents might be able to do the same job as three is academic. Furthermore, the total number of personnel needed to perform hospital-essential functions was relatively small compared to the size of the Hospital's student body. 145 interns and residents would have been replaced by approximately 40 full-time doctors, 10 nurse practitioners and 14 surgical technicians. 350 nursing students would have been replaced by 9 RN's and 17 LPN's. 400 allied health students would have been replaced by 8 RN's, 8 LPN's and 34 technicians.

e) All estimates of replacements were conservative; i.e., whenever there was a question of the number of people needed to maintain a service the lowest one was chosen. Nevertheless, if education programs had been abolished it would have cost $9,000 more to maintain only the hospital-essential services delivered in 1971. In other words, even if no value is placed on anything other than the services rendered by students, education is a "wash" item.

f) The non-quantifiable items listed at the end of the report cannot be given a dollar value, but at least three of them are probably of considerable benefit:

i.) Improved quality of care. This is presumed but cannot be proved in view of our present inability to quantify quality.

ii.) Production of manpower to staff the Hospital and other health facilities from one to thirty years into the future.

iii.) Most of the 223,850 man-hours of service delivered by interns and residents which are <u>not</u> hospital-essential would presumably have to be performed by practicing physicians who now delegate them to the house staff. While the value of $4.2 million placed on these services is a

rough estimate, the actual value is probably somewhere in this order of magnitude and would represent a new cost to the community.

6. OTHER IMPLICATIONS OF THE STUDY:

a) Are the students being exploited? The replacement value of the service rendered by radiologic technology and intravenous therapy students are disproportionate when compared with those of the nursing and other allied health students. The industrial engineering study mentioned above has been launched to investigate this. But while it is possible for a student to serve without learning, it is impossible for him to learn without serving. Furthermore, if students were paid proportionately to the value of their services they could legitimately be expected to pay a tuition proportional to the education they are receiving. The interns and residents, for example, spent 147,200 manhours in activities which they classified as educational, an average of about 20 hours per week for each. House staff pay no tuition, and allied health students only a nominal fee. Only students in the School of Nursing pay a significant amount, and even that is insufficient to cover more than one third of the salaries of that School's faculty.

b) Should the medical staff be contributing to the salaries of house staff? This question is moot. The study shows that the Hospital is receiving a return on its investment in the house staff sufficient to defray the costs of graduate medical education and part of those of nursing and allied health education as well. On the other hand, the value of services rendered to the medical staff is of the same order of magnitude. But Hospital and Staff are not the only beneficiaries. Since no resident is committed to practicing at Hartford Hospital and may choose any corner of the country, a strong case could be made for state and federal contributions to their salaries as an investment in a regional and/or national resource. Medical staff contributions would take

educational costs off the Hospital's balance sheet but still leave them in the community. Governmental support would transfer these costs to the wider base of public taxation.

c) Salaried physicians devote a previously unappreciated amount of their time to non-educational activities. While some of this represents administration (committees, etc.) much of it is in direct patient care (cardiac catherization, pulmonary function studies, ambulatory pediatrics, etc.). Most of these duties would continue unchanged, whether or not there was an educational program, in order to maintain the Hospital's accepted level of service.

d) Physicians in private practice devote an average of 5 hours per week to rounds, conferences, teaching and other educational activities. While some of this is involved in the teaching of students and house staff, much of it is probably devoted primarily to the doctor's own education.

7. IMPLICATIONS TO THE UNIVERSITY OF CONNECTICUT HEALTH CENTER:

a) The Hospital's involvement in on-site undergraduate medical education was so minimal in 1971 that the cost, while there must have been one, could not be identified. Medical students were assigned to the Hospital for a total of 120 months during 1971 (10 full-time student equivalents). As the Health Center increases in size, the number of students will increase, and it may be possible in a subsequent study to identify costs of undergraduate education by comparing them with this one.

b) Full-time physicians paid by Hartford Hospital are already making a considerable contribution to education outside the Hospital. Although this was not specifically identified, most of it related to the University of Connecticut. The estimated time spent in education outside the Hospital was in excess of 3,000 hours or 1½ full-time equivalents. This will also increase as the Health Center expands its educational program.

John G. Freymann, M.D.
Director of Education
August 23, 1972

TABLE OF CONTENTS

ERNST & ERNST
ONE CONSTITUTION PLAZA
HARTFORD, CONN. 06103



T. Stewart Hamilton, M.D., President
Hartford Hospital
80 Seymour Street
Hartford, Connecticut

Dear Dr. Hamilton:

We have completed our study of the costs of the Allied Health Programs, Nursing Programs and the Medical Programs for residents and interns at Hartford Hospital. The purpose of this study was to distinguish and determine the net cost effect of educational programs upon the total cost of operating Hartford Hospital during the fiscal year ended September 30, 1971, assuming that if the educational programs were discontinued the Hospital would maintain the same level of patient care and service to the community. This report presents our findings and conclusions.

The two major objectives of the study were:

1. To identify the educational programs of the Hospital and to determine their cost.

2. To evaluate the replacement services and estimated costs thereof that would be required if the educational programs should be phased out.

The educational programs covered in this study are those classified by the Hospital as Allied Health Programs, Nursing Programs and Medical Programs. The specific programs are:

ALLIED HEALTH PROGRAMS

Practical Nurse
Surgical Technicians
School of Radiologic Technology
Inhalation Therapist
Medical Technologist
Medical Laboratory Assistant
Intravenous Therapy Technician
Cytology Technician
Certified Inhalation Therapy Technician

NURSING PROGRAMS

School of Nursing
Associate Degree Nursing

MEDICAL PROGRAMS

Anesthesia
Radiology
Pathology
Oral Surgery
Rotating Interns
Medicine
Pediatrics
Surgery
Obstetrics - Gynecology
Orthopedic Surgery
Neuro Surgery
Urology
Otorhinolaryngology
Opthamology
Psychiatry

Excluded from this study were undergraduate medical education and in-service training. Undergraduate medical education was excluded because at the end of the Hospital fiscal year 1971 there was no 4th year class at the University of Connecticut Medical School and there were only 31 members in the 3rd year class. This small number of students made use of the facilities of 5 different hospitals of which Hartford Hospital was one. Since the equivalent number of full-time students at Hartford Hospital was only five these costs were not considered in this study. In-service training programs were excluded from this study at the Hospital's request, because this type of education is necessary to maintain and update the skills of those persons working at the Hospital.

The following steps were taken in determining the present cost and replacement value of student services of the various educational programs:

1. A detailed analysis of the financial records of the Hospital
2. The design and distribution of an educational program description questionnaire
3. A series of follow-up interviews on the program description questionnaires
4. The design and distribution of time logs for salaried physicians, practicing staff, and residents and interns
5. A series of follow-up interviews on the results of the time logs
6. The preparation and use in discussion with each department chief of a clinical program interview form
7. A series of interviews with the chief of departments in which, from the data gathered, they determined the replacement value
8. A series of meetings with members of Hospital's management to review and evaluate the findings and results
9. The recasting of the Hospital's financial data based on the findings to determine costs and to compute the imputed value of student services

Three classifications of costs were distinguished in determining the aggregate present cost of educational programs. The first of these were those costs that could be charged directly to a program and which would disappear if that individual program were discontinued. The second were those related costs which would remain substantially unchanged if any one program were dropped, but which would disappear or significantly diminish if most or all educational programs were abandoned. The third category of costs were defined as those costs which would remain substantially unchanged, even if all educational programs were to be discontinued, a portion of which costs should be distributed to the various educational programs because of the services that are furnished. For the purposes of this study these types of costs are referred to respectively as "Category A", "Category B", and "Category C".

In addition to the costs defined in the preceding paragraph, certain income or credits were found to be directly attributable or assignable to the programs. These were classified as arising from student payments in the form of tuition or fees, or external funds received by the Hospital only because they conducted one or more of the educational programs. These credits were applied to the gross cost to determine the net cost of educational programs.

From analysis of the questionnaires, interviews and studies, the amount and value of patient care services provided by the various program enrollees was determined. This imputed value was expressed as the cost the Hospital would have to incur in order to maintain the present level of patient care and community service if the educational program were discontinued.

