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Letter to the Editor

Note re: Position Paper on Curative Cancer Chemotherapy. Cancer Res., *45:* 6523–6537, 1985.

In my Position Paper (1), an effort was made to estimate the number of patients cured by chemotherapy in the United States per annum. These estimates were made largely by the determination of cure rates from disease-free survival plateau multiplied by the number of patients within a given disease who were candidates for such treatment. Such curative treatment observed in clinical trials should, over time and technology transfer, be reflected in a declining mortality for the given disease. Indeed, declining mortality not related to a change in incidence has clearly been observed for the childhood solid tumors, acute lymphocytic leukemia, Hodgkin's disease, and testicular cancer. However, in general the annual number of patients cured, as estimated by cure rates from clinical trials multiplied by patients at risk, gives higher estimates than cure rates determined by declining mortality. Among the many factors that may contribute to this discrepancy, the extension of cure rates observed in centers to the community at large is a major one. In an effort to reconcile these 2 approaches, the number of patients cured has been recalculated. Where, for example, a major discrepancy exists, between the 2 approaches (for example, testicular and trophoblastic cancer), calculations were deleted from the table. The revisions in the tables are as follows (Table 1).

Table 1 *Curability of cancer by chemotherapy*

Type of cancer	Incidence (—)[a]	Potential curability			
		Established		Putative	
		%	No.	%	No.
ALL (pediatric)	2,000 (2,000)	50	1,000	80	1,600
ALL (adult)	600 (600)	20	120	40	240
AML (pediatric)	350 (350)	20	70	40	140
AML (adult)	6,000 (4,500)	10	450	20	900
Breast (pre-M)	41,500 (20,750)	10	2,075	20	4,150
Breast (post-M)	72,500 (26,100)	0	0	15	3,915
Gastric (Stage I)	24,500 (8,050)	0	0	15	1,213
Hodgkins' (Stages III and IV)	7,100 (4,260)	40	1,704	80	3,408
Lung, small cell					
Limited	18,005 (15,188)	10	1,519	20	3,038
Advanced	18,005 (9,315)	0	0	5	465
Lymphoma, non-Hodgkins'	23,000 (8,050)	40	3,220	60	4,830
Ovarian	23,000 (7,000)	0	0	10	700
Pediatric solid tumors[b]	1,534 (1,384)	60	830	60	830
Testicular	5,400 (?)	60		90	
Trophoblastic disease	(?)	>80		>80	
Total			10,988		25,429

[a] (—), subset appropriate for curative intent chemotherapy [see text and Ref. 3 of original Position Paper (1)]. For references, see text of Position Paper.
[b] Includes Wilms', rhabdomyosarcoma, Ewing's, lymphoma, and osteosarcoma.

Acute Lymphocytic Leukemia in Adults

Specific incidence figures are not available and were originally extrapolated (2). The number, however, must be revised. For all patients with ALL,[1] some 25–30% are over the age of 15 (3). Since the incidence of pediatric ALL is well documented at 2000/year in the United States, the appropriate incidence for adult ALL would be 600.

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[1] The abbreviations used are: ALL, acute lymphocytic leukemia; ACS, American Cancer Society.

Lymphoma, Non-Hodgkin's

There are 23,000 new cases estimated for 1985 (4). This is an extraordinarily heterogeneous group of diseases in which the more aggressive large cell varieties are curable by chemotherapy. These categories include diffuse histiocytic (30% of total), diffuse mixed (8%), diffuse poorly differentiated (10%), diffuse undifferentiated (2%), nodular mixed (5%), and nodular histiocytic (5%). The cure rate in some of these minor categories is less than that of diffuse histiocytic lymphoma by 10–30%. Some 10–20% of patients are elderly and are probably not candidates for curative intent chemotherapy. Adjusting for the aforementioned age and numbers, it is concluded that approximately 40% of patients are appropriate for curative cancer chemotherapy, and the figures are calculated accordingly. It represents a slightly downward revision of the number of patients cured in the original table [the above data are taken from some of the references to lymphoma in that paper and from Wintrobe (5)].

Pediatric Solid Tumors

This is another heterogeneous group of tumors which are not easy to analyze in a quantitative sense. In this group I have included Wilms' tumor, rhabdomyosarcoma, Ewing's sarcoma, lymphoma, and osteosarcoma. My original calculation for this incidence was 2250, based on ACS 1985 statistics. In a monograph on the subject by Dr. John Young, the number 1034 was developed. The numbers calculated by Drs. Weinstein and Sallan, pediatric oncologists at the Dana-Farber Cancer Institute, are between 1500 and 2000. I will take, therefore, a conservative figure, 1534, which represents a decrease of some 30–40% over the incidence in the original table. Approximately 10% of all these patients would not receive chemotherapy, generally because they are cured by local treatment.

For Wilms' tumor, the current disease-free survival plateau is 80% and has been for 5–10 years. The respective figure with surgery and radiotherapy would be only 20%.

For Ewing's sarcoma, the cure rate without chemotherapy is less than 10%. With chemotherapy it is 80%. All patients with embryonal rhabdomyosarcoma require chemotherapy. The cure rate without chemotherapy is estimated at less than 20%, and with chemotherapy, 75%. For neuroblastoma, there are 600 new cases/year in the U. S., of which 10%, or 60, have Stage IV disease. With modern chemotherapy, the cure rate for this specific stage has gone from 10–90% (neuroblastoma not included in the table).

For osteogenic sarcoma the cure rate has gone from 20–60%. Of patients with lymphoma, 40% have Hodgkin's disease, of which approximately one-half require chemotherapy. The remaining non-Hodgkin's lymphoma group requires chemotherapy, and the cure rate has gone from less than 20 to 80%, a figure which has been well established for over 5 years (disease-free survival plateau data).

Based on the above, a 60% increase in cure rate attributable to chemotherapy for the childhood solid tumors was calculated, with the number of patients saved being 830.

Testicular Cancer

Coming from the clinical side, the overall figure according to ACS estimates for incidence in 1985 is 5400. However, the

incidence according to Surveillance, Epidemiology, and End Result is 3500. Mortality figures, both for testicular cancer and trophoblastic disease, clearly demonstrate that the numbers I have listed under potential curability are too high when considering mortality data. The reason for the discrepancy is uncertain. Since the numbers of patients for these diseases are not large in any event, they have been left out in the revised table to avoid controversy.

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