The overall results of the previously discussed steps and procedures are as follows:

OVERALL COST AND REPLACEMENT VALUE
OF EDUCATIONAL PROGRAMS AT HARTFORD HOSPITAL
FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1971

| | | |
|---|---|---|
| COSTS: | | |
| Category A | | $3,012,824 |
| Category B | | 308,600 |
| Category C | | 1,733,695 |
| | | 5,055,119 |
| CREDITS | | 530,412 |
| | NET COST | $4,524,707 |
| IMPUTED REPLACEMENT VALUE | | $2,800,100 |

Based on the definitions of costs, credits and replacement value presented previously the net theoretical increase in the total operating cost of Hartford Hospital for fiscal year 1971 would have been $9,088 had all educational programs been discontinued prior to the beginning of the fiscal year. This was computed as follows:

| | | |
|---|---|---|
| COST INCREASES: | | |
| Replacement Value | $2,800,100 | |
| Loss of Credits | 530,412 | |
| | TOTAL INCREASE | $3,330,512 |
| COST DECREASES: | | |
| Category A | $3,012,824 | |
| Category B | 308,600 | |
| | TOTAL DECREASE | 3,321,424 |
| | NET INCREASE | $ 9,088 |

The study also identified a number of benefits and costs arising from the educational programs that effect the Hospital, the staff, other hospitals, the patients, the community and the public in general. Since it was not possible to quantify these factors they are not included in the dollar results. However, because they are an important consideration in any decisions involving the educational programs, they are discussed in a separate section of this report under the heading of Qualitative Factors.

Additional detail pertaining to the costs of individual programs, methodology, and description of programs are also contained in separate sections of this report. There is, in addition, an appendix which contains samples of the questionnaires and logs used.

We would like to thank the many people at Hartford Hospital whose outstanding cooperation made the successful completion of this study possible. We appreciate having had the opportunity to perform this assignment and will provide any additional information or discuss this report with you further at your convenience.

Very truly yours,

Ernst & Ernst

## SUMMARY OF COSTS

The accompanying schedule in this section shows the various elements of gross cost, and reductions to that gross cost, for each formal educational program at Hartford Hospital for the year ended September 30, 1971.

Explanations of the various categories and the rationale for their derivation may be found in the section of this report headed "Methodology". More detailed information on the cost buildup of each program may be found in the section titled "Programs".

Although the accompanying schedules show gross cost, net cost and replacement value of student services for each program, these amounts can not be used, as is, to determine the savings or cost involved if only one or several programs were to be discontinued. This is because the Category B costs would continue unless most or all the programs were discontinued and the Category C costs, in general, would continue if all the programs were to be dropped. However, if all programs were abandoned the total cost of operating the Hospital should be reduced by the Category A and Category B costs and increased by the Replacement Value of Student Services, Student Payments and External Funds. This would result in a net increase in operating costs of approximately $9,088.

HARTFORD HOSPITAL

COST OF EDUCATIONAL PROGRAMS BASED ON OPERATIONS

Year ended September 30, 1971

SCHEDULE I

| Department Number | Department Name | Category A Cost | Category B Cost | Category C Costs: Allocated Costs and Depreciation of Fixed Equipment and Buildings | Category C Costs: Re-Allocated | Gross Cost | Direct Credits: Student Payments | Direct Credits: External Funds | Assigned Credits | Net Cost | Imputed Replacement Value of Student Services |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Allied Health Programs** | | | | | | | | | | |
| 701 | Practical Nurse | $ 256,779 | $ 61,824 | $ 64,017 | $100,633 | $ 483,253 | | | $26,136 | $ 457,117 | $ 76,000 |
| 702 | Surgical Technicians | 63,123 | 11,501 | 27,572 | 17,554 | 119,750 | $ 3,250 | | 4,691 | 111,809 | 53,000 |
| 703 | School of Radiologic Technology | 82,869 | 26,019 | 21,052 | 42,551 | 172,491 | 4,952 | | 11,171 | 156,368 | 204,000 |
| 704 | Inhalation Therapist | 50,010 | 8,594 | 16,681 | 9,947 | 85,232 | 1,298 | | 2,678 | 81,256 | 38,000 |
| 705 | Medical Technologist | 64,894 | 8,775 | 17,691 | 8,361 | 99,721 | 2,775 | | 2,238 | 94,708 | |
| 706 | Medical Laboratory Assistant | 29,798 | 10,412 | 11,884 | 14,116 | 66,210 | | | 3,777 | 62,433 | |
| 707 | Intravenous Therapy Technician | 51,547 | 9,072 | 15,087 | 15,503 | 91,209 | | | 4,192 | 87,017 | 130,000 |
| 713 | Cytology Technician | 10,954 | 5,147 | 1,828 | 1,231 | 19,160 | | | 378 | 18,782 | |
| 716 | Certified Inhalation Therapy Technician | 15,125 | 6,325 | 1,219 | 1,514 | 24,183 | | | 422 | 23,761 | 12,000 |
| | | 625,099 | 147,669 | 177,031 | 211,410 | 1,161,209 | 12,275 | | 55,683 | 1,093,251 | 513,000 |
| | **Nursing Programs** | | | | | | | | | | |
| 710 | School of Nursing | 767,789 | 28,624 | 987,794 | 6,820 | 1,791,027 | 292,356 | $ 14,612 | 2,837 | 1,481,222 | 265,100 |
| 714 | Associate Degree Nursing | 15,012 | 8,762 | 8,008 | 1,910 | 33,692 | | | 284 | 33,408 | |
| | | 782,801 | 37,386 | 995,802 | 8,730 | 1,824,719 | 292,356 | 14,612 | 3,121 | 1,514,630 | 265,100 |
| | **Medical Programs** | | | | | | | | | | |
| 725 | Anesthesia | 113,800 | 6,823 | 20,224 | 3,530 | 144,377 | | 133,900 | 604 | 9,873 | |
| 726 | Radiology | 90,560 | 5,489 | 15,962 | 2,848 | 114,859 | | | 513 | 114,346 | |
| 727 | Pathology | 157,294 | 7,610 | 27,224 | 3,253 | 195,381 | | 9,288 | 513 | 185,580 | 108,000 |
| 728 | Oral Surgery | 29,745 | 3,627 | 5,311 | 1,645 | 40,328 | | | 335 | 39,993 | 80,000 |
| 729 | Rotating | 82,221 | 21,326 | 14,780 | 10,095 | 128,422 | | | 603 | 127,819 | |
| 730 | Medicine | 432,841 | 26,023 | 75,535 | 13,172 | 547,571 | | | 1,995 | 545,576 | 509,000 |
| 731 | Pediatrics | 100,674 | 10,029 | 17,858 | 4,803 | 133,364 | | | 872 | 132,492 | 277,500 |
| 732 | Surgery | 356,179 | 16,312 | 62,316 | 9,194 | 444,001 | | | 1,546 | 442,455 | 637,500 |
| 733 | Obstetrics - Gynecology | 107,747 | 8,164 | 18,978 | 3,596 | 138,485 | | | 691 | 137,794 | 270,000 |
| 734 | Orthopedic Surgery | 33,906 | 3,626 | 6,026 | 1,645 | 45,203 | | | 335 | 44,868 | |
| 735 | Neuro Surgery | 42,409 | 3,627 | 7,483 | 1,643 | 55,162 | | | 334 | 54,828 | 105,000 |
| 736 | Urology | 30,009 | 2,693 | 5,280 | 1,041 | 39,023 | | | 244 | 38,779 | |
| 737 | Otorhinolaryngology | 18,128 | 2,227 | 3,180 | 736 | 24,271 | | | 199 | 24,072 | |
| 738 | Opthamology | 3,426 | 2,693 | 599 | 1,041 | 7,759 | | | 244 | 7,515 | |
| 739 | Psychiatry | 5,985 | 3,276 | 998 | 726 | 10,985 | | | 149 | 10,836 | 35,000 |
| | | 1,604,924 | 123,545 | 281,754 | 58,968 | 2,069,191 | | 143,188 | 9,177 | 1,916,826 | 2,022,000 |
| | Total Educational Programs | 3,012,824 | 308,600 | 1,454,587 | 279,108 | 5,055,119 | 304,631 | 157,800 | 67,981 | 4,524,707 | 2,800,100 |

HARTFORD HOSPITAL

COST OF EDUCATIONAL PROGRAMS BASED ON OPERATIONS - CONTINUED

Year ended September 30, 1971

SCHEDULE I
(Continued)

| Department Number | Department Name | Category A Cost | Category B Cost | Allocated Costs and Depreciation of Fixed Equipment and Buildings | Re-Allocated | Gross Cost | Direct Credits: Student Payments | Direct Credits: External Funds | Assigned Credits | Net Cost | Imputed Replacement Value of Student Services |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Related Cost Centers | | | | | | | | | | |
| 700 | Allied Health Administration | $ 59,734 | ($ 59,734) | $ 12,469 | ($ 12,469) | $ - | | | | $ - | $ - |
| 708 | Audio Visual Department | 19,046 | (19,046) | 4,767 | (4,767) | | | | | | |
| 709 | Medical Education | 60,447 | (60,447) | 26,932 | (26,932) | | | | | | |
| 711 | Health Sciences Library | 45,995 | (45,995) | 14,952 | (14,952) | | | $ 7,838 | ($ 7,838) | | |
| 712 | Student Health Clinic | 46,031 | (46,031) | 13,447 | (13,447) | | | 4,672 | (4,672) | | |
| 715 | Allied Health Residence | 48,185 | (48,185) | 204,093 | (204,093) | | $ 54,799 | | (54,799) | | |
| 691 | Department of Education | 50,624 | (50,624) | 10,337 | (10,337) | | | 4,985 | (4,985) | | |
| 114 | Summer Student Fellows | 10,100 | (10,100) | 1,927 | (1,927) | | | | | | |
| 116 | Anesthesia Summer Student Fellows | 400 | (400) | 74 | (74) | | | | | | |
| | | 340,562 | (340,562) | 288,998 | (288,998) | | 54,799 | 17,495 | (72,294) | | |
| | | $3,353,386 | ($ 31,962)(a) | $1,743,585 | ($ 9,890)(a) | $5,055,119 | $359,430 | $175,295 | ($ 4,313)(a) | $4,524,707 | $2,800,100 |

(a) Costs assigned to other than educational programs.

## METHODOLOGY

### SUMMARY AND DEFINITIONS OF THE VARIOUS ELEMENTS

It is recognized that there are several types of costs. In a large and complex organization there is usually no single answer to the question, "How much does this particular activity cost?" Such was the case at Hartford Hospital. Elements of cost were divided into three categories:

- Category A was defined as those costs which would disappear if that individual program were to be discontinued.
- Category B was defined as those costs which would remain substantially unchanged if any one program were to be discontinued but would be significantly diminished or eliminated if most or all educational programs were to be discontinued.
- Category C was defined as those costs which would remain substantially unchanged, even if all the educational programs were to be discontinued, yet a portion of these costs should be distributed to the various educational programs.

It was also determined that net costs of education were reduced in three identifiable ways:

- Tuition and fees paid by students in the various programs,
- Funds received by the Hospital only because they conducted one or more of the educational programs, and
- Patient care services provided by the various program enrollees which enable the Hospital to avoid hiring additional personnel to provide these services.

Recognition was also given to the fact that there are also intangible costs and benefits which should be attributed to the various educational programs. In many cases some costs and/or benefits are impossible to quantify with precision, but nonetheless are real and deserve consideration. This category is discussed more fully in another section of this report.

DETERMINATION OF THE VARIOUS COST ELEMENTS

1. Category A costs were defined as those costs which would disappear if that individual program were to be discontinued. These costs were the salaries, or stipends and fringe benefits of those people working full time in a given program; a proportionate share of the salary and fringe benefit of any individual who worked an identifiable portion of his time in the program; the supplies and miscellaneous expenses charged to that program; any supplies or expenses charged to another department which could be identified as being used for educational purposes within the particular program; and depreciation of movable equipment charged to the program.

2. Category B costs were defined as those costs to the Hospital which would remain substantially unchanged if any one program were to be discontinued, but would be significantly diminished or eliminated if most or all educational programs were to be discontinued. These costs were derived from a group of nine related cost centers and contained the same type of direct costs as in Category A. A substantial portion of the costs in each of these centers was devoted to the educational programs. A series of interviews with Hospital management and medical staff determined the portion of these costs which could fairly be assigned to the various educational programs and the manner in which those costs should be distributed. The total costs of these centers, which could be attributed to the various Allied Health, Nursing and Medical programs, were then distributed to those programs.

3. Category C costs were defined as those costs which would remain substantially unchanged, even if all the educational programs were to be discontinued, yet a portion of which should be distributed to the various educational programs. Such costs as building depreciation, housekeeping, communications, laundry and linen, operation of plant, employee benefits, accounting, public relations, personnel, maintenance of plant, purchasing and data processing were included in this category. Although it was recognized that some of these costs could be reduced or eliminated by extreme actions, such as the sale of the School of Nursing buildings, these were not considered as normal continuing operations and that the magnitude would not distort the effect of the study. For example, of the $1,743,585 of Category C costs allocated to the various programs only $223,839 was for building and fixed equipment depreciation. The basis for selecting these costs and the manner for their distribution was in accordance with the provisions of The Connecticut Hospital Association Accounting Manual.

DETERMINATION OF REDUCTIONS TO GROSS COST

The aggregate of the above costs was considered to be the gross cost of educational programs at Hartford Hospital. It was recognized, however, that in order to arrive at a fair representation of net cost several other factors, which tend to reduce gross cost, must be considered.

1. The payment of tuition, fees and rental paid by the students to the Hospital were determined from Hospital records.

2. Funds received by the Hospital specifically to aid in the payment of educational costs were considered to reduce gross costs to the Hospital. These amounts were determined from Hospital records.

3. In order to make a determination of the replacement value of student services, patient care services provided by the various program enrollees, and which enable the Hospital to avoid hiring additional personnel to provide these services, were considered. It was not an objective to place a value on the work performed by persons involved in the various educational programs, but rather to ask what additional costs, if any, the Hospital would need to incur to provide those services which is regarded as essential, if the educational programs were to be discontinued. The only costs considered relevant were those necessary to maintain the present level of patient care and community service in the absence of any educational programs.

Questionnaires were designed and distributed to selected Hospital personnel, all residents and interns, and the medical staff to determine how much time was spent on patient care activities and how much time was devoted to education by the various educational program enrollees (see appendix for further discussion). Once these questionnaires were returned and tabulated, Hospital management personnel, and/or medical staff responsible for providing these services to patients were interviewed in depth. During these interviews, they were asked to review the tabulations of questionnaire responses for reasonableness and to give their professional judgment of the number (assuming that a typical worker will be employed 2,080 hours per year) and qualifications of any employees who would be required to maintain the present level of care in the absence of educational program enrollees. Any time the qualifications included an MD the question of whether these services could be provided by private physicians, rather than a Hospital employed physician or allied health personnel, was discussed and the reasons for selecting one category or the other noted.

The purpose of this approach was not to evaluate the most appropriate or efficient way of utilizing personnel, but rather how they were presently being used. To do the former would have required an in depth industrial engineering type study which was beyond the scope of this study.

The findings of the above were then presented to representatives from the Hospital senior management and medical staff for their evaluation. Each service was discussed in detail; for each service careful consideration was given to the question, "Would Hartford Hospital need to pay to replace the services presently provided by enrollees in this educational program in order to maintain the present level of care?" If that question was answered in the affirmative, the question of whether the means chosen was the least costly manner of providing the necessary services was considered. Discussion of each of the above factors continued until either a consensus was reached regarding the need to provide replacement or until a need for specific additional information was identified.* A draft was then prepared showing the replacement cost for each of the programs and circulated to Hospital management members and medical staff for their comments and evaluation. The comments, criticisms and evaluations thus generated were incorporated into another draft and this procedure was repeated until there was general agreement among all concerned parties that this report fairly states the financial consequences of discontinuing the particular educational programs considered by this study.

---

* For example, it was agreed that the Hospital must provide an emergency room. This could be staffed either by salaried physicians, which would then be a Hospital expense, or by a group practice which would bill patients directly. The latter would not be a Hospital expense but it was decided that the cost to the community would be less in the former and the Hospital should assume this cost.

The value of patient care services included in this report as a valid reduction of educational expense represents those services where it was generally agreed that the services were indeed necessary, and were the responsibility of the Hospital to provide. Hospital personnel provided estimates of the cost of hiring the additional personnel in view of the numbers and qualifications required.

# PROGRAMS

## GENERAL

The basic methodology used in the study was described in the preceding section, therefore, this section will be concerned with the determination of the replacement value of student services, transfers in direct costs and the basis for distributing indirect costs from each of the related cost centers. All replacement values for student services are based upon information provided by Hospital management and/or medical staff.

The cost centers, which relate to education, have been divided into four groups:

1. The Allied Health Programs, or all the paramedical educational programs.
2. The Nursing Programs.
3. The Medical Programs, or those which have teaching responsibility for residents and interns.
4. Related cost centers, or those functions which are heavily involved in education, but do not have student programs in themselves.

The table on pages 17 and 18 shows: the number of physicians by category of physician by department; the number of man hours physicians devoted to education at Hartford Hospital during fiscal 1971, the percent of their total time that education represents (excludes practicing staff); the number of man hours devoted to patient care by House Staff physicians; the percent of total House Staff man hours devoted to patient care; the percent of salaried physicians total time devoted to education at institutions other than Hartford Hospital; and the number of man hours the Hospital has determined would be required to replace essential services now provided by the House Staff. All data in this table except the replacement hours were obtained from the physician questionnaires (for further description, particularly of how patient care was distinguished from education, see appendix).

It might be asked why the Hospital decided that it would hire physicians to provide the emergency room, on call and clinic coverage necessary rather than demand that practicing physicans volunteer this coverage if all educational programs were dropped. The answer is that it would require over 100,000 man hours to replace this coverage now provided by house staff. This would be in addition to all emergency room, on call and clinic coverage now provided by the practicing staff. This extra work would amount to approximately 300 man hours for each member of the active staff or the equivalent of five, sixty hour weeks per physician.

HARTFORD HOSPITAL

PHYSICIAN TIME (MAN HOURS PER YEAR)

SCHEDULE II

| | Number of Physicians | Hours Devoted to Educational Programs at Hartford Hospital | Education Hours as a Percent of Total Hours | House Staff Patient Care Hours | House Staff Patient Care as Percent of Total | Percent of Salaried Physicians Total Time Teaching at Other Hospital | Replacement Hours |
|---|---|---|---|---|---|---|---|
| ANESTHESIA | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 26 | 16,800 | x | x | x | x | x |
| House | 10 | 18,600 | 58% | 13,500 | 42% | x | x |
| RADIOLOGY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 19 | 3,960 | x | x | x | x | x |
| House | 8 | 11,950 | 60% | 7,950 | 40% | x | x |
| PATHOLOGY | | | | | | | |
| Salaried | 13 | 4,750 | 14% | x | x | 2.5% | x |
| Practicing | x | x | x | x | x | x | x |
| House | 8 | 11,700 | 59% | 8,100 | 41% | x | 5,200 |
| DENTISTRY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 17 | 7,050 | x | x | x | x | x |
| House | 4 | 4,640 | 31% | 10,320 | 69% | x | 4,100 |
| MEDICINE | | | | | | | |
| Salaried | 9 | 10,400 | 44% | x | x | 4 % | x |
| Practicing | 105 | 28,500 | x | x | x | x | x |
| House | 38 | 32,400 | 22% | 116,400 | 78% | x | 31,700 |
| PEDIATRICS | | | | | | | |
| Salaried | 2 | 1,500 | 26% | x | x | 8 % | x |
| Practicing | 23 | 7,250 | x | x | x | x | x |
| House | 13 | 10,400 | 27% | 28,000 | 73% | x | 26,000 |
| SURGERY | | | | | | | |
| Salaried | 4 | 4,650 | 48% | x | x | 4 % | x |
| Practicing | 31 | 10,200 | x | x | x | x | x |
| House | 28 | 29,000 | 26% | 83,000 | 74% | x | 49,250 |
| OBSTETRICS/GYNECOLOGY | | | | | | | |
| Salaried | 2 | 600 | 22% | x | x | 19 % | x |
| Practicing | 23 | 6,750 | x | x | x | x | x |
| House | 9 | 10,000 | 26% | 28,400 | 74% | x | 14,500 |
| ORTHOPEDIC | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 12 | 6,000 | x | x | x | x | x |
| House | 4 | 8,400 | 40% | 12,600 | 60% | x | x |

[HART]FORD HOSPITAL

PHYSICIAN TIME (MAN HOURS PER YEAR) - CONTINUED

SCHEDULE II
(Continued)

| | Number of Physicians | Hours Devoted to Educational Programs at Hartford Hospital | Education Hours as a Percent of Total Hours | House Staff Patient Care Hours | House Staff Patient Care as Percent of Total | Percent of Salaried Physicians Total Time Teaching at Other Hospital | Replacement Hours |
|---|---|---|---|---|---|---|---|
| NEUROSURGERY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 4 | 2,400 | x | x | x | x | x |
| House | 4 | 3,500 | 22% | 11,100 | 71% | x | x |
| UROLOGY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 5 | 1,350 | x | x | x | x | x |
| House | 2 | 3,000 | 26% | 8,400 | 74% | x | x |
| OTOLARYNGOLOGY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 8 | 2,500 | x | x | x | x | x |
| House | 1 | 1,160 | 31% | 2,580 | 69% | x | x |
| OPHTHALMOLOGY | | | | | | | |
| Salaried | x | x | x | x | x | x | x |
| Practicing | 13 | 1,650 | x | x | x | x | x |
| House | 2 | 2,050 | 47% | 2,350 | 53% | x | x |
| PSYCHIATRY | | | | | | | |
| Salaried | 4 | 4,150* | 32%* | x | x | 4 1/2% | x |
| Practicing | 24 | 3,200 | x | x | x | x | x |
| House | x | x | x | x | - | x | 2,000 |
| ROTATING INTERNS | 10 | 9,000 | 28% | 23,900 | 72% | x | x |
| | | | | 356,600 | | | 132,750 |

* 400 hours to residents and interns; remainder devoted to in-service training.

HOUSE STAFF RECAP

| | Man Hours Per Year |
|---|---|
| Devoted to Patient Care | 356,600 |
| Replacement Hours | 132,750 |
| Hours Not Replaced | 223,850 |

# ALLIED HEALTH

## PRACTICAL NURSE PROGRAM

The direct cost of this program was reduced by transferring a portion of the salary expense to the Associate Degree Nursing program. The replacement value was calculated by using the established values for ability (the capability to perform certain tasks) and usability (the time available for direct patient care) times the number of student hours worked. The value for ability ranged from 20% in the 17th to 20th week of the course to 80% in the last 8 weeks of the course. The value of usability was 60% in the 17th through the 24th week and 70% thereafter. No value was assigned these students for the first 16 weeks of the course. This time was converted to full time equivalents and multiplied by $9,400 (salary plus fringe benefits for a typical LPN) to obtain the replacement value of approximately $76,000.

## SURGICAL TECHNICIANS PROGRAM

The replacement value for surgical technicians was established by using a value of 1 student equals 0.2 technicians for the first 16 weeks, 1 student equals 0.5 technicians for the next 8 weeks and 1 student plus part time assistance from an instructor is equal to a technician for the balance of the program. An equivalent number of full time technicians was calculated and multiplied times the salary and fringe benefits cost of a technician. This gave a replacement value of $53,000 for the year.

## SCHOOL OF RADIOLOGIC TECHNOLOGY

There were 19 second year students in the program and 23 first year students. We were advised that 1 first year student plus 1 second year student were the equivalent of one graduate technologist. The four extra first year students were considered to equal one technician. Therefore replacement value consisted of an amount equal to the salaries and fringe benefits of 20 typical technicians. The typical salary was taken as $8,200 per year and fringe benefits in the amount of $2,000. Therefore replacement value was approximately $204,000.

## INHALATION THERAPIST PROGRAM

The Hospital determined that one full time therapist is the equivalent of four student therapists. Therefore the 14 students would require 3.5 graduate therapists to replace them. A typical therapist would cost the Hospital $8,800 in salary plus $2,200 in fringe benefits for a total of $11,000 per year. The replacement value was approximately $38,000.

## MEDICAL TECHNOLOGIST PROGRAM

Direct costs for this program were increased by transferring a portion of instructor salary to this program from the Medical Laboratory Assistants' program and 2.49% of the laboratory salary expense was transferred into this program from laboratory salary expense. Fringe benefits were not attached to the transfer of salaries from the laboratory because the factor which was developed in a previous study by the Hospital has been considered as the equitable amount to be transferred. It was stated by the education coordinator that no net benefits are received by the Hospital from student services, because value received was considered offset by time required from laboratory personnel to assist the students.

## MEDICAL LABORATORY ASSISTANT PROGRAM

Direct costs for this program were decreased by transferring a portion of instructor salary from this program to the Medical Technologist Program and transferring 0.41% of the laboratory salary expense from the laboratory to this program. No net value to the Hospital for student services was determined, because value received was considered to be offset by assistance to students rendered by laboratory personnel.

## INTRAVENOUS THERAPY TECHNICIAN PROGRAM

In order to determine the replacement value of students in this program the percent of total workload performed by the students was calculated. The Hospital determined that students performed 26% of the total work. The remaining 74% of the work was performed by 12 full time technicians, 20 full time RN's and 10 part time RN's. Therefore the students replaced 4 full time technicians, and approximately the equivalent of 8 full time RN's. The value of a technician was assumed to be $7,300 in salary and $1,800 in fringe benefits for a total of $9,100 per full time employee and the value of a RN at $9,360 per year with fringe benefits of $2,340 for a total of $11,700 per full time nurse. The total replacement value therefore was approximately $130,000.

## CYTOLOGY TECHNICIAN PROGRAM

This program was discontinued during fiscal year 1971. No replacement value, tuition and fees nor external funds were identified for this program.

## CERTIFIED INHALATION THERAPY TECHNICIAN PROGRAM

It is estimated that during their on-the-job training students in this program average 18 treatments per day compared with 24 treatments per day for a graduate technician. During the training period there are 20 weeks of clinical practice. Assuming 6 persons graduate; their value is equivalent to 90 man weeks as graduate technicians work. A graduate technician costs the Hospital $113 per week for salary plus about $27 per week in fringe benefits. Therefore the replacement value of student services in this program is approximately $12,000.

# NURSING

## SCHOOL OF NURSING

The School of Nursing program curriculum provides that freshmen each receive 290 hours of patient care time, juniors 625.5 hours each and seniors 992 hours each. This amounted to approximately 195,000 hours of patient care or the equivalent of 93 full time personnel in 1971. Nursing administration estimates that it would require 17 LPN's and 9 RN's full time to replace the useful and necessary service provided by the students of the School of Nursing. The difference between the approximately 195,000 man hours expended in 1971 and the approximately 54,000 man hours which Nursing Administration estimates would be required to replace the student nurses, is due to the fact that the hours of patient care rendered by student nurses is primarily intended to be a learning experience for the students. Therefore, the schedule of floor time does not necessarily coincide with the hours of greatest need and the ability of students is more limited than that of graduates. A typical LPN is paid $7,525 per year and fringe benefits amount to approximately $1,875 per year, and a typical RN is paid $9,360 per year with fringe benefits of $2,340; then the replacement value of 17 LPN's and 9 RN's is approximately $265,100. The direct expenses in this department were also adjusted by ten percent of Audio Visual management salary.

## ASSOCIATE DEGREE NURSING PROGRAM

This program is still in the development stage and does not as yet have any students enrolled. Therefore there was no replacement value to student services for this program. Direct expenses were increased by transferring a portion of salary expense into this program from the Practical Nursing Program.

# MEDICAL

## ANESTHESIA RESIDENTS AND INTERNS

It was estimated by the Chief of the Department of Anesthesia that it would require one and one half full time anesthesiologists to replace the residents and interns in this program. Since these physicians would be private practitioners there could be no cost to the Hospital, however, these costs would be passed on to society through charges to patients. Therefore no replacement value was assigned to the enrollees in this program.

## RADIOLOGY RESIDENTS AND INTERNS

It was estimated by the Chief of the Department of Radiology that it would require 1 less full time radiologist in this department if there were no residents and interns to be trained. Since this would be a private practitioner there would be no change in Hospital costs. Therefore no replacement value was assigned to this program.

## PATHOLOGY RESIDENTS AND INTERNS

It was estimated by the Chief of the Department of Pathology that it would require two and one half full time pathologists to perform the services rendered by the 8 residents presently enrolled in the program. These would be salaried positions. The cost to the Hospital for salaries and fringe benefits was estimated at $108,000 in 1971. This amount was equivalent to the average of the total salaries and fringe benefits for pathologists in 1971 for the additional two and one half pathologists that would be required. Direct expenses for this program include 14% of all pathologist salaries, which was their estimated percent of total time devoted to teaching in this program.

## ORAL SURGERY RESIDENTS AND DENTAL INTERNS

It was estimated by the Director of the Department of Dentistry that it would require 2 full time dentists to provide the emergency coverage and the care for clinic patients now given by the 4 house staff members who provided approximately 10,000 patient care man hours in 1971. Because over 7,000 man hours per year are donated to teaching and clinic patient care at the present time, it was believed that additional time could not be donated by private practitioners. Therefore, if it were desired to continue providing this care to the community it would be necessary for the Hospital to hire 2 full time dentists. The cost to Hartford Hospital for this is estimated at $80,000 per year for salary and fringe benefits. This is based upon a salary of $32,000 per year each plus 25% in fringe benefits.

## ROTATING INTERNS

Because the participants in this program give services to the various clinical departments in which they work, the replacement value, if any, is considered in the estimates of those various departments. Similarly teaching costs on the part of the salaried staff is considered in each of the various clinical departments and not transferred into this program.

## MEDICINE RESIDENTS AND INTERNS

Category A costs for this department were adjusted by including 44% (per cent of total time devoted to education - see appendix for full explanation) of the full time physician salaries from the Department of Medicine plus appropriate percentage of part-time salaried physicians. This percentage was based upon interviews and surveys. The other 56% of salaried physician time was devoted to functions having no relation to education. Of this 56%, 38% was devoted to departmental administration of a non-educational nature and to highly specialized service functions (e.g., cardiac catherization, pulmonary function studies, etc.) which would have to be performed to maintain the Hospital's present level of service whether or not there was an educational program. The remaining 18% involve

community and patient care services which might possibly be duplicated in the replacement categories listed below. The value of these hours was estimated as $49,000 and subtracted from the estimated total replacement value of residents' services as indicated below.

During 1971 residents and interns in the Department of Medicine devoted approximately 116,400 man hours to patient care. This time was distributed as follows: 11,650 hours in the Emergency Room, 10,300 hours in clinics, and 94,450 hours to floor coverage for care of ward and private patients. It was estimated that the average physician's salary would be $30,000 per year plus fringe benefits of approximately 25%. The replacement value of the students was estimated by the Chief of the Department of Medicine as follows:

1. Emergency Room: There are about 15,000 medical patient-visits annually, an around-the-clock average of 40 per day, 7 days a week. For this reason it would be necessary to replace the present house staff coverage on a one-to-one basis. This would require 11,650 man hours per year (1 doctor 3 shifts per day and a second doctor for 1 shift 7 days per week). This could be done with 5 full-time physicians at a cost to the Hospital of $188,000 per year for salary and fringe benefits. (N.B.: in view of the entirely different problems presented by medical and surgical patients and the entirely different skills of physicians and surgeons, it is not possible to have full-time surgeons attend medical patients or vice-versa.)

2. Medical Clinics: If one assumes higher productivity from experienced physicians, it would require one-half the time devoted by house staff to cover the clinics run by the Department of Medicine. Based on 11,000 visits per year at 30 minutes per visit, this would mean 5,500 hours of physician time. This could be done by part-time physicians at $20 per hour cheaper than by 5 full-time physicians. The cost to Hartford Hospital would be $110,000 per year.

3. Floor Coverage: The average daily census of inpatients in this Department is approximately 270, of whom around 10% are ward patients. Providing medical services for these ward patients and emergency services for private patients when the in attendance physician is not in the Hospital would require one physician during the day and two on each of the evening and night shifts seven days per week. This represents 14,550 man hours of physician time per year or 7 full-time physicians at a cost of approximately $260,000 per year to the Hospital.

The total replacement value of interns and residents in this department is therefore approximately $558,000 per year. From this $49,000 was subtracted to compensate for the money the Hospital is already spending for services to patients by salaried physicians as explained above. The net replacement value is therefore $509,000 per year.

## PEDIATRIC RESIDENTS AND INTERNS

Category A costs for this department were adjusted by including 26% (per cent of total time devoted to education - see appendix for full explanation) of the full-time physician salaries from the Department of Pediatrics plus appropriate percentage of part-time salaried physicians. This percentage was based upon interviews and surveys. The other 74% of salaried physician time was devoted to functions having no relation to education. Of this 74%, 31% was devoted to non-educational administrative affairs of the department and to highly specialized service functions (as explained under Department of Medicine) which would have to be performed to maintain the Hospital's present level of service whether or not there was an education program. The remaining 43% involve community and patient care services which might possibly be included in the replacement categories listed below. The value of these hours was estimated as $35,000 and subtracted from the estimated total replacement value of residents' services as indicated below.

During 1971 approximately 28,000 man hours of House Staff time was devoted to patient care activities in this department. It was distributed as follows: 5,200 man hours to the ambulatory clinic and 22,800 hours for general care of inpatients, care of newborn infants, coverage of the emergency room, and coverage of all pediatric needs on nights and week-ends. The replacement value of these services was estimated by the Chief of the Department of Pediatrics. He did not believe it would be possible to get private practitioners to practice in the Hospital on a part-time basis, nor did he believe that enough physicians could be hired on a full-time basis to work in the clinics or to cover nights and week-ends. However, many medical functions could be assumed by nurse-practitioners. It was estimated that an average pediatrician's salary would be $30,00 per year and a minimum nurse-practitioner's salary $10,000 per year. Fringe benefits for both were calculated at 25%.

1. Clinics: There were 8,500 outpatient visits in 1971. The clinic staff also covers Emergency Room admissions during the daytime hours when the clinics are open. (There were 3,000 emergency visits in 1971.) It was estimated that 2 physicians and 3 nurse-practitioners would be necessary to cover the clinics eight hours per day, 5 days per week.

2. Floor and Night and Weekend Emergency Room Coverage: There is an average daily census of 59 children plus 10 infants in the newborn nursery. There may also be up to 8 acutely ill infants in the pediatric intensive care unit. Private pediatricians could attend to the general care of children and newborns, but the care of ward patients, emergency coverage of all these patients, and coverage of the emergency ward require two physicians and two nurse-practitioners five evenings per week, 1 each on the night shift five nights per weeks, and 1 each around the clock on week-ends. Scheduling adequate coverage would be theoretically possible but very difficult.

The total replacement value of interns and residents in this department is therefore approximately $312,500 per year. From this $35,000 was subtracted to compensate for the money the Hospital is already spending for direct services to patients by salaried physicians as explained above. The net replacement value is therefore $277,500 per year.

GENERAL SURGERY RESIDENTS AND INTERNS

Direct expenses were adjusted by including the residents' salaries charged to Laboratory for Experimental Surgery, all of the full time physician salaries (because it was stated by the Chief of Surgery that if there were no educational program in surgery there would be no need for full time salaried surgeons and administration of the department would revert to the voluntary staff) and one half of the part time physician's salary from the Department of Surgery, the services purchased from Dr. Painter and the supplies and expenses of the Laboratory for Experimental Surgery. There were 83,000 man hours of House Staff time in the Department of Surgery expended on patient care activities in 1971. Distribution was as follows: 17,500 man hours in the Emergency Room; 1,750 man hours in clinics and 63,750 man hours doing histories and physicals on patients, performing procedures, general non-emergency care of inpatients, assisting in the operating room, operating, providing night and weekend coverage, etc. The replacement value of house staff services was estimated by the Chief of the Department of Surgery and Dr. Wiese as follows:

1. Coverage of the 22,000 surgical patient visits to the Emergency Room would require approximately 14,600 man hours of physician time (one man 8 hours per day and two men sixteen hours per day seven days per week). This would cost the Hospital approximately $260,000 per year for salary and fringe benefits. Average physician salary estimated at $30,000 per year plus 25% in fringe benefits. (As noted under Department of Medicine, internists prepared to manage medical emergencies are not suited to replace surgeons.)

2. Clinic coverage for 7,600 visits would require approximately 1,650 hours per year. If this were to be covered by part time physicians at $20 per hour the cost to the Hospital would approximate $33,000 per year.

3. General surgery and GU, which have been combined for accounting purposes, together use seven operating suites during regular hours. It was estimated that without house staff a non-physician second assistant would be required for each suite and non-physician first assistant for three of the suites. Remaining assistants would be surgeons from the practicing staff who would work at no cost to the Hospital. It was estimated that the cost to the Hospital of providing 10 surgical technicians would be $84,500 per year.

4. Night coverage of an average of 185 surgical inpatients, including up to 15 in the Intensive Care Unit, and providing emergency operation assistance would require approximately 13,000 man hours (3 surgeons from 7 P.M. to 7 A.M. seven days per week). This excludes routine care of ward patients, and all daytime support activities for private patients including work-ups and procedures (it is assumed that private practitioners would assume this large load at no cost to the hospital). Scheduling 6 surgeons to provide this coverage would be difficult, but possible. This would represent a cost to the Hospital of approximately $260,000 per year. Average surgeon's salary estimated at $35,000 per year.

Therefore the total replacement value of house staff to the Hospital approximates $637,500 per year.

OBSTETRICS-GYNECOLOGY RESIDENTS AND INTERNS

Category A costs for this department were adjusted by including 22% (per cent of total time devoted to education - see appendix for full explanation) of the full-time physician salaries from the Department of Obstetrics-Gynecology. This percentage was based upon interviews and surveys. The other 78% of salaried physician time was devoted to functions having no relation to education. Of this 78%, 29% was devoted to departmental administration of a non-educational nature which would have to be performed to maintain the Hospital's present level of service whether or not there was an education program. The remaining 49% involve patient care services, and community services which might possibly be duplicated in the replacement categories listed below. The value of these hours was estimated as $35,000 and subtracted from the estimated total replacement value of residents' services as indicated below.

In 1971 the House Staff in this department devoted approximately 28,000 man hours to patient care. Of this total, 5,200 went to 10,000 visits to the Obstetrical Clinic, and 22,800 were to provide all care for ward patients, general coverage of private patients, and night and week-end coverage of the operating, delivery and emergency rooms. The average daily census was 112 patients. There were 4,084 deliveries during the year, of which 19% were ward patients. There were 1,500 emergency room visits. It was estimated by the Chief of Department of Obstetrics and Gynecology that it would require the same number of man hours of physician time to cover the clinics (2 physicians 8 hours per day, 5 days per week and 1 physician 4 hours per day, 5 days per week), and that considerably fewer man hours (9,300) were necessary to provide care for the ward patients and night and week-end coverage for private patients and for the delivery, operating and emergency rooms. This could be done by two physicians 5 evenings per week and by 1 physician on nights and week-ends. (This type of scheduling would be difficult and recruiting physicians would be extremely hard, if not impossible.) Coverage of ward patients during the day would be provided by the physicians who are staffing the clinics.

It is conceivable that many of these duties could be performed by paramedical personnel if such were available, but this would probably require more time per patient than if the services were delivered by an obstetrician-gynecologist. It was estimated that 9 paramedical persons could cover the floors, clinics, delivery rooms and emergency room, but it would be mandatory for one supervising obstetrician to be in the Hospital around the clock. Since this would require a total of 5 physicians in addition to the paramedical personnel, the cost to the Hospital would be greater than the alternative of providing care by physicians alone. The replacement value of the House Staff in this

department to the Hospital was therefore based on the annual salaries of 7 full-time obstetrician-gynecologists ($35,000 per year plus 25% fringe benefits). The total replacement value of interns and residents in this department is therefore approximately $305,000 per year. From this $35,000 was subtracted to compensate for the money the Hospital is already spending for services to patients by salaried physicians as explained above. The net replacement value is therefore $270,000 per year.

## ORTHOPEDIC SURGERY RESIDENTS AND INTERNS

The Chief of the Department of Orthopedics estimates that it would require 3 full-time physicians to provide emergency coverage. Another potential replacement consideration could be the use of orthopedic physician-assistants. Since it was assumed that in either case the costs of additional personnel would be absorbed by the practicing orthopedic staff there would be no cost to the Hospital, although it would be passed on directly to patients by charges.

## NEUROSURGERY RESIDENTS

The Chief of the Department of Neurosurgery estimated that the house staff's workload in the emergency room and ambulatory service could be handled by another private practitioner. However, assistants in the operating room, coverage for intensive care, and non-intensive postoperative surgical care would require two special surgical assistants and at least one specially trained RN during the day and one each during the night. Based on 7 specially trained personnel at an average salary of $15,000 including fringe benefits the replacement cost to the Hospital would be $105,000.

## UROLOGY RESIDENTS AND INTERNS

It was estimated by the Chief of the Department of Urology and Dr. Ridlon that the work of the two residents in the program would be absorbed by the practicing Urology staff if the educational program were to be discontinued. Because the replacement would be by private practitioners there would be no additional cost to the Hospital, but only to the public in general.

## OTORHINOLARYNGOLOGY RESIDENTS AND INTERNS

It was estimated by the Chief of the Department of Otorhinolaryngology that it would require extra time equivalent to one half person to replace the work presently done by the house staff. It was anticipated that this would be done voluntarily by the practicing staff therefore no additional cost would be incurred by the Hospital.

## OPTHALMOLOGY RESIDENTS AND INTERNS

The Chief of the Department of Opthalmology estimated that without house staff, clinic time would be reduced slightly and that the practicing opthalmology staff would cover the emergency room on a 24 hour basis. Therefore there would be no replacement cost to the Hospital.

## PSYCHIATRY RESIDENTS AND INTERNS

There are no residents or interns in this program at present. However, the salaried staff of psychiatrists and psychologists does devote a portion of its time teaching residents and interns from other programs. This cost is included in this program. However, residents from the Department of Medicine rotating through psychiatry do provide first contact coverage around the clock in the Emergency Room, where there were 1,600 patient visits during the year directly involving psychiatry. It was estimated by the director of the Department of Psychiatry that it would require the equivalent of one M.D. to replace these services at an approximate cost of $35,000.

**RELATED**

## ALLIED HEALTH ADMINISTRATION

Direct costs for this program were adjusted to include the salary of the Director of Allied Health Education. The Director of Allied Health Education estimated that the total costs of this department should be distributed on the following basis:

1. 10% of the total costs to the Department of Education.
2. 10% to the Associate Degree Nursing Program.
3. 80% distributed to the remaining Allied Health Programs on the basis of the number of students.

## AUDIO VISUAL DEPARTMENT

Direct expenses in this department were adjusted by assigning 10% of salary expense to School of Nursing and 10% of salary expense to Allied Health Residence to reflect the fact that the A-V director is also manager of student residences. The remaining cost was distributed based upon the best estimate of the Audio Visual Department manager as follows:

| | 1971 |
|---|---|
| To Medical Programs divided equally among them | 35% |
| To the School of Nursing | 15% |
| To the Practical Nurse Education Program | 5% |
| To the remaining Allied Health Programs | 10% |
| To cost centers outside education (administrative, Public Relations, etc.) | 35% |

## MEDICAL EDUCATION

Direct expenses were decreased by transferring out all the physician salaries which had been allocated to this department and charging them to the various programs based upon our surveys.

The remaining costs relate entirely to medical educational programs and were distributed based upon the best estimates of the people in the department as to how they spent their time as follows:

1. 30% to the rotating intern program.
2. balance divided among remaining medical programs based upon number of students in each.

## HEALTH SCIENCES LIBRARY

The direct costs of Robinson Library and Medical Library were combined to arrive at total direct cost for the Health Sciences Library. The Controller estimated that if there were no students, the following reductions in library costs would be effected: personnel would be reduced to 1 professional librarian and 2 clerical staff (although this is less than minimum staffing of two professional librarians suggested by the Connecticut Regional Program for non-teaching hospitals of this size); supplies and expense would be reduced to 90% of present level (the vast majority of this expenditure is represented by books, journals and periodicals most of which would continue to be required) and space would be reduced by 50%. These changes would reduce total library costs by approximately 45%. Therefore 55% of the total costs should be borne by cost centers other than educational programs. The Chief Librarian estimated that The School of Nursing, Allied Health and the medical programs as a group used equal amounts of library resources.

The costs were distributed as follows:

| | | |
|---|---|---|
| 1. | To cost centers other than educational programs for continuing education and reference by regular Hospital personnel and staff | 55% |
| 2. | To School of Nursing | 15% |
| 3. | To other Allied Health programs distributed equally among them | 15% |
| 4. | To Medical Programs distributed equally among them | 15% |

## STUDENT HEALTH CLINIC

The expenses of this department were distributed to each of the educational programs on the basis of the number of students in each.

## ALLIED HEALTH RESIDENCE

The direct expenses for this program were adjusted by transferring in 10% of Audio Visual Management salary. The costs for this department were distributed to the educational programs on the basis of number of students in each program living in.

## DEPARTMENT OF EDUCATION

Direct expenses in this department were adjusted to include an appropriate portion of the Director of Medical Education's salary and to exclude the salary of the Director of Allied Health Education. The Director of Education determined the manner in which the efforts of this department were directed.

The total costs of this department were then distributed to the various educational programs as follows:

1. One-third to the School of Nursing.
2. One-third to the Medical Programs
   A. one-half of this divided equally among Medicine, Pediatrics, Surgery and OB/GYN.
   B. one-half divided equally among the remaining medical programs.
3. One-third to Allied Health Programs divided equally among them.

## SUMMER STUDENT FELLOWS

This program was assumed to have no indirect nor allocated components. There were no external funds, replacement value, tuition, or fees identified for this program. The direct costs were allocated to certain Medical Programs according to the assignment of the individual. The distribution was as follows:

| | |
|---|---|
| Pediatrics | 7% |
| Psychiatry | 15% |
| Medicine | 50% |
| Pathology | 21% |
| OB/GYN | 7% |

## ANESTHESIA SUMMER STUDENT FELLOWS

This program was assumed to have no indirect nor allocated costs. There were no external funds, replacement value, tuition, or fees identified for this program. The direct costs were transferred 100% to the Anesthesia clinical program.

# QUALITATIVE FACTORS

## QUALITATIVE FACTORS

In the course of this study a number of costs and benefits were identified which were excluded from the summary of net costs for one or more of the following reasons:

- a reasonable basis for the support of any quantification could not be made;
- the costs were deemed to be outside the exclusive province of the Hospital;
- the costs were imputed and no cash transactions transpired nor could a replacement value be determined.

In addition, several observations were made during the course of the study which seem appropriate to include in this report because they do have a bearing on the value of hospital educational programs. These various costs, benefits and observations are listed below. No order of importance should be inferred as none is intended.

- There was nearly unanimous agreement among the medical staff that the clinical teaching function improves the skills of the practicing staff and is an important factor in keeping the private physicians abreast of the rapidly changing technology in the field of medical care. Several physicians expressed doubt that it would be possible to maintain the same standards of care if the teaching function were to be discontinued.
- If there were no house staff, who would be responsible (from both a medical and financial standpoint) for the care of ward patients? It was estimated that approximately 22,385 man hours of physician time provided to ward patients by house staff in 1971 was not provided for by the replacement of essential services. (This was based upon 10% of the 223,850 hours of the house staff patient care hours not replaced by the Hospital shown on physician time table on page 18.
- The educational programs assure the Hospital and the community a supply of well trained personnel in the various health fields.
- If the educational programs were to be discontinued what impact would this have on the ability of the Hospital to obtain qualified personnel in the future?
- Because more persons are trained at Hartford Hospital than are needed by the Hospital, other hospitals are able to obtain trained personnel without assuming the expense of their own educational programs.

- The large size of this hospital affords a wealth of exposure for the students that could not be provided by a smaller institution. Thus, students are more likely to achieve a better total concept of their role in providing health care to the patient.

- A significant amount of money was spent by private practitioners taking residents and interns to medical society meetings, seminars, conventions, etc.

- Many departments have funds, which are separate from those of the Hospital, devoted to the educational expenses of residents and interns. The sources of these funds are from self-assessment of the various staffs, contributions, bequests, fees earned by salaried physicians or house staff members, etc. Examples are the Medical Staff Education Fund, the Surgical Associates Fund, the Pediatrics-Cardiology Fund, the Department of Medicine Fund, the Hartwell Thompson Fund. In total these funds made available approximately $20,000 during 1971 to provide speakers or pay travel expense to conventions and seminars for house staff members. It is estimated that this will amount to approximately $22,000 in 1972.

- Many salaried physicians teach at other institutions from time to time. The total value of their time (exclusive of travel expense) during 1971 is estimated to be $68,000 for salaries and fringe benefits paid by the Hospital.

- A rapidly growing number of Hospital resources are being devoted to undergraduate medical education for University of Connecticut Medical School students.

- Approximately 97,000 man hours of practicing staff time was devoted to the various educational programs at the Hospital, and at no cost to the Hospital. This number is based upon data (sum of first two columns), obtained from questionnaires returned by members of the practicing staff. (See Schedule II.) The way these questions were phrased made it impossible to distinguish between self-education (rounds and conferences) and actual teaching (either formal lecturing or supervision of house staff in patient care on ward rounds). Since this large total figure means only an average of 5 hours per week per staff member, most time was probably spent on self-education (which would have to continue, as explained below) rather than on formal teaching.

- There were approximately 223,850 man hours of time devoted to patient care by the house staff of Hartford Hospital during 1971 which are deemed to be outside the Hospital's responsibilities if there should be no house staff (see table on pages 17 and 18). In regards to the 97,000 man hours devoted to educational programs of the Hospital by the practicing staff, representatives of the medical staff stated that it would be necessary for physicians to spend virtually all of that time on self education. This was based on the premise that teaching physicians derive nearly as much educational benefit from their teaching as they give. Therefore the 223,850 man hours of house staff time devoted to patient histories, physical examinations, assisting in surgery, writing orders, routine procedures, in essence, all non-emergency type of patient care, that was deemed outside the Hospital's province to provide, cannot to any significant degree be reduced by the existing practicing staff of the Hospital. This gives rise to several questions:

- Would it be possible to provide adequate replacement of those hours?

- Would the mode of delivering health care in the Hospital have to be changed? Would the Hospital have to recruit, train and hire numbers of paramedical personnel; and, if so, could this be done?

- Assuming sufficient numbers of trained persons could be obtained, what would the cost be to replace this time? For example, if we assume the productivity of an experienced physician is twice that of a house officer (although we have no evidence that this is true), the cost of replacing 1/2 of this time by private practitioners at $35/hour would be approximately $4,200,000.

# APPENDIX

# APPENDIX

In order to obtain information regarding the number of man hours devoted to education and to patient care, a series of questionnaires were designed and distributed. The questionnaires were followed up with a series of interviews. The interviews were intended to clarify answers given to specific questions on the previously distributed questionnaires as well as gain additional information.

The purpose of these questionnaires was not to determine the most appropriate way of utilizing personnel, but rather how they are being used. To do the former would require a deeper industrial engineering type of approach. However, in most cases the margin of error would not be material because in no case are more than 3 physicians used as replacements on any one shift. In most cases there are only one or two. Therefore, whether six-tenths or nine-tenths of a full-time equivalent is needed, one individual would still have to be provided.

A sample of each questionnaire and interview guide appears in this appendix. Brief comments on each are given below:

1. The Educational Program Description was sent to each person responsible for one or more of the programs considered in this study. Based upon responses to this questionnaire and follow-up interviews, the remaining questionnaires were designed and the interview format developed.

2. Three separate time logs were developed for the various medical programs:

   a. The Salaried Physician form allowed the recipient to account for all his time during a twelve-day period, specifically identifying time devoted to education at the Hospital and at other institutions. The amount of time spent on each activity was tabulated for each department, expressed as a percent of total time and checked with the department head for reasonableness, and whether the time period was representative of the entire year. The percent of total time devoted to education, determined in this manner, served as the basis for allocating the physician salaries to the various educational programs.

b. The Practicing Staff form asked for the number of hours during the twelve-day period devoted to: teaching, supervising care of House Staff Patients and departmental business. It also asked on an optional basis that they estimate the market value of their time.

c. The Resident/Intern form asked recipients to categorize their working time into one of three categories: primarily education: primarily patient care: or unable to classify as either patient care or education primarily. Respondents were informed that patient care activities were those activities which would have to be done by someone if the patient were to receive quality care. It also included time spent in the emergency room, clinics, and on night and weekend duty. Education included rounds, conferences, seminars, lectures and self study. Approximately 15% of total reported time fell in the third category. The third category was further refined by asking the question "If you were not doing that particular task would someone else have had to do it in order to properly care for a patient?". This resulted in the majority of this time being reclassified as either primarily education or primarily patient care.

3. The Clinical Programs form was the basic guide for interviewing chiefs of the clinical departments. During these interviews comments regarding the representativeness of the questionnaires received from persons in their department were also solicited. If it seemed that responses were not representative, additional questionnaires were obtained from persons in the department. Completed questionnaires were obtained from 98% of the salaried staff, 40% of the practicing staff and 55% of the residents and interns. At least a 50% response by residents and interns was obtained from each of the medical programs with 5 or more residents and interns enrolled, except one. In this instance the questionnaires were supplemented by personal interviews.

In most instances the persons responsible for each program were interviewed more than one time (5 to 7 separate occasions totalling 8-10 hours was not unusual) and usually by more than one interviewer. Conclusions reach by Ernst & Ernst representatives were discussed and comments solicited. This process resulted in a number of changes and we believe substantially improved the quality of the findings.

## EDUCATIONAL PROGRAM DESCRIPTION

1. Name of program.

2. Number of students by category.

3. Length of course.

4. Percent of entering students who complete course.

5. Number of man hours budgeted for full-time and part-time instructors.

6. Salaries or stipends paid students per year (per student by category, 1971 and 1972)? Please indicate wage progressions where applicable.

7. Description of course.

8. What are the material costs, other than supplies and expense, which are associated with this program?

9. Space used -- office, classroom, storage, etc. Please indicate room number.

10. Number of hours of on-the-job training or work for each phase of course per student.

11. What percent of graduates are employed by Hospital within a month of graudation (last 3 years)?

12. Instruction provided by other Hartford Hospital personnel:

    a. How many?

    b. What do they do (lecture or supervise on-the-job training)?

    c. How many hours does each devote to this program?

13. What facilities are required?

    a. Library

    b. Laboratory

    c. Visual aide

    d.

    e.

14. Do students receive any fringe benefits?

    a. Free health care

    b. Free meals

    c. Free rooms

    d. Laundry

    e.

    f.

17. What fees are paid by students (per student)?

18. In what way does the Hospital benefit from this program?

## SALARIED PHYSICIAN

Please complete the table below on a daily basis for the days indicated and return to the department director by Monday, December 6, 1971

Name: _____
(Print)

Service: _____

| Date | Number of Hours Spent on Administration | | Number of Hours Teaching at Other Institutions | Number of Hours Spent on Community Service | Number of Hours Spent Teaching at HH | Number of Hours Spent on Patient Care | Other |
|---|---|---|---|---|---|---|---|
| | Education | Other | | | | | |
| 11/22 | | | | | | | |
| 11/23 | | | | | | | |
| 11/24 | | | | | | | |
| 11/25 | | | | | | | |
| 11/26 | | | | | | | |
| 11/27 | | | | | | | |
| 11/28 | | | | | | | |
| 11/29 | | | | | | | |
| 11/30 | | | | | | | |
| 12/1 | | | | | | | |
| 12/2 | | | | | | | |
| 12/3 | | | | | | | |

PRACTICING STAFF

Please complete the table below on a daily basis for the days indicated and return to the department director by Monday, December 6, 1971.

Name: _____
(Print)

Service: _____

| Date | Number of Hours Primarily Devoted to Teaching | Number of Hours Devoted to Supervising Patient Care of House Staff Patients | Number of Hours Devoted To Departmental Business | | (OPTIONAL) Market Value of This Time Based on What Your Time is Worth |
|---|---|---|---|---|---|
| | | | Administrative | Other | |
| 11/22 | | | | | |
| 11/23 | | | | | |
| 11/24 | | | | | |
| 11/25 | | | | | |
| 11/26 | | | | | |
| 11/27 | | | | | |
| 11/28 | | | | | |
| 11/29 | | | | | |
| 11/30 | | | | | |
| 12/1 | | | | | |
| 12/2 | | | | | |
| 12/3 | | | | | |

RESIDENT/INTERN

Please complete the table below and return to your department director by Monday, December 6, 1971

Name: _____
(Print)

Department: _____

Postion: Intern, 1st Yr. Resident, 2nd Yr. Resident, 3rd Yr. Resident, 4th Yr. Resident _____

| Date | Number of Working Hours Primarily Devoted to Learning or Teaching | Number of Working Hours Primarily Devoted to Patient Care | Number of Working Hours Where it is Impossible to Separate Your Activities into Primarily Patient Care or Primarily Educational |
|---|---|---|---|
| 11/22 | | | |
| 11/23 | | | |
| 11/24 | | | |
| 11/25 | | | |
| 11/26 | | | |
| 11/27 | | | |
| 11/28 | | | |
| 11/29 | | | |
| 11/30 | | | |
| 12/1 | | | |
| 12/2 | | | |
| 12/3 | | | |

## CLINICAL PROGRAMS

Date _____

1. Name of program:

   Person interviewed:

2. How does each category of enrollee in the program devote his time: i.e., primarily learning - learning and rendering service combined - primarily rendering service.

3. How does each instructor devote his time: i.e., primarily teaching - combined teaching and rendering service - primarily rendering service (related to research, administration or patient care).

4. If this teaching program did not exist, what categories of cost would have to be borne by Hartford Hospital to replace the services rendered by the program?

5. What services do you receive from other teaching programs and what services do you provide other teaching programs?

IF ADDITIONAL SPACE REQUIRED, USE REVERSE SIDE AND/OR STAPLE ADDITIONAL PAGES.